THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/c/en/us/about/legal/trademarks.html. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2020 Cisco Systems, Inc. All rights reserved.
CONTENTS

PREFACE

About this Guide xxxv
   CLI Command Sections xxxv
   Conventions Used xxxvi
   Supported Documents and Resources xxxviii
   Related Documentation xxxviii
   Contacting Customer Support xxxviii

CHAPTER 1

Call Control Profile Configuration Mode 1
   a-msisdn 5
   access-restriction-data 6
   accounting context 8
   accounting mode 10
   accounting stop-trigger 11
   allocate-ptmsi-signature 11
   apn-restriction 12
   associate 13
   attach access-type 16
   attach allow 19
   attach imei-query-type 21
   attach implicit-url 22
   attach restrict 23
   authenticate all-events 26
   authenticate attach 28
   authenticate context 29
   authenticate detach 31
   authenticate on-first-vector 31
<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>authenticate rau</td>
<td>32</td>
</tr>
<tr>
<td>authenticate service-request</td>
<td>34</td>
</tr>
<tr>
<td>authenticate sms</td>
<td>36</td>
</tr>
<tr>
<td>authenticate tau</td>
<td>37</td>
</tr>
<tr>
<td>cc</td>
<td>39</td>
</tr>
<tr>
<td>check-zone-code</td>
<td>41</td>
</tr>
<tr>
<td>ciot-optimisation</td>
<td>42</td>
</tr>
<tr>
<td>ciphering-algorithm-gprs</td>
<td>43</td>
</tr>
<tr>
<td>csfb</td>
<td>44</td>
</tr>
<tr>
<td>dcnr</td>
<td>45</td>
</tr>
<tr>
<td>decor</td>
<td>46</td>
</tr>
<tr>
<td>description</td>
<td>47</td>
</tr>
<tr>
<td>diameter-result-code-mapping</td>
<td>48</td>
</tr>
<tr>
<td>direct-tunnel</td>
<td>49</td>
</tr>
<tr>
<td>dns-ggsn</td>
<td>51</td>
</tr>
<tr>
<td>dns-mrme</td>
<td>51</td>
</tr>
<tr>
<td>dns-msc</td>
<td>53</td>
</tr>
<tr>
<td>dns-sgsn</td>
<td>54</td>
</tr>
<tr>
<td>dns-pgw</td>
<td>54</td>
</tr>
<tr>
<td>dns-sgw</td>
<td>55</td>
</tr>
<tr>
<td>ecn</td>
<td>56</td>
</tr>
<tr>
<td>edrx</td>
<td>57</td>
</tr>
<tr>
<td>egtp</td>
<td>59</td>
</tr>
<tr>
<td>eir-profile</td>
<td>60</td>
</tr>
<tr>
<td>encryption-algorithm-lte</td>
<td>60</td>
</tr>
<tr>
<td>encryption-algorithm-umts</td>
<td>62</td>
</tr>
<tr>
<td>end</td>
<td>63</td>
</tr>
<tr>
<td>epdg-s2b-gtpv2</td>
<td>63</td>
</tr>
<tr>
<td>epdg-swm</td>
<td>64</td>
</tr>
<tr>
<td>equivalent-plmn</td>
<td>65</td>
</tr>
<tr>
<td>esm t3396-timeout</td>
<td>66</td>
</tr>
<tr>
<td>exit</td>
<td>68</td>
</tr>
<tr>
<td>gbr-bearer-preservation-timer</td>
<td>68</td>
</tr>
<tr>
<td>gmm Extended-T3312-timeout</td>
<td>69</td>
</tr>
</tbody>
</table>
gmm information-in-messages  70
gmm rau-accept  71
gmm retrieve-equipment-identity  72
gmm t3346  74
gs-service  75
gtp send  76
gtpp  79
gtpu fast-path  80
guti  81
gw-selection  82
hss  84
ie-override  86
ignore-ul-data-status  87
idle-mode-signaling-reduction  87
ims-apn  88
integrity-algorithm-lte  89
integrity-algorithm-umts  91
lcs-mo  92
lcs-mt  92
lcs-ni  93
local-cause-code-mapping apn-mismatch  93
local-cause-code-mapping apn-not-subscribed  95
local-cause-code-mapping apn-not-supported-in-plmn-rat  95
local-cause-code-mapping auth-failure  97
local-cause-code-mapping congestion  98
local-cause-code-mapping ctxt-xfer-fail-mme  100
local-cause-code-mapping ctxt-xfer-fail-sgsn  101
local-cause-code-mapping gw-unreachable  102
local-cause-code-mapping hss-unavailable  103
local-cause-code-mapping map-cause-code  104
local-cause-code-mapping no-active-bearers  106
local-cause-code-mapping odb packet-services  107
local-cause-code-mapping odb roamer-to-vplmn  108
local-cause-code-mapping path-failure  109
prefer subscription-interface 149
psm 150
ptmsi-reallocate 152
ptmsi-signature-reallocate 154
qos 156
rau-inter 159
rau-inter-plmn 163
rau-intra 166
re-authenticate 169
regional-subscription-restriction 170
release-access-bearer 172
reporting-action 173
reuse-authentication-triplets 174
rfsp-override 175
rfsp-override ue-settings 176
routing-area-list 178
sl-reset 179
samog-cdr 179
samog-gtpv1 180
samog-s2a-gtpv2 181
sctp-down 183
secondary-rat 184
serving-plmn 185
serving-plmn-rate-control 186
sgs-cause-code-mapping 187
sgsn-address 188
sgsn-core-nw-interface 191
sgsn-number 193
sgtp-service 194
sgw-retry-max 195
sms-in-mme 196
sms-mo 197
sms-mt 198
srm-s-inter 199
srns-intra 200
srvcc exclude-stnsr-nanpi 202
drvcc 202
subscriber multi-device 203
subscriber-control-inactivity 204
super-charger 205
tau 206
tcp-maximum-segment-size 207
timeout 208
treat-as-hplmn 209
vplmn-address 209
zone-code 210

CHAPTER 2

Call-Home Configuration Mode 213
activate 213
alert-group 214
contact-email-addr 215
contract-id 216
customer-id 217
end 218
exit 218
mail-server 218
phone-number 219
profile 220
rate-limit 221
sender 221
site-id 222
street-address 223

CHAPTER 3

Call-Home Profile Configuration Mode 225
active 225
destination 226
end 228
exit 228
subscribe-to-alert-group 228

CHAPTER 4
CAMEL Service Configuration Mode Commands 233
associate-sccp-network 233
end 234
exit 234
tcap destination-address 235
timeout 235

CHAPTER 5
Card Configuration Mode Commands 239
end 239
exit 239
link-aggregation 240
mode 241
shutdown 242

CHAPTER 6
CBS Service Configuration Mode Commands 245
bind 245
cbc-address-validation 246
cbc-server 247
end 248
exit 248
sabp timer 248
sabp-class2-aggregation 249
tcp-keepalive 249
tcp-mode 250

CHAPTER 7
Cell Trace Module Configuration Mode Commands 253
cell-trace 253
do show 255
end 256
exit 256
file 256
CHAPTER 8

Certificate Policy Configuration Mode Commands 259
- do show 259
- end 260
- exit 260
- id 260

CHAPTER 9

CGW Service Configuration Mode Commands 263
- associate 263
- bind 265
- enable-bra-failure-handling 267
- end 267
- exit 267
- gre sequence-numbers 268
- reg-lifetime 268
- revocation 269
- session-delete-delay 270
- timestamp-option-validation 271
- timestamp-replay-protection 271

CHAPTER 10

Cipher Suite Configuration Mode Commands 273
- encryption 273
- end 274
- exit 274
- hmac 275
- key-exchange 275

CHAPTER 11

Class-Map Configuration Mode Commands 277
- end 277
- exit 278
- match any 278
- match dst-ip-address 279
- match dst-port-range 279
- match ip-tos 280
match ipsec-spi  281
match packet-size  282
match protocol  283
match src-ip-address  284
match src-port-range  285

CHAPTER 12

Congestion Action Profile Configuration Mode Commands  287
ddn  287
drop  288
end  290
exclude-emergency-events  291
exclude-voice-events  291
exit  292
none  292
reject  294
report-overload  296

CHAPTER 13

Connected Apps Configuration Mode Commands  299
activate  299
certificate-name  300
end  301
exit  301
ha-chassis-mode  301
ha-network-mode  302
rri-mode  303
sess-ip-address  304
sess-name  304
sess-passwd  305
sess-userid  306

CHAPTER 14

Content Filtering Policy Configuration Mode Commands  307
analyze  307
discarded-flow-content-id  312
end  313
Content Filtering Server Group Configuration Mode Commands 317

connection retry-timeout 317
deny-response code 318
dictionary 319
end 320
exit 321
failure-action 321
header extension options 323
icap server 324
origin address 326
response-timeout 326
timeout action 327
url-extraction 327

Context Configuration Mode Commands A-D 329

aaa accounting 330
aaa authentication 332
aaa constructed-nai 333
aaa filter-id rulebase mapping 335
aaa group 336
aaa nai-policy 337
aaa tacacs+ 338
access-list undefined 339
administrator 339
apn 342
asn-qos-descriptor 344
asn-service-profile 345
asngw-service 346
asnpe-service 347
associate 349
diameter dictionary 389

diameter endpoint 389

diameter-hdd-module 391

diameter sctp 392

diameter origin 393

dns-client 393

domain 394

CHAPTER 17

Context Configuration Mode Commands E-H 397

eap-profile 398

edr-module active-charging-service 399

egtp-service 400

dns-client 393
CHAPTER 18  

**Context Configuration Mode Commands I-M**  
ikev1 disable-initial-contact  481  
ikev1 disable-phase1-rekey  482  
ikev1 keepalive dpd  482  
ikev1 policy  484  
ikev2-ikesa  485  
ims-auth-service  487  
ims-sh-service  489  
inspector  490  
interface  492  
ip access-group  494  
ip access-list  495  
ip arp  496  
ip as-path access-list  497  
ip community-list  498  
ip dns-proxy source-address  500  
ip domain-lookup  501  
ip domain-name  501  
ip extcommunity-list  502  
ip forward  503  
ip guarantee  504  
ip identification packet-size-threshold  505  
ip igmp profile  506  
ip localhost  506  
ip name-servers  507  
ip pool  509  
ip prefix-list  523  
ip prefix-list sequence-number  524  
ip route  525  
ip routing maximum-paths  528  
ip routing overlap-pool  529  
ip rri  530  
ip rri-route  531
map-service  568
max-sessions  569
mipv6ha-service  571
mme-embms-service  572
mme-service  573
mobile-access-gateway  575
mobile-ip fa  575
mobile-ip ha assignment-table  577
mobile-ip ha newcall  578
mobile-ip ha reconnect  579
monitor-protocols  580
mpls bgp forwarding  580
mpls exp  581
mpls ip  582
mseg-service  583
multicast-proxy  583

CHAPTER 19

Context Configuration Mode Commands N-R  585

nw-reachability server  587
network-requested-pdp-context activate  588
network-requested-pdp-context gsn-map  590
network-requested-pdp-context hold-down-time  591
network-requested-pdp-context interval  592
network-requested-pdp-context sgsn-cache-time  592
operator  593
optimize pdsn inter-service-handoff  596
password  596
pcc-af-service  598
pcc-policy-service  599
pcc-service  601
pcc-sp-endpoint  602
pdg-service  604
pdif-service  604
pdns-service  605
radius dictionary 656
radius group 658
radius ip vrf 658
radius keepalive 659
radius max-outstanding 661
radius max-retries 662
radius max-transmissions 662
radius mediation-device 663
radius probe-interval 663
radius probe-max-retries 664
radius probe-message 665
radius probe-timeout 666
radius server 666
radius strip-domain 669
radius timeout 670
radius trigger 671
realtime-trace-module 672
remote-server-list 672
route-access-list extended 673
route-access-list named 675
route-access-list standard 676
route-map 677
router 678

CHAPTER 20

Context Configuration Mode Commands S-Z 681
s102-service 682
saegw-service 683
sbc-service 684
server 685
service-redundancy-protocol 687
session-event-module 687
sgsn-service 688
sgs-service 689
sgtp-service 690
<table>
<thead>
<tr>
<th>Command Line Interface Reference, Modes C - D, StarOS Release 21.20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Control Configuration Mode Commands</strong></td>
</tr>
<tr>
<td>apn-name-to-be-included 714</td>
</tr>
<tr>
<td>app-level-retransmission 715</td>
</tr>
<tr>
<td>associate 716</td>
</tr>
<tr>
<td>charging-rulebase-name 717</td>
</tr>
<tr>
<td>diameter dictionary 718</td>
</tr>
<tr>
<td>diameter disable-final-reporting-in-ccru 719</td>
</tr>
<tr>
<td>diameter dynamic-rules request-quota 720</td>
</tr>
<tr>
<td>diameter enable-quota-retry 721</td>
</tr>
<tr>
<td>diameter exclude-mscc-in-ccr-terminate 722</td>
</tr>
<tr>
<td>diameter fui-redirected-flow 723</td>
</tr>
<tr>
<td>diameter gsu-with-only-infinite-quota 723</td>
</tr>
<tr>
<td>diameter hdd 724</td>
</tr>
</tbody>
</table>
redirect-require-user-agent 764
servers-unreachable 765
subscription-id service-type 770
timestamp-rounding 771
trigger type 772
usage-reporting 774

CHAPTER 22
Credit Control Service Configuration Mode Commands 777
diameter dictionary 777
diameter endpoint 778
end 779
exit 779
failure-handling 779
request timeout 780

CHAPTER 23
CRP Configuration Mode Commands 783
CRP Configuration Mode Commands 783
node-type 784
monitor bgp context 784
end 785

CHAPTER 24
Crypto Group Configuration Mode Commands 787
end 787
exit 788
match address 788
match ip pool 789
switchover 791

CHAPTER 25
Crypto Map IPSec Dynamic Configuration Mode Commands 793
end 793
exit 794
set 794
CHAPTER 26  

Crypto IPSec Configuration Mode Commands  799
  end  799
  exit  800
  replay window-size  800
  transform-set  801

CHAPTER 27  

Crypto Map IPSec Manual Configuration Mode Commands  803
  end  804
  exit  804
  match address  804
  set control-dont-fragment  806
  set ip mtu  807
  set ipv6 mtu  808
  set peer  809
  set session-key  810
  set transform-set  813

CHAPTER 28  

Crypto Map IKEv2-IPv4 Configuration Mode Commands  815
  allow-cert-enc cert-hash-url  816
  authentication  816
  blacklist  818
  ca-certificate list  818
  ca-crl list  819
  certificate  821
  control-dont-fragment  822
  end  823
  exit  823
  ikev2-ikesa  824
  keepalive  826
  match  827
  natt  829
  ocsp  830
  payload  831
Crypto Map IPSec IKEv1 Configuration Mode Commands

end
exit
ipsec-on-demux
match address
match crypto group
match ip pool
set

Crypto Map IKEv2-IPv4 Payload Configuration Mode Commands

end
exit
ipsec
lifetime
rekey

Crypto Map IKEv2-IPv6 Configuration Mode Commands

allow-cert-enc cert-hash-url
authentication
blacklist
certificate
ca-certificate list
certificate
control-dont-fragment
end
exit
ikev2-ikesa
keepalive
match
certificates
Crypto Map IKEv2-IPv6 Payload Configuration Mode Commands 873

end 873
exit 874
ipsec 874
lifetime 875
rekey 877

Crypto Template Configuration Mode Commands 879

allow-cert-enc cert-hash-url 880
allow-custom-fqdn-idr 880
authentication 881
blacklist 883
certificate 885
certificate-list 884
dos-cookie-challenge notify-payload 888
dns-handling 887
ecn 889
end 890
exit 890
identity local 891
ikev2-ikesa 892
ikev2-ikesa-ddos 896
ikev2-ikesa-dscp 898
ip 898
ipv6 900
keepalive 901
Crypto Template IKEv2-Dynamic Payload Configuration Mode Commands

end 913
exit 914
ignore-rekeying-requests 914
ip-address-allocation 915
ipsec transform-set 916
lifetime 916
maximum-child-sa 917
rekey 918
tsi 919
tsr 920

Crypto Template IKEv2-Vendor Configuration Mode Commands

configuration-payload 923
do show 924
end 925
exit 925
ikev2-ikesa 925
keepalive 927
payload 928
CHAPTER 36  
**Crypto Template IKEv2-Vendor Payload Configuration Mode Commands**  
do show  
end  
exit  
ignore-rekeying-requests  
ipsec  
lifetime  
rekey  

CHAPTER 37  
**Crypto IPSec Transform Set Configuration Mode Commands**  
end  
exit  
mode  

CHAPTER 38  
**Crypto Vendor Policy Configuration Mode Commands**  
do show  
end  
exit  
precedence  

CHAPTER 39  
**CSS Delivery Sequence Configuration Mode Commands**  
end  
exit  
recovery  
server-interface  

CHAPTER 40  
**DDN APN Profile Configuration Mode Commands**  
end  
exit  
isr-sequential-paging  
qci
CHAPTER 41  Decor Profile Configuration Mode Commands  951

dcn-id  951
description  952
dns  953
do show  953
end  954
exit  954
mmegi  954
plmn-id  955
served-dcn  956
ue-usage-types  957

CHAPTER 42  DHCP Client Profile Configuration Mode Commands  959

client-identifier  959
dhcpv6-client-unicast  960
disable  961
enable  962
end  963
exit  963
request  963

CHAPTER 43  DHCP Server Profile Configuration Mode Commands  965

dhcpv6-server-preference  965
disable  966
enable  967
end  968
exit  968
process  969

CHAPTER 44  DHCP Service Configuration Mode Commands  971

allow  972
bind  973
default  975
DHCPv6 Client Configuration Mode Commands

```
dhcp chaddr-validate
dhcp client-identifier
dhcp deadtime
dhcp detect-dead-server
dhcp ip vrf
dhcp server
dhcp server selection-algorithm
```

CHAPTER 45

```
end
exit
lease-duration
lease-time
max-retransmissions
retransmission-timeout
T1-threshold
T2-threshold
```

DHCPv6 Server Configuration Mode Commands

```
dhcp server
```

CHAPTER 46

```
end
exit
ipv6
preferred-lifetime
prefix-delegation
rebind-time
renew-time
valid-lifetime
```

```
CHAPTER 47  DHCPv6 Service Configuration Mode Commands  1005

bind  1005
deadtime  1006
detect-dead-server  1007
dhcpv6-client  1008
dhcpv6-server  1009
end  1010
exit  1010
server  1010

CHAPTER 48  Diameter Endpoint Configuration Mode Commands  1013

app-level-retransmission  1014
associate  1015
cea-timeout  1016
connection retry-timeout  1017
connection timeout  1018
description  1018
destination-host-avp  1019
device-watchdog-request  1021
dpa-timeout  1021
dscp  1022
dynamic-peer-discovery  1023
dynamic-peer-failure-retry-count  1024
dynamic-peer-realm  1025
dynamic-route  1026
end  1026
exit  1027
load-balancing-algorithm  1027
max-outstanding  1028
origin address  1029
origin host  1029
origin realm  1031
osid-change  1032
DSCP Template Configuration Mode Commands

control-packet 1087
end 1089
exit 1089
data-packet 1090
About this Guide

The ASR 5000 hardware platform has reached end of life and is not supported in this release. Any references to the ASR 5000 (specific or implied) or its components in this document are coincidental. Full details on the ASR 5000 hardware platform end of life are available at: https://www.cisco.com/c/en/us/products/collateral/wireless/asr-5000-series/eos-eol-notice-c51-735573.html.

The HA, HSGW, PDSN, and SecGW products have reached end of life and are not supported in this release. Any references to these products (specific or implied) their components or functions including CLI commands and parameters in this document are coincidental and are not supported. Full details on the end of life for these products are available at: https://www.cisco.com/c/en/us/products/collateral/wireless/asr-5000-series/eos-eol-notice-c51-740422.html.

The ePDG and SaMOG products are not supported in this release. Any references to these products (specific or implied) their components or functions including CLI commands and parameters in this document are coincidental and are not supported. For more information, contact your Cisco Account representative.

This preface describes the Command Line Interface Reference and its document conventions.

This reference describes how to use the command line interface (CLI) to interact with the products supported by the StarOS™. The CLI commands are organized by command modes in the code and in this reference. The command modes are presented alphabetically. The description of each command states the command's function, describes its syntax, presents limitations when applicable, and offers an example of its usage.

- CLI Command Sections, on page xxxv
- Conventions Used, on page xxxvi
- Supported Documents and Resources, on page xxxviii
- Contacting Customer Support, on page xxxviii

CLI Command Sections

The following table describes the individual sections in the command descriptions presented in this reference.
### Section

**Product**  
The product(s) supporting the CLI command.

**Privilege**  
The user privilege levels having access to the CLI command.  
For more information on user types and user privileges, refer to the *CLI Administrative Users* section in the *Command Line Interface Overview* chapter.

**Mode**  
The command and configuration mode sequences to the CLI configuration mode for the CLI command.  
For more information on command modes, refer to the *CLI Command Modes* section in the *Command Line Interface Overview* chapter.

**Syntax**  
The command's syntax.  
For more information on CLI command syntax, refer to the *CLI Command Syntax* section in the *Command Line Interface Overview* chapter.

**Usage**  
Information about the command's usage including dependencies and limitations, if any.

**Example**  
Example(s) of the command.

---

### Conventions Used

The following tables describe the conventions used throughout this documentation.

<table>
<thead>
<tr>
<th>Notice Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Note</td>
<td>Provides information about important features or instructions.</td>
</tr>
<tr>
<td>Caution</td>
<td>Alerts you of potential damage to a program, device, or system.</td>
</tr>
<tr>
<td>Warning</td>
<td>Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typeface Conventions</th>
<th>Description</th>
</tr>
</thead>
</table>
| Text represented as a screen display | This typeface represents displays that appear on your terminal screen, for example:  
  **Login:** |
### Typeface Conventions

<table>
<thead>
<tr>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text represented as <strong>commands</strong></td>
<td>show ip access-list</td>
</tr>
<tr>
<td></td>
<td>This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.</td>
</tr>
<tr>
<td>Text represented as a <strong>command variable</strong></td>
<td>show card slot_number</td>
</tr>
<tr>
<td></td>
<td>slot_number is a variable representing the desired chassis slot number.</td>
</tr>
<tr>
<td>Text represented as menu or sub-menu names</td>
<td>Click the <strong>File</strong> menu, then click <strong>New</strong></td>
</tr>
</tbody>
</table>

### Command Syntax Conventions

<table>
<thead>
<tr>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>{ <strong>keyword</strong> or <strong>variable</strong> }</td>
<td>sctp-max-data-chunks { limit max_chunks</td>
</tr>
<tr>
<td></td>
<td>If a keyword or variable is not enclosed in braces or brackets, it is mandatory. For example:</td>
</tr>
<tr>
<td></td>
<td>snmp trap link-status</td>
</tr>
<tr>
<td>[ <strong>keyword</strong> or <strong>variable</strong> ]</td>
<td>Optional keywords or variables, or those that a user may or may not choose to use, are surrounded by brackets.</td>
</tr>
</tbody>
</table>
**Command Syntax Conventions**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some commands support multiple options. These are documented within braces or brackets by separating each option with a vertical bar. These options can be used in conjunction with required or optional keywords or variables. For example:</td>
</tr>
<tr>
<td>`action activate-flow-detection { initiation</td>
</tr>
<tr>
<td>`ip address [ count number_of_packets</td>
</tr>
</tbody>
</table>

**Supported Documents and Resources**

**Related Documentation**

The most up-to-date information for this product is available in the product *Release Notes* provided with each software release.

The following related product documents are also available:

- *AAA Interface Administration and Reference*
- *GTPP Interface Administration and Reference*
- *IPSec Reference*
- *Platform-specific System Administration Guides*
- *Product-specific Administration Guides*
- *Release Change Reference*
- *SNMP MIB Reference*
- *Statistics and Counters Reference*
- *Statistics and Counters Reference - Bulk Statistics Descriptions*
- *Thresholding Configuration Guide*

**Contacting Customer Support**

Use the information in this section to contact customer support.
Refer to the support area of http://www.cisco.com for up-to-date product documentation or to submit a service request. A valid username and password are required to access this site. Please contact your Cisco sales or service representative for additional information.
CHAPTER 1

Call Control Profile Configuration Mode

The MME and SGSN each support a maximum of 1,000 call control profiles; only one profile can be associated with an operator policy.

By configuring a call control profile, the operator fine tunes any desired restrictions or limitations needed to control call handling per subscriber or for a group of callers across IMSI (International Mobile Subscriber Identity) ranges.

Command Modes

Call Control Profile configuration mode defines call-handling rules which can be combined with other profiles – such as an APN profile (see the APN Profile Configuration Mode Commands chapter) – when using the Operator Policy feature. The call control profile is a key element in the Operator Policy feature and the profile is not valid until it is associated with an operator policy (see the associate command in the Operator Policy Configuration Mode Commands chapter).

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- a-msisdn, on page 5
- access-restriction-data, on page 6
- accounting context, on page 8
- accounting mode, on page 10
- accounting stop-trigger, on page 11
- allocate-ptmsi-signature, on page 11
- apn-restriction, on page 12
- associate, on page 13
- attach access-type, on page 16
- attach allow, on page 19
- attach imei-query-type, on page 21
- attach implicit-ulr, on page 22
- attach restrict, on page 23
• authenticate all-events, on page 26
• authenticate attach, on page 28
• authenticate context, on page 29
• authenticate detach, on page 31
• authenticate on-first-vector, on page 31
• authenticate rau, on page 32
• authenticate service-request, on page 34
• authenticate sms, on page 36
• authenticate tau, on page 37
• cc, on page 39
• check-zone-code, on page 41
• ciot-optimisation, on page 42
• ciphering-algorithm-gprs, on page 43
• csfb, on page 44
• dcnr, on page 45
• decor, on page 46
• description, on page 47
• diameter-result-code-mapping, on page 48
• direct-tunnel, on page 49
• dns-ggsn, on page 51
• dns-mrne, on page 51
• dns-msc, on page 53
• dns-sgsn, on page 54
• dns-pgw, on page 54
• dns-sgw, on page 55
• ecn, on page 56
• edrx, on page 57
• egtp, on page 59
• eir-profile, on page 60
• encryption-algorithm-lte, on page 60
• encryption-algorithm-umts, on page 62
• end, on page 63
• epdg-s2b-gtpv2, on page 63
• epdg-swm, on page 64
• equivalent-plmn, on page 65
• esm t3396-timeout, on page 66
• exit, on page 68
• gbr-bearer-preservation-timer, on page 68
• gmm Extended-T3312-timeout, on page 69
• gmm information-in-messages, on page 70
• gmm rau-accept, on page 71
• gmm retrieve-equipment-identity, on page 72
• gmm t3346, on page 74
• gs-service, on page 75
• gtp send, on page 76
• gtp, on page 79
• gtpu fast-path, on page 80
• guti, on page 81
• gw-selection, on page 82
• hss, on page 84
• ie-override, on page 86
• ignore-ul-data-status, on page 87
• idle-mode-signaling-reduction, on page 87
• ims-apn, on page 88
• integrity-algorithm-lte, on page 89
• integrity-algorithm-umts, on page 91
• lcs-mo, on page 92
• lcs-mt, on page 92
• lcs-ni, on page 93
• local-cause-code-mapping apn-mismatch, on page 93
• local-cause-code-mapping apn-not-subscribed, on page 95
• local-cause-code-mapping apn-not-supported-in-plmn-rat, on page 95
• local-cause-code-mapping auth-failure, on page 97
• local-cause-code-mapping congestion, on page 98
• local-cause-code-mapping ctxt-xfail-mme, on page 100
• local-cause-code-mapping ctxt-xfail-sgsn, on page 101
• local-cause-code-mapping gw-unreachable, on page 102
• local-cause-code-mapping hss-unavailable, on page 103
• local-cause-code-mapping map-cause-code, on page 104
• local-cause-code-mapping no-active-bearers, on page 106
• local-cause-code-mapping odb packet-services, on page 107
• local-cause-code-mapping odb roamer-to-vplmn, on page 108
• local-cause-code-mapping path-failure, on page 109
• local-cause-code-mapping peer-node-unknown, on page 110
• local-cause-code-mapping pgw-selection-failure, on page 111
• local-cause-code-mapping restricted-zone-code, on page 112
• local-cause-code-mapping sgw-selection-failure, on page 113
• local-cause-code-mapping vlr-down, on page 114
• local-cause-code-mapping vlr-unreachable, on page 115
• location-area-list, on page 116
• location-reporting, on page 117
• lte-zone-code, on page 118
• map, on page 120
• map-service, on page 122
• max-bearers-per-subscriber, on page 122
• max-pdns-per-subscriber, on page 123
• min-unused-auth-vectors , on page 124
• mme sf6a, on page 125
• mme sgd, on page 126
• mobility-protocol, on page 127
• monitoring-events, on page 127
• mps, on page 128
- msc-fallback-disable, on page 129
- nb-iot, on page 130
- network-feature-support-ie, on page 132
- network-initiated-pdp-activation, on page 133
- override-arp-with-ggsn-arp, on page 136
- paging-priority, on page 137
- pcesf-restoration, on page 139
- pdp-activate access-type, on page 139
- pdp-activate allow, on page 140
- pdp-activate restrict, on page 141
- pdn-type-override, on page 143
- peer-mme, on page 144
- peer-msc, on page 146
- peer-nri-length, on page 146
- plmn-protocol, on page 148
- prefer subscription-interface, on page 149
- psm, on page 150
- ptmsi-reallocate, on page 152
- ptmsi-signature-reallocate, on page 154
- qos, on page 156
- rau-inter, on page 159
- rau-inter-plmn, on page 163
- rau-intra, on page 166
- re-authenticate, on page 169
- regional-subscription-restriction, on page 170
- release-access-bearer, on page 172
- reporting-action, on page 173
- reuse-authentication-triplets, on page 174
- rfsr-override, on page 175
- rfsr-override ue-settings, on page 176
- routing-area-list, on page 178
- s1-reset, on page 179
- samog-cdr, on page 179
- samog-gtpv1, on page 180
- samog-s2a-gtpv2, on page 181
- sctp-down, on page 183
- secondary-rat, on page 184
- serving-plmn, on page 185
- serving-plmn-rate-control, on page 186
- sgs-cause-code-mapping, on page 187
- sgsn-address, on page 188
- sgsn-core-nw-interface, on page 191
- sgsn-number, on page 193
- sgtp-service, on page 194
- sgw-retry-max, on page 195
- sms-in-mme, on page 196
a-msisdn

Enables the MME to advertise support for Additional Mobile Station ISDN number (A-MSISDN) functionality to the HSS.

**Product**
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] a-msisdn
```

**remove**

Disables support for A-MSISDN functionality on the MME. Disabled is the default behavior.

**Usage Guidelines**

This command enables the MME to notify the HSS of support for Additional-MSISDN for the PLMN associated with this call-control profile in Update Location Request (ULR) messages. Complete the MME configuration to fully support A-MSISDN functionality by instructing the MME to support the AVPs as defined in 3GPP 29.274 Release 11. This is done by using the 3gpp-r11 keyword with the diameter update-dictionary-avps command in the HSS Peer Service configuration mode.

With A-MSISDN functionality configured, the MME informs the HSS of A-MSISDN support so the MME sends Feature-List AVP, with an A-MSISDN flag set and the MSISDN, in Update Location Request (ULR) messages over the S6a interface to the HSS at the time a UE Attaches.

If the the MSISDN (A-MSISDN) is available in the subscription data, the HSS sends the provisioned Additional-MSISDN together with the MSISDN in the Update Location Answer (ULA) or the
Insert-Subscriber-Data-Request (ISDR). The MME uses the received A-MSISDN as a Correlation-MSISDN (C-MSISDN) in "SRVCC PS to CS Request" and/or in "Forward Relocation Request" messages.

**Example**
After the `a-msisdn` command has been used to enable support, disable A-MSISDN support with the following command:

```plaintext
remove a-msisdn
```

---

**access-restriction-data**

Enables the operator to assign a failure code to be included in reject messages if the attach rejection is due to access restriction data (ARD) checking in the incoming subscriber data (ISD) messages. The operator can also disable the ARD checking behavior.

**Product**
MME  
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration  
```plaintext
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
access-restriction-data { eutran-not-allowed | failure-code cause_code | no-check | target-access-restriction }
remove access-restriction-data { failure-code | eutran-not-allowed | no-check | target-access-restriction }
remove
```

**eutran-not-allowed**

Overrides the eutran-not-allowed flag received in ISD/ULA messages from the HLR/HSS received during the Attach process. The overridden value will be sent to the RNC during PDP context activation (in RAB Assignment Request messages) so that the RNC subsequently avoids performing a handover to E-UTRAN. Configuration of the `eutran-not-allowed` parameter is valid only if SRNS relocation first has been configured in Call Control Profile Configuration Mode via the `srns-inter` and/or `srns-intra` commands. The call-control-profile then must be associated with an operator policy in Operator Policy Configuration Mode using the `associate` command. Once the operator policy is associated with the call-control-profile, inclusion of the E-UTRAN Service Handover Information Element in RAB Assignment Request and Relocation Request RANAP messages must be enabled. This is done by executing the `ranap eutran-service-handover-ie` command in RNC Configuration Mode.
**failure-code cause_code**

*cause_code*: Enter an integer from 2 through 111; default code is 13 (roaming not allowed in this location area [LA]).

Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

- 2 - IMSI unknown in HLR
- 3 - Illegal MS
- 6 - Illegal ME
- 7 - GPRS services not allowed
- 8 - GPRS services and non-GPRS services not allowed
- 9 - MSID cannot be derived by the network
- 10 - Implicitly detached
- 11 - PLMN not allowed
- 12 - Location Area not allowed
- 13 - Roaming not allowed in this location area
- 14 - GPRS services not allowed in this PLMN
- 15 - No Suitable Cells In Location Area
- 16 -MSC temporarily not reachable
- 17 - Network failure
- 20 - MAC failure
- 21 - Synch failure
- 22 - Congestion
- 23 - GSM authentication unacceptable
- 40 - No PDP context activated
- 48 to 63 - retry upon entry into a new cell
- 95 - Semantically incorrect message
- 96 - Invalid mandatory information
- 97 - Message type non-existent or not implemented
- 98 - Message type not compatible with state
- 99 - Information element non-existent or not implemented
- 100 - Conditional IE error
- 101 - Message not compatible with the protocol state
- 111 - Protocol error, unspecified
no-check
Including this keyword with the command disables the ARD checking behavior.

target-access-restriction
Including this keyword with the command enables the target access restriction functionality. This functionality works a bit differently for the MME and SGSN:

• MME - No Rejection: if "target-access-restriction" is not enabled, then the source-MME will not reject the outbound RAU Request based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.
• MME - Rejection: if "target-access-restriction" is enabled, then the source-MME will reject the outbound RAU Request based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.
• SGSN - No Rejection: if "target-access-restriction" is enabled, and if "access-restriction-data no-check" is enabled, then the source-SGSN will not reject the outbound RAU Request based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.
• SGSN - Rejection: if "target-access-restriction" is enabled, and if "access-restriction-data no-check" is not enabled, then the source-SGSN will ignore the "target-access-restriction enabled" configuration and the source-SGSN will reject the outbound RAU Request based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.

Usage Guidelines
The only feature available to the MME for access-restriction-data is the target access restriction; all others are exclusive to the SGSN.

By default, the SGSN checks access restriction data (ARD) within incoming insert subscriber data (ISD) messages. This enables operator to selectively restrict subscribers in either 3G (UTRAN) or 2G (GERAN). The SGSN ARD checking behavior occurs during the attach procedure and if a reject occurs, the SGSN sends the subscriber an Attach Reject message with a configurable failure cause code.

With the target access restriction feature enabled, including the no-check keyword with the command instructs the source-SGSN not to reject the outbound RAU Request based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.

With the target access restriction feature enabled, including the remove command filter with the no-check keyword instructs the SGSN to reject the outbound RAU Reject based on the ARD profile of the subscriber per the Access-Restriction-Data received in ULA/ULR using the RAT Type IE received in the Context Request.

Example
For this call control profile, the following command disables the ARD checking function:

access-restriction-data no-check

accounting context
Defines the name of the accounting context and optionally associates a GTPP group with this call control profile.
**Product**
- ePDG
- S-GW
- SAEGW
- SGSN
- SaMOG

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Call Control Profile Configuration
- `configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
accounting context  ctxt_name  [ aaa-group  grp_name ] [ gtpp group  grp_name ]
remove accounting context [ aaa-group | gtpp ]
```

**remove**
Removes the accounting configuration from this profile's configuration.

**ctxt_name**
Specifies the accounting context as an alphanumeric string of 1 through 79 characters.

**aaa-group grp_name**
Configures AAA Group for MRME.

`grp_name`is a string of 1 to 63 characters (any combination of letters and digits) to identify the aaa-group created with the `aaa-group` command in the Context configuration mode.

**gtpp group grp_name**
Identifies the GTTP group, where the GTTP related parameters have been configured in the GTTP Group Configuration mode, to associate with this call control profile.

`grp_name`is a string of 1 to 63 characters (any combination of letters and digits) to identify the GTTP group created with the `gtpp group` command in the Context configuration mode.

**Usage Guidelines**
This command can be used to associate a predefined GTTP server group - including all its associated configuration - with a specific call control profile. The GTTP group would have been defined with the `gtpp group` command (see the Context Configuration Mode Commands chapter).

If the GTTP group is not specified, then a default GTTP group in the accounting context will be used.

If this command is not specified, use the name of the accounting context configured in the SGSN service configuration mode (for 3G) or the GPRS service configuration mode (for 2G), either will automatically use a "default" GTTP group generated in that accounting context.

If the accounting context is specified in the GPRS service or SGSN service and in a call control profile, the priority is given to the accounting context of the call control profile.
Example

For this call control profile, the following command identifies an accounting context called `acctng1` and associates a GTPP server group named `roamers` with defined charging gateway accounting functionality.

```
accounting context acctng1 gtpp group roamers
```

### accounting mode

Configures the mode to be used for accounting – GTP (default), RADIUS/Diameter or None.

<table>
<thead>
<tr>
<th>Product</th>
<th>ePDG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S-GW</td>
</tr>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
</tbody>
</table>

| Privilege | Administrator |

| Command Modes | Exec > Global Configuration > Call Control Profile Configuration  
               | configure > call-control-profile profile_name  
               |
|---------------|--------------------------------------------------|
|               | Entering the above command sequence results in the following prompt:  
               | [local]host_name(config-call-control-profile-profile_name)# |

#### Syntax Description

```
accounting mode { gtpp | none | radius-diameter }
remove accounting mode
```

- **remove**
  Removes the accounting mode.

  - **gtpp**
    Specifies that GTP accounting is performed. This is the default method.

  - **none**
    Specifies that no accounting will be performed for the call control profile.

  - **radius-diameter**
    Specifies that RADIUS/Diameter will be performed for the call control profile.

#### Usage Guidelines

Use this command to specify the accounting mode for a call control profile. For additional information on accounting mode and its relationship to operator policy, refer to the *System Administration Guide*. 
Example
The following command specifies that RADIUS/Diameter accounting will be used for the call control profile:

```
accounting mode radius-diameter
```

**accounting stop-trigger**

Configures the trigger point for accounting stop CDR. Default is on session deletion request.

<table>
<thead>
<tr>
<th>Product</th>
<th>S-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAEGW</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Privilege</th>
<th>Administrator</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Exec &gt; Global Configuration &gt; Call Control Profile Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>configure &gt; call-control-profile profile_name</code></td>
<td>Entering the above command sequence results in the following prompt:</td>
</tr>
<tr>
<td>[local]<code>host_name(config-call-control-profile-profile_name)#</code></td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**

- `accounting stop-trigger custom`
- `default accounting stop-trigger`

**default**

Accounting stop CDR triggered once Delete Session/Delete Bearer Request is received at S-GW.

**custom**

Accounting stop CDR triggered once Delete Session/Delete Bearer Response is received at S-GW.

**Usage Guidelines**

Use this command to specify the trigger point for accounting stop CDR for a call control profile.

**Example**

The following command specifies that accounting stop trigger would be at response of session deletion:

```
accounting stop-trigger custom
```

**allocate-ptmsi-signature**

Enables or disables the allocation of a P-TMSI (Packet Temporary Mobile Subscriber Identity) signature.

<table>
<thead>
<tr>
<th>Product</th>
<th>SGSN</th>
</tr>
</thead>
</table>

**Syntax Description**

- `allocate-ptmsi-signature enable`
- `allocate-ptmsi-signature disable`

**enable**

Enables the allocation of P-TMSI.

**disable**

Disables the allocation of P-TMSI.
### apn-restriction

Enables the APN restriction feature and configures the instruction for the SGSN on the action to take when an APN restriction value is received from the GGSN during an Update PDP Context procedure.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no | default ] apn-restriction update-policy deactivate restriction
default apn-restriction
```

- **default**
  Creates a default APN restriction configuration.
**update-policy deactivate restriction**

Specifies one of the two restriction types to define the appropriate action if the APN restriction value received conflicts with the stored value:

- **least-restrictive** set the least restrictive value applicable when there are no already active PDP context(s).
- **most-restrictive** sets the most stringent restriction required by any already active PDP context(s).

**Usage Guidelines**

When this feature is enabled, the SGSN will send the maximum APN restriction value in every CPC Request message sent to the GGSN. The SGSN expects to receive an APN restriction value in each PDP Context received from the GGSN. The SGSN stores and compares received APN restriction values to check for conflicts. In the case of a conflict, the SGSN rejects the PDP Context with appropriate messages and error codes to the MS.

If an APN restriction value is not assigned by the GGSN, the SGSN assumes the value of "1" (least restrictive) to allow APN restriction rules will be possible when valid values are assigned for new PDP Context(s) from the same MS.

The least or most restrictive values of the APN restriction are applicable only for the Gn SGSN, as the APN restriction can be present in UPCQ/UPCR for Gn SGSN and this configuration is required to determine the PDN to be de-activated when an APN restriction violation occurs during modification procedures in the Gn SGSN. In the case of S4-SGSN, the APN restriction arrives at the S4-SGSN only in Create Session Response during activation. During activation in S4-SGSN, a PDN connection that violates the current Maximum APN restriction is always de-activated. Therefore in the case of S4-SGSN, this CLI is used only for enabling or disabling APN restriction.

**Example**

The following command applies the lowest level of APN restrictions:

```
apn-restriction update-policy deactivate least-restrictive
```

**associate**

Associates various MME-specific lists and databases with this call control profile. On an SGSN, this command can be used to associate some of these MME-related items to GPRS and/or SGSN services in support of S4 functionality. For SaMOG, this command can be used to associate various SGW and SGSN CDR triggers for the call control profile.

**Product**

ePDG
MME
SGSN
SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
associate { access-policy policy_name | accounting-policy policy_name | decor-profile profile_name access-type { all | eutran | nb-iot } | ho-restrict-list list_name | hss-peer-service service_name [ s13-interface | s6a-interface | s13-prime-interface | s6d-interface ] | scef-service service_name | tai-mgmt-db tai-db_name }
remove associate { access-policy | accounting-policy | decor-profile profile_name access-type { all | eutran | nb-iot } | ho-restrict-list | hss-peer-service [ s13-interface diameter-destination-realm realm_name | s6a-interface diameter-destination-realm realm_name | s13-prime-interface | s6d-interface ] | tai-mgmt-db }
```

**remove**

Remove the specified association definition from the call control profile.

**access-policy policy_name**

Specifies the access-policy to be associated with the call-control-profile.

`policy_name` must be an alphanumeric string of 1 through 64 characters.

**associate monitoring-event-profile profile_monte**

Specifies the monitoring event profile to be associated with the call-control-profile.

**accounting-policy policy_name**

SaMOG only.

**Important**

With SaMOG mixed license, SaMOG supports both SGSN and SGW CDRs. With SaMOG 3G license, SaMOG supports only SGSN CDRs.

Associates the APN with specific pre-configured policies configured in the same context for SaMOG charging.

`policy_name` must be an alphanumeric string of 1 through 63 characters.

**decor-profile profile_name access-type { all | eutran | nb-iot }**

Specifies the DECOR profile that is associated with the call-control-profile. `profile_name` must be an alphanumeric string of length 1 through 63 characters.

A maximum number of 16 decor-profile associations can be configured for the call-control-profile.

**access-type**: Configures the type of network access for the decor-profile.

- **all**: Specifies allows all access types.
- **eutran**: Specifies the access type as E-UTRAN.
- **nb-iot**: Specifies the access-type as NB-IoT.
**ho-restrict-list** list_name

MME only.

Identifies the handover restriction list that should be associated with this call control profile.

list_name is a string of 1 to 64 characters (any combination of letters and digits).

**hss-peer-service** service_name

Associates a home subscriber server (HSS) peer service with this call control profile.

service_name is an existing HSS peer service expressed as a string of 1 to 63 characters (any combination of letters and digits).

[ s13-interface diameter-destination-realm realm_name | s6a-interface diameter-destination-realm realm_name | s13-prime-interface | s6d-interface ]

Optionally, identify the interface to be associated with the HSS service in this call control profile.

The s13-interface and the s6a-interface options apply to the MME only.

The s13-prime-interface and s6d-interface options apply to the SGSN only.

The s6d-interface is used by the SGSN to communicate with the HSS. It is a Diameter-based interface which supports location management, subscriber data handling, authentication, and fault recovery procedures.

The s13-prime-interface is used by the SGSN to communicate with the equipment identity register (EIR). It is a Diameter-based interface which performs the mobile equipment (ME) identity check procedure.

---

**tai-mgmt-db** tai-db_name

Identifies the tracking area identifier (TAI) database that should be associated with this call control profile.

tai-db_name is a string of 1 to 64 characters (any combination of letters and digits).

This configuration overrides the S-GW selection and TAI list assignment functionality for a call that uses an operator policy associated with this call control profile. The TAI management object provides a TAI list for calls and provides S-GW selection functionality if a DNS is not configured for S-GW discovery for this operator policy or if a DNS discovery fails.

If a TAI management database is associated with a call-control-profile, and if DNS is used for S-GW lookups, then the DNS configuration for S-GW lookups must also be configured within the same call-control-profile using the **dns-sgw** command in the call-control-profile configuration mode.

On the S4-SGSN, use this option to associate a locally configured S-GW address for the RAI address for selection if operators wish to bypass DNS resolution of RAI FQDN. This option is valid only after the following commands have been executed on the S4-SGSN:

- The **tai-mgmt-db** command in **LTE Policy Configuration Mode**
- The **tai-mgmt-obj** command in **LTE TAI Management Database Configuration Mode**.
- The **tai** and **sgw-address** commands in **LTE TAI Management Object Configuration Mode**.

---

---
Usage Guidelines

Use this command to associate handover restriction lists, HSS service (and interfaces), and a TAI database with the call control profile. This ensures that the information is available for application when a Request is received.

For SaMOG, use this command to associate the SaMOG call control profile with an accounting policy configured in this context to provide triggers to generate CDRs. If no policy is configured, triggers based on the call control profile will not be generated, and the accounting policy in the SaMOG service context will be used. Even if an accounting policy is also specified in a call control profile, the priority is given to the accounting policy of the APN profile.

Repeat the command as needed to associate each feature.

Example

Link HO restriction list named HOrestrict1 with this call control profile:

`associate ho-restrict-list HOrestrict1`

The following command associates this SaMOG call control profile with an accounting policy called acct1:

`associate accounting-policy acct1`

**attach access-type**

Defines attach-related configuration parameters for this call control profile based on the access-type (GPRS, UMTS, or both) and location area list.

**Important**

SGSN only: Before using this command, ensure that the appropriate location area code (LAC) information has been defined via the `location-area-list` command.

**Product**

MME

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

`[local]host_name(config-call-control-profile-profile_name)#`

**Syntax Description**

```
attach access-type { gprs | umts } { all | location-area-list instance list_id } { failure-code code | user-device-release { before-r99 failure code code | r99-or-later failure code code } }
default attach access-type { eps | gprs | umts } { all | location-area-list instance list_id } { failure-code | user-device-release { before-r99 failure code | r99-or-later failure code } }
```
default
Restores the default values for the for the specified parameter.

access-type type
Defines the type of access to be allowed or restricted.

• gprs
• umts

all
Instructs the SGSN or MME to apply the command action to all location area lists. Location area lists should already have been created with the location-area-list command. The location area list consists of one or more LACs, location area codes, where the MS is when placing the call.

location-area-list instance list_id
Instructs the SGSN to apply the command action to a specific location area list. Location area lists should already have been created with the location-area-list command. The location area list consists of one or more LACs, location area codes, where the MS is when placing the call.

Using this keyword with either the allow or restrict keywords enables you to configure with more granularity.

list_id: Enter an integer between 1 and 5.

failure-code fail_code
Specify a GMM failure cause code to identify the reason an attach did not occur. This GMM cause code will be sent in the reject message to the MS.

Default: 14.

fail_code: Enter an integer from 2 to 111. Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

• 2 - IMSI unknown in HLR
• 3 - Illegal MS
• 6 - Illegal ME
• 7 - GPRS services not allowed
• 8 - GPRS services and non-GPRS services not allowed
• 9 - MSID cannot be derived by the network
• 10 - Implicitly detached
• 11 - PLMN not allowed
• 12 - Location Area not allowed
• 13 - Roaming not allowed in this location area
• 14 - GPRS services not allowed in this PLMN
• 15 - No Suitable Cells In Location Area
• 16 - MSC temporarily not reachable
• 17 - Network failure
• 20 - MAC failure
• 21 - Synch failure
• 22 - Congestion
• 23 - GSM authentication unacceptable
• 40 - No PDP context activated
• 48 to 63 - retry upon entry into a new cell
• 95 - Semantically incorrect message
• 96 - Invalid mandatory information
• 97 - Message type non-existent or not implemented
• 98 - Message type not compatible with state
• 99 - Information element non-existent or not implemented
• 100 - Conditional IE error
• 101 - Message not compatible with the protocol state
• 111 - Protocol error, unspecified

**Note**

It is mandatory to enable the command `attach restrict access-type gprs all` so that the failure code is saved after a re-boot. The `attach access-type gprs all failure-code < code >` command and the `attach restrict access-type gprs all` command work together and have to be enabled together.

**user-device-release { before-r99 | r99-or-later } failure-code code**

Default: disabled

Enables the SGSN to reject an Attach procedure based on the detected 3GPP release version of the MS equipment and selectively send a failure cause code in the reject message. The SGSN uses the following procedure to implement this configuration:

1. When Attach Request is received, the SGSN checks the subscriber's IMSI and current location information.
2. Based on the IMSI, an operator policy and call control profile are found that relate to this Attach Request.
3. Profile is checked for access limitations.
4. Attach Request is checked to see if the revision indicator bit is set
   • if not, then the configured common failure code for reject is sent;
   • if set, then the 3GPP release level is verified and action is taken based on the configuration of this parameter
One of the following options must be selected and completed:

- **before-r99**: Indicates the MS would be a 3GPP release prior to R99 and an appropriate failure code should be defined.

  **failure-code** code: Enter an integer from 2 to 111.

- **r99-or-later**: Indicates the MS would be a 3GPP Release 99 or later and an appropriate failure code should be defined.

  **failure-code** code: Enter an integer from 2 to 111.

### Usage Guidelines

Once the IMSI of an incoming call is known and matched with a specific operator policy, according to the filter definition of the **mcc** command, then the associated call control profile is selected to determine how the incoming call is handled.

By default, all attaches are allowed. If no access limitations are needed, do not use the **attach** command.

---

**Important**

Before using this command, ensure that the appropriate LAC information has been defined with the **location-area-list** command.

Use this command to define attach limitations for the call control profile.

Use this command to fine-tune the attach configuration specifying which calls/subscribers can attach and which calls are restricted from attaching and what failure code is included in the Reject message.

Attachment restrictions can be based on any one or combination of the options, such as location area code or access type. It is even possible to restrict all attaches.

The command can be repeated using different keyword values to further fine-tune the attachment configuration.

### Related Commands

- Use the **attach restrict** command to restrict attaches.
- Use the **attach allow** command to re-enable restrictions after an **attach restrict** command has been used.

### Example

The following example sets all restrictions for access-type gprs and specified release version to the default setting.

```
default attach access-type gprs all user-device-release before-r99 failure-code
```

## attach allow

Configures the system to re-enable attaches that were previously restricted using the **attach restrict** command.

---

**Important**

SGSN only: Before using this command, ensure that the appropriate location area code (LAC) information has been defined via the **location-area-list** command.
**Product**
MME
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no ] attach allow access-type { eps | gprs | umts } location-area-list
instance instance_id| routing-area-list instance instance_id
```

- **no**
  Deletes the specified attach configuration.

- **allow**
  Enables attaches in the configuration after an **attach restrict** command has been used.

- **access-type type**
  Defines the type of access to be allowed.

  - **eps**
  - **gprs**
  - **umts**

- **location-area-list instance instance_id**
  Instructs the SGSN to apply the command action to a specific location area list. Location area lists should already have been created with the **location-area-list** command. The location area list consists of one or more LACs, location area codes, where the MS is when placing the call.

  `instance_id` must be an integer from 1 to 5.

- **routing-area-list instance instance_id**
  Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the **routing-area-list** command.

  `instance_id` must be an integer from 1 to 5.

**Usage Guidelines**

Once the IMSI of an incoming call is known and matched with a specific operator policy, according to the filter definition of the **mcc** command, then the associated call control profile is selected to determine how the incoming call is handled.

By default, all attaches are allowed. If no access limitations are needed, then do not use the **attach** command.
Before using this command, ensure that the appropriate LAC information has been defined with the `location-area-list` command.

Use this command to define attach limitations for the call control profile.

Use this command to fine-tune the attach configuration specifying which calls/subscribers can attach and which calls are restricted from attaching and what failure code is included in the Reject message.

Attachment restrictions can be based on any one or combination of the options, such as location area code or access type or routing area code. It is even possible to restrict all attaches.

The command can be repeated using different keyword values to further fine-tune the attachment configuration.

**Related Commands**

- Use the `attach access-type` command to define the type of access to restrict or allow.
- Use the `attach restrict` command to restrict attaches.

**Example**

For calls under the purview of this call control profile, the following command allows attaches of all subscribers using the GPRS access type.

```
attach allow access-type gprs all
```

### `attach imei-query-type`

Defines device Attach limitations for this call control profile if an IMEI is not already present in the Attach Request.

**Product**

- MME
- SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
attach imei-query-type { imei | imei-sv | none } [ verify-equipment-identity [ allow-on-eca-timeout | deny-greylisted | deny-unknown | verify-emergency ] + ]
remove attach imei-query-type
```
**attach implicit-ulr**

Configures the implicit sending of ULR during local GUTI attach.

**Product**
- MME
- SGSN

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

**attach implicit-ulr**

**Example**

The following command configures the implicit sending of ULR during local GUTI attach

```
attach implicit-ulr
```

### attach restrict

Configures the system to restrict attaches based on access type, routing areas, and location areas (either all or specified location area list) for this call control profile.

**Important**

SGSN only: Before using this command, ensure that the appropriate location area code (LAC) information has been defined via the `location-area-list` command.

**Product**

MME

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

```
```

**no**

Deletes the specified attach configuration.

**access-type type**

Defines the type of access to be allowed or restricted.

- eps
- gprs
• umts

**emm-cause-code code**

Specifies the EPS Mobility Management (EMM) cause code to return to the UE:

- **eps-service-disallowed**
- **eps-service-not-allowed-in-this-plmn**
- **no-suitable-cell-in-tracking-area**
- **plmn-not-allowed**
- **roaming-not-allowed-in-this-tracking-area**
- **tracking-area-not-allowed**

The default cause code is **no-suitable-cell-in-tracking-area**.

---

**Important**

The **tracking-area-not-allowed** cause code is not supported for the MME.

---

**Important**

The **roaming-not-allowed-in-this-tracking-area** and **tracking-area-not-allowed** cause codes are not applicable for use with the **imsi-attach-fail** or **voice-unsupported** keywords.

---

**imsi-attach-fail**

Directs the MME to restrict EPS attach when IMSI attach fails. If the policy is configured, all IMSI failures will result in an EPS restriction.

The default cause code for calls rejected for imsi-attach-fail is **no-suitable-cell-in-tracking-area**.

---

**voice-unsupported**

Directs the MME to restrict EPS attach when voice is not supported, such as when Voice over IMS is not supported and the UE does not support Circuit Switched Fall Back (CSFB).

This setting is applicable when all of the following conditions apply:

- The UE is voice-centric as determined in the UE usage setting of the Voice Domain and UE Settings IE sent in the request.
- The UE does not support CSFB as determined in the EMM Combined procedures Capability bit of the MS Network Capability IE sent in the request, OR if CSFB is not supported on the MME as determined by the SGs service not being associated with the MME service.
- Voice over IMS is not supported in the network as defined by the **network-feature-support-ie imsi-voice-over-ps** command.

The default cause code for calls rejected for voice-unsupported is **no-suitable-cell-in-tracking-area**.
**all**

Instructs the system to apply the command action to all location area lists. Location area lists should already have been created with the `location-area-list` command. The location area list consists of one or more LACs, location area codes, where the MS is when placing the call.

**location-area-list instance instance_id**

Instructs the SGSN to apply the command action to a specific location area list. Location area lists should already have been created with the `location-area-list` command. The location area list consists of one or more LACs, location area codes, where the MS is when placing the call.

Using this keyword with either the `allow` or `restrict` keywords enables you to configure with more granularity. `instance_id` must be an integer from 1 to 5.

**Important**

This keyword only applies to the SGSN.

**routing-area-list instance instance_id**

Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the `routing-area-list` command.

`instance_id` must be an integer from 1 to 5.

**Usage Guidelines**

Once the IMSI of an incoming call is known and matched with a specific operator policy, according to the filter definition of the `mcc` command, then the associated call control profile is selected to determine how the incoming call is handled.

By default, all attaches are allowed. If no access limitations are needed, then do not use the `attach` command.

**Important**

Before using this command, ensure that the appropriate LAC information has been defined with the `location-area-list` command.

Use this command to restrict attaches for the call control profile.

Use this command to fine-tune the attach configuration specifying which calls/subscribers can attach and which calls are restricted from attaching and what failure code is included in the Reject message.

Attachment restrictions can be based on any one or combination of the options, such as location area code or access type or routing area code. It is even possible to restrict all attaches.

The command can be repeated using different keyword values to further fine-tune the attachment configuration.

**Related Commands**

- Use the `attach access-type` command to define the type of access to restrict or allow. The command `attach restrict access-type gprs all` has to be enabled, if the command `attach access-type gprs all failure-code < code >` is used to define a failure code. The failure code is saved after a re-boot only when the command `attach restrict access-type gprs all` is enabled.

- Use the `attach allow` command to re-enable restrictions after an `attach restrict` command has been used.
Example

For calls under the purview of this call control profile, the following command restricts the attaches of all subscribers using the GPRS access type.

```
attach restrict access-type gprs all
```

To change the attach restriction to only restrict attaches of GPRS subscribers from specified LACs included in location area list #2 and include failure-code 45 as the reject cause. This configuration requires two CLI commands:

```
attach restrict access-type gprs location-area-list instance 2
attach access-type gprs location-area-list instance 2 failure-code 45
```

In the case of a dual-access SGSN, it is possible to also add a second definition to restrict attaches of UMTS subscribers within the LACs included in location area list #3.

```
attach restrict access-type UMTS location-area-list instance 3
```

Change the configuration to allow attaches for GPRS access for all previously restricted LACs - note that GPRS attaches would still be limited:

```
no attach restrict access-type gprs all
```

Restrict (deny) all GPRS attach requests (coming from any location area) and assign a single failure code for the reject messages. This is a two command process:

```
attach restrict access-type
gprs all
attach access-type gprs
all failure-code 22
```

authenticate all-events

Allows the operator to quickly define authentication procedures, based on limited parameters, for all types of events.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGSN</td>
<td></td>
</tr>
</tbody>
</table>

| Privilege     | Security Administrator, Administrator    |

| Command Modes | Exec > Global Configuration > Call Control Profile Configuration |

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

| Syntax Description | authenticate all-events [ access-type { gprs | umts } | frequency frequency

[ access-type { gprs | umts } ] | periodicity duration [ access-type { gprs | umts } ] ]

no authenticate all-events [ access-type { gprs | umts } ] |
remove authenticate all-events [ access-type { gprs | umts } ] [ frequency [ access-type { gprs | umts } ] ] [ periodicity [ access-type { gprs | umts } ] ]

no

Disables the specified authentication configuration in the call control profile.

remove

Removes the specified authentication configuration from the call control profile configuration file.

access-type type

One of the following must be selected to identify the type of network access if the access-type keyword is included in the command:

- gprs
- umts

The access-type keyword can be included with any of the other three keywords available with the authenticate all-events command.

frequency frequency

This keyword defines 1-in-N selective authentication for all types of subscriber events. If the frequency is set for 12, then the service skips authentication for the first 11 events and authenticates on the 12th event.

In releases prior to 21.2, the frequency is an integer value from 1 up to 16.

From release 21.2 onwards the frequency is an integer value from 1 up to 256.

periodicity duration

The periodicity configured specifies authentication periodicity. The periodicity is an integer with a range "1" up to "10800" minutes. For example, if the configured periodicity is "20" minutes, the UE is authenticated at every "20" minutes.

Usage Guidelines

By default, authentication is not performed for any subscriber events. Use this command to enable authentication for all types of events at one time, such as but not limited to: Activate Requests, Attach Requests, Detach Requests, Service-Requests.

Important

For the SGSN, in releases 15.0 and forward, the authentication on activation functionality has been removed so the SGSN will not authenticate on Activate Requests.

Example

The following command configures all authentication for all subscriber events to occur every tenth time a specific type of event occurs (for example every tenth time an Attach Request is received):

authenticate all-events frequency 10
The following command configures authentication for all Detach Requests and RAUs to occur if the UE access-type is UMTS:

```
authenticate all-events access-type umts
```

### authenticate attach

Allows the operator to define authentication for Attach procedures.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SGSN</td>
</tr>
</tbody>
</table>

| Privilege          | Security Administrator, Administrator |

**Command Modes**

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
authenticate attach access-type { gprs | umts } 
authenticate attach attach-type { combined | gprs-only } [ access-type { gprs | umts } | frequency frequency ] 
authenticate attach frequency frequency [ access-type { gprs | umts } ] 
authenticate attach inter-rat [ access-type { gprs | umts } | attach-type { combined | gprs-only } | access-type { gprs | umts } | frequency frequency ] [ access-type { gprs | umts } ] | periodicity duration [ access-type { gprs | umts } ] ] 
authenticate attach periodicity duration [ access-type { gprs | umts } ] 
{ no | remove } authenticate attach [ access-type { gprs | umts } | attach-type { combined | gprs-only } | inter-rat | attach-type { combined | gprs-only } ] [ access-type { gprs | umts } ] ]
```

**no**

Disables the defined authentication procedures configured for Attach Requests from the call control profile.

**remove**

Deletes the defined authentication procedures for Attach Requests from the call control profile configuration file.

**access-type type**

One of the following must be selected to identify the type of network access if the `access-type` keyword is included in the command:

- `gprs`
- `umts`
attach-type

This keyword configures the Attach authentication based on the type of attach requested. The attach-type must be one of the following options:

- **combined**: Authenticates combined GPRS/IMSI Attaches.
- **gprs-only**: Authenticates GRPS Attaches only.

frequency [frequency]

This keyword defines 1-in-N selective authentication for this type of subscriber event - Attach Request. If the frequency is set for 12, then the service skips authentication for the first 11 events and authenticates on the twelfth event.

In releases prior to 21.2, the frequency is an integer value from 1 up to 16.

From release 21.2 onwards the frequency is an integer value from 1 up to 256.

inter-rat

Enables/disables authentication for Inter-RAT Attaches.

periodicity duration

The periodicity configured specifies authentication periodicity. For example, if the configured periodicity is "20" minutes, the UE is authenticated at every "20" minutes.

The duration is an integer with a range "1" up to "10800" minutes.

**Usage Guidelines**

Authentication for Attach is disabled by default. This command enables/disables authentication for an Attach with a local P-TMSI or Attaches with an IMSI, which will be authenticated to acquire the CK (cipher key) and the IK (integrity key).

**Example**

The following command configures authentication to occur after every tenth attach event for GPRS access.

```
authenticate attach frequency 10 access-type gprs
```

The following command disables authentication for Inter-RAT Attaches, use:

```
no authenticate attach inter-rat
```

**authenticate context**

This command allows you to specify the authentication group, authentication method, context, and type of authentication for the AAA server.

**Product**

SaMOG
ePDG
**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
authenticate context context_name [ aaa-group aaa_group_name ] [ auth-type { diameter | radius } ] [ auth-method { [ eap ] [non-eap] } ]
```

`remove authenticate context [ aaa-group ]`

`set`

Sets the authentication type to its default value:

- Default (SaMOG 3G license): radius
- Default (SaMOG Mixed Mode license): diameter

- `context_name`
  Specified the name of the context for authentication.
  - `context_name` must be an alphanumeric string of 1 through 79 characters.

- `aaa-group aaa_group_name`
  Optionally, specifies the AAA group for MRME. `aaa_group_name` must be an alphanumeric string of 1 through 63 characters.

- `auth-method { [ eap ] [non-eap] }`
  Optionally, specifies the authentication method for the call control profile.
  - If this configuration is not used, the default value is EAP based authentication method.

**Important**

The SaMOG Web Authorization feature is license dependent. Contact your Cisco account representative for more information on license requirements.

**Usage Guidelines**

Use this command to specify the authentication group, context, and type of authentication for the AAA server. Also specify an authentication method of EAP or non-EAP or both for the call control profile in the operator policy.

**Example**

The following command configures authentication of a context named `cxtSamOG`, specifies AAA group named `AAASamOG`, and sets the authentication to a DIAMETER-based authentication:

```
authenticate context cxtSAMOG aaa-group AAASamOG auth-type diameter
```
authenticate detach

Allows the operator to enable and define authentication for Detach procedures.

**Product**  
SGSN

**Privilege**  
Security Administrator, Administrator

**Command Modes**  
Exec > Global Configuration > Call Control Profile Configuration

```bash
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```sql
authenticate detach [ access-type umts ]
[ no | remove ] authenticate detach [ access-type umts ]
```

- **no**  
  Disables the defined authentication procedures configured for Detach Requests from the call control profile.

- **remove**  
  Deletes the defined authentication procedures for Detach Requests from the call control profile configuration file.

- **access-type umts**  
  Optionally, identifies the type of network access if the `access-type umts` keywords are included in the command. By default, access-type UMTS is assumed.

**Usage Guidelines**  
Authentication for Detach procedures is disabled by default. This command enables/disables authentication for a Detach Request and allows the operator to limit authentication based on the MS/UE access-type.

**Example**  
The following command configures detach authentication to occur only for UMTS attached subscribers:

```bash
authenticate detach access-type umts
```

The following command disables authentication for all Detach Requests, use:

```bash
no authenticate detach
```

authenticate on-first-vector

Allows the operator to enable the SGSN to begin MS authentication immediately after receiving the first vector from the HLR.
authenticate rau

Enables or disables and fine tunes authentication procedures for routing area updates (RAUs)

Product
SGSN

Privilege
Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
authenticate rau [ access-type { gprs | umts } ] [ frequency frequency [ access { gprs | umts } ] ] [ periodicity duration [ access { gprs | umts } ] ] [ update-type { combined-update | imsi-combined-update | periodic | ra-update } [ access-type { gprs | umts } ] [ frequency frequency ] [ periodicity duration ] [ with { foreign-ptmsi | inter-rat-local-ptmsi | local-ptmsi } [ access-type { gprs | umts } ] [ frequency frequency ] [ periodicity duration ] ]
```

```plaintext
no authenticate rau [ access-type { gprs | umts } ] [ update-type { combined-update | imsi-combined-update | periodic | ra-update } [ access-type { gprs | umts } ] [ with { foreign-ptmsi | inter-rat-local-ptmsi | local-ptmsi } [ access-type { gprs | umts } ] ]
```

```plaintext
remove authenticate rau [ access-type { gprs | umts } ] [ periodicity [ access { gprs | umts } ] [ update-type { combined-update | imsi-combined-update | periodic | ra-update } [ access-type { gprs | umts } ] [ periodicity [ with { foreign-ptmsi | inter-rat-local-ptmsi | local-ptmsi } [ access-type { gprs | umts } ] ]
```

```plaintext
no
```

Disables authentication for the RAUs specified in the configuration for the call control profile.

```plaintext
remove
```

Deletes the authentication configuration for the RAUs from the call control profile in the configuration file.

**access-type type**

One of the following must be selected to identify the type of network access if the `access-type` keyword is included in the command:

- `gprs`
- `umts`

The `access-type` keyword can be included with any of the other keywords available with the `authenticate rau` command.

**frequency frequency**

Defines 1-in-N selective authentication for RAU events. If the frequency is set for 12, then the SGSN skips authentication for the first 11 events and authenticates on the twelfth event.

In releases prior to 21.2, the `frequency` is an integer value from 1 up to 16.

From release 21.2 onwards the `frequency` is an integer value from 1 up to 256.
periodicity duration
Defines the length of time (number of minutes) that authentication can be skipped.
duration: Must be an integer from 1 to 10800.

update-type
Defines the type of RAU Request. Select one of the following:
• combined-update [ access-type | with inter-rat-local-ptmsi ]
• imsi-combined-update [ access-type | with inter-rat-local-ptmsi ]
• periodic [ access-type | frequency | periodicity ]
• ra-update [ access-type | with inter-rat-local-ptmsi ]

Usage Guidelines
By default, authentication is not performed for routing area updates (RAUs). Use this command to enable/disable authentication and to fine tune the authentication procedure based on frequency, periods for skipping authentication and the various types of routing area updates.

Example
The following command configures RAU authentication to occur after every tenth event for GPRS access.
authenticate rau frequency 10 access-type gprs
The following command disables authentication for RAUs based on the combined IMSI with foreign P-TMSIs, use:
no authenticate rau imsi-combined-update with foreign-ptmsi
The following command deletes all authentication configuration from the call control profile for all RAUs using GPRS access-type:
remove authenticate rau access-type gprs

authenticate service-request
Enables or disables and fine-tunes authentication procedures for Service Requests.

Product
MME
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name
Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#
authenticate service-request

Syntax Description

authenticate service-request [ frequency frequency | periodicity duration | service-type { data | page-response | signaling } [ frequency frequency | periodicity duration ] ]
no authenticate service-request [ service-type { data | page-response | signaling }]
remove authenticate service-request [ frequency | periodicity | service-type { data | page-response | signaling } [ frequency | periodicity ] ]

no
Disables authentication for the Service Requests specified in the configuration for the call control profile.

remove
Deletes the authentication configuration for Service Requests from the call control profile in the configuration file.

frequency frequency
Defines 1-in-N selective authentication for this type of subscriber event - Service Request. If the frequency is set for 12, then the service skips authentication for the first 11 events and authenticates on the twelfth event.

In releases prior to 21.2, the frequency is an integer value from 1 up to 16.
From release 21.2 onwards the frequency is an integer value from 1 up to 256.

periodicity duration
Defines the length of time (number of minutes) that authentication can be skipped.

duration: Must be an integer from 1 to 10800.

signaling-type
Defines the type of service being requested by the Service Request. Select one of the following:

• data
• page-response
• signaling

Usage Guidelines

By default, authentication is not performed for Service Requests. Use this command to enable/disable authentication and to fine-tune the authentication procedure based on frequency and periods for skipping authentication and the various types of service. Repeat the commands as needed to configure criteria for all service types.

Example

The following command configures authentication Service Requests for data service to only occur every 5 minutes:

authenticate service-request service-type data periodicity 5
authenticate sms

Enables or disables and fine tunes authentication procedures for Short Message Service (SMS).

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

- `configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
authenticate sms [ access-type { gprs | umts } | frequency frequency [ access-type { gprs | umts } | sms-type { mo-sms | mt-sms } [ access-type { gprs | umts } | frequency frequency ] ] [ no | remove ] authenticate sms [ access-type { gprs | umts } | sms-type { mo-sms | mt-sms } [ access-type { gprs | umts } ] ]
```

- **no**
  Disables authentication for the SMS Requests specified in the configuration for the call control profile.

- **remove**
  Deletes the authentication configuration for SMS Requests from the call control profile in the configuration file.

**access-type type**

One of the following must be selected to identify the type of network access if the `access-type` keyword is included in the command:

- `gprs`
- `umts`

The `access-type` keyword can be included with any of the other keywords available with the `authenticate sms` command.

**frequency frequency**

Defines 1-in-N selective authentication for SMS Requests. If the frequency is set for 12, then the SGSN skips authentication for the first 11 events and authenticates on the twelfth event.

In releases prior to 21.2, the `frequency` is an integer value from 1 up to 16.

From release 21.2 onwards the `frequency` is an integer value from 1 up to 256.
sms-type

Enables authentication for the following SMS types:

- **mo-sms**: mobile-originated SMS
- **mt-sms**: mobile-terminated SMS

Usage Guidelines

By default, authentication is not performed for short message service (SMS). Use this command to enable/disable authentication and to fine-tune the authentication procedure based on MS/UE access type and the frequency for the selected SMS type. Repeat the commands as needed to configure criteria for all service types.

Example

The following command configures MO-SMS authentication to occur every fifth request:

```
authenticate sms sms-type mo-sms frequency 5
```

authenticate tau

Allows the operator to enable/disable and fine-tune authentication for the tracking area update (TAU) procedures.

Product

MME

Privilege

Security Administrator, Administrator

Command Modes

```
configure > Global Configuration > Call Control Profile Configuration
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
authenticate tau [ frequency frequency | inter-rat | periodicity interval ]
authenticate tau frequency frequency
authenticate tau inter-rat [ frequency frequency | periodicity duration ]
authenticate tau intra-rat [ frequency frequency | periodicity duration ]
authenticate tau normal [ frequency frequency | periodicity duration ]
authenticate tau periodic [ frequency frequency | periodicity duration ]
authenticate tau periodicity duration
remove authenticate tau frequency
remove authenticate tau inter-rat [ frequency | periodicity ]
remove authenticate tau intra-rat [ frequency | periodicity ]
remove authenticate tau normal [ frequency | periodicity ]
remove authenticate tau periodic [ frequency | periodicity ]
remove authenticate tau periodicity
no authenticate tau
```
no
Disables the TAU authentication procedures specified in the call control profile configuration.

remove
This keyword removes the configured TAU authentication procedures.

frequency frequency
Defines 1-in-N selective authentication for this type of subscriber event - a tracking area update for an inter-RAT Attach. If the frequency is set for 12, the MME skips authentication for the first 11 events and authenticates on the twelfth event.
In releases prior to 21.2, the frequency is an integer value from 1 up to 16.
From release 21.2 onwards the frequency is an integer value from 1 up to 256.

inter-rat
Enables authentication for TAU procedures for inter-RAT Attaches.

intra-rat
This keyword specifies authentication to be applied for Intra-RAT TAU.

normal
This keyword specifies authentication to be applied for normal (TA/LA update) TAU.

periodic
This keyword specifies authentication to be applied for periodic TAU.

periodicity duration
Defines the length of time (number of minutes) that authentication can be skipped.

duration: Must be an integer from 1 to 10800.

Usage Guidelines
Authentication for TAU procedures is disabled by default. This command enables/disables authentication for a inter-RAT TAU procedures and allows the operator to limit authentication based on the frequency of the events or elapsed intervals between the events.

Example
The following command configures TAU authentication to occur when there is 15 minutes between inter-RAT Attaches:

authenticate tau periodicity 15

The following command disables authentication for all TAU Inter-RAT Attaches, use:

no authenticate tau
CC

Defines the charging characteristics to be applied for CDR generation when the handling rules are applied via the Operator Policy feature.

Product

ePDG
MME
SAEGW
S-GW
SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description


no cc { behavior-bit no-records | gen-cdr-for-profile }

remove cc { behavior-bit no-records | local-value | prefer }

no

Disables the no records generation behavior-bit configuration for this call control profile.

In 21.7 and later releases, use the no cc gen-cdr-for-profile CLI command to disable the Controlled SGWCDR Generation feature. In other words, the SGWCDR generation will happen as before.

Important

The Controlled SGWCDR Generation feature is not fully qualified in release 21.7. It is available only for testing purposes. For more information, contact your Cisco Accounts representative.

remove

Removes the specified charging characteristic configuration from this profile.

behavior-bit no-records bit_value

Default: disabled

Specifies the charging characteristic behavior bit. no-records instructs the system not to generate any accounting records regardless of what may be configured elsewhere.
*bit_value* is an integer from 1 through 12.

```
```

The Controlled SGWCDR Generation feature is not fully qualified in release 21.7. It is available only for testing purposes. For more information, contact your Cisco Accounts representative.

Use this CLI command to generate SGWCDR based on certain Charging-Characteristics profile value received in Charging-Characteristics IE inside CSReq.

- **0 … 15**: Configures CC-profile number 0 for SGWCDR generation ... Configures CC-profile number 15 for SGWCDR generation.

Existing CLI commands for SGWCDR generation are not impacted:

- The `cc gen-cdr-for-profile` CLI command takes effect only if the existing `cc behavior-bit no-records` CLI command has no impact based on Charging-Characteristics profile value received.

- The existing `accounting-mode gtpp` CLI command is still required for SGWCDR generation.

The Controlled SGWCDR Generation feature will not work if the `cc prefer local-value` CLI command is configured.

Subsequent configuration of `cc gen-cdr-for-profile` CLI command results in earlier values being discarded.

The values of `cc gen-cdr-for-profile` CLI command are applicable only for new subscribers connected after the CLI is configured.

```
local-value behavior bit_value profile index_bit
```

Defaults: `bit_value = 0x0`, `index_bit = 8`

Sets the local value of the behavior bits and profile index for the charging characteristics when the HLR/HSS does not provide values for these parameters.

*bit_value* is a hexadecimal value between 0x0 and 0xFFF.

*index_bit* is an integer value from 1 through 15.

Setting the profile index bis selects different charging trigger profiles to be used with the call control profile. Some of the index values are predefined according to 3GPP standard:

- **1** for hot billing
- **2** for flat billing
- **4** for prepaid billing
- **8** for normal billing

If the HLR/HSS provides the charging characteristics with behavior bits and profile index and the operator prefers to ignore the HLR/HSS values, then *also* configure the `prefer local-value` keyword.

```
prefer { hlr-hss-value | local-value }
```

Default: `hlr-hss-value`
Specifies a preference for using charging characteristics settings received from HLR or HSS, or those set by the SGSN or MME locally with the local-value behavior command.

- **hlr-hss-value** sets the call control profile to use charging characteristics settings received from HLR or HSS. This is the default preference.
- **local-value** sets the call control profile to use charging characteristics settings from the SGSN or MME only. If no charging characteristics are received from the HLR/HSS then local values will be applied.

**Usage Guidelines**

Use this command to set the behavior for charging characteristic comings from either an HLR/HSS or locally from an MME/SGSN.

These charging characteristics parameters can also be set within an APN profile with the commands of the APN Profile configuration mode. For generation of M-CDRs, the parameters configured in this mode, Call Control Profile configuration mode, will prevail but for generation of S-CDRs the parameters configured in the APN Profile configuration mode will prevail.

The 12 behavior bits (of the local-value behavior keyword) can be used to enable or disable CDR generation.

**Example**

The following command specifies a rule not to generate charging records (CDRs) and sets the charging characteristics behavior bit to 2:

```
cc behavior-bit no-records 2
```

**check-zone-code**

Enables or disables the zone code checking mechanism.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no | remove ] check-zone-code
```

- **no**
  
  Included with the command, this keyword disables the mechanism.

- **remove**
  
  Included with the command, this keyword causes the removal of the current check-zone-code configuration and returns to the SGSN to the default where zone-code checking is enabled.
**Usage Guidelines**

Use this command to enable/disable the zone-code checking function.

**Example**

Disable checking of the zone code:

```
no check-zone-code
```

---

**ciot-optimisation**

This command is used to configure Control Plane (CP) CIoT optimization for an UE.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
ciot-optimisation { cp-optimisation { access-type { all | nb-iot | wb-eutran } | ciot-capable-ue } | eps-attach-wo-pdn access-type { all | nb-iot | wb-eutran } }
remove ciot-optimisation cp-optimisation ciot-capable-ue
remove ciot-optimisation eps-attach-wo-pdn access-type { all | nb-iot | wb-eutran }
remove
```

The keyword remove deletes the existing configuration.

**cp-optimisation**

Use this keyword to enable Control Plane optimization for an UE.

**access-type**

Use this keyword to specify the access type extension on which control plane optimization should be enabled. Control plane optimization and EPS attach without PDN can be enabled on both NB-IoT and WB-EUTRAN RATs or on either of them.

**ciot-capable-ue**

Uses only the ue-nw-capability to determine whether CP optimization or not.
all

Use this keyword to enable control plane optimization on both RAT types WB-EUTRAN and NB-IOT. This keyword is provided to the operator for the ease of configuring. Both NB-IoT and WB-EUTRAN will be considered as two independent access types for all functions.

nb-iot

Use this keyword to enable control plane optimization on the RAT type NB-IoT.

wb-eutran

Use this keyword to enable control plane optimization on the RAT type WB-EUTRAN.

eps-attach-wo-pdn

Use this keyword to enable EPS attach without PDN support for an UE.

Usage Guidelines

Use this command to configure the control plane optimization on the RAT type and to configure EPS attach without PDN support for UE. This command is not enabled by default. The call-control-profile can be associated with the operator-policy or with IME-TAC group, therefore it is possible to either enable or disable CIoT optimization on a per subscriber (IMSI) basis or on a group of subscribers or on per group of IMEI basis. CIoT optimization can be enabled on both NB-IoT and WB-EUTRAN RATs or on either of them. Enabling one RAT type does not disable the other RAT type.

Example

Use the following command to configure control plane optimization by specifying the access type as NB-IoT:

ciot-optimisation cp-optimisation access-type nb-iot

Use the following command to configure EPS attach without PDN support for UE, specify the access type as WB-EUTRAN:

ciot-optimisation eps-attach-wo-pdn access-type wb-eutran

ciphering-algorithm-gprs

Defines the order of preference of the ciphering algorithms.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#
Syntax Description

ciphering-algorithm-gprs priority priority algorithm
remove ciphering-algorithm-gprs priority priority

remove
Delete the priority definition.

priority priority
Sets the order in which the algorithm will be selected for use.

algorithm
Identifies the ciphering algorithm to be used.

Usage Guidelines
Define the order in which the ciphering algorithms are chosen for use. The command can be repeated to provide multiple definitions -- multiple priorities.

Example
Define gea1 as the third priority algorithm:
ciphering-algorithm-gprs priority 3 gea1

Usage Guidelines
Define the order in which the ciphering algorithms are chosen for use. The command can be repeated to provide multiple definitions -- multiple priorities.

Example
Define gea1 as the third priority algorithm:
ciphering-algorithm-gprs priority 3 gea1

csfb

Configures circuit-switched fallback options. CSFB is the mechanism to move a subscriber from LTE to a legacy technology to obtain circuit switched voice or short message.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
{local}host_name(config-call-control-profile-profile_name)#

Syntax Description
csfb { policy { ho-restriction | not-allowed | not-preferred | sms-only |
| suppress-call-reject } | sms-only }
remove csfb { policy | sms-only }

sms-only: Removes the SMS-only restriction allowing the UE to request voice and short message service (SMS) support for circuit-switched fallback (CSFB).
policy: Removes the configured policy.

policy { ho-restriction | not-allowed | not-preferred | sms-only | suppress-call-reject }

ho-restriction: This keyword enables ho-restriction support for CSFB MO Emergency Calls. If this keyword is enabled the MME sets the "Additional CS Fallback Indicator IE" in S1AP UE Context Setup/Modification as "restriction".

not-allowed: Specifies that the CSFB function is not allowed for both voice and SMS.

not-preferred: Specifies that the MME returns a "not-preferred" response for CSFB services. The MME does not enforce this and a voice centric is allowed to make CSFB calls on a not-preferred case if it chooses to do so.

sms-only: Specifies that the CSFB function only supports SMS.

suppress-call-reject: Configures the MME to ignore a paging request for an SMS-only CS call for an attached UE and suppress the paging reject. This allows the MME to process SGs CS call SMS-only paging requests for Ultra Card users where the same MSISDN is allocated to different IMSIs. By default the MME will reject the paging request with a cause:
SGSAP_SGS_CAUSE_MOBILE_TERMINATING_CSFB_REJECTED_BY_USER

sms-only

Specifies that the circuit-switched fallback function only supports SMS.

---

Important

This is a legacy keyword that remains to support earlier versions of the code. It operates identically to the policy sms-only keyword.

Usage Guidelines

Use this command to restrict the circuit-switched fallback function to SMS only or no support for either voice or SMS.

Example

The following command enforces the SMS-only functionality for UEs requesting circuit-switched fallback:

csfb policy sms-only

---

dcnr

Enables Dual Connectivity with New Radio (DCNR) to support 5G Non Standalone (NSA).

Product

MME, SGSN

Privilege

Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name
Entering the above command sequence results in the following prompt:

\[(local)host_name(config-call-control-profile-profile_name)#\]

**Syntax Description**

\[
\text{decor} \quad [\ \text{no} \ | \ \text{remove} \ ] \ \text{dcnr}
\]

- **no**
  - Disables the DCNR configuration.

- **remove**
  - Removes the configured values for DCNR.

**Usage Guidelines**

Use this command to enable DCNR for 5G NSA support.

---

**decor**

This command allows you to locally configure the UE Usage Type for UEs that complies with the Call Control Profile match criteria.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

\[
\text{configure} \ > \ \text{call-control-profile} \ \text{profile_name}
\]

Entering the above command sequence results in the following prompt:

\[(local)host_name(config-call-control-profile-profile_name)#\]

**Syntax Description**

\[
\text{decor} \ { s6a \ ue-usage-type \ [ \ suppress \ ] } \ | \ \text{send-ue-usage-type-in-csr} \ | \ \text{ue-usage-type} \ \text{usage_type_value} \}

\[
\text{remove} \ \text{decor} \ { s6a \ ue-usage-type } \ | \ \text{send-ue-usage-type-in-csr} \ | \ \text{ue-usage-type} \}

- **remove**
  - Removes the specified DECOR configuration from the Call Control Profile.

**decor**

Specifies the Dedicated Core Network configuration.

**s6a ue-usage-type [ suppress ]**

Configures the S6a interface for DECOR configuration.

**ue-usage-type**: Specifies the UE usage type that needs to be sent in the Authentication-Information-Request message over the S6a interface.

**suppress**: Suppresses sending the UE usage type in S6a Authentication-Information-Request message.
**send-ue-usage-type-in-csr**
Enables the sending of ue-usage-type in create-session-request to SPGW.

**ue-usage-type usage_type_value**
Configures the UE Usage Type locally. usage_type_value must be an integer from 0 to 255.

**Usage Guidelines**
Use this command to locally configure the UE Usage Type for UEs that complies with the Call Control Profile match criteria.

**Example**
The following command configures the UE usage type with value set to 100:
```
decor ue-usage-type 100
```

**description**
Allows you to enter a relevant descriptive string.

**Product**
MME  
SAEGW  
S-GW  
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:
```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**
```
description description  
no description
```

**description**
Enter an alphanumeric string of 1 to 100 characters. The string may include spaces, punctuation, and case-sensitive letters if the string is enclosed in double quotation marks ( " ).

**no**
Removes the description from the call control profile.

**Usage Guidelines**
Define information that identifies this particularly call control profile.
diameter-result-code-mapping

Maps an EMM (EPS Mobility Management) NAS (Network Access Server) cause code to a Diameter result code.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

diameter-result-code-mapping s6a diameter_result_code mme-emm-cause mme_emm_error_code

remove diameter-result-code-mapping s6a diameter_result_code

Removes the mapping for the specified Diameter result code.

s6a diameter_result_code

Specifies the Diameter result code to which the EMM NAS cause code is mapped.

diameter_result_code: Specify one of the supported Diameter result codes:

  • diameter-authorization-rejected - s6a result code 5003. Default mapped EMM code: "No suitable cells in tracking area."
  • diameter-error-other - miscellaneous s6a error result code. Default mapped EMM code: "Network failure."
  • diameter-error-rat-not-allowed - s6a result code 5421. Default mapped EMM code: "No suitable cells in tracking area."
  • diameter-error-roaming-not-allowed - s6a result code 5004. Default mapped EMM code: "PLMN not allowed."
  • diameter-error-user-unknown - s6a result code 5001/5030. Default mapped EMM code: "EPS Service and non-EPS services not allowed."
  • diameter-invalid-avp-value - s6a result code 5004. Default mapped EMM code: "Network failure."
  • diameter-unable-to-comply - s6a result code 5012. Default mapped EMM code: "Network failure."
  • diameter-unknown-eps-subscription - s6a result code 5420. Default mapped EMM code: "No suitable cells in tracking area."
  • diameter-unsupported-feature - s6a result code 5011. Default mapped EMM code: "Network failure."
**mme-emm-cause mme_emm_error_code**

Specifies the EMM NAS cause code to be mapped to the Diameter result code.

**mme_emm_error_code**: Specify one of the supported EMM NAS error codes:

- **eps-non-eps-not-allowed**: Specifies that the EMM NAS cause code #8 "EPS services and non-EPS services not allowed" is to be mapped to the specified Diameter result code.

- **network-failure**: Specifies that the EMM NAS cause code #17 "Network failure" is to be mapped to the specified Diameter result code.

- **no-suitable-cell-in-tracking-area**: Specifies that the EMM NAS cause code #15 "No suitable cells in tracking area" is to be mapped to the specified Diameter result code.

- **plmn-not-allowed**: Specifies that the EMM NAS cause code #11 "PLMN not allowed" is to be mapped to the specified Diameter result code.

- **roaming-not-allowed-in-this-tracking-area**: Specifies that the EMM NAS cause code #13 "Roaming not allowed in this tracking area" is to be mapped to the specified Diameter result code.

- **severe-network-failure**: Specifies that the EMM NAS cause code #42 "Severe network failure" is to be mapped to the specified Diameter result code.

- **tracking-area-not-allowed**: Specifies that the EMM NAS cause code #12 "Tracking area not allowed" is to be mapped to the specified Diameter result code.

**Usage Guidelines**

Use this command to map a selected EMM NAS cause code to a specific Diameter result code.

**Example**

The following command maps the EMM NAS cause code "Roaming not allowed in this tracking area" to the Diameter result code "S6a Diameter error RAT not allowed":

```
diameter-result-code-mapping s6a diameter-error-rat-not-allowed
mme-emm-cause roaming-not-allowed-in-this-tracking-area
```

**direct-tunnel**

Enables setup of a direct tunnel if direct tunneling is supported by the destination node.

**Important**

Direct tunneling must be enabled at both of these two points to allow direct tunneling for the MS/UE.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:
direct-tunnel attempt-when-permitted [ to-ggsn | to-sgw ]

remove direct-tunnel [ to-ggsn | to-sgw ]

remove

Removes the configured setting from the call control profile. An existing configuration to enable direct tunneling must be removed before creating a new direct tunnel enabling configuration.

attempt-when-permitted

Enables direct tunneling if the destination node allows it. Default: disabled.

[to-ggsn | to-sgw]

Beginning with Release 19.3.5, including one of these keyword filters allows the operator to select the interface for the direct tunnel.

- to-ggsn enables only the GTP-U interface between the RNC and the GGSN for the direct tunnel.
- to-sgw enables only the S4's S12 interface between the RNC and the SGW for the direct tunnel.

Usage Guidelines

By default, the direct tunnel feature is not enabled. Use this command to enable the direct tunnel feature.

To ensure that direct tunnel is fully configured for support by the SGSN, check the settings for direct-tunnel in

- the APN profile -- from the Exec mode, use command: show apn-profile <profile_name> all
- the RNC (radio network controller) configuration -- from the Exec mode, use command: iups-service <service_name> all

There are three optional configurations:

1. attempt-when-permitted enables both the GTP-U interface towards the GGSN and the S12 interface towards the SGW.
2. attempt-when-permitted to-ggsn enables only the GTP-U interface towards the GGSN.
3. attempt-when-permitted to-sgw enables only the S12 interface towards the SGW.

Important

All three forms of the CLI function independently. This means that the configuration created with one command (for example: direct-tunnel attempt-when-permitted to-ggsn) is not overwritten by the entry of one of the other commands (for example: direct-tunnel attempt-when-permitted). The existing configuration must be removed to disable the configuration and then the next configuration must be added.

Example

The following command sets the configuration to instruct the SGSN to attempt to setup a direct tunnel if permitted at the destination node:
**direct-tunnel attempt-when-permitted**

The following command allows the operator to select the direct tunnel interface and sets the configuration to instruct the S4-SGSN to attempt to setup a direct tunnel using an S12 interface to the destination SGW if the SGW permits direct tunnels:

```
direct-tunnel attempt-when-permitted to-sgw
```

---

**dns-ggsn**

Defines the context to be used to do DNS lookup for GGSNs.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
dns-ggsn context ctxt_name
no dns-ggsn context ctxt_name
```

- **no**
  
  Removes the dns-ggsn configuration from this call control profile.

- **context ctxt_name**
  
  Specifies the context to be used to do DNS lookup for GGSNs as an alphanumeric string of 1 through 64 characters.

**Usage Guidelines**

Use this command to define the context to be used to do DNS lookup to find the GGSN address.

**Example**

```
dns-ggsn context sgsn1
```

---

**dns-mrme**

This command is used to configure the DNS client context and DNS query type used for the PGW/GGSN resolution for MRME.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

**configure > call-control-profile** *profile_name*

Entering the above command sequence results in the following prompt:

[local]:host_name(config-call-control-profile-profile_name)#

**Syntax Description**

```plaintext
dns-mrme { context  context_name [ query-type { a-aaa | snaptr } ] | query-type { a-aaa | snaptr } } |
no dns-mrme context

default dns-mrme query-type

no
```

Removes the dns-mrme configuration from this call control profile.

**default**

Sets the default value for the query-type and context will not be modified.

Default (SaMOG 3G license): a-aaa

Default (SaMOG Mixed Mode license): snaptr

---

**Important**

The **default dns-mrme query-type** command is available only when the SaMOG Mixed Mode license (supporting both 3G and 4G) is configured.

**context_name**

Specifies the DNS client context to be used for DNS lookup. *context_name* must be an alphanumeric string of 1 through 79 characters.

**query-type { a-aaa | snaptr }**

Specifies the type of DNS query used for the PGW/GGSN resolution for MRME.

- **a-aaa**: Specifies to use A-AAA queries using pre-release 8 DNS procedures.
- **snaptr**: Specifies to use SNAPTR queries using post-release 7 DNS procedures. This is the default value when SaMOG Mixed Mode license is configured.

---

**Important**

This keyword is available only when the SaMOG Mixed Mode license (supporting both 3G and 4G) is configured. However, when an SaMOG 3G license is configured, the query type for the DNS query is set to use A-AAA queries using pre-release 8 DNS procedures.

**Usage Guidelines**

Use this command to configure the DNS client context and DNS query type used for the PGW/GGSN resolution for MRME. The DNS context configuration is used to provide the context name where the DNS client for this AAA server is configured. The default dns-context is configured under the MRME Service Configuration Mode. If no DNS context is configured under the MRME Service Configuration Mode, the DNS context will be used as the context for the MRME service.
Example

dns-mrme context mrme1 query-type snaptr

dns-mc

Defines the context to be used to do DNS lookup for Mobile Switching Centers (MSCs).

Product

MME

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

- **dns-mc context ctxt_name**
- **remove dns-mc**

remove

Deletes this definition from the call control profile.

context **ctxt_name**

Specifies the context to be used to do DNS lookup for MSCs as an alphanumeric string of 1 through 64 characters.

This specifies the name of the context where the DNS client is configured that will be used for DNS resolution of MSCs for Single Radio Voice Call Continuity (SRVCC).

Usage Guidelines

This feature requires that a valid SRVCC license key be installed.

Use this command to configure the context ID for the DNS lookup.

MSC selection using DNS takes precedence over locally configured MSCs. If DNS lookup fails, the MME will select the MSC from local configuration.

DNS based MSC selection can be defined for an MME service, or for a Call Control Profile. Both configuration options specify the context in which a DNS client configuration has been defined. Configuration via Call Control Profile takes precedence in cases where DNS selection is also configured in the MME service.

Example

The following command associates a pre-configured context *dns_ctx1* where a DNS client service is configured for DNS query to MSC for this Call Control Profile.

**dns-mc context dns_ctx1**
**dns-sgsn**

Identifies the context to be used to do DNS to find an SGSN address.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no ] dns-sgsn context ctxt_name
```

- **no**
  Removes the dns-sgsn configuration from this call control profile.

- **context ctxt_name**
  Identify the context where the DNS client is configured to send the DNS query to get the peer SGSN address.
  - **context_name**: Enter a string of 1 to 79 alphanumeric characters to identify the context.
  - This configuration would override any similar configuration for `dns-sgsn context` in the SGTP service configuration.

**Usage Guidelines**
Use this command to configure the context ID for the SGSN address that will be used to do the DNS lookup.

**Example**
Configure context `sgsn1` for DNS lookup:

```
dns-sgsn context sgsn1
```

---

**dns-pgw**

Defines the context to be used to do DNS lookup for P-GWs.

**Product**
MME
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
`configure > call-control-profile profile_name`

---

`Command Line Interface Reference, Modes C - D, StarOS Release 21.20`
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
[ remove ] dns-pgw context ctxt_name
```

- **remove**
  Deletes this definition from the call control profile.

- **context ctxt_name**
  Specifies the context to be used to do DNS lookup for P-GWs as an alphanumeric string of 1 through 64 characters.

On the S4-SGSN, if the interface selected for a UE is S4 and if there is no DNS-PGW context configured under a call control profile, then by default the system will look for the DNS client in the context where the eGTP service is defined. If the interface selected for a UE is Gn-Gp and if there is no **dns-pgw context** configured in a call control profile, then by default the S4-SGSN will look for the DNS client in the context where the SGTP service is configured for selecting a co-located PGW/GGSN if:

- the UE is EPC capable and,

- **apn-resolve-dns-query snaptr** is configured in an APN profile using *APN Profile Configuration Mode*.

If the **dns-pgw context** is deleted with the **remove** option, the S4-SGSN chooses the DNS client from the context where the eGTP service is configured.

### Usage Guidelines

Use this command to configure the context ID for the DNS lookup.

---

**Important**

It is recommended to execute the S4 SGSN configuration commands during the maintenance window. After configuring the node, re-start the node to activate the configuration commands. This will ensure that the node is in a consistent state and S4 SGSN service instability scenarios are avoided.

---

### Example

```
dns-pgw context pgw1
```

### dns-sgw

Defines the context to be used to do DNS lookup for S-GWs.

- **Product**
  - MME
  - SGSN

- **Privilege**
  - Security Administrator, Administrator

- **Command Modes**
  - Exec > Global Configuration > Call Control Profile Configuration
  - `configure > call-control-profile profile_name`
Entering the above command sequence results in the following prompt:

\[(\text{local})\text{host\_name}(\text{config-call\_control\_profile-profile\_name})\#\]

**Syntax Description**

\[ \text{[ remove \]} \text{ dns-sgw context ctxt\_name } \]

**remove**

Deletes this definition from the call control profile.

**context ctxt\_name**

Specifies the context to be used to do DNS lookup for S-GWs as an alphanumeric string of 1 through 64 characters.

This command must be used to configure DNS client settings when using dynamic S-GW selection where the tai-mgmt-db has been associated with a call-control-profile.

On the S4-SGSN, this specifies the name of the context where the DNS client is configured that will be used for DNS resolution of S-GWs. If `dns-sgw context` is not specified, the S4-SGSN uses the DNS client configured in the context where the eGTP service is configured to query the S-GW DNS address.

**Usage Guidelines**

Use this command to configure the context ID for the DNS lookup.

---

**Important**

It is recommended to execute the S4 SGSN configuration commands during the maintenance window. After configuring the node, re-start the node to activate the configuration commands. This will ensure that the node is in a consistent state and S4 SGSN service instability scenarios are avoided.

---

**Example**

dns-sgw context sgw1

---

**ecn**

This command enables explicit congestion notification (ECN) in normal mode or compatible mode for the GTP tunnel over S2b interface.

**Product**

ePDG

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > Global Configuration > Call Control Profile Configuration`

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

\[(\text{local})\text{host\_name}(\text{config-call\_control\_profile-profile\_name})\#\]

**Syntax Description**

ecn gtp mode normal

remove ecn gtp mode
ecn
Specifies ECN over GTP tunnel in normal mode.

gtp
Enables ECN handling over GTP tunnel.

mode
Specifies the tunnel ingress encapsulation mode.

normal
Specifies the normal mode of encapsulation.

remove
Enables ECN in compatible mode for GTP tunnel over the S2b interface. The default mode is the compatible mode, supported for backward compatibility.

Usage Guidelines
Use this command to enable ECN in normal mode or compatible mode for the GTP tunnel over S2b interface.

Example
The following command enables ECN in normal mode for the GTP tunnel:

```
ecn gtp mode normal
```

edrx
This command enables Extended Discontinuous Reception (eDRX) and configures its respective parameters, on the MME.

Product
MME

Privilege
Administrator

Command Modes
Exec> Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax
```
edrx { ptw ptw_value edrx-cycle cycle_length_value | ue-requested } [ dl-buf-duration [ packet-count packet_count_value ] ]
remove edrx
```
remove

The keyword remove disables the eDRX configuration on the MME.

ptw ptw_value

This keyword is used to configure the PTW value.
In releases prior to 21.2: The ptw_value is an integer ranging from "0" up to "20".
In 21.2 and later releases: The ptw_value is an integer ranging from "0" up to "15".

ue-requested

The keyword ue-requested specifies the UE requested values of the Paging Time Window (PTW) and the eDRX cycle length received from the UE in the Attach Request/TAU Request message be accepted.

edrx-cycle cycle_length_value

The keyword edrx-cycle is used to configure the eDRX cycle length. The cycle_length_value is an integer value from "512" up to "262144". It is a multiple of 2 starting from 512 up to 262144 (for example: 512, 1024, 2048, and so on).

dl-buf-duration

The keyword dl-buf-duration is used to send downlink buffer duration in DDN ACK when unable to page UE.

packet-count packet_count_value

The keyword packet-count is used to send 'DL Buffering Suggested Packet Count' in DDN ACK when unable to page UE. The packet_count_value is an integer value from "0" up to "65535". If the packet_count_value is not configured locally, the subscription provided value for the packet_count_value is used. The subscription value can be "0" in which case packet count IE will not be sent for that subscriber even if it is configured locally.

Usage Guidelines

Use this command to enable eDRX on the MME. This command is configured as part of the eDRX feature for MME - it allows UEs to connect to the network on a need basis. With eDRX, a device can remain inactive or in sleep mode for minutes, hours or even days based on the H-SFN synchronization time (UTC Time). The H-SFN synchronization time for eDRX is configured at an MME-Service level. See MME Service Configuration Mode Commands chapter for configuration information on H-SFN synchronization. This command is not enabled by default.

Example

The following command is used to configure the PTW and eDRX cycle length. The command is also used to send the downlink buffer duration in the DDN ACK along with a suggested packet count:
edrx ptw 10 edrx-cycle 512 dl-buf-duration packet-count 10
egtp

Configures the type of PLMN sent in either the user location information (ULI) IE or the Serving Network IE.

Product
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

egtp network-sharing-plmn { serving-network { use-common-plmn | use-selected-plmn | use-ue-plmn } | uli { use-common-plmn | use-selected-plmn | use-ue-plmn } }

remove egtp network-sharing-plmn { serving-network | uli }

remove
Erases the IE choice from the call control profile configuration.

use-common-plmn
Instructs the SGSN to identify the Common PLMN for the shared network.

use-selected-plmn
Instructs the SGSN to identify the Selected PLMN for the shared network.

use-ue-plmn
Instructs the SGSN to identify the UE selected PLMN that is available in the shared network.

Usage Guidelines

The SGSN supports location change reporting on the S4 interface, when requested by the P-GW, using a ULI IE in GTPv2 messages. When the network sharing feature is enabled the operator can determine which PLMN to send to the P-GW in the ULI IE and Serving Network IE. The command can be issued multiple times to configure the PLMN type for each IE.

The selections made for this configuration must match those configured for the call control profile's GTP configuration.

This command can only be used if network sharing is enabled and the appropriate "Location-reporting in connected-mode" feature license is installed. For details, check with your Cisco Representative.

Example
Configure the ue-plmn type PLMN to be sent in the Serving Network IE:

egtp network-sharing-plmn serving-network ue-plmn
eir-profile

Identifies and associates an EIR profile to be used by the SGSN for EIR selection.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
[ no ] eir-profile profile_name
```

- **no**
  
  Disassociates the EIR profile with the call control profile.

**Usage Guidelines**

The equipment identify register (EIR) profile contains all the parameters needed to identify and work with an EIR to perform check IMEI procedures and to address multiple EIR through a single EIR address. The configuration in the EIR profile associated with the call control profile take precedence over the EIR parameters configured in the MAP service.

**Example**

Associate the EIR profile called *LondonEIR1*:

```plaintext
eir-profile LondonEIR1
```

encryption-algorithm-lte

Defines the priorities for using the encryption algorithms.

**Product**
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
encryption-algorithm-lte priority1 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } [ priority2 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ] [ priority3 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ] [ priority4 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ]
```

```plaintext
encryption-algorithm-lte priority1 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } [ priority2 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ] [ priority3 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ] [ priority4 { 128-eea0 | 128-eea1 | 128-eea2 | 128-eea3 } ]
```
remove encryption-algorithm-lte

remove

Deletes the priorities definition from the call control profile configuration.

priority1

Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 1.

priority2

Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 2.

priority3

Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 3.

priority4

Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 4.

128-eea0

Sets the Null ciphering algorithm (128-EEA0) for LTE encryption as the encryption algorithm for security procedures.
Default: priority1

128-eea1

Sets the SNOW 3G synchronous stream ciphering algorithm (128-EEA1) for LTE encryption as the encryption algorithm for security procedures. SNOW 3G is a stream cipher that forms the base of the 3GPP confidentiality algorithm UEA2 and the 3GPP integrity algorithm UIA2.
Default: priority2

128-eea2

Sets the Advance Encryption Standard (AES) ciphering algorithm (128-EEA2) for LTE encryption as the encryption algorithm for security procedures.
Default: priority3

128-eea3

Sets the ZUC algorithm (128-EEA3) for LTE encryption as the encryption algorithm for security procedures.
Default: priority4
Usage Guidelines

Set the order or priority in which the MME will select an encryption algorithm for use. All three priorities must be set or the definition is invalid. The command can be re-entered to change the priorities without removing the configuration.

Example

The following command sets the 128-EEA2 as the LTE encryption algorithm with priority 3 for security procedures with the call control profile:

```
encryption-algorithm-lte priority1 128-eea2 priority3
```

**encryption-algorithm-umts**

Defines the priorities for using the encryption algorithms.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local|host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
encryption-algorithm-umts { uea0 | uea1 | uea2 } [ then-uea# | then-uea# ]
no encryption-algorithm-lte
```

no

Deletes the priorities definition from the call control profile configuration.

```
{ uea0 | uea1 | uea2 }
```

Enter one of the three options to define the first priority algorithm.

```
[ then-uea# | then-uea# ]
```

If a second algorithm is to be included as an option, give it second priority. Enter 0, 1, or 2 at the end of then-uea to define the algorithm being given second priority.

```
then-uea#
```

If a third algorithm is to be included as an option, give it third priority. Enter 0, 1, or 2 at the end of then-uea to define the algorithm being given third priority.

Usage Guidelines

Set the order or priority in which the SGSN will select a UEA algorithm for use. It is not necessary to define priorities for all three priority levels. The command can be re-entered to change the priorities without removing the configuration.
Example
Configure algorithm UEA2 as the first priority encryption algorithm with no others to be considered:

```
encryption-algorithm-umts uea2
```

end

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
end
```

**Usage Guidelines**
Use this command to return to the Exec mode.

**epdg-s2b-gtpv2**

Configures S2b GTPv2 IE Options.

**Product**
ePDG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:
```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**
```
[ remove ] epdg-s2b-gtpv2 send { aaa-server-id | message { mbr trigger mobike } | serving-network { value uli } | ue-local-ip-port | uli | wlan-location-info-timestamp }
```

remove
Using the "remove" keyword will remove the configuration and restore the default behavior. By default the inclusion of the AVPs in the Create Session Request Message will be disabled.

send
Configure the IE or message options in send direction.

**aaa-server-id**
This is used to send AAA origin-host and origin.realm in Node Identifier IE.
message
This is used to configure the message options to be sent.

serving-network
This is used to send serving-network IE.

ue-local-ip-port
This is used to send UE Local IP IE and UE UDP Port IE.

uli
This is used to send uli IE.

wlan-location-info-timestamp
This is used to send UE Wlan Location Information and Timestamp IE.

Usage Guidelines
Use this command to Enable/Disable the inclusion of the "UE Local IP Address" and "UE UDP Port" AVPs in the GTPv2 Create Session Request message from ePDG to PGW.

Example
Use the following command to include "UE Local IP Address" and UE UDP Port" AVPs in the GTPv2 Create Session Request message from ePDG to PGW.
```plaintext
epdg-s2b-gtpv2 send ue-local-ip-port
```

epdg-swm

Configures Swm Message Options for ePDG.

Product ePDG

Privilege Security Administrator, Administrator

Command Modes Exec > Global Configuration > Call Control Profile Configuration
```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:
```
[local] host_name(config-call-control-profile-profile_name) #
```

Syntax Description
```
epdg-swm send message aar trigger location-retrieval
[ remove ] epdg-swm send message aar [ trigger ]
```

remove
Using the "remove" keyword will remove the configuration and restore the default behavior.
send
Configure the IE or message options in send direction.

message
This is used to configure the message options to be sent.

aar
Authorisation and Authentication Request.

trigger
This is used to set trigger on which message shall be sent.

location-retrieval
Sets Trigger as location-retrieval.

Usage Guidelines
Use this command to Swm Message Options for ePDG.

Example
Use the following command to configure Swm Message Options like sending a message with authorisation and authentication request setting trigger as location retrieval.

epdg-swm send message aar trigger location-retrieval

equivalent-plmn
Configures the definition for an equivalent public land mobile network identifier (PLMN ID) and the preferred radio access technology (RAT). This is a of PLMNs which should be considered by the mobile as equivalent to the visited PLMN for cell reselection and network selection. When configured, the equivalent PLMN list will be sent to the UE in NAS ATTACH ACCEPT / TAU ACCEPT messages (up to 15 PLMNs in each message).

Product
MME
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Syntax Description
equivalent-plmn radio-access-technology { 2G | 3g | 4g | any } plmnid mcc
mcc_number mnc mnc_number priority priority
no equivalent-plmn radio-access-technology { 2G | 3g | any } plmnid
mcc:mcc_number mnc mnc_number

no
Removes the equivalent-PLMN configuration from this call control profile.

radio-access-technology { 2G | 3g | 4g | any }
Identify the RAT type of the equivalent PLMN:
• 2G: 2nd generation
• 3G: 3rd generation
• 4G: 4th generation
• any: Any RAT

plmnid mcc:mcc_number mnc mnc_number
• mcc: Specifies the mobile country code (MCC) portion of the PLMN ID. The number can be any integer between 100 and 999.
• mnc: Specifies the mobile network code (MNC) portion of the PLMN ID. The number can be any 2- or 3-digit integer between 00 and 999.

priority priority
Enter an integer between 1 and 15 with the highest priority assigned to the integer of the lowest numeric value.

Usage Guidelines
Use the command to identify an 'equivalent PLMN' and assign it a priority to define the preferred equivalent PLMN to be used. This command can be entered multiple times to set priorities of usage.

Example
The following command sets up a secondary equivalent PLMN definition that allows for any RAT with a PLMN ID of MCC121.MNC767:

```
equivalent-plmn radio_access_technology any plmnid mcc 121 mnc 767 priority 2
```

esm t3396-timeout
This command is used to configure the ESM T3396 timer to be sent to UE in ESM reject messages.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

```plaintext
esm t3396-timeout timeout_value cause cause_code_value
remove esm t3396-timeout cause cause_code_value
```

**remove**

Removes the T3396 timeout configuration for the specified cause code from Call Control profile. The T3396 timeout will then be applied from the MME-service.

**t3396-timeout timeout_value**

Configures the value for ESM backoff timer (in seconds) to be sent to UE for ESM reject cause 'insufficient resources' and 'missing or unknown apn'. This value overrides the MME-service level configuration.

The *timeout_value* is an integer from 0 to 111600.

**cause cause_code_value**

Configures the cause code value as an integer that is either 26 or 27. If the configured value is present in the ESM reject messages, the T3396 back-off timer will be included.

- The following cause values are supported:
  - 26 - Insufficient resources
  - 27 - Missing or Unknown APN

- Only one cause value can be configured with the *cause* keyword. Multiple cause values cannot be configured.

**Usage Guidelines**

This command configures the ESM T3396 timer to be sent to UE in ESM reject messages. There is no specified default value for T3396 timeout for a given cause code.

- To configure the T3396 timeout for different cause codes, the configuration must be done in multiple lines. For example:

  ```plaintext
esm t3396-timeout 1100 cause 26
esm t3396-timeout 1500 cause 27
```

- The new configuration for T3396 timeout for a given cause code will override the previous configuration. For example:

  ```plaintext
esm t3396-timeout 1500 cause 26
esm t3396-timeout 1800 cause 26
```

  The final T3396 timeout that will be applied for cause code 26 is 1800 seconds.

**Example**

The following command sets the ESM T3396 timeout value as 1860 seconds for cause code value 26:
**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
exit
```

**Usage Guidelines**
Use this command to return to the parent configuration mode.

---

**gbr-bearer-preservation-timer**

Configures the system to preserve GBR bearers for a configurable timer value.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
```
Exec > Global Configuration > Call Control Profile Configuration
```
```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:
```
{local}host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**
```
gbr-bearer-preservation-timer timer_value
remove gbr-bearer-preservation-timer
```

**remove**
Disables the timer configuration.

**gbr-bearer-preservation-timer**
The above command allows the operator to set the preservation time for the Bearer on receiving the UE Context Release with the Radio Connection With UE Lost cause code.

**timer_value**
Specifies the duration for preserving the bearers in seconds. *timer_value* must be an integer from 1 to 600.

**Usage Guidelines**
MME provides a configurable timer. Operators can configure a timer value for which the GBR bearers are preserved when the subscriber is out of coverage during a VoLTE call.
Example
The following command preserves the GBR bearers for 300 seconds.

```
gbr-bearer-preservation-timer 300
```

### gmm Extended-T3312-timeout

This command enables the operator to determine how the SGSN handles Extended T3312 timer values at the Call-Control Profile level.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
gmm Extended-T3312-timeout { value ext3312_minutes | when-subscribed } [ low-priority-ind-ue ]
no gmm Extended-T3312-timeout
```

**no**

This command filter instructs the SGSN to remove the Extended T3312 configuration from the Call-Control Profile configuration.

**value**

This keyword instructs the SGSN to send the defined Extended T3312 timer value in Attach or RAU Accept messages to the MS if the subscriber has a subscription for the Extended T3312 timer (Subscribed Periodic RAU/TAU Timer in ISD) and indicates support for the extended periodic timer via the MS Network Feature Support.

*ext3312_minutes*: Enter an integer from 0 to 18600 to identify the number of minutes for the timeout; default is 186 minutes.

**when-subscribed**

This keyword instructs the SGSN to only send the Extended T3312 period RAU timer value in Attach or RAU Accept messages if the SGSN receives the timeout value in an ISD (insert subscriber data) when the MS has indicated support in "MS Network Feature Support".

**low-priority-ind-ue**

This keyword instructs the SGSN to include the extended T3312 timer value only if the Attach/RAU Request messages include a LAPI (low access priority indicator) in the "MS Device Properties".
Usage Guidelines

An Extended-T3312-timeout configuration in the Call-Control Profile will override an Extended-T3312-timeout configuration done for either the GPRS or SGSN services. As well, a Call-Control Profile configuration enables the operator to finetune for Homers and Roamers.

Example

Use a command similar to the following to instruct the SGSN to only send the Extended T3312 value when the Attach/RAU Request includes a LAPI and when the received "MS Network Feature Support" information indicates the the user is subscribed for this timer:

```
gmm Extended-T3312-timeout when-subscribed low-priority-ind-ue
```

Use the following command to remove the Extended T3312 timer configuration from the Call-Control Profile.

```
no gmm Extended-T3312-timeout
```

gmm information-in-messages

Provides the configuration to include the information in messages for the GPRS mobility management (GMM) parameters.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
gmm information-in-messages access-type { { gprs | umts } [ network-name
{ full-text name | short-text name } | [ send-after { attach | rau } ] ] }
[ default | no ] gmm { information-in-messages access-type { gprs | umts
}
```

no

Disables the GMM configuration from this call control profile.

default

Sets up a GMM configuration with system default values.

access-type

Must select one of the following options:

- **gprs** - General Packet Radio Service network
- **umts** - Universal Mobile Telecommunications System network
After selecting the access-type, an additional parameter can be configured:

- **network-name**: identifies the network name in either short text or full text.
- **send-after**: configures the information in message to send after attachment or Routing Area Update (RAU).

**network-name \{ full-text name | short-text name \}**

This keyword provides the option to add the network name to the message. The network name will in full text or short text. Possible options are:

- full-text name: Indicate the network name in full text
- short-text name: Indicate the network name in short text

**send-after \{ attach | rau \}**

This keyword configures the information in message to send after attachment or RAU message. Possible options are:

- attach: Information sent after attachment
- rau: Information sent after routing area update

**Usage Guidelines**

Use this command to configure identifying information about the network that will be included in GMM messages.

**Example**

Set default settings for calls coming from 2.5G networks:

default gmm information-in-messages access-type gprs

gmm rau-accept

Provides the configuration to set the Follow-On Proceed (FOP) bit in the Routing Area Update Accept (RAU) message.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

**configure > call-control-profile profile_name**

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#
Syntax Description

```bash
gmm rau-accept follow-on-proceed { on-following-nw-procedure | only-on-ue-request }
remove gmm rau-accept follow-on-proceed

remove
Disables the SGSN from sending the Follow On Proceed bit in the RAU response.

follow-on-proceed
This keyword configures the SGSN to send FOP bit in RAU Accept message.

on-following-nw-procedure
This keyword configures the SGSN to send FOP bit when there is a following Network Procedure.

only-on-ue-request
This keyword configures the SGSN to send FOP bit only when UE requests for it.
```

Usage Guidelines

Use this command to configure the setting of Follow On Proceed bit in Routing Area Accept Message. The FOP bit can be set only when the UE requests for it by configuring the command option `only-on-ue-request` or the FOP bit can be set when there is a following network procedure by configuring the CLI option `on-following-nw-procedure`. By default, the configuration is `gmm rau-accept follow-on-proceed only-on-ue-request`.

Example

Use this command to configure the SGSN to send the Follow On Proceed bit when there is a following Network Initiated Procedure.

```bash
gmm rau-accept follow-on-proceed on-following-nw-procedure
```

### gmm retrieve-equipment-identity

Configures the International Mobile Equipment Identity (IMEI) or software version (SV) retrieval and validation procedure.

<table>
<thead>
<tr>
<th>Product</th>
<th>SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```bash
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```
Syntax Description

```bash
gmm retrieve-equipment-identity { imei | imeisv [ unciphered ] [ then-imei ] } [ verify-equipment-identity [ deny-greylisted ] [ allow-unknown ] ] [ no | default ] gmm retrieve-equipment-identity
```

**no**
Disables the equipment identity retrieval procedure configured for this call control profile.

**default**
Sets the default action for equipment identity retrieval (EIR) procedure:

- `retrieve-equipment-identity`: Default action is disabled - no retrieval of IMEI/IMEI-SV
- `verify-equipment-identity`: Default action is disabled - no verification with Equipment Identity Register (EIR)

**equipment-identity-type**
Default: disabled
Indicates the type of equipment identification, with the possible values:

- `imei`: International Mobile Equipment Identity
- `imeisv`: International Mobile Equipment Identity - Software Version

**imei**
Indicates the equipment identity retrieval type to International Mobile Equipment Identity (IMEI). IMEI is a unique 15-digit number consisting of a TAC (Technical Approval Code), a FAC (Final Assembly Code), an SNR (Serial Number), and a check digit.

**imeisv [ unciphered ] [ then-imei ]**
Indicates the equipment identity retrieval type to IMEI with software version (SV). IMEI with SV is a unique 16-digit number consisting of a TAC (Technical Approval Code), a FAC (Final Assembly Code), an SNR (Serial Number), and a 2-digit software version number.

- `unciphered`: This optional keyword enables the unciphered retrieval of IMEI-SV. If this option is enabled the retrieval procedure will get IMEISV (if auth is still pending, get as part of Authentication and Ciphering Response otherwise, via explicit Identification Request after Security Mode Complete).
- `then-imei`: This optional keyword enables the retrieval of software version number before the IMEI. If this option is enabled the equipment identity retrieval procedure will get IMEISV on secured link (after Security mode procedure via explicit GMM Identification Request), and if MS is not having IMEISV (responded with NO Identity), SGSN will try to get IMEI.

If no other keyword is provided, imeisv will get IMEISV on a secured link (after a Security mode procedure via explicit GMM Identification Request).

**verify-equipment-identity [ deny-greylisted ] [ allow-unknown ]**
Default: disabled
This keyword enables the equipment identity validation and validates the equipment identity against the EIR.

- **deny-greylisted**: This keyword fine-tunes the configuration and enables the restriction to the user having mobile equipment with an IMEI in the EIR grey list.

- **allow-unknown**: If this keyword is configured and EIR sends equipment status as "UNKNOWN EQUIPMENT" then the call will be allowed to continue in SGSN.

### Usage Guidelines

Use this command to enable and configure the procedures for mobile equipment identity retrieval and validation from the EIR identified in the MAP Service Configuration mode.

### Example

The following command enables the SGSN to send "check IMEI" messages to the EIR:

```plaintext
gmm retrieve-equipment-identity imei verify-equipment-identity
```

## gmm t3346

The `gmm` command includes a new keyword to set the MM T3346 back-off timer for a Call-Control Profile.

### Product

SGSN

### Privilege

Security Administrator, Administrator

### Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```plaintext`
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```plaintext
gmm t3346 min minimum_minutes max maximum_minutes
no gmm t3346
```

- **no**

  Including this filter with the command removes the MM back-off timer definition from the Call-Control Profile configuration.

- **min minimum_minutes**

  Enter an integer from 1 to 15 to identify the minimum number of minutes the timer should run; default is 15 minutes.

- **max maximum_minutes**

  Enter an integer from 1 to 30 to identify the maximum number of minutes the timer should run; default is 30 minutes.
Usage Guidelines

- Under congestion, the SGSN can assign the T3346 back-off timers to the UEs and request the UEs not to access the network for a given (timer value) period of time.
- If an Attach Request or RAU Request or Service Request is rejected due to congestion, then the T3346 value will be included in the reject message with GMM cause code 22 (congestion). The MM back-off timer value sent will be chosen randomly from within the configured T3346 timer value range.
- If T3346 timer value is configured in a Call-Control Profile then it will override the back-off timer values defined for either the SGSN Service or GPRS Service configurations.
- The timer will be ignored if an Attach Request or RAU Request is received after congestion has cleared.

Example

Use a command similar to the following to define a T3346 with a timeout range of 2 to 15 minutes.

```
gmm t3346 min 2 max 15
```

gs-service

Associates the context of a Gs service interface with this call control profile.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
gs-service gs_srvc_name context ctx_name
no gs-service svc_name
```

no

Removes/disassociates the named Gs service from the call control profile.

```
gs-service gs_srvc_name
```

Specifies the name of a specific Gs service for which to display information. `gs_srvc_name` is the name of a configured Gs service expressed as an alphanumeric string of 1 through 63 characters that is case sensitive.

```
context ctx_name
```

Specifies the specific context name where Gs service is configured. If this keyword is omitted, the named Gs service must exist in the same context as the GPRS/SGSN service.

`ctx_name` is name of the configured context of Gs service expressed as an alphanumeric string from 1 through 63 characters that is case sensitive.

Usage Guidelines

Use this command to associate a specific Gs service interface with this GPRS service instance.
A Gs service can be used with multiple SGSN and/or GPRS service.

**Example**

The following command associates a Gs service instance named *stargs1*, which is configured in context named *star_ctx*, with a call control profile:

```
gs-service stargs1 context star_ctx
```

**gtp send**

Configures which information elements (IE) the SGSN sends in GTP messages. These are required by the GGSN.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
```

**remove**

Removes the specified GTP send definition from the system configuration.

**no**

Disables the specified GTP send configuration.

**imeisv**

Instructs the SGSN to include the IMEISV (International Mobile Equipment Identity with Software Version) of the mobile when sending GTP messages of the type Create PDP Context Request.

By default, this function is disabled.
**derive-imeisv-from-imei**

This is a filter for the imeisv keyword. It allows the operator to configure the SGSN to send IMEI to the GGSN as IMEI-SV.

This filter instructs the SGSN to add four 1s (1111) to the final semi-octet of the CPCQ (Create PDP Context Request) message which enables the SGSN to deduce the IMEI-SV value from the IMEI. If this filter is used, then IMEI is also sent as IMEI-SV when the **gmm retrieve-equipment-identity** command is configured.

**ms-timezone**

Instructs the SGSN to include this IE in GTP messages of the type Create PDP Request and Update PDP Context Request. This IE specifies the offset between universal time and local time, where the MS currently resides, in 15-minute steps.

This IE is sent by default.

**rai**

Configures the SGSN to include the Routing Area Identity (RAI) of the SGSN in the following situations:

- 2G new SGSN RAU
- 3G new SGSN SRNS
- 2G -> 3G HO (only if PLMN Id has changed)
- 3G -> 2G HO (only if PLMN Id has changed)
- multiple IUPS service RAU (only if PLMN Id has changed)
- multiple GPRS service RAU (only if PLMN Id has changed)
- 3G new SGSN RAU (change in behavior)
- 3G primary and secondary PDP activation (change in behavior)
- 2G primary and secondary PDP activation (change in behavior)

Optionally, this keyword can be followed with the keyword selection for the PLMN - **use-local-plmn**.

**rat**

Specifies which radio access technology (RAT) is being used by the MS (GERAN, UTRAN, or GAN).

Including this keyword instructs the SGSN to include this IE when sending GTP messages of the type Create PDP Request and Update PDP Context Request.

This IE is sent by default.

**uli**

Specifies the CGI (MCC, MNC, etc.) and SAI of the MS where it is registered. Including this keyword instructs the SGSN to include the IE when sending GTP messages of the type Create PDP Request and Update PDP Context Request.

This IE is not sent by default.

Optionally, this keyword can be followed with the keyword selection for the PLMN - **use-local-plmn**.
Currently, the next 5 (five) keywords, are only used with parameters rai or uli.

**Important**

**use-local-plmn**
This keyword selects the local PLMN when network is not shared.

**network-sharing**
This keyword is used to configure network-sharing.

**use-selected-plmn**
This keyword selects the Selected PLMN when network is shared.

**use-ue-plmn**
This keyword selects Selected PLMN for supporting UE and Common PLMN for non-supporting UE when network is shared.

**use-common-plmn**
This keyword selects the Common PLMN when network is shared.

**Usage Guidelines**

Use this command to define a preferred set of information to include when GTP messages are sent. Repeat this command multiple times to enable or disable multiple options. This instruction will be implemented when the specific operator policy and call control profile are applied.

The PLMN value in RAI/ULI can be selected if 3G network-sharing is enabled.

**Example**

The following command series instructs the SGSN (1) not to send MS' timezone IE, and (2) to identify the MS' radio access technology info in the GTP messages:

```
no gtp send ms-timezone
gtp send rat
```

The next set of commands provides examples indicating the usage of keywords to select PLMN values in RAI/ULI.

On executing the following command, ULI is sent and PLMN will be "use-selected-plmn" if network-sharing is enabled. If network-sharing is not enabled, PLMN will be "use-local-plmn".

```
gtp send uli
```

On executing the following command, ULI is sent and PLMN will be "use-selected-plmn" if network-sharing is enabled. If network-sharing is not enabled, PLMN will be "use-local-plmn".

```
gtp send uli use-local-plmn
```

On executing the following command, ULI is sent and PLMN will be "use-selected-plmn" if network-sharing is enabled. If network-sharing is not enabled PLMN will be "use-local-plmn".

```
gtp send uli use-local-plmn network-sharing use-selected-plmn
```
On executing the following command, ULI is sent and PLMN will be "use-common-plmn" if network-sharing is enabled. If network-sharing is not enabled PLMN will be "use-local-plmn".

```
gtp send uli use-local-plmn network-sharing use-common-plmn
```

### gtp

Enables secondary GTPP accounting for an S-GW call control profile. By default, secondary GTPP accounting is disabled.

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>S-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
</tbody>
</table>

| **Privilege** | Security Administrator, Administrator |

<table>
<thead>
<tr>
<th><strong>Command Modes</strong></th>
<th>Exec &gt; Global Configuration &gt; Call Control Profile Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>configure &gt; call-control-profile profile_name</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

<table>
<thead>
<tr>
<th><strong>Syntax Description</strong></th>
<th>gtpp secondary-group group_name [ accounting context ctx_name ]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no gtpp secondary-group</td>
</tr>
</tbody>
</table>

**no**

Disables secondary GTPP accounting.

**secondary-group group_name**

Enables secondary GTPP accounting and specifies a GTPP group name.

*group_name* must be an alphanumeric string of 1 through 63 characters.

**accounting context ctx_name**

Specifies the specific accounting context to be used for secondary GTPP accounting. If this keyword is omitted, source context will be used for secondary GTPP accounting.

*ctx_name* must be an alphanumeric string of 1 through 79 characters.

<table>
<thead>
<tr>
<th><strong>Usage Guidelines</strong></th>
<th>Use this command to enable or disable secondary GTPP accounting for an S-GW call control profile.</th>
</tr>
</thead>
</table>

**Example**

The following command enables secondary GTPP accounting for an S-GW call control profile and specifies a GTPP group named *gtpp-grp1*:

```
gtpp secondary-group gtpp-grp1
```
**gtpu fast-path**

Enables or disables the network processing unit (NPU) Fast Path support for NPU processing of GTP-U packets of user sessions at the NPU.

---

**Important**

This command is deprecated from StarOS release 16.2 onwards as the NPU FastPath feature is not supported from the StarOS 16.2 release.

---

**Product**

SAEGW
SGSN
S-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] gtpu fast-path
```

- **remove**

  Removes the NPU fast path functionality configuration from the call control profile.

**Usage Guidelines**

Use this command to enable/disable the NPU processed fast-path feature for processing of GTP-U data packets received from GGSN/RNC or P-GW/eNodeB. This feature enhances the GTP-U packet processing by adding the ability to fully process and forward the packets through the NPU itself.

---

**Important**

When enabled/disabled, fast-path processing will be applicable only to new subscriber who establishes a PDP context after issuing this command (enabling GTP-U fast path). No existing subscriber session will be affected by this command.

---

**Example**

The following command enables the NPU fast path processing for all new subscribers' session established with this call control profile:

```
gtpu fast-path
```
guti

This command is used to configure the periodicity (time interval) / frequency of GUTI reallocation for a UE.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] guti reallocation [ frequency frequency | periodicity duration ]
```

**remove**
The `remove` keyword is used to remove the configured GUTI reallocation frequency and periodicity specified in the call control profile configuration.

**guti**
The keyword `guti` identifies the Globally Unique Temporary UE Identity (GUTI).

**reallocation**
The keyword `reallocation` specifies reallocation of GUTI.

**frequency frequency**
The frequency configured specifies the GUTI reallocation frequency. The frequency is an integer with a range "1" up to "65535" requests. A configured frequency of "n" requests triggers GUTI Reallocation for every 'nth' ATTACH / TAU / SERVICE REQUEST received from the UE.

**periodicity duration**
The periodicity configured specifies GUTI reallocation periodicity. The periodicity is an integer with a range "1" up to "65535" minutes. A configured periodicity of "t" minutes triggers GUTI Reallocation at every "t" minutes for a UE.

**Usage Guidelines**
GUTI reallocation is disabled by default. Use this command to configure the periodicity (time interval) / frequency of GUTI reallocation for a UE.

**Example**
The following command is used to configure the frequency of GUTI reallocation for a UE as "10".

```
guti reallocation frequency 10
```
gw-selection

Configures the parameters controlling the gateway selection process.

Product

- MME
- SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
```

**remove gw-selection**

Deletes the gw-selection definition from the call control profile.

**co-location [ weight [ prefer { sgw | pgw } ] ]**

Selects "co-location" as the determining factor for gateway selection. Collocation should be configured for both P-GW and S-GW selection for collocation to function. If a collocated PGW/SGW node cannot be found, then topologically closest nodes are chosen next. Host names with both "topon" and "topoff" labels will be considered in collocation.

- **weight**: Enables weighted selection if there are multiple co-located pairs.
- **prefer { pgw | sgw}**: Configures which weight to be used for weighted selection.

**gtp-weight**

Is the weight value calculated from the Load Control Information received from the GTP peers. The option enables the MME selection of SGW and PGW based on the advertised load control information. This configuration can be applied selectively to subscribers.

**pgw weight**

Selects PDN-Gateway as the determining factor for gateway selection.

**sgw weight**

Selects Serving Gateway as the determining factor for gateway selection.
**topology** [ **weight** [ **prefer** { sgw | pgw } ] ]

Selects topology as the determining factor for gateway selection. Topological selection is done only during initial attach, and not used during S-GW relocation or additional-pdn-connection.

**weight**: Enables weighted selection if there are multiple pairs with the same degree of topological closeness.

**prefer** { pgw | sgw}: Configures which weight to be used for weighted selection.

**Usage Guidelines**

Use this command to define the criteria for gateway selection.

Selection of a co-located gateway (GW) node or a topologically closer GW node is based on string comparison of canonical node names included in two or more sets of records received in DNS S-NAPTR query result. For comparison, the canonical node names are derived from the hostnames received in the DNS records. The hostnames must adhere to the following format:

<topon|topoff>.<single-label-interface-name>.<canonical-node-name>;

Where "topon" or "topoff" is a prefix of the hostname and indicates whether or not the canonical node name can be used for topology matching.

The table below lists the behaviors with various CLI options:

**Table 1: CLI Behavior Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Keyword Selected</th>
<th>Prefix in Hostname</th>
<th>Topological Match Nodes Selected</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>co-location</td>
<td>topon</td>
<td>Yes</td>
<td>Co-located nodes are selected if available as they are listed before topologically closer nodes in the DNS records.</td>
</tr>
<tr>
<td>2</td>
<td>co-location</td>
<td>topoff</td>
<td>Yes</td>
<td>Co-located nodes are selected if available as they are listed before topologically closer nodes in the DNS records.</td>
</tr>
<tr>
<td>3</td>
<td>topology</td>
<td>topon</td>
<td>Yes</td>
<td>Co-located nodes are selected if available as they are listed before topologically closer nodes in the DNS records.</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Option</th>
<th>Keyword Selected</th>
<th>Prefix in Hostname</th>
<th>Topological Match Nodes Selected</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>topology</td>
<td>topoff</td>
<td>No</td>
<td>Nodes with prefix 'topoff' are ignored for topological matching purposes. If no nodes are present with 'topon' as prefix then nodes are selected independently based on Order/Priority mentioned in DNS Records.</td>
</tr>
<tr>
<td>5</td>
<td>co-location</td>
<td>neither</td>
<td>Yes</td>
<td>Will strip only the first label from hostname to fetch canonical node name for topology matching. Co-located nodes are selected if available as they are listed before topologically closer nodes in the DNS records.</td>
</tr>
<tr>
<td>6</td>
<td>topology</td>
<td>neither</td>
<td>No</td>
<td>No co-located node pair listing; topologically closer node listing used if available (Same behavior as defined for (4)).</td>
</tr>
</tbody>
</table>

#### Example

The following command instructs the MME or SGSN to determine gateway selection on the basis of topology:

```
gw-selection topology
```

---

**hss**

This command defines the HSS message specific configurations. Using this command the operator can control GPRS Subscription Data Requests in Update Location Request (ULR) messages to the HSS.

**Product**

SGSN
Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
hss message update-location-request gprs-subscription-indicator { never | non-epc-ue }
```

```
remove hss message update-location-request gprs-subscription-indicator
```

**remove**

Use this keyword to remove the configuration to GPRS Subscription Data requests in the ULR messages to the HSS.

**message**

Use this keyword to define the HSS message specific configurations.

**update-location-request**

Use this keyword to specify Update Location Request (ULR) message configuration.

**gprs-subscription-indicator**

The HSS includes the GPRS Subscription data in the ULA command if **gprs-subscription-indicator** keyword is set in the ULR message. By default, GPRS Subscription Data is always requested from the HSS.

**never**

Use this keyword to specify that GPRS Subscription Data should never be requested from the HSS.

**non-epc-ue**

Use this keyword to specify that GPRS Subscription Data should be requested from the HSS when the UE is not an EPC-capable device.

Usage Guidelines

This command provides operator control over GPRS Subscription Data Requests in ULR messages to the HSS. If this command is configured, the parameter GPRS-Subscription-Data-Indicator is set in the ULR message. The HSS includes the GPRS subscription data in the ULA command. If the GPRS subscription data is available in the HSS and GPRS-Subscription-Data-Indicator bit is set in the ULR message, the HSS includes the GPRS Subscription data in the ULA command. By default, GPRS Subscription Data is always requested from the HSS.

Example

Use the following command to ensure the SGSN will not request GPRS Subscription Data from the HSS.

```
hss message update-location-request gprs-subscription-indicator never
```
Use the following command to ensure the SGSN will request GPRS Subscription Data from the HSS for Non-EPC-capable UEs.

```
hss message update-location-request gprs-subscription-indicator non-epc-ue
```

### ie-override

This command is used to override the RAT type AVP value with the configured value for messages sent from MME to HSS.

**Important**

This command ensures backward compatibility with previous releases as the HSS does not support the new NB-IoT RAT type.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name) #
```

### Syntax Description

```
[ remove ] ie-override s6a rat-type wb-eutran
```

**remove**

The keyword remove deletes the existing configuration.

**ie-override**

This keyword allows the operator to configure IE override in messages sent from MME to HSS.

**s6a**

This keyword is used to specify the interface as s6a. The s6a interface used by the MME to communicate with the Home Subscriber Server (HSS).

**rat-type**

Use this keyword to configure the supported RAT type AVP IE.

**wb-eutran**

Use this keyword to specify the WB-EUTRAN AVP Value.
Usage Guidelines
Use this command to override the RAT type AVP value with the configured value for messages sent from MME to HSS over the s6a interface. If the configured RAT type is NB-IoT, it is changed to wb-eutran for messages sent from the MME to HSS. This command is not enabled by default.

Example
The following command is used to enable override of the RAT type AVP value with the configured value of WB-EUTRAN:

```
ie-override s6a rat-type wb-eutran```

### ignore-ul-data-status

This command is used to enable or disable processing of Uplink Data Status IE in Service Request.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] ignore-ul-data-status
```

**remove**
Use this keyword to enable processing of Uplink Data Status IE in Service Request.

**Usage Guidelines**
This feature is enabled by default, to disable the feature use the command `ignore-ul-data-status`. To enable this feature use the command `remove ignore-ul-data-status`. When this feature is enabled, RAB is established for NSAPIs present in the Uplink data status IE. RABs are not established if the NSAPI PDPs are not present in the SGSN. If the Uplink data Status IE contains NSAPI not known to the SGSN, the SGSN establishes all the RAB's. RAB's are not established if corresponding NSAPI is absent in the PDP-Context Status IE. When this feature is disabled, if Uplink data status IE is received in service request the SGSN ignores it and establishes RAB's for all the PDP's.

**Example**
Use the following command to disable processing of Uplink Data Status IE in Service Request:

```
ignore-ul-data-status```

### idle-mode-signaling-reduction

Enables or disables the Idle-Mode-Signaling-Reduction (ISR) feature on the S4-SGSN.
**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] idle-mode-signaling-reduction access-type [ gprs | umts ]
```

- **remove**
  Disables the ISR feature configuration from this call control profile.

- **idle-mode-signaling-reduction**
  Configures ISR for this call control profile.

- **access-type**
  Specifies the network access type for the ISR feature. Select one of the following options:
  - **gprs** - General Packet Radio Service network. Specifies 2G network access support for the ISR feature. *This option is only supported for Release 15.0 and beyond.*
  - **umts** - Universal Mobile Telecommunications System network. Specifies 3G network access support for the ISR feature.

**Usage Guidelines**

Use this command to enable or disable the ISR feature on the S4-SGSN. Note that ISR is supported on the S4-SGSN only.

This command is available only if the *Idle Mode Signaling Reduction* license is enabled on the SGSN.

When 3G ISR is enabled, operators should set the ISR deactivation timer value sent by the S4-SGSN to the UE in Attach Accept and Routing Area Update Accept messages. Use the `gmm T3323-timeout` command in *SGSN Service Configuration Mode* to set the ISR deactivation timer value.

When 2G ISR is enabled, operators should set the implicit detach timeout value to use for 2G ISR. Use the `gmm implicit-detach-timeout` command in *GPRS Service Configuration Mode*.

**Example**

```
idle-mode-signaling-reduction access-type umts
```

**ims-apn**

Use this command to add or remove network identifier in Call Control Profile.

**Product**
SGSN
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

`ims-apn network-identifier  network_identifier_name`

`remove ims-apn network-identifier`

`network_identifier_name`

Configures the network identifier on MME. Once configured APN is considered as IMS APN and UE is allowed attempt IMS PDN connection only if it is subscribed to that APN. network_identifier_name Must be string of 1 through 63 characters. It should consist only of alphabetic characters (A-Z and a-z), digits (0-9), dot(.) and the dash (-).

`remove`

Removes the network identifier configured for IMS APN.

Example

Use the following command to add or remove network identifier in Call Control Profile:

`ims-apn network-identifier  network_identifier_name`

---

`integrity-algorithm-lte`

Specifies the order of preference for using an Integrity Algorithm.

Product

MME

Privilege

Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

`integrity-algorithm-lte priority1 { 128-eia0 | 128-eia1 | 128-eia2 | 128-eia3 } [ priority2 { 128-eia0 | 128-eia1 | 128-eia2 | 128-eia3 } ] [ priority3 { 128-eia0 | 128-eia1 | 128-eia2 | 128-eia3 } ] [ priority4 { 128-eia0 | 128-eia1 | 128-eia2 | 128-eia3 } ]

`remove integrity-algorithm-lte`
remove
Deletes the priorities definition from the call control profile configuration.

priority1
Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 1.
This is the mandatory and default priority keyword.

priority2
Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 2.

priority3
Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 3.

priority4
Specifies the preference of integrity algorithm for security procedures on this call control profile as priority 4.

128-eia0
Sets the Null ciphering algorithm (128-EIA0) for LTE integrity as the integrity algorithm for security procedures.
Default: priority1

128-eia1
Sets the SNOW 3G synchronous stream ciphering algorithm (128-EIA1) for LTE integrity as the integrity algorithm for security procedures. SNOW 3G is a stream cipher that forms the base of the 3GPP confidentiality algorithm UEA2 and the 3GPP integrity algorithm UIA2.
Default: priority2

128-eia2
Sets the Advance Encryption Standard (AES) ciphering algorithm (128-EIA2) for LTE integrity as the integrity algorithm for security procedures.
Default: priority3

128-eia3
Sets the ZUC algorithm (128-EIA3) for LTE integrity as the integrity algorithm for security procedures.
Default: priority4
**Usage Guidelines**

Set the order or priority in which the MME will select an integrity algorithm for use. All the priorities must be set or the definition is invalid. The command can be re-entered to change the priorities without removing the configuration.

**Example**

Configure 128-EIA0 as first priority integrity algorithm:

```
integrity-algorithm-lte priority1 128-eia 0 priority2 128-eia 2 priority3 128-eia 1
```

**integrity-algorithm-umts**

Configures the order of preference for the Integrity Algorithm used for 3G.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
integrity-algorithm-umts type then_type

default integrity-algorithm-umts
```

**default**

Specifies the default preference based on system defaults.

**type**

Creates a configuration defining an order of preference. Enter one or more of the following options in the order of preference:

- `uia1` - uia1 Algorithm
- `uia2` - uia2 Algorithm

**Usage Guidelines**

Use this command to determine which integrity algorithm is preferred 3G. This command is configured in tandem with the algorithm type for `encryption-algorithm-umts` command.

**Example**

```
default integrity-algorithm-umts
```
**lcs-mo**

This command enables/disables mobile-originating Location Requests by access-type when Location Services functionality is enabled.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

*configure > call-control-profile profile_name*

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

`lcs-mo { allow | restrict } access-type { gprs | umts }`

*allow*

Enables mobile-originating Location Requests. This is the default state when Location Services are enabled.

**Usage Guidelines**

This command ties Location Service functionality to a call-control profile by IMSI so that Location Services can optionally be determined by an operator policy for incoming calls.

**Example**

Use the following command to disable or disallow mobile-originating Location Requests within a GPRS network:

`lcs-mo restrict access-type gprs`

**lcs-mt**

This command enables/disables mobile-terminating Location Requests by access-type when Location Services functionality is enabled.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

*configure > call-control-profile profile_name*

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

`lcs-mt { allow | restrict } access-type { gprs | umts }`
**allow**

Enables mobile-terminating Location Requests. This is the default state when Location Services are enabled.

**Usage Guidelines**

This command ties Location Service functionality to a call-control profile by IMSI so that Location Services can optionally be determined by an operator policy for incoming calls.

**Example**

Use the following command to disable or disallow mobile-terminating Location Requests within a UMTS network:

```
1cs-mt restrict access-type umts
```

### lcs-ni

This command enables/disables network-initiated Location Requests by access-type when Location Services functionality is enabled.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
lcs-ni { allow | restrict } access-type { gprs | umts }
```

**allow**

Enables network-initiated Location Requests. This is the default state when Location Services are enabled.

**Usage Guidelines**

This command ties Location Service functionality to a call-control profile by IMSI so that Location Services can optionally be determined by an operator policy for incoming calls.

**Example**

Use the following command to enable or allow network-initiated Location Requests within a UMTS network if this function has been restricted previously:

```
lcs-ni allow access-type umts
```

### local-cause-code-mapping apn-mismatch

Configures the reject cause code to send to a UE when an APN mismatch occurs.
Product MME
Privilege Administrator
Command Modes Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
local-cause-code-mapping apn-mismatch emm-cause-code {
eps-service-not-allowed-in-this-plmn | esm-failure esm-cause-code
unknown-apn | no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
```

Removes the configured cause code mapping.

```
remove local-cause-code-mapping apn-mismatch
```

Usage Guidelines

Use this command to configure the cause code returned to a UE when an APN mismatch occurs, such as when an APN is present in the HSS subscription but the HSS subscription for this IMSI has other APNs present in the subscription.

If a condition is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "PLMN not allowed" cause code to the APN mismatch condition:

```
local-cause-code-mapping apn-mismatch emm-cause-code plmn-not-allowed
```
**local-cause-code-mapping apn-not-subscribed**

Gives the operator the option to specify the local cause-code mapping when the UE-requested APN is not subscribed.

**Product**  
MME

**Privilege**  
Security Administrator, Administrator

**Command Modes**  
Exec > Global Configuration > Call Control Profile Configuration  
`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:  
`[local]host_name(config-call-control-profile-profile_name)#`

**Syntax Description**

```
local-cause-code-mapping apn-not-subscribed esm-cause-code  
requested-service-option-not-subscribed  
remove local-cause-code-mapping apn-not-subscribed
```

**Usage Guidelines**

The operator can specify "Requested-Option-Not-Subscribed" cause code value #33 will be sent in the Reject message when the PDN Connectivity Request is rejected because no subscription is found. If the command option is not configured, then by default the MME uses the cause code value #27 (Unknown or Missing APN) in standalone PDN Connectivity Reject message when the UE-requested APN is not subscribed.

The new keyword apn-not-subscribed is added to specify the local cause-code mapping when the UE-requested APN is not subscribed for that subscriber. If cause code mapping for apn-not-subscribed is explicitly configured with requested-service-option-not-subscribed in either the Call-Control-Profile or MME-Service configuration mode, then the new code "Requested-Option-Not-Subscribed" (cause-code #33) will be sent in the Reject message when the PDN Connectivity Request is rejected because no subscription is found.

**Example**

The following instructs the MME to use cause code #33 ("Requested-Option-Not-Subscribed") in place of the default #27 (Unknown or Missing APN):

```
local-cause-code-mapping apn-not-subscribed esm-cause-code  
requested-service-option-not-subscribed
```

**local-cause-code-mapping apn-not-supported-in-plmn-rat**

In support of 3GPP Release 11 EMM/ESM cause code #66, this command remaps the EMM/ESM/SM cause codes to operator-preferred codes in the Call Control Profile. These replacements codes are sent in Reject messages when the activation rejection is due to the APN not being supported in the requested PLMN/RAT.
local-cause-code-mapping apn-not-supported-in-plmn-rat

**Product**  SGSN

**MME**

**Privilege**  Administrator

**Command Modes**  Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

`local-cause-code-mapping apn-not-supported-in-plmn-rat { emm-cause-code emm_cause_number esm-cause-code esm_cause_number [ attach ] [ tau ] } | esm-cause-code esm_cause_number esm-proc | sm-cause-code sm_cause_number }`

`remove local-cause-code-mapping apn-not-supported-in-plmn-rat [ attach | esm-proc | sm-cause-code | tau ]`

**remove**

Removes the configured cause code mapping.

**apn-not-supported-in-plmn-rat**

The keyword `apn-not-supported-in-plmn-rat` specifies that the MME is to use the mapped operator-preferred replacement cause codes when a call is rejected because the requested APN is not supported in current RAT and PLMN combination.

**emm-cause-code emm_cause_number esm-cause-code esm_cause_number [ attach ] [ tau ]**

MME only.

The keyword `emm-cause-code` configures the operator-preferred EMM cause code to be used if a NAS Request is rejected due to this configuration.

- `emm_cause_number` specifies the EMM code replacement integer. The system accepts a value in the range 0 through 255, however, the standards-compliant valid values are in the range 2 through 111.
- `esm-cause-code` configures the operator-preferred ESM cause code to be used if a NAS Request is rejected due to this configuration.
- `esm_cause_number` specifies the ESM code replacement integer. The system accepts a value in the range 0 through 255, however, the standards-compliant valid values are in the range 8 through 112.
- The `attach` keyword filter instructs the MME to use the mapped replacement cause code if an Attach procedure is rejected due to the noted APN not supported error condition.
- The `tau` keyword filter instructs the MME to use the mapped replacement cause code if an TAU procedure is rejected due to the noted APN not supported error condition.

**esm-cause-code esm_cause_number esm-proc**

MME only.

`esm-cause-code` configures the operator-preferred ESM cause code to be used if a bearer management Request is rejected due to this configuration.

- `esm_cause_number` specifies the ESM cause code replacement integer in the range 0 through 255.
• The `esm-proc` keyword filter instructs the MME to use the mapped replacement cause code if an ESM procedure is rejected due to the noted APN not supported error condition.

**sm-cause-code sm_cause_number**

SGSN only.

The keyword `sm-cause-code` identifies the operator-preferred SM cause code to be used towards the UE. `sm_cause_number` value can be any integer in the range 0 through 255.

**Usage Guidelines**

This command specifies the cause codes that operator would prefer to send our in Reject messages when the cause of the call rejection is the APN not being supported in the current RAT and PLMN combination. This mapping is not done by default.

• The `emm-cause-code` keyword is used to specify the EMM cause code to be used if a NAS request is rejected due to this configuration.

• The `esm-cause-code` keyword is used to specify the ESM cause code to be used if a bearer management request is rejected due to this configuration.

• The `sm-cause-code` keyword is used to specify the SM cause code used towards UE.

**Example**

The following command maps cause code 20 in place of standard cause code #66 for the SGSN to send in activate rejection messages.

`local-cause-code-mapping apn-not-supported-in-plmn-rat sm-cause-code 20`

### local-cause-code-mapping auth-failure

Configures the reject cause code to send to a UE when an authentication failure occurs.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

`[local] host_name(config-call-control-profile-profile_name)#`

**Syntax Description**


`remove local-cause-code-mapping auth-failure`

Removes the configured cause code mapping.
auth-failure emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure |
no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
tracking-area-not-allowed }

Specifies the EPS Mobility Management (EMM) cause code to return when an authentication failure occurs.

- eps-service-not-allowed-in-this-plmn
- network-failure
- no-suitable-cell-in-tracking-area
- plmn-not-allowed
- roaming-not-allowed-in-this-tracking-area
- tracking-area-not-allowed

**Usage Guidelines**

Use this command to configure the cause code returned to a UE when an authentication failure occurs. By default, the MME sends the UE the #3 - Illegal MS cause code when encountering an authentication failure.

This condition occurs for TAU and ATTACH procedures in the following cases:

- The Authentication response from the UE does not match the expected value in the MME.
- Security Mode Reject is sent by the UE.
- The UE responds to any identity request with a different type of identity (for example, the MME could query for IMSI and the UE responds with IMEI).

The following are **not** considered for the authentication failure condition:

- HSS returning a result code other than SUCCESS.
- HSS not available.
- EIR failures.
- UE not responding to requests.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the *MME Service Configuration Mode Commands* chapter.

**Example**

The following command maps the "network-failure" cause code to the authentication failure condition:

```bash
local-cause-code-mapping auth-failure emm-cause-code network-failure
```

**local-cause-code-mapping congestion**

Configures the reject cause code to send to a UE when a procedure fails due to a congestion condition.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```bash
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
```

```
remove local-cause-code-mapping congestion
```

Removes the configured cause code mapping.

```
```

Specifies the EPS Mobility Management (EMM) cause code to return when a UE requests access when the system is exceeding any of its congestion control thresholds.

- **congestion** - Default
- **eps-service-not-allowed-in-this-plmn**
- **network-failure**
- **no-suitable-cell-in-tracking-area**
- **plmn-not-allowed**
- **roaming-not-allowed-in-this-tracking-area**
- **tracking-area-not-allowed**

```
esm-cause-code { congestion | insufficient-resources | service-option-temporarily-out-of-order }
```

Specifies the EPS Session Management (ESM) cause code to return when a UE requests access when the system is exceeding any of its congestion control thresholds.

- **congestion** - Default
- **insufficient-resources**
- **service-option-temporarily-out-of-order**

### Usage Guidelines

Use this command to configure the cause code returned to a UE when a UE procedure fails due to a congestion condition on the MME.

To set the cause codes for situations where a call control profile cannot be attached to a call (for example new-call restrictions, congestion during new call attempt, etc.), use the `local-cause-code-mapping` command in the `mme-service` configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

### Example

The following command maps the "network failure" cause code to the congestion event:
Configure the reject cause code to send to a UE when a UE context transfer failure from a peer MME occurs.

**Product**
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
{local}host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
local-cause-code-mapping ctxt-xfer-fail-mme emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
remove local-cause-code-mapping ctxt-xfer-fail-mme
```

```
ctxt-xfer-fail-mme emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
```

Removes the configured cause code mapping.

```
remove local-cause-code-mapping ctxt-xfer-fail-mme
```

```
ctxt-xfer-fail-mme emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
```

Specifies the EPS Mobility Management (EMM) cause code to return when a UE context transfer failure from a peer MME occurs.

- `eps-service-not-allowed-in-this-plmn`
- `network-failure`
- `no-suitable-cell-in-tracking-area`
- `plmn-not-allowed`
- `roaming-not-allowed-in-this-tracking-area`
- `tracking-area-not-allowed`

**Usage Guidelines**

Use this command to configure the cause code returned to a UE when a UE context transfer failure from a peer MME occurs. By default, the MME sends the UE the `#9 - MS identity cannot be derived by the network` cause code for this condition.

After the peer node has been identified, the MME sends a Context Request to the peer node. If the peer node is an MME, and if the context transfer procedure fails, this condition is detected.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the
local-cause-code-mapping command in the mme-service configuration mode. This command is described in the *MME Service Configuration Mode Commands* chapter.

**Example**

The following command maps the "network-failure" cause code to the context transfer failure from MME condition:

```
local-cause-code-mapping ctxt-xfer-fail-mme emm-cause-code network-failure
```

**local-cause-code-mapping ctxt-xfer-fail-sgsn**

Configures the reject cause code to send to a UE when a UE context transfer failure from a peer SGSN occurs.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
local-cause-code-mapping ctxt-xfer-fail-sgsn emm-cause-code {
    eps-service-not-allowed-in-this-plmn | network-failure |
    no-suitable-cell-in-tracking-area | plmn-not-allowed |
    roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
```

```
remove local-cause-code-mapping ctxt-xfer-fail-sgsn
```

Removes the configured cause code mapping.

```
ctxt-xfer-fail-sgsn emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure |
    no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
    tracking-area-not-allowed }
```

Specifies the EPS Mobility Management (EMM) cause code to return when a UE context transfer failure from a peer SGSN occurs.

- eps-service-not-allowed-in-this-plmn
- network-failure
- no-suitable-cell-in-tracking-area
- plmn-not-allowed
- roaming-not-allowed-in-this-tracking-area
- tracking-area-not-allowed
Usage Guidelines

Use this command to configure the cause code returned to a UE when a UE context transfer failure from a peer SGSN occurs. By default, the MME sends the UE the #9 - MS identity cannot be derived by the network cause code when encountering this condition.

After the peer node has been identified, the MME sends a Context Request to the peer node. If the peer node is an SGSN, and if the context transfer procedure fails, this condition is detected.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "network-failure" cause code to the context transfer failure from SGSN condition:

```
local-cause-code-mapping ctxt-xfer-fail-sgsn emm-cause-code network-failure
```

local-cause-code-mapping gw-unreachable

Configures the reject cause code to send to a UE when a gateway (S-GW or P-GW) does not respond during an EMM procedure.

### Product

MME

### Privilege

Administrator

### Command Modes

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
local-cause-code-mapping gw-unreachable emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed |
  [ attach | tau ] | tau [ attach ] | { no-bearers-active tau |
remove local-cause-code-mapping gw-unreachable [ attach | tau ]
```

Removes the configured cause code mapping.

```
gw-unreachable emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
  tracking-area-not-allowed }
```

Specifies the EPS Mobility Management (EMM) cause code to return when a gateway does not respond.
• eps-service-not-allowed-in-this-plmn
• network-failure
• no-bearers-active
• no-suitable-cell-in-tracking-area
• plmn-not-allowed
• roaming-not-allowed-in-this-tracking-area
• tracking-area-not-allowed

[ attach [ tau ] | tau [ attach ] ] | { no-bearers-active tau }

Optionally, the MME can return separate cause codes for Attach procedures and TAU procedures. This capability is available for any of the above EMM cause codes except no-bearers-active, which can only be defined for TAU procedures.

Usage Guidelines

Use this command to configure the cause code returned to a UE when a gateway (S-GW or P-GW) does not respond during an EMM procedure.

Defaults:

Prior to StarOS 15.0 MR5, the MME sends the UE the #19 - ESM Failure cause code when encountering this condition.

In StarOS 15.0 MR5 and higher releases, the MME sends the UE the #19 - ESM Failure cause code for Attach procedures, and #40 - NO-EPS-BEARER-CONTEXT-ACTIVATED for TAU procedures.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "network-failure" cause code to the gateway unreachable condition:

local-cause-code-mapping gw-unreachable emm-cause-code network-failure

local-cause-code-mapping hss-unavailable

Configures the reject cause code to send to a UE when the HSS does not respond.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#
### Syntax Description

```plaintext
local-cause-code-mapping hss-unavailable emm-cause-code {
eps-service-not-allowed-in-this-plmn | network-failure |
no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
```

remove local-cause-code-mapping hss-unavailable

Removes the configured cause code mapping.

```plaintext
hss-unavailable emm-cause-code {
eps-service-not-allowed-in-this-plmn | network-failure |
no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area |
tracking-area-not-allowed }
```

Specifies the EPS Mobility Management (EMM) cause code to return when the HSS does not respond.

- eps-service-not-allowed-in-this-plmn
- network-failure
- no-suitable-cell-in-tracking-area
- plmn-not-allowed
- roaming-not-allowed-in-this-tracking-area
- tracking-area-not-allowed

### Usage Guidelines

Use this command to configure the cause code returned to a UE when the HSS is unavailable. By default, the MME sends the UE the **#17 - Network failure** cause code when encountering this condition.

This condition is detected in the following cases:

- HSS resolution fails in the MME.
- HSS does not respond in time.

The cause code configured for this condition will be signaled in TAU and ATTACH REJECT messages.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the *MME Service Configuration Mode Commands* chapter.

### Example

The following command maps the "tracking-area-not-allowed" cause code to the HSS unavailable condition:

```plaintext
local-cause-code-mapping hss-unavailable emm-cause-code
tracking-area-not-allowed
```

### local-cause-code-mapping map-cause-code

Configures the operator-preferred GMM reject cause code to send to a UE in response to some failures, such as Inbound RAU Context Transfer failure.
Product: SGSN
Privilege: Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local] host_name(config-call-control-profile-profile_name)#

Syntax Description

local-cause-code-mapping map-cause-code { roaming-not-allowed | gmm-cause-code gmm-cause | unknown-subscriber { gmm-cause-code gmm-cause | map-diag-info { gprs-subscription-unknown gmm-cause-code gmm-cause | imsi-unknown gmm-cause-code gmm-cause } } } remove local-cause-code-mapping map-cause-code { roaming-not-allowed | unknown-subscriber { gmm-cause-code | map-diag-info { gprs-subscription-unknown | imsi-unknown } } } }

remove
Removes the specified, previously configured cause code mapping.

roaming-not-allowed
Instructs the SGSN to send a different GPRS mobility management (GMM) cause code to a UE when the UE's access request is rejected due to map cause 'roaming not allowed'. Specify one of the GMM cause codes listed below.

unknown-subscriber
Instructs the SGSN to send a different GPRS mobility management (GMM) cause code to a UE when the UE's access request is rejected due to map cause 'unknown-subscriber'. As well, the Operator is given the option to include MAP diagnostic information in the Reject message to provide additional details about the MAP failure.

• gmm-cause-code replaces the cause code. For options see below.
• map-diag-info instructs the SGSN to include one of two types of MAP diagnostic information in the Reject message AND specifies the replacement GMM cause code to use in the Reject message.
  • gprs-subscription-unknown
  • imsi-unknown

gmm-cause-code gmm-cause
Specifies the GPRS mobility management (GMM) cause code to return to a UE in access request Reject messages. Replacement cause code options include:

• gprs-serv-and-non-gprs-serv-not-allowed
• gprs-serv-not-allowed
• gprs-serv-not-in-this-plmn
• location-area-not-allowed
• network-failure
Usage Guidelines

This command enables the operator to configure a preferred GMM cause code to return to the UE when a UE access request is rejected due to map-cause 'roaming-not-allowed' or 'unknown-subscriber'.

As well, the operator can send additional MAP failure details in the reject message when the map-cause being replaced is 'unknown-subscriber'.

It is possible to map replacement cause codes for both 'roaming-not-allowed' and 'unknown-subscriber, but additional configurations for either would overwrite.

Example

The following command maps network-failure as the GMM cause code to be included in an Access Reject sent to the UE when the UE is denied due to map-cause 'roaming-not-allowed':

```
local-cause-code-mapping map-cause-code roaming-not-allowed gmm-cause-code network-failure
```

Use the following to change a mapping configuration of 'unknown-subscriber' replaced by 'roaming-not-allowed-in-this-la' to 'unknown-subscriber' replaced by cause code 'gprs-serv-not-in-this-plmn' and include MAP diagnostic information in the Reject message:

```
local-cause-code-mapping map-cause-code unknown-subscriber map-diag-info
gprs-subscription-unknown gmm-cause-code gprs-serv-not-in-this-plmn
```

local-cause-code-mapping no-active-bearers

Configures the reject cause code to send to a UE when the context received from a peer SGSN (during a TAU procedure) does not contain any active PDP contexts.

Product

MME

Privilege

Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
{local}host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
local-cause-code-mapping no-active-bearers emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure | no-bearers-active
  | no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
remove local-cause-code-mapping no-active-bearers
```
remove local-cause-code-mapping no-active-bearers

Removes the configured cause code mapping.

no-active-bearers emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure |
no-bearers-active | no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }

Specifies the EPS Mobility Management (EMM) cause code to return when no active PDP context exists.

  • eps-service-not-allowed-in-this-plmn
  • network-failure
  • no-bearers-active
  • no-suitable-cell-in-tracking-area
  • plmn-not-allowed
  • roaming-not-allowed-in-this-tracking-area
  • tracking-area-not-allowed

Usage Guidelines

Use this command to configure the cause code returned to a UE when the context received from a peer SGSN (during a TAU procedure) does not contain any active PDP contexts. By default, the MME sends the UE the 
#40 - No PDP context activated cause code when encountering this condition.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "plmn-not-allowed" cause code to the no active bearer condition:

local-cause-code-mapping no-active-bearers emm-cause-code plmn-not-allowed

local-cause-code-mapping odb packet-services

Configures the ESM and EMM cause codes to send to a UE depending on the Operator Determined Barring (ODB) condition.

Product

MME

Privilege

Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#
local-cause-code-mapping odb packet-services emm-cause-code cc_value [ esm-cause-code cc_value ]
remove local-cause-code-mapping odb packet-services

Removes the configured cause code mapping.

packet-services emm-cause-code cc_value [ esm-cause-code cc_value ]

Specifies the EPS Mobility Management (EMM) cause code to return when ODB condition is hit.

emm-cause-code cc_value : Specifies the EMM cause code for ODB all packet services. The EMM cause code value is an integer from 0 to 255.
esm-cause-code cc_value : This is an optional keyword used to specify the ESM cause code as an integer from 0 to 255.

Usage Guidelines

Use this command to configure the cause code returned to a UE when ODB condition is hit, such as when the subscriber does not have an LTE/EPS subscription.

Related Commands:

If a condition is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signaled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the EMM cause code #15 (NO_SUITABLE_CELL_IN_TRACKING_AREA) to the ODB condition:

local-cause-code-mapping odb packet-services emm-cause-code 15

local-cause-code-mapping odb roamer-to-vplmn

Configures the ESM and EMM cause codes to send to a UE depending on the Operator Determined Barring (ODB) condition.

Product

MME

Privilege

Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local] host_name(config-call-control-profile-profile_name)#
Syntax Description

local-cause-code-mapping odb roamer-to-vplmn emm-cause-code cc_value [ esm-cause-code cc_value ]

remove local-cause-code-mapping odb roamer-to-vplmn

roamer-to-vplmn emm-cause-code cc_value [ esm-cause-code cc_value ]

Specifies the EPS Mobility Management (EMM) cause code to return when ODB condition is hit.

Example

The following command maps the EMM cause code #15 (NO_SUITABLE_CELL_IN_TRACKING_AREA) to the ODB condition:

local-cause-code-mapping odb roamer-to-vplmn emm-cause-code 15

Usage Guidelines

Use this command to configure the cause code returned to a UE when ODB condition is hit, such as when the subscriber does not have an LTE/EPS subscription.

Related Commands:

If a condition is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signaled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the EMM cause code #15 (NO_SUITABLE_CELL_IN_TRACKING_AREA) to the ODB condition:

local-cause-code-mapping odb roamer-to-vplmn emm-cause-code 15

local-cause-code-mapping path-failure

Configures SM cause codes for SGSN to send in Deactivate PDP Request.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

local-cause-code-mapping path-failure sm-cause-code { insufficient-resources | network-failure | reactivation-requested |
regular-deactivation }
remove local-cause-code-mapping path-failure

remove
Erases defined cause code configuration.

sm-cause-code
Defines the SM cause code to replace the default cause code sent in a Deactivate PDP Request message when a GTP-C path failure occurs. Options include:
   • insufficient-resources
   • network-failure
   • reactivation-requested
   • regular-deactivation

Usage Guidelines
This command is part of the Cause Code Mapping feature, documented in the SGSN Administration Guide, that provides the operator with the option to configure preferred cause codes to be sent in error or failure messages to the UE.

Example
Use the following command to replace the default cause code with SM cause network-failure:
local-cause-code-mapping path-failure sm-cause-code network-failure

local-cause-code-mapping peer-node-unknown

Configures the reject cause code to send to a UE when peer node resolution is not successful.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
   configure > call-control-profile profile_name

Syntax Description
Entering the above command sequence results in the following prompt:
   {local}@host_name(config-call-control-profile-profile_name)#

   local-cause-code-mapping peer-node-unknown emm-cause-code {
       eps-service-not-allowed-in-this-plmn | network-failure |
       no-suitable-cell-in-tracking-area | plmn-not-allowed |
       roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
remove local-cause-code-mapping peer-node-unknown

   remove local-cause-code-mapping peer-node-unknown

Removes the configured cause code mapping.

Specifiesthe EPS Mobility Management (EMM) cause code to return when the peer node resolution is not successful.

- eps-service-not-allowed-in-this-plmn
- network-failure
- no-suitable-cell-in-tracking-area
- plmn-not-allowed
- roaming-not-allowed-in-this-tracking-area
- tracking-area-not-allowed

**Usage Guidelines**

Use this command to configure the cause code returned to a UE when peer node resolution is not successful. By default, the MME sends the UE the **#9 - MS identity cannot be derived by the network** cause code when encountering this condition.

During processing of a TAU REQUEST, the resolution of a peer MME that had allocated the temporary identity that is signaled to the UE takes several steps in the MME. This resolution can be done based on DNS or based on local configuration. This condition occurs when all mechanisms for peer node resolution are done with no success.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

**Example**

The following command maps the "plmn-not-allowed" cause code to the peer node unknown condition:

```
local-cause-code-mapping peer-node-unknown emm-cause-code plmn-not-allowed
```

---

**local-cause-code-mapping pgw-selection-failure**

Configures the reject cause code to send to a UE when a failure occurs during P-GW selection.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
local-cause-code-mapping pgw-selection-failure emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure | ...
```
no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
remove local-cause-code-mapping pgw-selection-failure

remove local-cause-code-mapping pgw-selection-failure
Removes the configured cause code mapping.

pgw-selection-failure emm-cause-code { eps-service-not-allowed-in-this-plmn | network-failure |
no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
tracking-area-not-allowed }
Specifies the EPS Mobility Management (EMM) cause code to return when a failure occurs during P-GW selection.

• eps-service-not-allowed-in-this-plmn
• network-failure
• no-suitable-cell-in-tracking-area
• plmn-not-allowed
• roaming-not-allowed-in-this-tracking-area
• tracking-area-not-allowed

Usage Guidelines
Use this command to configure the cause code returned to a UE when a failure occurs during P-GW selection. By default, the MME sends the UE the #17 - Network failure cause code when encountering this condition.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example
The following command maps the "plmn-not-allowed" cause code to the P-GW selection failure condition:

local-cause-code-mapping pgw-selection-failure emm-cause-code plmn-not-allowed

local-cause-code-mapping restricted-zone-code
Configures the reject cause code to send to a UE when a UE requests access to a restricted zone.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
Syntax Description

Syntax: `local-cause-code-mapping restricted-zone-code emm-cause-code` { 
eps-service-not-allowed-in-this-plmn | no-suitable-cell-in-tracking-area 
| plmn-not-allowed | roaming-not-allowed-in-this-tracking-area | 
tracking-area-not-allowed } 
remove local-cause-code-mapping restricted-zone-code

Remove the configured cause code mapping.

restricted-zone-code emm-cause-code emm_cause_code

Specifies the EPS Mobility Management (EMM) cause code to return when a UE requests access to a restricted zone.

emm_cause_code must be one of the following options:

- eps-service-not-allowed-in-this-plmn
- no-suitable-cell-in-tracking-area - Default.
- plmn-not-allowed
- roaming-not-allowed-in-this-tracking-area
- tracking-area-not-allowed

Usage Guidelines

Use this command to configure the cause code returned to a UE when a UE requests access to a restricted zone.

To set the cause codes for situations where a call control profile cannot be attached to a call (for example new-call restrictions, congestion during new call attempt, etc.), use the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "PLMN not allowed" cause code to the restricted zone code event:

```
local-cause-code-mapping restricted-zone-code emm-cause-code
plmn-not-allowed
```

`local-cause-code-mapping sgw-selection-failure`

Configures the reject cause code to send to a UE when a failure occurs during S-GW selection.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
local-cause-code-mapping sgw-selection-failure emm-cause-code {
  eps-service-not-allowed-in-this-plmn | network-failure |
  no-suitable-cell-in-tracking-area | plmn-not-allowed |
  roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed }
remove local-cause-code-mapping sgw-selection-failure
```

**Usage Guidelines**

Use this command to configure the cause code returned to a UE when a failure occurs during S-GW selection. By default, the MME sends the UE the #17 - Network failure cause code when encountering this condition.

If a cause code mapping is specified in both the call-control-profile associated with a call, and also the mme-service, the cause configured for the call-control-profile will be signalled to the UE. See also the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

**Example**

The following command maps the "plmn-not-allowed" cause code to the S-GW selection failure condition:

```
local-cause-code-mapping sgw-selection-failure emm-cause-code
plmn-not-allowed
```

**local-cause-code-mapping vlr-down**

Configures the cause code to send in a ATTACH ACCEPT or TAU ACCEPT to a UE that attachment to the VLR has failed because a VLR down condition is present.

**Product**

MME
**Call Control Profile Configuration Mode**

**local-cause-code-mapping vlr-unreachable**

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
```
configure > call-control-profile profile_name
```
Entering the above command sequence results in the following prompt:
```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**
```
local-cause-code-mapping vlr-down emm-cause-code { congestion | cs-domain-unavailable | imsi-unknown-in-hlr | msc-temp-unreachable | network-failure }
remove local-cause-code-mapping vlr-down
```

**Usage Guidelines**
Use this command to configure the cause code returned to a UE when a VLR down condition is present.
To set the cause codes for situations where a call control profile cannot be attached to a call (for example new-call restrictions, congestion during new call attempt, etc.), use the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the **MME Service Configuration Mode** Commands chapter.

**Example**
The following command maps the "network failure" EMM cause code to the VLR down condition:
```
local-cause-code-mapping vlr-down emm-cause-code network-failure
```

**local-cause-code-mapping vlr-unreachable**

**Product**
MME

**Privilege**
Administrator
Command Modes

Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

{local}host_name(config-call-control-profile-profile_name)#

Syntax Description

local-cause-code-mapping vlr-unreachable emm-cause-code { congestion | cs-domain-unavailable | imsi-unknown-in-hlr | msc-temp-unreachable | network-failure }
remove local-cause-code-mapping vlr-unreachable

remove local-cause-code-mapping vlr-unreachable
Removes the configured cause code mapping.

vlr-down emm-cause-code emm_cause_code

Specifies the EPS Mobility Management (EMM) cause code to return when a VLR unreachable condition is present.

emm_cause_code must be one of the following options:

• congestion
• cs-domain-unavailable
• imsi-unknown-in-hlr
• msc-temp-unreachable - Default.
• network-failure

Usage Guidelines

Use this command to configure the cause code returned to a UE when a VLR unreachable condition is present.

To set the cause codes for situations where a call control profile cannot be attached to a call (for example new-call restrictions, congestion during new call attempt, etc.), use the local-cause-code-mapping command in the mme-service configuration mode. This command is described in the MME Service Configuration Mode Commands chapter.

Example

The following command maps the "network failure" EMM cause code to the VLR unreachable condition:

local-cause-code-mapping vlr-unreachable emm-cause-code network-failure

location-area-list

Defines the location area list to allow or restrict services in the specified location areas identified by location area code (LAC).

Product

SGSN

Privilege

Security Administrator, Administrator
Command Modes
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

Syntax Description
```
location-area-list instance instance area-code area_code [ area_code * ]
no location-area-list instance instance [ area-code area_code ]
```

`no`
If the `area-code` keyword is included in the command, then only the specified area code is removed from the identified list. If the `area-code` keyword is not included with the command, the entire list of LACs is removed from this call control profile.

`instance instance`
Specifies an identification for the specific location area list.

`instance` must be an integer between 1 and 5.

`area-code area_code *`
This keyword defines the location area codes (LACs) to be used by this call control profile as a determining factor in the handling of incoming calls. Multiple LACs can be defined in a single location-area-list.

`area_code`: Enter an integer between 1 and 65535.

* If desired, enter multiple LACs separated by a single blank space.

Usage Guidelines
Use the command multiple times to configure multiple LAC lists or to modify the a list.

Example
The following command creates a location area list for a single area code:
```
location-area-list instance 1 area-code 514
```
This command creates a second location area list for with multiple area codes - all separated by a single blank space:
```
location-area-list instance 2 area-code 514 62552 32 1513
```
The next command corrects an area code mistake (327 not 32) made in the previous configuration:
```
location-area-list instance 1 area-code 514 62552 327 1513
```

location-reporting
Enable 3G/2G Location Change Reporting feature on the SGSN.

Product
SGSN
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

[ remove ] location-reporting access-type { gprs | umts }

remove

If the remove keyword is included in the command, then the location change reporting feature is disabled.

access-type type

Defines the type of subscriber access which is to reported for location changes.

• gprs - 2G
• umts - 3G

Usage Guidelines

Use the command multiple times to configure both types of access types.

This command enables the 3G/2G Location Change Reporting feature which notifies the GGSN whenever one of the following changes for a UE:

• the serving cell global identity (CGI), or
• the service area identity (SAI), or
• the routing area identity (RAI).

Example

The following command enables location change reporting to a GGSN for 3G subscribers:

location-reporting access-type umts

This command disables location change reporting that has been enabled for 2G subscribers:

remove location-reporting access-type gprs

lte-zone-code

Configures the enforcement of allowed or restricted zone code lists and associates an EPS Mobility Management (EMM) cause code to rejected attach attempts.

Product

MME

Privilege

Administrator
Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

lte-zone-code [ allow | restrict ] { emm-cause-code {
eps-service-not-allowed-in-this-plmn | no-suitable-cell-in-tracking-area
| plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
tracking-area-not-allowed } zone-code-list zc_id +
remove lte-zone-code zone-code-list

remove

Removes the zone code list from the call control profile.

[ allow | restrict ]

Specifies whether the zone code list is allowed or restricted.

Important

You can only create an allowed or restricted list, not both.

emm-cause-code [ eps-service-not-allowed-in-this-plmn | no-suitable-cell-in-tracking-area | plmn-not-allowed |
roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed ]

Optionally, specify one of the following EMM cause codes to apply when a UE request is rejected:

eps-service-not-allowed-in-this-plmn

no-suitable-cell-in-tracking-area

plmn-not-allowed

roaming-not-allowed-in-this-tracking-area

tracking-area-not-allowed

zone-code-list zc_id +

Specifies the zone code in the allowed or restricted list of zone codes. zone_code must be an integer value
from 0 to 65535.

Usage Guidelines

Use this command to create zone code lists that allow or restrict access to UEs managed by this call control
profile.

Example

The following command restricts access to zone codes 234 and 456 and returns an EMM cause code
of "tracking area not allowed":

lte-zone-code restrict emm-cause-code tracking-area-not-allowed
zone-code-list 234 456
map

Configures the optional extensions to Mobile Application Part (MAP) messages. Using this command the operator can control GPRS/EPS Subscription data requests in UGL messages to the HLR.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description


remove

IMEI-SV is not included in the GLU request -- this is the default behavior. The remove option is also used to remove the configuration of GPRS subscription data or EPS subscription data requests in UGL messages to the HLR.

message mo-fwd-sm imsi

Configures the SGSN to include the IMSI of the originating subscriber in the mobile-originated SM transfer. This parameter shall be included when the sending entity (MSC or SGSN) supports mobile number portability (MNP). This IMSI IE is required in the in MAP-MO-FORWARD-SHORT-MESSAGE in countries where MNP is deployed. This keyword-set is required. The default is disabled.

update-gprs-location

Includes a GLU message.

eps-subscription-not-needed

The operator can use this keyword to control the request for EPS Subscription Data in addition to GPRS Subscription Data from the HLR. By default, EPS Subscription Data is always requested from the HLR. Optionally include:

• always - Include this keyword to specify that EPS Subscription Data should never be requested from the HLR.

• non-epc-ue - Include this keyword to specify that EPS Subscription Data should never be requested from the HLR when the UE is not an EPC capable device.
**exclude-gmlc**

This keyword configures the SGSN to exclude the GMLC address in the Update-GPRS-Location (UGL) messages sent to the HLR.

**gprs-subscription-not-needed**

The operator can use this keyword to control the request for GPRS Subscription Data in addition to EPS Subscription Data from the HLR. By default, GPRS Subscription Data is always requested from the HLR.

Optionally include:

- **always** - Include this keyword to specify that GPRS Subscription Data should never be requested from the HLR.
- **non-epc-ue** - Include this keyword to specify that GRPS Subscription Data should never be requested from the HLR when the UE is an EPC capable device.

**imeisv**

Specifies the International Mobile equipment Identity-Software Version (IMEI-SV) information to include in the GPRS Location Update (GLU) request message. SGSN will include IMEI-SV in the message, if available. Default: disabled

**private-extension access-type**

Includes a specific access-type private extension in the message.

**Usage Guidelines**

This command configures optional extensions to MAP messages. The HLR should ignore these extensions if not supported by the HLR. This command allows operator control over the GPRS Subscription Data or EPS Subscription Data requests in UGL messages to the HLR.

**Example**

Use the following command to have the SGSN add GLU extension information to the MAP messages sent to the HLR.

```
map message update-gprs-location private-extension access-type
```

Use the following command to ensure the SGSN (or MME/IWF) will not request GPRS Subscription Data in addition to EPS Subscription Data from the HLR.

```
map message update-gprs-location gprs-subscription-not-needed always
```

Use the following command to ensure the SGSN (or MME/IWF) will not request GPRS Subscription Data in addition to EPS Subscription Data from the HLR for EPC capable UEs.

```
map message update-gprs-location gprs-subscription-not-needed epc-ue
```

Use the following command to ensure the SGSN will not request EPS Subscription Data in addition to GPRS Subscription Data from the HLR.

```
map message update-gprs-location eps-subscription-not-needed always
```

Use the following command to ensure the SGSN will not request EPS Subscription Data in addition to GPRS Subscription Data from the HLR for Non-EPC capable UEs.

```
map message update-gprs-location eps-subscription-not-needed non-epc-ue
```
map-service

Identifies a Mobile Application Part (MAP) service and the context which contains it and associates both with the call control profile.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)##
```

**Syntax Description**

```
map-service context ctxt_name service map_srvc_name
no map-service context
```

**Usage Guidelines**
Use this command to enable or disable MAP service with this call control profile.

**Example**
```
no map-service context
```

---

max-bearers-per-subscriber

Defines the maximum number of bearers allowed per subscriber.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:
max-bearers-per-subscriber

Syntax Description
max-bearers-per-subscriber number
remove max-bearers-per-subscriber

remove
Deletes the definition from the call control profile.

number
Identifies the maximum number of bearers allowed per subscriber as an integer from 1 to 11.

Usage Guidelines
Use this command to set the maximum number of bearers allowed per subscriber.

Example
Set the maximum to 3:
max-bearers-per-subscriber 3

max-pdns-per-subscriber

Defines the maximum number of PDNs allowed per subscriber.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
configure > call-control-profile profile_name
Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

Syntax Description
max-pdns-per-subscriber number
remove max-pdns-per-subscriber

remove
Deletes the definition from the call control profile.

number
Identifies the maximum number of PDNs allowed per subscriber as an integer from 1 to 11.

Usage Guidelines
Use this command to set the maximum number of PDNs allowed per subscriber.
Example
Set the maximum to 4:

\texttt{max-pdns-per-subscriber 4}

\section*{min-unused-auth-vectors}

Configures a specific minimum number of unused vectors to be maintained by the SGSN.

\begin{itemize}
\item \textbf{Product}: SGSN
\item \textbf{Privilege}: Security Administrator, Administrator
\item \textbf{Command Modes}: Exec > Global Configuration > Call Control Profile Configuration
\end{itemize}

\texttt{configure > call-control-profile profile\_name}

Entering the above command sequence results in the following prompt:

\texttt{[\textit{local\_host\_name(config-call-control-profile-profile\_name)}]\#}

\subsection*{Syntax Description}

\texttt{min-unused-auth-vectors min\#_vectors}

\texttt{remove min-unused-auth-vectors}

\texttt{remove}

Removes the definition from the configuration file and restores the default behavior, which does not use the threshold.

\texttt{min\#_vectors}

Enables and defines a threshold for the minimum number of unused vectors that the SGSN retains to trigger the initiation of a service area identity request (SAI).

\texttt{min\#_vectors}: Enter a digit between 1 and 4.

\subsection*{Usage Guidelines}

Vectors are used by the SGSN for authentication. Use this command to enable a minimum threshold for unused vector for this call control profile. When the unused vector count falls below this configured threshold, then an SAI is initiated to fill the buffer back to 5 or to the most appropriate number based on the MAP service configuration.

\section*{Example}

Enter a command similar to the following to set a threshold of 3:

\texttt{min-unused-auth-vectors 3}

Use the following command to disable this function and restore the default behavior, which does not use a threshold to trigger an SAI:

\texttt{remove min-unused-auth-vectors}
**mme s6a**

This command is used to control sending the Notify Request (NOR) on the S6a interface.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no ] mme s6a send message nor trigger mnrf
```

**no**

Disables sending the NOR on the S6a interface.

**mme**

Configures MME capability.

**s6a**

Configures MME capability on the S6a interface.

**send**

Configures MME capability to send on the S6a interface.

**message**

Configures MME capability to send message on the S6a interface.

**nor**

Configures MME capability to send NOR on the S6a interface.

**trigger**

Configures trigger to send the message.

**mnrf**

Sends message to trigger MNRF flag on the S6a interface (SMS in MME).

**Usage Guidelines**

Use this command to control sending the NOR on the S6a interface. This command is disabled by default. The user sends the NOR on the S6a interface to HSS in the event of user availability to received SMS (if the user moved to active state from idle or the user's memory is available).
mme sgd

This command is used to control sending the Alert SC Request (ALR) on the SGd interface.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Call Control Profile Configuration</td>
</tr>
</tbody>
</table>

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
[ no ] mme sgd send message alr trigger mnrf
```

- **no**
  - Disables sending the ALR on the SGd interface.

- **mme**
  - Configures MME capability.

- **sgd**
  - Configures MME capability on the SGd interface.

- **send**
  - Configures MME capability to send on the SGd interface.

- **message**
  - Configures MME capability to send message on the SGd interface.

- **alr**
  - Configures MME capability to send ALR on the SGd interface.

- **trigger**
  - Configures trigger to send the message.

- **mnrf**
  - Sends message to trigger MNRF flag on the SGd interface (SMS in MME).

### Usage Guidelines

Use this command to control sending the ALR on the SGd interface. This command is disabled by default.
The user sends the ALR on the SGd interface to SMSC in the event of user availability to received SMS (if the user moved to active state from idle or the user's memory is available). It is also sent if the user did a handover to the new MME/SGSN and any MT SMS was pending for the user.

**mobility-protocol**

This command allows you to configure the default mobility protocol type to be used for setting up a call when the AAA server forwards an IP address directly.

<table>
<thead>
<tr>
<th>Product</th>
<th>SaMOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
mobility-protocol { GTPv1 | GTPv2 | pmip } default mobility-protocol
```

- **default**
  - Sets the mobility-protocol configuration to its default values.
  - Default (SaMOG 3G license): GTPv1
  - Default (SaMOG Mixed Mode license): GTPv2

**Usage Guidelines**

Use this command to configure the default mobility protocol type to be used for setting up a call when the AAA server forwards an IP address directly. If the mobility protocol is also configured in the APN Profile Configuration Mode, the value configured here will be overridden with the configured value in the APN profile.

**Example**

The following command configures mobility protocol to GTPv2:

```
mobility-protocol GTPv2
```

**monitoring-events**

This command allows you to configure monitoring events for a call control profile for all users.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>
**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ no ] monitoring-events

default
```

Disables monitoring-events at the time of MME service configuration for users.

**Usage Guidelines**

Use this command to configure monitoring events for MME service for users.

**Example**

The following command configures cli Monitoring Events in a call control profile:

```
monitoring-events
```

---

**mps**

This command under the Call Control profile configuration mode is configured to support Multimedia Priority Service (MPS) in the CS/EPS domain.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] mps [ cs-priority | eps-priority ] { subscribed | none }
```

**remove**

The `remove` keyword deletes the existing configuration.

**cs-priority**

The keyword `cs-priority` configures support for priority service in the CS domain.

**eps-priority**

The keyword eps-priority configures support for MPS in the EPS domain.
subscribed

The keyword **subscribed** configures support for priority service in the CS/EPS domain.

none

The keyword **none** configures disables support for priority service in the CS/EPS domain.

**Usage Guidelines**

This CLI helps operator to override the MPS CS/EPS Subscription received from HSS. It allows the operator to prioritize the Mobile originating voice calls of a set of subscribers irrespective of them subscribed for MPS services or not. By default MME sets the value of "CS fallback indicator IE" as "CSFB High Priority" in the S1AP UE Context Setup/Modification if the MPS-CS-Priority bit is set in MPS-Priority AVP received from HSS.

**Example**

The following command is issued to set "CSFB High Priority" for "CS Fallback Indicator IE", in the S1AP UE Context Setup/Modification message:

```
[local]asr5x00(config-call-control-profile-call1)# mps cs-priority subscribed
```

The following command is issued to set "CSFB Required" for "CS Fallback Indicator IE", in the S1AP UE Context Setup/Modification message:

```
[local]asr5000(config-call-control-profile-call1)# mps cs-priority none
```

**msc-fallback-disable**

Define all SRVCC causes for which the MME does not try sending PS-CS Request to a next available MSC, during an SRVCC handover, if the MME received one of the configured SRVCC causes in the PS-CS Response received from the first MSC.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] msc-fallback-disable srvcc-cause cause
```

**remove**

When added to the command, this command filter causes the MME to delete the specified SRVCC cause code definition.
**srvcc-cause cause**

This keyword configures an SRVCC cause code. If the MME receives this SRVCC cause code in a negative PS-CS Response from the first MSC tried in an SRVCC handover, then the MME sends SRVCC HO Failure and no other MSCs are tried. The cause must be any integer from 0 to 255, as defined in 3GPP TS 29.280.

**Usage Guidelines**

This command can be repeated to configure more than one SRVCC cause.

This command is only applicable for PS-CS Requests and not for PS to CS complete messages.

This command is applicable for both statically configured MSC addresses (in an MSC Pool) and for MSC addresses returned by DNS.

If this command is not used to define SRVCC causes, then the MME will use default behavior to select the next MSC to retry PS-CS Request.

To confirm the MME's current configuration of SRVCC causes, use the **show call-control-profile full** command to generate output with a list of the 'MSC fallback disabled SRVCC causes'.

**Example**

Use a command similar to the following to configure one or more SRVCC cause codes. The following set of commands configures three SRVCC cause codes:

```
msc-fallback-disable srvcc-cause 8
msc-fallback-disable srvcc-cause 9
msc-fallback-disable srvcc-cause 10
```

**nb-iot**

This command enables Extended Discontinuous Reception (eDRX) and configures the respective parameters for NB-IoT subscribers on the MME.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**nb-iot**

```
conf-call-control-profile profile_name
{ edrx { ptw ptw_value edrx-cycle cycle_length_value | ue-requested } [ dl-buf-duration [ packet-count packet_count_value ] ] | mo-exception-data reporting-threshold-value threshold_value } remove nb-iot { edrx | mo-exception-data }
```

This keyword disables the eDRX configuration on the MME for NB-IoT subscribers.
edrx
This keyword configures extended discontinuous reception parameters.

ptw ptw_value
This keyword configures the Paging Time Window (PTW) value. *ptw_value* must be an integer value in seconds. The allowed values are 2.56, 5.12, 7.68, 10.24, 12.80, 15.36, 17.92, 20.48, 23.04, 25.60, 28.16, 30.72, 33.28, 35.84, 38.40 and 40.96 seconds.

ue-requested
This keyword specifies the UE requested values of the Paging Time Window (PTW) and the eDRX cycle length received from the UE in the Attach Request or TAU Request message be accepted.

edrx-cycle cycle_length_value
This keyword configures the eDRX cycle length. *cycle_length_value* is an integer value in seconds. The allowed values are 5.12, 7.68, 10.24, 12.80, 15.36, 17.92, 20.48, 40.96, 81.92, 163.84, 327.68, 655.36, 1310.72, 2621.44, 5242.88 and 10485.76 seconds.

dl-buf-duration
This optional keyword sends downlink buffer duration in DDN ACK when unable to page UE.

packet-count packet_count_value
This optional keyword sends "DL Buffering Suggested Packet Count" in DDN ACK when unable to page UE. The *packet_count_value* is an integer value from 0 to 65535. If the *packet_count_value* is not configured locally, the subscription provided value for the *packet_count_value* is used. The subscription value can be 0 in which case the packet count IE will not be sent for that subscriber even if it is configured locally.

mo-exception-data
Configures NBIOT RRC Cause MO Exception Data counter.

reporting-threshold-value value
Specifies reporting threshold value. *value* Must be an integer from 1 to 50.

**Usage Guidelines**

Use this command to enable eDRX on the MME for NB-IoT subscribers. The operator can use this command for:

- Accept eDRX parameters: Paging Time Window (PTW) and eDRX cycle length value, from the UE
- Configure PTW and eDRX cycle length value
- Configure downlink buffer duration in DDN ACK when unable to page UE
- Configure "DL Buffering Suggested Packet Count" in DDN ACK when unable to page UE

When the eDRX feature is enabled on the MME, it pages the NB-IoT subscribers only at valid paging occasions. The MME sends the NB-IoT eDRX paging parameters to the eNodeB during paging. The operator can either configure the option to accept the UE requested values or configure the values using this command. This command is not enabled by default.
A similar CLI command is implemented for WB-EUTRAN subscribers. Both WB-UTRAN eDRX and NB-IoT eDRX parameters can be configured on the system for WB-UTRAN and NB-IoT subscribers. See the eDRX Support on the MME feature chapter in the MME Administration Guide for more information.

**Example**

The following command configures the PTW and eDRX cycle length. The command also sends the downlink buffer duration in the DDN ACK along with a suggested packet count:

```
nb-iot edrx ptw 256 edrx-cycle 512 dl-buf-duration packet-count 10
```

### network-feature-support-ie

Configures support for the IMS Voice over Packet-Switched indication and Homogenous Support of IMS Voice over PS indication.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
{local}host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
network-feature-support-ie ims-voice-over-ps [ not-supported | supported srvcc-ue-with-voice-domain-pref ]
remove network-feature-support-ie
```

**remove**

Disables support for Voice over PS.

**ims-voice-over-ps [ not-supported | supported ]**

Enables support for Voice over PS in all Tracking Areas.

**not-supported**: Configures the MME to add the "Homogenous Support of IMS Voice over PS Sessions" AVP to the S6a Update-Location-Request and Notify Request messages to the HSS, with the value set to "Not Supported". This indicates that IMS Voice over PS is not supported in any Tracking Areas.

**supported**: Configures the MME to add the "Homogenous Support of IMS Voice over PS Sessions" AVP to the S6a Update-Location-Request and Notify Request messages to the HSS, with the value set to "Supported". This indicates that IMS Voice over PS is supported in all Tracking Areas.

**srvcc-ue-with-voice-domain-pref**: IMS Voice Over PS not Supported for srvcc with cs voice preference UE only.

If the command is entered without either the **supported** or **not-supported** keywords, then MME indicates network feature support in the Attach Accept sent to the UE and includes the "Homogenous Support of IMS Voice over PS Sessions" AVP to the S6a Update-Location-Request and Notify Request messages to the HSS.
Voice over PS Sessions AVP to the S6a Update-Location-Request and Notify Request messages sent to the HSS, with the value set to "Not Supported". This indicates that IMS Voice over PS is supported in all Tracking Areas.

Usage Guidelines

Use this command to include the "IMS Voice over PS" indication, thereby indicating support for IMS Voice over PS sessions for all Tracking Areas.

This command also configures whether to include the "Homogenous Support of IMS Voice over PS Sessions" indication as well as the included in the indication, either supported or not supported.

Example

The following command enables support for IMS Voice over PS on the MME:

```
network-feature-support-ie ims-voice-over-ps
```

network-initiated-pdp-activation

Configures the call control profile to perform two functions: (1) to enable or disable network-requested PDP context activation (NRPCA) for 3G attachments and (2) to define a failure cause code for inclusion in NRPCA-related reject messages.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
[ remove ] network-initiated-pdp-activation { allow primary | restrict primary | secondary } access type { gprs | umts } { all | location-area-list instance <instance> } network-initiated-pdp-activation primary access type { gprs | umts } { all | location-area-list instance <instance> } failure-code code network-initiated-pdp-activation secondary access type { gprs | umts } { all | location-area-list instance <instance> } failure-code code
```

remove

Including this keyword with the command, removes all configured values for the specified configuration.

allow

Allows network-initiated PDP context activation. This keyword must be followed by other parameters to indicate the limitations for allowing the NRPCA.

Allow is the default for NRPCA.
restrict
Restricts network-initiated PDP context activation. This keyword must be followed by other command parameters to indicate the limitations for restricting the NRPCA.

primary
Specifies that only network-initiated primary PDP context activations are to be allowed.

secondary
Specifies that only network-initiated secondary PDP context activations (NRSPCAs) are to be allowed.

Important
The secondary keyword is visible and can be selected. However, NRSPCA functionality is only supported for Release 15.0 onwards.

all
Configures the SGSN to allow or to restrict NRPCA for calls within all location areas.

location-area-list instance instance
Selects a pre-defined list of location area codes (LACs) and allows/restricts the NRPCA procedure for calls within the listed area codes.

instance: Enter a list ID; an integer between 1 and 5.

Important
Before using this keyword, ensure that the appropriate LAC information has been defined with the location-area-list command, also in this configuration mode.

failure-codes code
Enter an integer from 192 to 226 to identify the GTPP failure cause code (from 3GPP TS29.060, list below) to be included in the reject messages when NRPCA is restricted. If a failure cause code is not defined, the default value is 200 (service not supported).

- 192 - Non-existent
- 193 - Invalid message format
- 194 - IMSI not known
- 195 - MS is GPRS Detached
- 196 - MS is not GPRS Responding
- 197 - MS Refuses
- 198 - Version not supported
- 199 - No resources available
- 200 - Service not supported
• 201 - Mandatory IE incorrect
• 202 - Mandatory IE missing
• 203 - Optional IE incorrect
• 204 - System failure
• 205 - Roaming restriction
• 206 - P-TMSI Signature mismatch
• 207 - GPRS connection suspended
• 208 - Authentication failure
• 209 - User authentication failed
• 210 - Context not found
• 211 - All dynamic PDP addresses are occupied
• 212 - No memory is available
• 213 - Relocation failure
• 214 - Unknown mandatory extension header
• 215 - Semantic error in the TFT operation
• 216 - Syntactic error in the TFT operation
• 217 - Semantic errors in packet filter(s)
• 218 - Syntactic errors in packet filter(s)
• 219 - Missing or unknown APN
• 220 - Unknown PDP address or PDP type
• 221 - PDP context without TFT already activated
• 222 - APN access denied – no subscription
• 223 - APN Restriction type incompatibility with currently active PDP Contexts
• 224 - MS MBMS Capabilities Insufficient
• 225 - Invalid Correlation-ID
• 226 - MBMS Bearer Context Superseded

**Usage Guidelines**

Use this command to allow or restrict network-requested PDP context activation (NRPCA) based on access-type and location areas. NRPCA is used when there is downlink data at the GGSN for a subscriber, but there is no valid context for the already-established PDP address so the GGSN initiates an NRPCA procedure towards the SGSN.

This command can also be used to define the failure cause code that will be included in activation reject messages.
These commands can be repeated to define a unique set of NRPCA parameters for each access-type and each location area list.

The **T3385-timeout** and the **max-actv-retransmission** timers configure the retransmission timer and the number of retries for PDP context activation requests. Both of these timers are set in the SGSN service configuration mode.

The configuration for NRPCA can be viewed via the show call-control-profile full name profile_name. Statistics associated with NRPCA can be seen via the show gmm-sm statistics output and via the show sgtpc statistics verbose output.

**Example**

The following command changes the failure code for Reject messages from 200 (service not supported) to 205 (roaming restriction) for primary NRPCA for all GRPS access and all LACs:

```plaintext
network-initiated-pdp-activation primary access-type gprs all failure-code 205
```

The following command enables network-initiated primary PDP context activation for UMTS calls from the LACs in location-area-list 1:

```plaintext
network-initiated-pdp-activation allow primary access-type umts location-area-list instance 1
```

The following command restricts network-initiated primary PDP context activation for UMTS calls from the LACs in location-area-list 2:

```plaintext
network-initiated-pdp-activation restrict primary access-type umts location-area-list instance 2
```

**override-arp-with-ggsn-arp**

Enables or disables the ability of the SGSN to override an Allocation/Retention Priority (ARP) value with one received from a GGSN. If there is no authorized Evolved ARP received from the GGSN, by default the SGSN continues to use the legacy ARP included in the Quality of Service (QoS) Profile IE.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```plaintext
config> call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```plaintext
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
[ remove ] override-arp-with-ggsn-arp
```

- **remove**

  Adding the remove keyword to the command disables the override feature.
**Usage Guidelines**

Enabling this function on the SGSN will allow the ARP sent by the GGSN, in CPCR / UPCR / UPCQ, to be applicable as an overriding value.

**Example**

Use this command to configure the SGSN to negotiate the ARP to be used as an overriding value:

`override-arp-with-ggsn-arp`

---

**paging-priority**

This command is configured to support sending of paging-priority value in S1AP paging-request message to the eNodeB. This command supports both PS and CS traffic types.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

Configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

```
[ remove ] paging-priority cs cs_value
```

From release 20.0 onwards the paging priority command is updated to support PS traffic:

```
[remove] paging-priority { cs { cs_value | map emlpp-priority emlpp_value sl-paging-priority priority_value } | ps map arp arp_value sl-paging-priority priority_value }
```

**remove**

The **remove** keyword deletes the configured value of paging-priority to be sent to eNodeB for CS/PS paging.

**cs**

This keyword is used to configure the value of paging-priority to be sent to eNodeB for Circuit Switched (CS) traffic. The paging priority value can be configured or it can be used to map the received value to the paging-priority.

**cs_value**

The paging priority value is an integer in the range "0" up to "7". Configuring a value of "0" disables sending of paging priority value to eNodeB.
ps
This keyword is used to configure the value of paging-priority to be sent to eNodeB for Packet Switched (PS) traffic. The paging priority value can be configured or it can be used to map the received value to the paging-priority.

map
This keyword is used to map the received value to paging-priority.

emlpp-priority
This keyword is used to configure priority value of enhanced Multi Level Precedence and Pre-emption service

emlpp_value
The emlpp value is an integer in the range "0" up to "7".

s1-paging-priority
This keyword is used to configure the value of paging-priority to be sent to eNodeB.

priority_value
The priority_value is an integer in the range "0" up to "7". Configuring a value of "0" disables sending of paging priority value to eNodeB.

arp
This keyword is used to configure the value of allocation and retention priority.

arp_value
The arp_value is an integer in the range "1" up to "15".

Usage Guidelines
This command helps operator to map eMLPP Priority / ARP to s1 ap paging priority to be sent to eNB. By default, sending of paging priority-ie in SIAP paging-request message to eNodeBs is enabled. The priority value received from the MSC/VLR is relayed to the eNodeB. A lower value of paging priority indicates a higher priority. Older values of paging priority are overridden by configuring new values. By default no mapping is enabled. From release 20.0 onwards this command is enhanced to emlpp-priority to paging-priority. It is used to configure the priority value of enhanced Multi Level Precedence and Pre-emption service. This command is also used to configure the Allocation Retention priority value for PS paging.

Example
The following command is issued to disable sending of paging priority value to the eNodeB:

[local]asr5x00(config-call-control-profile-call1)# paging-priority cs 0

The following command enables sending of paging priority value to the eNodeB, a priority value of "5" is configured using this command:

[local]asr5000(config-call-control-profile-call1)# paging-priority cs 5
pcscf-restoration

This command enables HSS-based P-CSCF Restoration procedure.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

  `configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] pcscf-restoration
```

**remove**
The remove keyword disables HSS-based P-CSCF Restoration in the MME.

**pcscf-restoration**
The `pcscf-restoration` command in the above configuration enables HSS-based P-CSCF restoration. When enabled, MME supports P-CSCF Restoration on the S6a interface towards HSS for IMS PDN.

**Usage Guidelines**
The command `pcscf-restoration` aids in successful establishment of MT VoLTE calls when the serving P-CSCF is unreachable. By default, the above configuration is disabled. To select the method for P-CSCF Restoration, use the `pcscf-restoration` keyword in `apn-type ims` command under APN Profile Configuration mode.

**Example**
The following configurations enables HSS-based P-CSCF Restoration:

```
pcscf-restoration
```

pdp-activate access-type

Configures the PDP context activation option based the type of access technology.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

  `configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:
pdp-activate allow

Syntax Description

```plaintext
pdp-activate access-type { grps | umts } { all | location-area-list instance instance } failure-code failure_code
default pdp-activate access-type { grps | umts } { all | location-area-list instance instance } failure-code code

default

Resets the configuration to system default values for PDP context activation request.

{ grps | umts }

Specifies the access technology type for PDP context activation.

- **grps**: Enables access type as GPRS.
- **umts**: Enables access type as UMTS.

all

Default: allow

Configures the system to allow the creation of all PDP context activation requests received from MS.

**location-area-list instance instance**

Specifies the location area instance for which to create a PDP context as an integer from 1 through 5. The value must be an already defined instance of a location area code (LAC) list created via the `location-area-list` command.

**failure-code code**

Specifies the failure code for PDP context activation as an integer from 8 through 112. Default: 8

Usage Guidelines

Use this command to configure this call control profile to allow GPRS/UMTS access through PDP context activation request from MS.

Example

The following command configures the system to create the PDP context for requests from MS for GPRS access with location area list instance 2 and failure-code 5:

```
pdp-activate access-type gprs location-area-list 2 failure-code 5
```

pdp-activate allow

Configures the system to allow the PDP context activation based on the type of access technology.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

[ no ] pdp-activate allow access-type { grps | umts } location-area-list instance instance

no

Removes the configured permission to create PDP context on request of PDP context activation from MS for an access type.

access-type { grps | umts }

Specifies the access technology type for PDP context activation.

- grps: Enables access type as GPRS.
- umts: Enables access type as UMTS.

location-area-list instance instance

Specifies the location area instance to create PDP context.

instance must be an integer from 1 through 5. The value must be an already defined instance of a location area code (LAC) list created via the location-area-list command.

Usage Guidelines

Use this command to configure this call control profile to allow GPRS/UMTS access through PDP context activation request from MS.

Example

The following command configures the system to allow the PDP context activation for GPRS access type with location area list instance 2:

pdp-activate allow access-type gprs location-area-list instance 2

pdp-activate restrict

Configures the system to restrict the PDP context activation based on the type of access technology.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
Syntax Description

```
[ no | remove ] { { access-type { gprs | umts } { all | location-area-list instance instance } } | { pdp-type { all | dual-ipv4v6 | ipv4 | ipv6 | ppp } { access-type { gprs | umts } { all | location-area-list instance instance } } } | { secondary-activation access-type { gprs | umts } { all | location-area-list instance instance } } }
```

no | remove

Either of these prefixes removes the previously configured restriction on PDP context activation and returns the 'allow' default.

access-type { gprs | umts }

Specifies the access technology type for which to restrict PDP context activation.

- **gprs**: Enables access type as GPRS.
- **umts**: Enables access type as UMTS.
- **all**: Configures the system to restrict all PDP context activation requests from the MS.
- **location-area-list instance instance**: Specifies the location area instance to restrict PDP context activation, where `list_id` must be an integer from 1 through 5. The value must be an already defined instance of a location area code (LAC) list created with the `location-area-list` command.

pdp-type

Sets the configuration to restrict PDP activation based on the requested PDP type.

To restrict more than one type of PDP, the command must be reissued for each PDP type.

- **all**: restricts activation of all types PDP.
- **dual-ipv4v6**: restricts activation when dual-IPv4v6 PDP contexts are requested.
- **ipv4**: restricts activation when IPv4 PDP contexts are requested.
- **ipv6**: restricts activation when IPv6 PDP contexts are requested.
- **ppp**: restricts activation when PPP PDP contexts are requested.

secondary-activation

Restricts the SGSN, based on the access-type, so that secondary PDP contexts are not created when receiving the PDP Context Activation Request from the MS.

Usage Guidelines

Use this command to configure this call control profile to restrict PDP context activation requests from MS.

Example

The following command configures the system to restrict the PDP context activation for request from 2G MS with location area list instance 2:

```
pdp-activate restrict access-type gprs location-area-list instance 2
```
The following command configures the SGSN to restrict PDP context activation for requests from 3G MS if their PDP-type is IPv4. The second command restricts based on PDP-type IPv6.

```
pdp-activate restrict pdp-type ipv4 access-type umts all
pdp-activate restrict pdp-type ipv6 access-type umts location-area-list instance 1
```

### pdn-type-override

Configures the MME or the SGSN to override the requested packet data network (PDN) type based on the inbound roamer PLMN, and re-assigns the UE to an IPv4-only or IPv6-only PDN. This override can be applied based on the type of access technology.

- **Product**: MME, SGSN
- **Privilege**: Security Administrator, Administrator
- **Command Modes**: Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
pdn-type-override { ipv4-only | ipv4v6 { ipv4 | ipv6 } [ access-type { eps | grps | umts } ] } 
remove pdn-type-override [ access-type { eps | grps | umts } | ipv4-only ]
```

**remove**

Removes the configured PDN type override.

**ipv4-only**

Enables MME to allow only IPv4 addresses to a PDN connection.

The default behavior allows PDN to have IPv6 addresses when subscription allows it.

**ipv4v6 { ipv4 | ipv6 }**

Defines the PDN type (IPv4 or IPv6) to which UEs should be restricted.

**access-type { eps | grps | umts }**

Specifies the access technology type to which the override is applied.

- **eps** - enables PDN override for EPS access type.
- **grps** - enables PDN override for GPRS access type.
- **umts** - enables PDN override for UMTS access type.
If this keyword is not included, then all three access types can have the PDN type overridden.

**Usage Guidelines**

Use this command to configure the call control profile to override the requested packet data network (PDN) type and re-assign the UE to a different PDN type. Optionally, it is possible to filter the override based on access technology.

**Important**

This call control profile becomes valid only when it is associated with an operator policy using the `associate` command in the Operator Policy configuration mode.

**Example**

The following command configures the system to override the requested PDN type and assign a UE to an IPv4-only PDN if the UE's access technology is GPRS:

```
pdn-type-override ipv4v6 ipv4 access-type gprs
```

**peer-mme**

Configures a peer MME address. S4-SGSN operators can use this command if they wish to bypass DNS resolution to obtain the MME address.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
peer-mme { mme-groupid <lac val> mme-code <rac value> | tac tac } prefer {
  fallback-for-dns | local } address { <ipv4_address> | <ipv6_address> } interface
  { gn [ s3 ] | s3 [ gn ] }
remove peer-mme { mme-groupid <lac val> mme-code <rac value> | tac tac }
  address [ <ipv4_address> | <ipv6_address> ] [ interface { gn [ s3 ] | s3 [ gn ] }
  ]

remove
```

Removes a specified peer MME from the call control profile. The `interface` keyword is optional. If it is not used, the entire interface will be deleted.

**mme-groupid <lac val>**

Specifies the location area code value of the peer MME. The MME group ID of the peer MME maps to the LAC value when GUTI is converted to P-TMSI.
<lac val> must be an integer from 1 to 65535.

**mme-code <rac value>**

Specifies the routing area code value of the peer MME. The MME code of the peer MME maps to the RAC value when GUTI is converted to P-TMSI.

<rac value> must be an integer from 0 to 255.

**tac tac**

Optional. Specifies the Tracking Area Code (TAC) of the target eNodeB that is used for UTRAN to E-UTRAN (SGSN to MME) SRNS relocation across the S3 interface. Valid entries are 1 to 65535. This setting applies only if SRNS relocation first has been configured via the srns-inter and/or srns-intra commands in Call Control Profile Configuration Mode.

**prefer { fallback-for-dns | local }**

Indicates whether to use a DNS query to obtain the address or to use a locally configured peer MME address:

- **fallback-for-dns** - Instructs the SGSN to perform a DNS query to get the IP address of the peer MME. If the DNS query fails, then the IP address configured with this command is used.
- **local** - Use the locally configured address for the MME address.

---

**Important**

If the prefer command is used to change an existing peer-mme configuration (with the same LAC and RAC) from fallback-for-dns to local or from local to fallback-for-dns, the new setting overwrites the previously configured setting for all interfaces.

**address { ipv4_address | ipv6_address }**

Specifies the IP address of the peer MME. Currently, the IPv6 address option is not supported on the S4-SGSN. ipv4 must be in standard dotted-decimal notation.

**interface { gn [ s3 ] | s3 [ gn ] }**

Specifies the interface to use for communication between the SGSN and the peer MME:

- **gn**: Use the Gn interface between the S4-SGSN and the MME in the LTE network.

- **s3**: Use the S3 interface between the S4-SGSN and the MME in the LTE network. This is the default setting.

**Usage Guidelines**

Use this command to instruct the S4-SGSN how to determine a peer MME address, via DNS or local configuration. For a local address, use this command to configure the peer MME address.

This command also sets the interface type to be used between the peer MME and the SGSN.
Example

The following command configures LAC/RAC 111/22 for the peer MME and instructs the SGSN to use the MME's locally configured IPv4 address of 1.1.1.1 and an S3 interface between the MME and the SGSN.

```
peer-mme mme-groupid 111 mme-code 22 prefer local address 1.1.1.1 interface s3
```

**peer-msc**

Enables/disables weight-based selection of a peer MSC during MSC lookup. By default, this functionality is disabled.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Call Control Profile Configuration</td>
</tr>
<tr>
<td>configure &gt; call-control-profile profile_name</td>
<td></td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
peer-msc interface-type sv weight
remove peer-msc interface-type sv weight
```

**remove**

Deletes the weight-based selection for peer-MSC configuration if it has been enabled using this command and returns to the default of preference-based selection of a peer MSC.

**Usage Guidelines**

This command enables the operator to override the default behavior and define weight-based selection of a peer-MSC during MSC lookup to facilitate 'weight' based load balancing for the MME's Sv interface.

**Example**

Disable weight-based MSC selection when it has been configured:

```
remove peer-msc interface-type sv weight
```

**peer-nri-length**

Enables the SGSN to use NRI-FQDN-based DNS resolution for non-local RAI when selection of the call control profile is based on the old-RAI and the PLMN Id of the RNC (for 3G subscribers) or BSC (for 2G subscribers) where the subscriber originally attached. The SGSN also supports RAI based query when NRI based query fails.
Product: SGSN

Privilege: Security Administrator, Administrator

Command Modes: Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

- **peer-nri-length length [ rai-fqdn-fallback ] [nri-for-inter-pool-address]**
- **remove peer-nri-length [ rai-fqdn-fallback ] [nri-for-inter-pool-address]**

**remove**

Deletes the NRI length configuration for the non-local RAIs and the SGSN sends RAI-FQDN-based DNS resolution.

**length**

This defines the NRI length for the peer SGSN and enables use of NRI-FQDN-based DNS resolution for non-local RAIs. This variable allows for an integer from 1 to 10.

**rai-fqdn-fallback**

This keyword allows the operator to configure SGSN support for RAI based query when NRI based query fails. By default this keyword is disabled.

**nri-for-inter-pool-address**

This keyword enables NRI-only based static peer-sgsn address configuration for inter-pool. If this keyword is configured and if the NRI value derived from the PTMSI received in the RAU request matches the NRI value configured in the CLI `sgsn-address nri nri-value prefer local address ipv4 addr interface name`, the static sgsn-address configured in the above CLI will be used to initiate the context request. Otherwise, a DNS query will be initiated to fetch the peer-sgsn address.

### Usage Guidelines

- **Important**
  - This feature is supported only for 3G subscribers until Release 15.0.
  - This feature is also supported for 2G subscribers from Release 16.0 onwards.

- **Important**
  - Fall back to RAI based query when NRI based query fails is not supported in the following scenarios:
    - 2G Context Request and Identification Request are not supported.
    - S4 support of this extension for all applicable scenarios are not supported.

The command enables the SGSN to perform DNS query with an NRI when RAU comes from an SGSN outside the pool. The SGSN uses NRI-FQDN-based DNS resolution for the non-local RAIs for 3G and 2G subscribers in place of RAI-FQDN-based DNS resolution.
This functionality is applicable in situations for either inter- or intra-PLMN when the SGSN has not chosen a local NRI value (configured with SGSN Service commands) other than local-pool-rai or nb-rai. This means the RAI (outside pool but intra-PLMN) NRI length configured here will be applicable even for intra-PLMN with differently configured NRI lengths (different from the local pool).

This functionality is not applicable to call control profiles with an associated MSIN range as cprofile selection is not IMSI-based. When this feature is enabled, the selection of the cprofile is based on the old-RAI and the PLMN Id (if configured) of the RNC (for 3G subscribers) or BSC (for 2G subscribers) where the subscriber originally attached.

When the CLI keyword `nri-for-inter-pool-address` is enabled the static SGSN address configured in the command `sgsn-address` is used for inter-pool Attaches/RAUs if the NRI value configured in the CLI `sgsn-address` matches the NRI value calculated from the PTMSI received in the attach/RAU message. If the keyword `nri-for-inter-pool-address` is not enabled, a DNS query is sent out to fetch the peer-sgsn address. This enhancement is applicable for both 2G and 3G scenarios. The primary advantage of this enhancement is that the DNS query for inter-pool 3G or 2G Attach/RAU scenarios is avoided.

**Example**

The following command is used to configure a peer-nri-length of 3, with support for RAI based query when NRI based query fails:

```plaintext
peer-nri-length 3 rai-fqdn-fallback
```

---

**plmn-protocol**

Configures the protocol supported by the PLMN (Public Land Mobile Network).

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
plmn-protocol plmnid mcc mcc_num mnc mnc_num { s5-protocol | s8-protocol } { gtp | pmip }
remove plmn-protocol plmnid mcc mcc_num mnc mnc_num
```

**remove**

Deletes the definition from the call control profile configuration.

```plaintext
plmn-id mcc mcc_num mnc mnc_num
```

Identifies the PLMN by MCC (mobile country code) and MNC (mobile network code).

`mcc_num`: Enter a 3-digit integer from 100-999.
mnc_num: Enter a 2- or 3-digit integer from 00 to 999.

s5-protocol | s8-protocol
Select which protocol – S5 or S8 – that controls the identified PLMN.

gtp | pmip
Select the protocol variant - GTP or PMIP - that controls functionality for the identified PLMN.

Usage Guidelines
Use this command to identify a particular PLMN and, at a higher level, its operational characteristics.

Example
The following command instructs the MME to use PLMN MCC423.MNC40.GPRS with PMIP under S8 Protocol:

plmn-protocol plmnid mcc 423 mnc 40 s8-protocol pmip

prefer subscription-interface

Selects the specified subscription interface (Gr or S6d) if both interface types are associated with a call-control-profile. Use of this command requires an S6d license. The SGSN also allows selection of S6d interface only if the UE is EPC capable. The keyword epc-ue supports the selection of HSS interface only for EPC capable subscribers.

Product
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

Syntax Description
prefer subscription-interface { hlr | hss [ epc-ue ] }
remove prefer subscription-interface

remove
Removes the preferred subscription-interface for the call control profile.

hlr
Selects the HLR Gr interface.

hss
Selects the HSS S6d interface.
epc-ue

Configure this keyword to select the HSS interface for EPC capable subscribers. For other subscribers the MAP interface will be selected. This keyword will be applicable only when both MAP and HSS interfaces are configured in the Call-control profile. If this keyword is not configured then SGSN follows existing logic for interface selection. The interface selection based on UE capability is done only at the time of Attach / new SGSN RAU / SRNS. Once the interface is selected, the subscriber remains in same interface till the UE moves out of the SGSN.

Usage Guidelines

Use of this command requires an S6d license.

The SGSN provides a mechanism to associate a MAP service with call control profile. It is possible that both MAP service and HSS peer service are associated with the call control profile. If the interface preference selected is "hlr", the MAP protocol is used to exchange messages with the HLR. If the interface preference selected is "hss", the Diameter-protocol is used to exchange messages with the HSS.

Example

The following command specifies that "hss" for S6d is selected as the subscription-interface:

prefer subscription-interface hss

psm

This command is used to configure UE Power Saving Mode parameters.

Product

MME

Privilege

Security Administrator, Administrator

Command Modes

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

[remove] psm {ue-requested [dl-buf-duration [packet-count packet_value ]]} t3324-timeout t3324_value t3412-extended-timeout t3412_ext_value [dl-buf-duration [packet-count packet_value ]]}  

remove

The remove keyword deletes the existing power saving mode configuration.

ue-requested

Use this keyword when UE requested values for Active and Extended Periodic timers are to be accepted.

t3324-timeout t3324_value

Use this keyword to configure the T3324 active timer value.
t3324_value
The T3324 active timer is an integer value in the range 0 up to 11160 seconds.

**t3412-extended-timeout t3412_ext_value**
Use this keyword to configure the T3412 Extended timer value.

**t3412_ext_value**
The T3412 extended timer is an integer value in the range 0 up to 35712000 seconds.

dl-buf-duration
Use this keyword to Send Downlink Buffer Duration in DDN ACK when unable to page UE.

**packet-count packet_value**
Use this keyword to send 'DL Buffering Suggested Packet Count' in DDN ACK when unable to page UE.

**packet_value**
The packet_value is an integer value from 0 up to 65535.

---

**Usage Guidelines**
Use this CLI command to configure the T3324 active and T3412 extended timers. The CLI also provides an option to either accept UE requested values or HSS subscribed values or MME configured values for these timers. This command is used to configure either to send or not send the Downlink Buffer Duration in DDN Ack, the DDN Ack Optional IE "Downlink Suggested Packet Count". The CLI option dl-buf-duration [ packet-count packet_value ] is used to optionally configure either to send or not send the downlink buffer duration in DDN Ack, the DDN Ack Optional IE "Downlink Suggested Packet Count" can also be configured. If this option is not configured and not sent in subscription, MME does not send IE in DDN reject. If the packet-count value is not configured locally, the subscription value for packet-count is used. The subscription value can be "0", in this case the packet count IE will not be sent for that subscriber even if it is configured locally. If the T3324 active and T3412 extended timers are locally configured these values are always used. If the psm command is configured to use the UE requested values for Active and Extended Periodic timers the UE requested values are accepted, but in case if the UE does not request T3412 extended timer, then the value available in subscription data are used for Extended Periodic timer. If the values are not available in the subscription data then the values configured under the MME service are used .

As per latest version of 3GPP TS 24.008, the maximum value of T3412 extended timer can be "320*31" hours that is "35712000" seconds. Due to MME constraints on timer implementation the T3412 extended timer is restricted to 1050 hours that is "3780000" seconds. However, the nearest usable value of this timer as 3GPP TS 24.008 GPRS Timer 3 is 960 hours (320 * 3) that is 3456000 seconds.

**Example**
Use the following command to enable power saving mode and to accept UE requested values for T3324 and T3412 timers.

```
psm ue-requested
```

Use the following command enable UE power saving mode and provide operator desired values for T3324 and T3412 timers:

```
psm t3324-timeout 100 t3412-extended-timeout 5000
```
Use the following command to enable PSM and accept UE requested values for T3324 and T3412 timers. This command also specifies the 'DL Buffering Suggested Packet Count' in DDN ACK when unable to page UE.

```
psm ue-requested dl-buf-duration packet-count 100
```

In the following example, PSM is enabled and values of T3324 and T3412 timers are specified along with configuring a packet count in DDN ACK:

```
psm t3324-timeout 1000 t3412-extended-timeout 5000 dl-buf-duration packet-count 100
```

### ptmsi-reallocate

Defines P-TMSI reallocation for Attach Requests, RAU Request, and Service Requests.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

#### Syntax Description

```
ptmsi-reallocate { attach [ frequency frequency ] [ interval interval ] [ routing-area-update [ update-type ] | service-request [ service-type ] ] [ access-type { gprs | umts } ] } ptmsi-reallocate routing-area-update [ access-type { gprs | umts } ] [ frequency frequency ] [ update-type { combined-update | imsi-combined-update | periodic | ra-update } [ access-type { gprs | umts } ] [ frequency frequency ] ]
ptmsi-reallocate service-request [ frequency frequency ] [ service-type { data | page-response | signaling } [ frequency frequency ] ] [ no | remove ] ptmsi-reallocate { attach | frequency | interval | routing-area-update [ update-type { combined-update | imsi-combined-update | periodic | ra-update } [ access-type { gprs | umts } ] ] | service-request [ service-type { data | page-response | signaling } ] } [ access-type { gprs | umts } ]
```

**no**

Disables the authentication procedures configured for the specified P-TMSI reallocation configuration in the call control profile.

**remove**

Deletes the defined authentication procedures for the specified P-TMSI reallocation configuration from the call control profile configuration file.
attach

Enables/disables P-TMSI reallocation for Attach with local P-TMSI.

---

**Important**

IMSI or inter-SGSN Attach is not configurable and will always be reallocated.

---

**access-type type**

One of the following must be selected to reallocate on the basis of the type of network access:

- gprs
- umts

This keyword can be used in combination with other keywords to refine the reallocation configuration.

**frequency frequency**

Defines frequency of reallocation based on the number of messages skipped. If the frequency is set for 1, then the SGSN skips 1 message and then reallocates on receipt of the 2nd (alternate) request message, essentially reallocating the P-TMSI every time. If the frequency is set for 12, then the SGSN skips reallocation for 12 messages and reallocates on receipt of the 13th request message. This keyword can be used in combination with other keywords to refine the reallocation configuration.

*frequency* must be an integer from 1 to 50.

By default, frequency is not defined and, therefore, reallocation is done for every request message and none are skipped.

**interval minutes**

Enter an integer between 1 and 1440 to define the time interval (in minutes) for skipping the service/RAU/attach request message procedure.

**routing-area-update [ update-type ]**

Enables/disables P-TMSI reallocation for RAU (routing area update) with local P-TMSI. To refine the reallocation configuration, include one of the optional types of updates to limit reallocation:

- combined-update
- imsi-combined-update
- periodic
- ra-update

---

**Important**

Inter-SGSN RAU will always be reallocated.
**service-request [service-type]**

Enables/disables P-TMSI reallocation for Service Requests. To refine the Service-Request reallocation configuration, include one of the optional service-types to limit the reallocation:

- **data**
- **page-response**
- **signaling**

**Usage Guidelines**

By default, reallocation is not enabled. Use this command to enable P-TMSI reallocation for Attach Requests, RAU Request, and Service Requests. Fine-tune the reallocation configuration according to frequency, interval, or access-type.

**Example**

The following command configures the SGSN to perform P-TMSI reallocation upon receiving 2G Attach Requests

```
ptmsi-reallocate attach access-type gprs
```

The following command configures the SGSN to disable all previously defined P-TMSI reallocations based on the combined criteria of interval and 3G requests:

```
no ptmsi-reallocate interval access-type umts
```

**ptmsi-signature-reallocate**

Enables P-TMSI signature reallocation during Attach/RAU procedures.

### Product

SGSN

### Privilege

Security Administrator, Administrator

### Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

### Syntax Description

```
ptmsi-signature-reallocate { attach | frequency frequency | interval interval | ptmsi-reallocation-command | routing-area-update [ update-type ] } [ access-type { gprs | umts } | frequency frequency ]
ptmsi-signature-reallocate routing-area-update [ access-type { gprs | umts } | frequency frequency ] update-type { combined-update | imsi-combined-update | periodic | ra-update } ] [ access-type { gprs | umts } | frequency frequency ]
[ no | remove ] ptmsi-signature-reallocate { attach | frequency | interval | routing-area-update [ update-type { combined-update |
imsi-combined-update | periodic | ra-update ] ] [ access-type { gprs | umts } ]

no
Disables the authentication procedures configured for the specified P-TMSI signature reallocation configuration in the call control profile.

remove
Deletes the defined authentication procedures for the specified P-TMSI signature reallocation configuration from the call control profile configuration file.

attach
Enables/disables P-TMSI signature reallocation for Attach with local P-TMSI.

access-type type
One of the following must be selected to reallocate on the basis of the type of network access:
  • gprs
  • umts
This keyword can be used in combination with other keywords to refine the reallocation configuration.

frequency frequency
Defines 1-in-N selective reallocation. If the frequency is set for 12, then the SGSN skips reallocation for the first 11 messages and reallocates on receipt of the twelfth request message.
frequency must be an integer from 1 to 50.
This keyword can be used in combination with other keywords to refine the reallocation configuration.

interval minutes
Enter an integer between 1 and 1440 to define the time interval (in minutes) for skipping the service/RAU/attach request message procedure before performing a P-TMSI signature reallocation.

ptmsi-reallocation-command
Includes P-TMSI signature reallocation as a part of the P-TMSI reallocation configuration.

routing-area-update [ update-type ]
Enables/disables P-TMSI signature reallocation for RAU (routing area update) with local P-TMSI. To refine the reallocation configuration, include one of the optional types of updates to limit reallocation:
  • combined-update
  • imsi-combined-update
  • periodic
  • ra-update
**Usage Guidelines**

By default, P-TMSI signature reallocation is disabled. This command allows the operator to configure when the P-TMSI signature is reallocated.

**Example**

The following command configures the SGSN to reallocate the P-TMSI signature for every third UMTS attach procedure:

```plaintext
ptmsi-signature-reallocate attach frequency 3 access-type umts
```

The following command configures the SGSN to reallocate the P-TMSI signature for every seventh GPRS periodic RAU procedure:

```plaintext
ptmsi-signature-reallocate routing-area-update uupdate-type periodic frequency 7 access-type gprs
```

The following command removes all configuration instances for reallocating the P-TMSI signature based on intervals and UMTS access:

```plaintext
remove ptmsi-signature-reallocate interval access-type umts
```

**qos**

Configures the quality of service (QoS) parameters to be applied.

**Product**

- MME
- SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

`(local)host_name(config-call-control-profile-profile_name)#`

**Syntax Description**

```plaintext
qos { gn-gp | ue-ambr }
qos gn-gp { arp high-priority priority medium-priority priority | pre-emption capability { may-trigger-pre-emption | shall-not-trigger-pre-emption } | vulnerability { not-pre-emptable | pre-emptable } }
qos ue-ambr { max-ul mbr_up max-dl mbr_dl | prefer-as-cap { both-hss-and-local minimum | local } }
qos ue-ambr { max-ul mbr_up max-dl mbr_dl | prefer-as-cap both-hss-and-local { local-when-subscription-not-available minimum } | subscription-exceed-reject { emm-cause-code { eps-service-disallowed | eps-service-not-allowed-in-this-plmn | no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area | tracking-area-not-allowed } } }
remove qos { gn-gp | ue-ambr }
```
**remove**

Deletes the configuration from the call control profile.

**gn-gp**

Configures Gn-Gp pre-release 8 ARP and pre-emption parameters.

**arp**

Maps usage of ARP (allocation/retention policy) high-priority (H) and medium-priority (M):

- **high-priority priority**: Enter an integer from 1 to 13.
- **medium-priority priority**: Enter an integer from 2 to 14.

**pre-emption**

Defines the pre-emption/vulnerability criteria for PDP Contexts imported from SGSN on Gn/Gp:

- **capability**
  - **may-trigger-pre-emption**: PDP Contexts imported from Gn/Gp SGSN may preempt existing bearers.
  - **shall-not-trigger-pre-emption**: PDP Contexts imported from Gn/Gp SGSN shall not preempt existing bearers.

- **vulnerability**
  - **not-pre-emptable**: PDP Contexts imported from Gn/Gp SGSN are not vulnerable to pre-emption.
  - **pre-emptable**: PDP Contexts imported from Gn/Gp SGSN are vulnerable to pre-emption.

**ue-ambr**

This keyword enables the operator to configure either the aggregate maximum bit rate stored on the UE (UE AMBR) or select the preferred uplink and downlink QoS cap values.

---

**Important**

The SGSN only supports the **ue-ambr** keyword beginning in Release 16.

Configures the aggregate maximum bit rate that will be stored on the UE (user equipment).

- **max-ul mbr_up**: Defines the maximum bit rate for uplink traffic.
  
  **mbr_up**: Enter a value from 1 to 1410065408 (StarOS release 16.1 and higher), or 0 to 1410065408 (Kbps).

  In StarOS 21.8 and later releases, **mbr_up** must be an integer from 0 to 4000000000000 (4 Tbps).

- **max-dl mbr_down**: Defines the maximum bit rate for downlink traffic.
  
  **mbr_down**: Enter a value from 1 to 1410065408 (StarOS release 16.1 and higher), or 0 to 1410065408 (Kbps).
In StarOS 21.8 and later releases: mbr_down must be an integer from 0 to 4000000000000 (4 Tbps).

prefer-as-cap both-hss-and-local { local-when-subscription-not-available | minimum |
subscription-exceed-reject [ emm-cause-code [ eps-service-disallowed | eps-service-not-allowed-in-this-plmn |
no-suitable-cell-in-tracking-area | plmn-not-allowed | roaming-not-allowed-in-this-tracking-area |
tracking-area-not-allowed ] ] }

This set of options is only available on the MME.

Specifies the QoS cap value to use.

- **local-when-subscription-not-available**: Use the locally configured values if the Home Subscriber Server (HSS) does not provide QoS bit rate values.
- **minimum**: Use the lower of either the locally configured QoS bit rate or the HSS-provided QoS bit rate. This will override the HSS provided values if it is greater than the locally configured values, or if the HSS does not provide any values.
- **subscription-exceed-reject**: If the requested QoS bit rate exceeds the locally configured value, reject the PDN connection.
- **emm-cause-code**: Specifies the EPS Mobility Management (EMM) cause code to return when the PDN connection is rejected.
  - **eps-service-disallowed** - Default
  - **eps-service-not-allowed-in-this-plmn**
  - **no-suitable-cell-in-tracking-area**
  - **plmn-not-allowed**
  - **roaming-not-allowed-in-this-tracking-area**
  - **tracking-area-not-allowed**

prefer-as-cap { both-hss-and-local minimum | local }

This set of options is only available on the SGSN.

Specifies the QoS cap value to use:

- **both-hss-and-local minimum** Use the lower of either the locally configured QoS bit rate or the Home Subscriber Server (HSS)-provided QoS bit rate.
- **local** Use the locally configured QoS bit rate.

**Usage Guidelines**

Use this command to configure the QoS parameters for the call control profile for either the MME or the SGSN.

On an S4-SGSN, this command ensures proper QoS parameter mapping between the S4-SGSN and EPC UEs, SGWs and PGWs:

- Map EPC ARP parameters to pre-release 8 ARP (Gn/Gp ARP) used during S4-SGSN-to-Gn SGSN call handovers.
- Map ARP parameters received in a GPRS subscription from the HLR to EPC ARP parameters if:
  - The S4 interface is selected for an EPC capable UE, and
  - The UE has only a GPRS subscription (but no EPS subscription) in the HLR / HSS.
Example
Configure the Gn/Gp interface ARP priority values:
```
qos gn-gp arp high-priority 2 medium-priority 3
```

**rau-inter**

Defines acceptable parameters for inter-SGSN routing area updates.

<table>
<thead>
<tr>
<th>Product</th>
<th>SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:
```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
rau-inter { accept use-auth-vector | access-type gprs { all | location-area-list instance instance_id | routing-area-list instance instance_id } ( failure-code fail_code | user-device-release { before-r99 | r99-or-later } failure-code fail_code ) } | allow accept access-type gprs location-area-list instance instance_id | avoid-s12-direct-tunnel | txt-xfer-failure | exclude-uteid-in-mbr | ignore-peer-context-id | peer-sgsn-addr-resolution-failure failure-code fail_code | restrict access-type { { gprs | umts } { all | location-area-list instance instance_id | routing-area-list instance instance_id } default rau-inter { accept use-auth-vector | access-type { { gprs | umts } { all | location-area-list instance instance_id | routing-area-list instance instance_id } user-device-release { before-r99 | r99-or-later } failure-code fail_code } } | avoid-s12-direct-tunnel | failure-code fail_code | ignore-peer-context-id | peer-sgsn-addr-resolution-failure failure-code fail_code } no rau-inter { accept use-auth-vector | allow access-type { gprs | umts } location-area-list instance instance_id | routing-area-list instance instance_id | ignore-peer-context-id | restrict access-type { gprs | umts } { all | location-area-list instance instance_id | routing-area-list instance instance_id } }
```

Including `no` as part of the command structure disables the values already configured for parameters specified in the command.
**default**

Resets the configuration of specified parameters to system default values.

**remove**

**remove** can only be used with the **avoid-s12-direct-tunnel** keyword to erase a configuration instructing the SGSN to avoid establishment of a direct tunnel for S12 interfaces.

**accept use-auth-vector**

Sets the SGSN to accept using the authorization vector.

**allow access-type**

Including this keyword with one of the following options, configures the SGSN to allow MS/UE with the identified access-type extension to be part of the intra-RAU procedure.

- **gprs** - General Packet Radio Service
- **umts** - Universal Mobile Telecommunications System

**avoid-s12-direct-tunnel**

Enables the operator to modify the Call-Control profile default configuration and instructs the SGSN to avoid establishment of a direct tunnel for S12 interfaces.

This keyword is only supported for configuration of S12 interfaces.

**ctxt-xfer-failure fail_code**

Configure or removes a GMM failure cause code to be sent in a RAU Reject to the UE due to context transfer failures.

*fail_code* For acceptable options, refer to the failure-codes listed below.

**remove** filter works with this keyword to erase the context transfer failure cause code definition.

**exclude-uteid-in-mbr**

By default, the SGSN sends user plane fully qualified tunnel end-point identifier (UTEID) in the Modify Bearer Request (MBR). If RABs are not yet established, this keyword disables or enables the sending of the UTEID in the MBR during a new SGSN RAU over S16/S3. This keyword is in compliance with 3GPP TS 23.401 v11.8.0.

**ignore-peer-context-id**

Sets the SGSN to ignore the peer's context-ID and replace with PDP context-ID information based on the HLR subscription.

**peer-sgsn-addr-resolution-failure fail_code**

Configure or remove a GMM failure cause code to be sent in a RAU Reject to the UE due to peer address resolution failures at the SGSN.
**fail_code** Enter either 9 (MSID cannot be derived by the network) or 10 (Implicitly detached) to identify the GMM failure cause code.

**remove** filter works with this keyword to erase the failure code definition.

**restrict access-type**
Including this keyword-set with one of the following options, configures the SGSN to restrict MS/UE with the identified access-type extension from the inter-RAU procedure.

- **gprs** - General Packet Radio Service
- **umts** - Universal Mobile Telecommunications System

**all**

**all** - adding this option to the keyword determines that the failure cause code will be applicable to all location areas.

**location-area-list instance instance_id**

**instance_id** must be an integer between 1 and 5. The value must be an already defined instance of a location area code (LAC) list created with the **location-area-list** command.

**routing-area-list instance instance_id**

Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the **routing-area-list** command.

**instance_id** must be an integer from 1 to 5.

**failure-code fail-code**

Specify a GSM Mobility Management (GMM) failure cause code to identify the reason an inter SGSN RAU does not occur. This GMM cause code will be sent in the reject message to the MS.

**fail-code** must be an integer from 2 to 111. Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

- 2 - IMSI unknown in HLR
- 3 - Illegal MS
- 6 - Illegal ME
- 7 - GPRS services not allowed
- 8 - GPRS services and non-GPRS services not allowed
- 9 - MSID cannot be derived by the network
- 10 - Implicitly detached
- 11 - PLMN not allowed
- 12 - Location Area not allowed
- 13 - Roaming not allowed in this location area
• 14 - GPRS services not allowed in this PLMN
• 15 - No Suitable Cells In Location Area
• 16 - MSC temporarily not reachable
• 17 - Network failure
• 20 - MAC failure
• 21 - Synch failure
• 22 - Congestion
• 23 - GSM authentication unacceptable
• 40 - No PDP context activated
• 48 to 63 - retry upon entry into a new cell
• 95 - Semantically incorrect message
• 96 - Invalid mandatory information
• 97 - Message type non-existent or not implemented
• 98 - Message type not compatible with state
• 99 - Information element non-existent or not implemented
• 100 - Conditional IE error
• 101 - Message not compatible with the protocol state
• 111 - Protocol error, unspecified

**user-device-release { before-r99 | r99-or-later } failure-code code**

Default: Disabled

Enables the SGSN to reject an Inter-RAU procedure based on the detected 3GPP release version of the MS equipment and selectively send a failure cause code in the reject message. The SGSN uses the following procedure to implement this configuration:

1. When Attach Request is received, the SGSN checks the subscriber's IMSI and current location information.
2. Based on the IMSI, an operator policy and call control profile is found that relates to this Attach Request.
3. The call control profile is checked for access limitations.
4. Attach Request is checked to see if the revision indicator bit is set
   • if not, then the configured common failure code for reject is sent;
   • if set, then the 3GPP release level is verified and action is taken based on the configuration of this parameter

One of the following options must be selected and completed:
• **before-r99**: Indicates the MS would be a 3GPP release prior to R99 and an appropriate failure code should be defined.

  **failure-code code**: Enter an integer from 2 to 111.

• **r99-or-later**: Indicates the MS would be a 3GPP Release 99 or later and an appropriate failure code should be defined.

  **failure-code code**: Enter an integer from 2 to 111.

### Usage Guidelines

Use this command to configure the restrictions and function of the inter-RAU procedure.

### Example

Configure default inter-RAU settings for Edge calls from subscribers on location-area-list no. 1:

```bash
default rau-inter allow access-type gprs location-area-list instance 1
```

---

### rau-inter-plmn

Enables or disables restriction of all Routing Area Updates (RAUs) occurring between different PLMNs.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```bash
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```bash
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```bash
rau-inter-plmn access-type { all | location-area-list instance instance } { failure-code fail_code | user-device-release { before-r99 failure-code fail_code | r99-or-later failure-code fail_code } | rau-inter-plmn access-type { all | location-area-list instance instance } user-device-release { before-r99 failure-code | r99-or-later failure-code } } { no } rau-inter-plmn { restrict | allow } access-type { gprs umts } { all | location-area-list instance instance } { no } rau-inter-plmn { allow access-type | restrict access-type } { [ all ] failure-code fail_code | location-area-list instance instance } { no } rau-inter { allow access-type | restrict access-type } { [ all ] failure-code fail_code | location-area-list instance instance } }
```

**no**

Including "no" as part of the command structure disables the values already configured for parameters specified in the command.
**default**
Resets the configuration of specified parameters to system default values.

**allow access-type**
Including this keyword-set with one of the following options, configures the SGSN to allow MS/UE with the identified access-type extension to be part of the intra-RAU procedure.

  - gprs - General Packet Radio Service
  - umts - Universal Mobile Telecommunications System

**restrict access-type**
Including this keyword-set with one of the following options, configures the SGSN to restrict MS/UE with the identified access-type extension from the inter-RAU procedure.

  - gprs - General Packet Radio Service
  - umts - Universal Mobile Telecommunications System

**all**
**all** - adding this option to the keyword determines that the failure cause code will be applicable to all location areas.

**location-area-list instance instance**
*list_id* must be an integer between 1 and 5. The value must be an already defined instance of a LAC list created with the **location-area-list** command.

**failure-code fail-code**
Specify a GSM Mobility Management (GMM) failure cause code to identify the reason an inter SGSN RAU does not occur. This GMM cause code will be sent in the reject message to the MS.

*fail-code* must be an integer from 2 to 111. Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

  - 2 - IMSI unknown in HLR
  - 3 - Illegal MS
  - 6 - Illegel ME
  - 7 - GPRS services not allowed
  - 8 - GPRS services and non-GPRS services not allowed
  - 9 - MSID cannot be derived by the network
  - 10 - Implicitly detached
  - 11 - PLMN not allowed
  - 12 - Location Area not allowed
• 13 - Roaming not allowed in this location area
• 14 - GPRS services not allowed in this PLMN
• 15 - No Suitable Cells In Location Area
• 16 - MSC temporarily not reachable
• 17 - Network failure
• 20 - MAC failure
• 21 - Synch failure
• 22 - Congestion
• 23 - GSM authentication unacceptable
• 40 - No PDP context activated
• 48 to 63 - retry upon entry into a new cell
• 95 - Semantically incorrect message
• 96 - Invalid mandatory information
• 97 - Message type non-existent or not implemented
• 98 - Message type not compatible with state
• 99 - Information element non-existent or not implemented
• 100 - Conditional IE error
• 101 - Message not compatible with the protocol state
• 111 - Protocol error, unspecified

**user-device-release { before-r99 | r99-or-later } failure-code code**

Default: Disabled

Enables the SGSN to reject an Inter-RAU procedure based on the detected 3GPP release version of the MS equipment and selectively send a failure cause code in the reject message. The SGSN uses the following procedure to implement this configuration:

1. When Attach Request is received, the SGSN checks the subscriber's IMSI and current location information.
2. Based on the IMSI, an operator policy and call control profile are found that relate to this Attach Request.
3. The call control profile is checked for access limitations.
4. Attach Request is checked to see if the revision indicator bit is set
   • if not, then the configured common failure code for reject is sent;
   • if set, then the 3GPP release level is verified and action is taken based on the configuration of this parameter

One of the following options must be selected and completed:
• **before-r99**: Indicates the MS would be a 3GPP release prior to R99 and an appropriate failure code should be defined.

  **failure-code code**: Enter an integer from 2 to 111.

• **r99-or-later**: Indicates the MS would be a 3GPP Release 99 or later and an appropriate failure code should be defined.

  **failure-code code**: Enter an integer from 2 to 111.

---

**Usage Guidelines**

Use this command to configure the restrictions and function of the inter-RAU procedure occurring across RNCs or BSSs where the PLMN changes. For example:

- inter-IuPS RAU, where the two IuPSs have different PLMNs
- inter-GPRS RAU, where the two GPRSs have different PLMNs
- inter-RAT RAU (2G > 3G), where the IuPS/GPRS services have different PLMNs
- inter-RAT-RAU (3G > 2G), where the IuPS/GPRS services have different PLMNs

---

**Example**

default rau-inter allow access-type gprs location-area-list instance 1

---

**rau-intra**

Defines an acceptable procedure for intra-SGSN Routing Area Updates (RAUs).

---

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

`[local] host_name(config-call-control-profile-profile_name)#`

---

**Syntax Description**

```
rau-intra access-type { all | location-area-list instance instance_id } { failure-code fail_code | user-device-release { before-r99 } { failure-code fail_code | r99-or-later } { failure-code fail_code } }

default rau-intra access-type { all | location-area-list instance instance_id } { failure-code fail_code | routing-area-list instance instance_id } user-device-release { before-r99 } { failure-code fail_code | r99-or-later failure-code }

rau-intra { allow access-type | restrict access-type } { [ all ] failure-code fail_code | location-area-list instance instance_id | routing-area-list instance instance_id } }

no rau-intra { allow access-type | restrict access-type } { [ all ] failure-code fail_code | location-area-list instance instance_id | routing-area-list instance instance_id } }
```

routing-area-list instance instance_id }
default rau-intra { allow access-type | restrict access-type } { [ all ]
  failure-code fail_code | location-area-list instance instance_id |
routing-area-list instance instance_id }

no
Including "no" as part of the command structure disables the values already configured for parameters specified in the command.

default
Resets the configuration of specified parameters to system default values.

allow access-type
Including this keyword-set with one of the following options, configures the SGSN to allow an MS/UE with the identified access-type extension to be part of the intra-RAU procedure.
  • gprs - General Packet Radio Service
  • umts - Universal Mobile Telecommunications System

restrict access-type
Including this keyword-set with one of the following options, configures the SGSN to restrict an MS/UE with the identified access-type extension from the intra-RAU procedure.
  • gprs - General Packet Radio Service
  • umts - Universal Mobile Telecommunications System

all
all - adding this option to the keyword determines that the failure cause code will be applicable to all location areas.

location-area-list instance instance_id
instance_id must be an integer from 1 to 5. The value must be an already defined instance of a location area code (LAC) list created via the location-area-list command.

routing-area-list instance instance_id
Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the routing-area-list command.
instance_id must be an integer from 1 to 5.

failure-code fail-code
Specify a GSM Mobility Management (GMM) failure cause code to identify the reason an inter SGSN RAU does not occur. This GMM cause code will be sent in the reject message to the MS.
**fail-code** must be an integer from 2 to 111. Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

- 2 - IMSI unknown in HLR
- 3 - Illegal MS
- 6 - Illegal ME
- 7 - GPRS services not allowed
- 8 - GPRS services and non-GPRS services not allowed
- 9 - MSID cannot be derived by the network
- 10 - Implicitly detached
- 11 - PLMN not allowed
- 12 - Location Area not allowed
- 13 - Roaming not allowed in this location area
- 14 - GPRS services not allowed in this PLMN
- 15 - No Suitable Cells In Location Area
- 16 - MSC temporarily not reachable
- 17 - Network failure
- 20 - MAC failure
- 21 - Synch failure
- 22 - Congestion
- 23 - GSM authentication unacceptable
- 40 - No PDP context activated
- 48 to 63 - retry upon entry into a new cell
- 95 - Semantically incorrect message
- 96 - Invalid mandatory information
- 97 - Message type non-existent or not implemented
- 98 - Message type not compatible with state
- 99 - Information element non-existent or not implemented
- 100 - Conditional IE error
- 101 - Message not compatible with the protocol state
- 111 - Protocol error, unspecified

```
user-device-release { before-r99 | r99-or-later } failure-code code
```

Default: Disabled
Enables the SGSN to reject an Intra-RAU procedure based on the detected 3GPP release version of the MS equipment and selectively send a failure cause code in the reject message. The SGSN uses the following procedure to implement this configuration:

1. When Attach Request is received, the SGSN checks the subscriber's IMSI and current location information.
2. Based on the IMSI, an operator policy and call control profile are found that relate to this Attach Request.
3. Call control profile is checked for access limitations.
4. Attach Request is checked to see if the revision indicator bit is set
   • if not, then the configured common failure code for reject is sent;
   • if set, then the 3GPP release level is verified and action is taken based on the configuration of this parameter

One of the following options must be selected and completed:

- **before-r99**: Indicates the MS would be a 3GPP release prior to R99 and an appropriate failure code should be defined.
  
  **failure-code code**: Enter an integer from 2 to 111.

- **r99-or-later**: Indicates the MS would be a 3GPP Release 99 or later and an appropriate failure code should be defined.
  
  **failure-code code**: Enter an integer from 2 to 111.

**Usage Guidelines**

Use this command to configure the restrictions and function of the intra-RAU procedure.

**Example**

```
default rau-intra allow access-type gprs location-area-list instance 1
```

### re-authenticate

Enables or disables the re-authentication feature. This command is available in releases 8.1 and higher.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
re-authenticate [ access-type { gprs | umts } ]
remove re-authenticate
```
**remove**
Including this keyword with the command disables the feature. The feature is disabled by default.

**access-type**
Defines the type of access to be allowed or restricted.

- **gprs**
- **umts**

If this keyword is not included, then both access types are allowed by default.

**Usage Guidelines**
Use this command to enable or disable the re-authentication feature, which instructs the SGSN to retry authentication with another RAND in situations where failure of the first authentication has occurred. To address the introduction of new SIM cards, for security reasons a systematic "last chance" authentication retry with a fresh Authentication Vector is needed, particularly in cases where there is an SRES mismatch at authentication.

**Example**
**re-authenticate**

---

**regional-subscription-restriction**
Allows the operator to define the cause code for subscriber rejection when it is due to regional subscription information failure.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration
command: configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] regional-subscription-restriction [ failure-code code | user-device-release { before-r99 failure-code code | r99-or-later failure-code code } ]
```

**remove**
This keyword causes the configuration to be deleted from the call control profile configuration.

**failure-code cause_code**

*cause_code*: Enter an integer from 2 to 111; default code is 13 (roaming not allowed in this location area [LA]).
Refer to the GMM failure cause codes listed below (from section 10.5.5.14 of the 3GPP TS 124.008 v7.2.0 R7):

- 2 - IMSI unknown in HLR
- 3 - Illegal MS
- 6 - Illegal ME
- 7 - GPRS services not allowed
- 8 - GPRS services and non-GPRS services not allowed
- 9 - MSID cannot be derived by the network
- 10 - Implicitly detached
- 11 - PLMN not allowed
- 12 - Location Area not allowed
- 13 - Roaming not allowed in this location area
- 14 - GPRS services not allowed in this PLMN
- 15 - No Suitable Cells In Location Area
- 16 - MSC temporarily not reachable
- 17 - Network failure
- 20 - MAC failure
- 21 - Synch failure
- 22 - Congestion
- 23 - GSM authentication unacceptable
- 40 - No PDP context activated
- 48 to 63 - retry upon entry into a new cell
- 95 - Semantically incorrect message
- 96 - Invalid mandatory information
- 97 - Message type non-existent or not implemented
- 98 - Message type not compatible with state
- 99 - Information element non-existent or not implemented
- 100 - Conditional IE error
- 101 - Message not compatible with the protocol state
- 111 - Protocol error, unspecified
user-device-release { before-r99 | r99-or-later } failure-code code

Enables the SGSN to assign a reject cause code based on the detected 3GPP release version of the MS equipment.

One of the following options must be selected and completed:

- **before-r99**: Indicates the MS would be a 3GPP release prior to R99 and an appropriate failure code should be defined.
  
  **failure-code code**: Enter an integer from 2 to 111. Refer to the list above.

- **r99-or-later**: Indicates the MS would be a 3GPP Release 99 or later and an appropriate failure code should be defined.
  
  **failure-code code**: Enter an integer from 2 to 111. Refer to the list above.

**Usage Guidelines**

Use this command to define GMM reject cause codes when rejection is due to regional subscription information failure.

**Example**

The following command sets a location area rejection message, code 12 for regional restriction rejections:

```
regional-subscription-restriction failure-code 12
```

**release-access-bearer**

Enables sending of Release Access Bearer and configures the S4-SGSN to send Release Access Bearer Request on Iu-Release for non-DT and non-ISR subscribers in 3G and on Ready-to-Standby or Radio-Status-Bad for non-ISR subscribers in 2G.

**Product**

We recommend that Release Access Bearer be enabled (with this command) prior to enabling Subscriber Overcharging Protection for S4-SGSN. This will ensure that the S4-SGSN sends Release Access Bearer with the ARRL bit set if LORC (loss of radio coverage) is detected.

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Call Control Profile Configuration
- configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```
**Syntax Description**

```plaintext
release-access-bearer [ on-iu-release | on-ready-to-standby ]
remove release-access-bearer [ on-iu-release | on-ready-to-standby ]
remove
```

When included with the command, remove disables sending Release Access Bearer in either the selected (with optional keyword) 2G or 3G environment or both environments (with no keyword included).

**on-iu-release**

This optional keyword instructs the SGSN to send Release Access Bearer upon Iu-Release in a 3G network so that Release Access Bearer will be initiated for non-ISR and non-DT subscribers upon Iu-Release. For ISR and DT subscribers, Release Access Bearer will be initiated unconditionally.

**on-ready-to-standby**

This optional keyword instructs the SGSN to send Release Access Bearer on Ready-to-Standby transition in a 2G network so that Release Access Bearer will be initiated for non-ISR subscribers on Ready-to-Standby transition. For ISR subscribers, Release Access Bearer will be initiated unconditionally.

**Usage Guidelines**

If no optional keywords are included with the `release-access-bearer` command, then the S4-SGSN applies Release Access Bearer for both 2G and 3G networks.

By default, Release Access Bearer initiation on Iu-Release or Ready-to-Standby transition is not enabled. When disabled or prior to being enabled, either/both remove release-access-bearer on-iu-release or/and remove release-access-bearer on-ready-to-standby will display in the output generated by the `show configuration [verbose]` command.

This command, in compliance with 3GPP TS 23.060 v11.7.0, provides the operator with the option to have the S4-SGSN send Release Access Bearer Request to the S-GW to remove the downlink user plane on the S4 interface for non-DT and non-ISR scenarios.

In accordance with 3GPP TS 23.401 v11.8.0, if the SGSN and the S-GW are configured to release S4 U-Plane when the EPS bearer contexts associated with the released RABs are to be preserved, then the SGSN should not send SGSN address and TEID for U-Plane in the Modify Bearer Request (MBR). The operator can now use the `rau-inter exclude-uteid-in-mbr` command (under Call-Control Profile configuration mode) to configure the SGSN not to send the UTEID in the MBR.

**Example**

To enable release access bearer in both 2G and 3G networks, use a command similar to the following:

```plaintext
release-access-bearer
```

To disable release access bearer in 3G networks, use a command similar to the following:

```plaintext
remove release-access-bearer on-iu-release
```

**reporting-action**

This command enables event logging in the MME.

**Product**

MME
reuse-authentication-triplets

Creates a configuration entry to enable or disable the reuse of authentication triplets in the event of a failure.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

[ remove ] reporting-action { event-stream event-report-conn
gmpc_event_report_name | mme-event-record}

remove

This command disables the reporting action configuration.

event-stream event-report-conn

Provides event logs for both MME and SGSN procedures using packet streaming.

mme-event-record

Provides event logs for MME procedures in the form of event records using CDRMOD.

Usage Guidelines

The reporting-action command is configured in the Call Control Profile Configuration mode. This command enables procedure reports (Event Data Records). However, the Event Data Records (EDRs) are configured in the Context Configuration mode under the edr-module active-charging-service command. Along with EDR configuration, the file parameters can also be configured in the Context Configuration mode under the session-event-module command. Finally, to enable the Event Logging, the EDR configuration profile must be associated to an MME-Service available under Operator Policy and LTE Policy configuration.

Example

The following configuration enables Event Logging in the MME:

reporting-action event-stream
reporting-action mme-event-record
**Syntax Description**

[ no | remove ] reuse-authentication-triplets no-limit

- **no**
  Disables this configuration entry and disables reuse of authentication triplets.

- **remove**
  This keyword causes the reuse configuration to be deleted from the call control profile configuration. This is the default behavior. Triplets are reused.

- **no-limit**
  This keyword enables reuse triplets as needed.

**Usage Guidelines**

Use this command to enable reuse of authentication triplets.

**Example**

`reuse-authentication-triplets no limit`

---

**rfsp-overide**

Configures RAT frequency selection priority override parameters for this call control profile.

**Product**

- MME
- SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

rfsp-overide { default value | eutran-ho-restricted value | ue-val value 
new-val value } 
remove rfsp-overide { default | eutran-ho-restricted | ue-val value }

- **remove**
  Deletes the rfsp-overide configuration from the call control profile.

- **default**
  Restores the default value assigned.
eutran-ho-restricted value
This keyword is used to configure the value for RAT frequency selection priority when Handover to EUTRAN is restricted. This value overrides the RFSP ID value sent by the HLR/HSS in an EPS subscription.

value: Enter an integer from 1 to 256.

ue-val value
Assign the UE value for the RAT frequency selection priority.

value: Enter an integer from 1 to 256.

new-val value
Assign a new RFSP Index value.

value: Enter an integer from 1 to 256.

Multiple UE value/new value combinations can be configured in a single command.

Usage Guidelines
Use this command to configure the RAT frequency selection priority override parameter.
Multiple UE value/new value combinations can be configured.

Example
The following command resets the specified RFSP Index value (1) to its default value, thereby removing the RFSP Index override value previously configured:

rfsp-override default 1

rfsp-override ue-settings
Configures the override of the RAT Frequency Selection Priority (RFSP) of matching subscribers.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]@host_name(config-call-control-profile-profile_name)#

Syntax Description
[ remove ] rfsp-override ue-settings { data-centric
  ue-voice-domain-preference { cs-voice-only |
  cs-voice-preferred-ims-ps-voice-secondary | ims-ps-voice-only |
  ims-ps-voice-preferred-cs-voice-secondary } | voice-centric
  ue-voice-domain-preference { cs-voice-only |
  cs-voice-preferred-ims-ps-voice-secondary | ims-ps-voice-only |
  ims-ps-voice-preferred-cs-voice-secondary } new-val value }
remove
Deletes the rfsp-override configuration from the call control profile.

**ue-settings value**
Assign the UE value for the RAT frequency selection priority.

**data-centric ue-voice-domain-preference**
Assign the UE value for the RAT frequency selection priority for data-centric calls.

- **cs-voice-only**: Circuit switched voice only.
- **cs-voice-preferred-ims-ps-voice-secondary**: Circuit switched voice preferred.
- **ims-ps-voice-only**: IMS Packet switched voice only.

**voice-centric ue-voice-domain-preference**
Assign the UE value for the RAT frequency selection priority for voice-centric calls.

- **cs-voice-only**: Circuit switched voice only.
- **cs-voice-preferred-ims-ps-voice-secondary**: Circuit switched voice preferred.
- **ims-ps-voice-only**: IMS Packet switched voice only.

**new-val value**
Assign a new RFSP Index value.

**value**: Enter an integer from 1 to 256.

Multiple UE value/new value combinations can be configured in a single command.

**Usage Guidelines**
Use this command to assign an RFSP Index for a UE based on the following factors:

- Operator policy (where IMSI range or PLMN can influence the selected RFSP)
- UE usage setting (voice centric, data centric)
- Voice domain preference (CS voice only, CS voice preferred, IMS PS voice preferred, IMS PS voice only).

To support Radio Resource Management (RRM) in E-UTRAN, the MME provides the parameter RFSP Index to an eNodeB across S1. The RFSP Index is used by the eNodeB to apply specific RRM strategies.

The MME receives the subscribed RFSP Index from the HSS, then overrides the RFSP Index for the UE based on the settings defined in this command.

Multiple UE value/new value combinations can be configured.

**Example**
The following command overrides the RFSP Index value for voice-centric circuit switched calls to an RFSP Index of 10:

```bash
rfsp-override ue-setting voice-centric voice-domain-pref cs-voice_only new-val 10
```
routing-area-list

Defines the routing area list to allow or restrict services in the specified routing areas identified by routing area code (RAC).

Product
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

routin-are-list instance instance_id lac rac rac

no routing-area-list instance instance_id

no
Deletes the specified routing area list configurations.

instance instance_id
Specifies an identification for the specific routing area list.
instance must be an integer between 1 and 5. Instance number will be valid only if the area code is configured for this instance.

lac lac
This keyword defines the location area codes (LACs) to be used by this call control profile as a determining factor in the handling of incoming calls.
lac must be an integer from 1 to 65535.

rac rac
This keyword defines the routing area codes (RACs) to be used by this call control profile as a determining factor in the handling of incoming calls.
rac must be an integer from 0 to 255.

Usage Guidelines
Use the command multiple times to configure multiple RAC lists or to modify the list.

Example
The following command creates a routing area list:

routin-are-list instance 1 lac 514 rac 10
**s1-reset**

Configures the behavior of user equipment (UE) on S1-reset.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

`s1-reset { detach-ue | idle-mode-entry }`

default s1-reset

default

Reset the profile configuration to the system default of **idle-mode-entry**.

**detach-ue**

Upon S1-reset the MME will detach the UE.

**idle-mode-entry**

Upon S1-reset the MME will move the UE to idle-mode. This is the default setting for this command.

**Usage Guidelines**

Use this command to set the MME’s reactions to an S1-reset.

**Example**

Configure the MME to put the UE into idle-mode upon receipt of S1-reset:

```
s1-reset idle-mode-entry
```

---

**samog-cdr**

Enables the SaMOG Gateway to send the AP Group Name in the SSID field of tWANUserLocationInformation in the S-GW CDR.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)>
```

**Syntax Description**

```plaintext
samog-cdr twanuli ap-group-name
no samog-cdr twanuli ap-group-name

no
```

If configured, disables SaMOG from sending the AP Group Name in the SSID field of tWANUserLocationInformation in the S-GW CDR, and reverts the configuration to its default behavior. By default, the SaMOG Gateway sends the SSID information in the tWANUserLocationInformation attribute.

**Usage Guidelines**

Use this command to enable the SaMOG Gateway to send the AP Group Name in the SSID field of tWANUserLocationInformation (TWAN ULI) in the S-GW CDR.

To enable the SaMOG Gateway to send the TWAN ULI attribute in the GTPP requests, use the `gtpp attribute twanuli` command under the GTPPP Group Configuration Mode.

**Important**

SaMOG services and standalone S-GW services must not share a GTPP group that has the `gtpp attribute twanuli` command configured. Instead, configure the command under different GTPP groups for each service.

**Example**

Configure SaMOG Gateway to send the AP Group Name in the SSID field of tWANUserLocationInformation in the S-GW CDR:

```plaintext
samog-cdr twanuli ap-group-name
```

---

**samog-gtpv1**

Enables SaMOG to forward the User Equipment's (UE) Identity, and/or the Access Point's (AP) Location information over the GTPv1 interface.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)>
```

**Syntax Description**

```plaintext
samog-gtpv1 send { imeisv value ue-mac [ decimal | filler filler_value ] | uli value cgi }
no samog-gtpv1 send { imeisv | uli }
```
no
If configured, disables SaMOG from forwarding the UE Identity and/or AP Location information over the GTPv1 interface.

imeisv value ue-mac
Specifies to forward the UE Identity. By default this configuration is disabled.

decimal
Specifies to encode the UE's MAC address for the IMEIsV IE value in decimal format. By default, the UE's MAC address in the IMEIsV IE value is encoded in Hexa-decimal format.

filler filler_value
Specifies the 2 bytes of padding to be used with the UE's MAC address for the IMEIsV IE value. filler_value must be a hexadecimal number from 0x0 through 0xFFFE. The default filler value is 0xFFFF.

uli value cgi
Specifies to forward the AP's User Location Information (ULI) IE during the PDP context setup.

Usage Guidelines
Use this command to enable SaMOG to forward the User Equipment's (UE) Identity, and/or the Access Point's (AP) Location information over the GTPv1 interface.

Example
Configure SaMOG to forward the AP location information:

```
samog-gtpv1 uli value cgi
```

### samog-s2a-gtpv2

Enables SaMOG to forward S2a GTPv2 Information Element (IE) related parameters.

This command is available only when the SaMOG General license (supporting both 3G and 4G) is configured. Contact your Cisco account representative for more information on license requirements.

**Product**
SaMOG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```
Syntax Description

`samog-s2a-gtpv2 send { imeisv value ue-mac [ decimal | filler filler_value ] | pco pap value mn-nai | serving-network value uli | twan-identifier { civic-addr-fld ca-type name value ap-group-name | ssid-fld value ap-group-name } | uli }

no samog-s2a-gtpv2 send { imeisv | pco pap value mn-nai | serving-network value uli | twan-identifier { civic-addr-fld | ssid-fld value ap-group-name } | uli }

no

Disables a previously enabled configuration.

`imeisv value ue-mac [ decimal | filler filler_value ]`

Specifies to forward the UE Identity in the IMEIsv IE value. By default this configuration is disabled.

`decimal`: Specifies to encode the UE’s MAC address for the IMEIsv IE value in decimal format. By default, the UE’s MAC address in the IMEIsv IE value is encoded in Hexa-decimal format.

`filler`: Specifies the 2 bytes of padding to be used with the UE's MAC address for the IMEIsv IE value.

`filler_value` must be a hexadecimal number from 0x0 through 0xFFFE.

`pco pap value mn-nai`

Specifies to forward the UE's MN-NAI value in the PAP container within the PCO IE in the CSR message to P-GW.

This configuration is disabled by default.

`serving-network value uli`

Specifies to populate the Serving-Network Information Element (IE) with the PLMN ID (MCC and MNC values) from the 3GPP-User-Location-Information AVPs sent by the AAA Server (STa interface).

This configuration is disabled by default.

`twan-identifier ssid-fld value ap-group-name`

Specifies to forward the AP group name in the SSID sub-field of TWAN-Identifier.

By default, the SSID value is forwarded in the SSID sub-field of TWAN-Identifier.

`twan-identifier civic-addr-fld ca-type name value ap-group-name`

Specifies to the AP group name value in the Civic Address Information sub-field of the TWAN-Identifier IE over the S2a interface.

This configuration is disabled by default.

`uli`

Specifies to forward the User-Location-Information (ULI) Information Element (IE) in the CSR message over the S2a interface. SaMOG populates the ULI IE from the 3GPP-User-Location-Information AVP received from the AAA Server over the STa interface.
This configuration is disabled by default.

Usage Guidelines
Use this command to enable SaMOG to forward:

- The User Equipment's (UE) Identity information over the GTPv2 interface in decimal or hexa-decimal format
- The UE's MN-NAI value in the PAP container within the PCO IE in the CSR message.
- The Serving-Network IE information in the Create Session Request message over the S2a interface.
- The AP group name in the SSID sub-field of the TWAN-Identifier.
- The AP group name in the Civic Address Information sub-field of the TWAN-Identifier.
- The ULI IE information in the Create Session Request message over the S2a interface.

Example
Configure SaMOG to forward the UE identity with a padding value of \texttt{0xFEFE}:

\texttt{samog-s2a-gtpv2 send imeisv value ue-mac filler 0xFEFE}

Configure SaMOG to forward the UE's MN-NAI value in the PAP container within the PCO IE in the CSR message:

\texttt{samog-s2a-gtpv2 send pco pap value mn-nai}

\texttt{sctp-down}

Configures the behavior towards UE (user equipment) when Stream Control Transmission Protocol (SCTP) goes down.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description
\texttt{sctp-down \{ detach-ue | idle-mode-entry \}}
\texttt{default sctp-down}

\texttt{default}

Reset the profile configuration to the system default when SCTP layer goes down. The default for this command is \texttt{idle-mode-entry}. 
**detach-ue**
When SCTP goes down, the MME will detach the UE.

**idle-mode-entry**
When the SCTP goes down, the MME will move the UE to idle-mode. This is the default for this command.

**Usage Guidelines**
Use this command to set the MME’s reactions when the SCTP goes down.

**Example**
Configure the MME to put the UE into idle-mode when the SCTP layer goes down:
```
sctp-down idle-mode-entry
```

---

**secondary-rat**
Enables the Secondary RAT Data Usage Report to support 5G NSA.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:
```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**
```
[ no | remove ] secondary-rat data-usage-report
```

**no**
Disables the Secondary RAT Usage Report at call-control-profile.

**remove**
Removes the Secondary-RAT Usage Report configuration from call-control-profile. It fall-back to MME service level configuration.

```
```

MME sets IR-SGW and IR-PGW flags based on the available options configured for Secondary-RAT data usage report. By default, MME disables the Secondary-RAT data usage reporting towards both SGW and PGW. If the configuration is removed from call-control-profile, then it fall-back to MME-SERVICE level configuration for Secondary-RAT-Data-Usage-Report functionality.

- **secondary-rat data-usage-report pgw**: Disables the Secondary-RAT Usage Report option for S-GW and enables only for PGW.
• **secondary-rat data-usage-report sgw**: Disables the Secondary-RAT Usage Report option for P-GW and enables only for S-GW.

• **secondary-rat data-usage-report pgw sgw**: Enables Secondary-RAT Usage Report option for both SGW and PGW.

• **secondary-rat data-usage-report sgw pgw**: Enables Secondary-RAT Usage Report option for both SGW and PGW.

**Usage Guidelines**

Use this command to enable the Secondary RAT Data Usage Report to support 5G NSA.

**Example**

Configures the Secondary-RAT Usage Report option for both SGW and PGW:

```plaintext
secondary-rat data-usage-report pgw sgw
```

**serving-plmn**

Configures a static serving node PLMN Identifier (MCC and MNC) for this Call Control Profile.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```plaintext
serving-plmn id mcc mcc_value mnc mnc_value
remove serving-plmn id
```

**remove**

Removes the static serving node PLMN ID configuration from this Call Control Profile.

**mcc mcc_value**

Specifies the Mobile Country Code (MCC) of the serving PLMN Identifier for this Call Control Profile. **mcc_value** must be an integer between 100 and 999.

**mnc mnc_value**

Specifies the Mobile Network Code (MNC) of the serving PLMN Identifier for this Call Control Profile. **mnc_value** must be an integer between 0 and 999.
Usage Guidelines

Use this command to configure a static serving node PLMN Identifier (MCC and MNC) for this Call Control Profile.

Example

Configure a static serving PLMN ID with a value of 777 for MCC and 109 for MNC using the following example:

`serving-plmn id mcc 777 mnc 109`

serving-plmn-rate-control

This command is used to configure the serving PLMN rate control for control plane CIoT optimization. The serving PLMN rate control limits the rate at which UE or PGW/SCEF can send data over the control plane when CP optimization is enabled.

Product

MME

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

`(local) host_name(config-call-control-profile-profile_name)#`

Syntax Description

`serving-plmn-rate-control ul-rate ul_rate_value dl-rate dl_rate_value`

`remove serving-plmn-rate-control`

remove

The keyword remove deletes the existing configuration.

ul-rate `ul_rate_value`

The maximum number of data NAS PDUs the UE can send in uplink path per deci-hour (6 minutes). The uplink rate is an integer from 10 up to 65535. A value of 65535 in this case implies no limit on the number of PDUs the UE can send in the uplink path per deci-hour.

dl-rate `dl_rate_value`

The maximum number of data NAS PDUs the PGW/SCEF can send in the downlink path to the UE per deci-hour (6 minutes). The downlink rate is an integer from 10 up to 65535. A value of 65535 in this case implies no limit on the number of PDUs the PGW/SCEF can send in the downlink path per deci-hour.

Usage Guidelines

This command configures serving PLMN rate for data over NAS. It limits the rate for data exchange between UE and the PGW/SCEF while using control plane CIoT optimization. This command is not enabled by default.
Example

Use the following command to configure the serving PLMN rate for data over NAS, with uplink rate as 35 and downlink rate as 45:

```
    serving-plmn-rate-control ul-rate 35 dl-rate 45
```

### sgs-cause-code-mapping

Configures the EMM reject cause code to send to a UE when an SGs cause code is received.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
sgs-cause-code-mapping sgs-cause emm-cause-code emm_cause_code
remove sgs-cause-code-mapping sgs-cause
```

- **remove sgs-cause-code-mapping sgs-cause**
  
  Removes the configured cause code mapping and returns it to its default value.

**sgs-cause-code**

Specifies the SGs cause code received on the SGs interface to which the new cause code should be mapped.

- **congestion** - Default mapped EMM cause code: #22 Congestion.
- **illegal-me** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **illegal-ms** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **imei-not-accepted** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **imsi-unknown-in-hss** - Default mapped EMM cause code: #2 IMSI unknown in HSS.
- **imsi-unknown-in-vlr** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **la-not-allowed** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **network-failure** - Default mapped EMM cause code: #17 Network failure.
- **no-suitable-cells-in-la** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **plmn-not-allowed** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **protocol-error** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **roaming-not-allowed-in-la** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **service-not-subscribed** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **service-not-supported** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
- **service-out-of-order** - Default mapped EMM cause code: #16 MSC temporarily unreachable.
**emm-cause-code emm_cause_code**

Specifies the EPS Mobility Management (EMM) cause code to return to the UE for the given SGs cause code.

• congestion
• cs-domain-unavailable
• imsi-unknown-in-hss
• msc-temp-unreachable
• network-failure

**Usage Guidelines**

Use this command to configure the EMM cause code returned to a UE when an error is reported via the SGs interface when attachment to the VLR has failed.

If a condition is specified in both the call control profile associated with a call and also the MME service, the cause configured on the call control profile is signalled to the UE.

---

**Important**

EMM cause code #18 "CS Domain not available" is not mapped to any SGs code but is returned when SGs service is disallowed by a policy or on unexpected behavior such as when the MME is unable to send an SGs message to a VLR.

---

**Related Commands**

To set the cause codes for situations where a call control profile cannot be attached to a call (for example new-call restrictions, congestion during new call attempt, etc.), use the `local-cause-code-mapping` command in the mme-service configuration mode. This command is described in the *MME Service Configuration Mode Commands* chapter.

---

**Example**

The following command maps the "congestion" EMM cause code to the "network-failure" SGs cause code:

```
sgs-cause-code-mapping network-failure emm-cause-code congestion
```

---

**sgsn-address**

Defines the IP addresses for peer SGSNs in a static SGSN address table. These configured addresses can be used if operators wish to bypass DNS.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```
SGSN address configuration

Syntax Description

```
sgsn-address { nri nri | rac rac-id lac lac_id | rnc_id rnc_id } [ nri nri ]
pref { fallback-for-dns | local } address { ipv4 ip_address | ipv6 ip_address } interface { gn | s16 }
no sgsn-address { ipv4 ip_address | ipv6 ip_address } { nri nri | rac rac_id lac lac_id [ nri nri | rnc_id rnc_id ] [ interface { gn | s16 } ] }
```

**no**

Disables the specified peer-SGSN address configuration.

**rac rac_id**

Identifies the foreign routing area code (RAC) of the peer-SGSN address to be configured in the static peer-SGSN address table. *rac_id* must be an integer from 1 to 255.

**lac lac_id**

Identifies the foreign location area code (LAC) ID of the peer-SGSN address to be configured in the static peer-SGSN address table. *lac_id* must be an integer from 1 to 65535.

**rnc_id rnc_id**

Optional. Specifies the target RNC ID that maps to the address of the peer SGSN via the S16 interface. The RNC ID is used by the S4-SGSN for inter-SGSN SRNS relocations. Valid entries are 1 to 65535. This setting only applies if SRNS relocation has been configured via the srns-inter and/or srns-intra commands in *Call Control Profile Configuration Mode*.

**nri nri**

Identifies the network resource identifier stored in the P-TMSI (bit 17 to bit 23). *nri* must be an integer from 0 to 63.

**Important**

Typically, use of this keyword is optional. However, it must be included in the command when Flex (SGSN-Pooling) is implemented.

**Important**

Look up for peer SGSN in the local pool can be performed by configuring only the NRI value, as the NRI value is unique in a pool.

**prefer { fallback-for-dns | local }**

Indicates the preferred source of the address to be used.

- **fallback-for-dns** - Instructs the SGSN to perform a DNS query to get the IP address of the peer-SGSN. If the DNS query fails, then the IP address configured with this command is used.

- **local** - instructs the system to use the local IP address configured with this command.
If the `prefer` command is used to change an existing `sgsn-address` configuration (with the same LAC and RAC) from `fallback-for-dns` to `local` or from `local` to `fallback-for-dns`, the new setting overwrites the previously configured setting for all interfaces.

---

**address { ipv4 ip_address | ipv6 ip_address }**

Specifies the IP address of the peer SGSN. Currently, the IPv6 address option is not supported on the S4-SGSN.

- `ipv4 ip_address` - specifies a valid address in IPv4 dotted-decimal notation.
- `ipv6 ip_address` -

---

**interface { gn | s16 }**

`interface` - optional. Specifies the interface type used for communicating with the peer SGSN. Must be one of the following:

- `gn` specifies that communication will occur over the Gn interface with a peer SGSN configured for 2.5G, 3G, or dual access SGSN services.
- `s16` specifies that communication will occur over the S16 interface with a peer S4-SGSN.

---

**Usage Guidelines**

Use this command to save time by avoiding DNS. This command enables a local mapping by setting the peer-SGSN IP address to be used for inter-SGSN Attach and inter-SGSN-RAU. When configured, if the SGSN receives a RAU or an Attach Request with a P-TMSI and an old-RAI that is not local, the SGSN consults this table and uses the configured IP address instead of resolving via DNS. If this table is not configured, then IP address resolution is done using DNS.

The MCC and MNC of the RAI are taken from the IMSI range configured in the operator policy and the LAC and RAC are configured here in the call control profile configuration mode.

The `sgsn-address` command differs from other Call Control Profile configuration mode commands in the following ways:

- Within the SGSN's call logic, all other configuration elements defined with the other commands in this mode are used after the IMSI is learnt. The configuration defined with this command is part of the decision logic prior to the IMSI being known.
- With the peer-SGSN address configured using this `sgsn-address` command, the peer-SGSN-RAI's MCC/MNC is used as a 5 or 6-digit IMSI and the operator policy and call control profile selection are completed.
Typically, use of this command is optional. However, it must be included in the configuration when Flex (SGSN-Pooling) is implemented if (1) the SGSN functions as a default SGSN, then configure the local-NRI of other SGSN with this command; or if (2) another SGSN is offloading, then configure the NB-RAI/null-NRI of the peer-SGSN with this command.

Important

It is recommended to execute the S4 SGSN configuration commands during the maintenance window. After configuring the node, re-start the node to activate the configuration commands. This will ensure that the node is in a consistent state and S4 SGSN service instability scenarios are avoided.

Example

Create a local peer-SGSN address mapping of an RAI with RAC of 123 and LAC of 4444 and an IPv4 address of 123.11.313.11 for the peer-SGSN:

```
sgsn-address rac 123 lac 4444 local address ipv4 123.11.313.11
```

sgsn-core-nw-interface

This command enables operators to select the Gn interface or the S4 interface for EPC capable UEs and Non-EPC capable UEs on the S4-SGSN.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]@host_name(config-call-control-profile-profile_name)>
```

Syntax Description

```
sgsn-core-nw-interface { gn | s4 [ epc-ue { always | eps-subscribed } ] | non-epc-ue { never | always | eps-subscribed } ] }
```

```
sgsn-core-nw-interface { gn | s4 }
```

Specifies the interface that EPC-capable UEs will use to communicate with the packet core gateways (GGSN/SGW). Selection must be one of:

- **gn**: Forces the SGSN to forcefully select the Gn interface for EPC-capable UEs.
- **s4**: Specifies that the SGSN will use the S4 interface between the S4-SGSN and packet core gateways (GGSN/SGW). This is the default setting for EPC-capable UEs.

The S4-SGSN uses GTPv2 by default and allows new Inter SGSN RAUs over GTPv2 for all subscribers. The S4-SGSN allows ISRAUs over GTPv2 even if the subscriber’s call-control-profile is configured explicitly.
with Gn interface as the S4-SGSN does not check for core network interface configured for a specific subscriber before allowing GTPv2. The inbound ISRAUs over GTPv2 interface has to be restricted for roaming subscribers. Access to S4 interface or GTPv2 should be limited only to home subscribers.

In release 19.3.10 the configuration of the CLI command `sgsn-core-nw-interface` was used to decide whether to reject/honor the RAU request upon context response received via GTPv2.

The configuration of the CLI command `sgsn-core-nw-interface` is used to impose restriction on roaming subscribers for ISRAU over GTPv2. The command `sgsn-core-nw-interface gn` has to be configured in the roaming subscribers call-control-profile to implement the restriction on ISRAU over GTPv2 for roaming subscribers. When the EGTP context response is received from the peer during inbound ISRAU over GTPv2, a new check is introduced where the `sgsn-core-nw-interface gn` command configuration is verified. If the subscriber’s call-control profile is configured to use Gn interface alone, then EGTP Context ACK with failure cause will be sent to peer and RAU will fall back to GTPv1. The failure cause value sent in EGTP context Ack message to peer is EGTP_CAUSE_USER_AUTHENTICATION_FAILED. This is applicable for both 2G and 3G scenarios. The following table displays the actions based on the configuration:

<table>
<thead>
<tr>
<th>Interface</th>
<th><code>sgsn-core-nw-interface gn</code></th>
<th><code>sgsn-core-nw-interface s4</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>GTPv1 protocol</td>
<td>Proceed with call</td>
<td>Proceed with call</td>
</tr>
<tr>
<td>GTPv2 protocol</td>
<td>RAU fall back to GTPv1 and proceed with call</td>
<td>Proceed with call</td>
</tr>
</tbody>
</table>

**epc-ue**

Configures the S4 Interface Selection Option for EPC Capable UE.

**non-epc-ue**

Configures the S4 Interface Selection Option for Non-EPC Capable UE.

**always**

Instructs the SGSN to always choose a S4 Interface.

**never**

Instructs the SGSN to not choose a S4 Interface.

**eps-subscribed**

Instructs the SGSN to choose a S4 Interface if EPS Subscription is available.

---

**Important**

- When keywords or options are not selected with the selection of the S4 interface option, it implies that the SGSN will apply S4 interface always for both EPC and Non-EPC devices. This is also synonymous to the CLI command configured as `sgsn-core-nw-interface s4 epc-ue always non-epc-ue always`.
- To configure SGSN behavior supported in previous releases, the CLI is configured as `sgsn-core-nw-interface s4 epc-ue always non-epc-ue eps-subscribed`. This is also the default behavior when the CLI is not configured.
It is recommended to execute the S4 SGSN configuration commands during the maintenance window. After configuring the node, re-start the node to activate the configuration commands. This will ensure that the node is in a consistent state and S4 SGSN service instability scenarios are avoided.

**Usage Guidelines**

Use this command to forcefully select the interface that the SGSN will use for EPC-capable UEs. This command is available only if the *SGSN S4 Interface* license is enabled on the SGSN.

**Example**

```
sgsn-core-nw-interface gn
```

### sgsn-number

Defines the SGSN's E.164 number to be used for interactions via the Mobile Application Part (MAP) protocol. E.164 is an ITU-T recommendation that defines the international public telecommunication numbering plan used in public switched telephone networks (PSTN) and some other data networks.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
sgsn-number E164_number
no sgsn-number
```

**no**

Disables the use of this configuration definition.

**E164_number**

Specifies a string of 1 to 16 digits that serve as the SGSN's E.164 identification.

**Usage Guidelines**

This command configures the current SGSN E164 contact number.

The SGSN number configured for a call control profile is related to the SGSN number configured in the SGSN service configuration and/or in the GPRS service configuration. If the SGSN number is not configured as part of the call control profile configuration, then the SGSN number defined as part of the SGSN service or GPRS service configuration is used.

When the 3G SGSN supports multiple PLMNs configured through different IuPS services or when network sharing is implemented, then it may be required to use different SGSN numbers for each PLMN. In such
cases, configure the per-PLMN SGSN number in a call control profile. SGSN number definition for a call control profile allows emulation of a different SGSN to each HLR per PLMN. SGSN number definitions in the call control profile also enable the SGSN to use a different SGSN number per operator when network sharing is implemented.

**Example**

Map the E.164 number 198765432123456 for the SGSN to this call control profile configuration:

```
sgsn-number 198765432123456
```

### sgtp-service

Identifies the SGTP service configuration to be used according to this call control profile.

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privilege</strong></td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td><strong>Command Modes</strong></td>
<td>Exec &gt; Global Configuration &gt; Call Control Profile Configuration</td>
</tr>
</tbody>
</table>

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

- **sgtp-service context ctxt_name service sgtp_service_name**
- **no sgtp-service context**

**context ctxt_name**

Specifies the SGTP context as an alphanumeric string of 1 through 64 characters.

**service sgtp_service_name**

Specifies the SGTP service name as an alphanumeric string of 1 through 64 characters.

**no**

Disables use of SGTP service.

**Usage Guidelines**

Use this command to configure enabling or disabling of SGTP service for this call control profile.

**Example**

```
sgtp-service context sgtpl service sgt-p-srvcl
```
sgw-retry-max

Sets the maximum number of SGW selection retries to be attempted during Attach/HO/TAU. By default, this functionality is not enabled.

**Product**
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

sgw-retry-max max_number

no sgw-retry-max

**no**

Disables the configuration for the maximum number of retries.

**max_number**

Sets the maximum number of retries possible. Enter an integer from 0 to 5. If 0 (zero) is configured, then the MME sends Create-Session-Request to the 1st SGW and if that SGW does not reply, the MME does not select any further SGW to retry. The MME then rejects the ongoing procedure (Attach/HO/TAU) and sends a Reject message.

**Usage Guidelines**

Using this command sets a limit to the maximum number of SGW selection retries to be attempted during Attach/HO/TAU. This means, the total number of tries would be 1 (the initial try) + the sgw-retry-max value (the maximum number of retries). This command is applicable only to scenarios, where SGW is selected from the DNS pool (i.e. not taken from static configuration of MME). For statically configured SGW nodes the SGW selection takes place only once.

Entering a value with this command overrides the default behavior. If no value is configured, then the MME uses or falls back to the default behavior which is in compliance with 3GPP TS 29.274, Section 7.6. The MME sends Create-Session-Request message to one SGW in the pool. If the SGW node is not available, the MME picks the next SGW from the pool and again sends a Create-Session-Request message. The MME repeats this process. For an Attach procedure, the MME tries up to five (1 + 4 retries) different SGWs from the pool. In the case of a HO procedure, the MME will try every SGW in the entire pool of SGWs sent by the DNS. If there are no further SGW nodes available in the DNS pool or if the guard timer expires, then MME stops trying and sends a Reject with cause "Network-Failure" towards the UE and the UE must restart the Attach/Handover procedure.

Benefits of this configuration -- The amount of signaling at Attach or Handover can be reduced and the amount of time to find an available SGW can be reduced.

If the sgw-retry-max command is configured under both the MME service and the Call-Control Profile, then the configuration under Call-Control Profile takes precedence.
Example
Use this command to enable the functionality for limiting the number of SGWs tried during Attach/HO/TAU to 2 retries:

sgw-retry-max 2

sms-in-mme

Configures the MME preference for SMS and SMSC address.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

sms-in-mme { preferred [ smsc-address smsc_address ] | smsc-address smsc_address |
subscribe [ notify ue ] }
default sms-in-mme { subscribe [ notify ue ] }
no sms-in-mme { preferred [ smsc-address ] | smsc-address | subscribe [ 
notify ue ] }

default

Restores the default configuration, which is to enable the Subscription Request for SMS services (via SGd) to HSS for all users.

no

Deletes the specified configuration.

sms-in-mme { preferred [ smsc-address smsc_address ] | smsc-address smsc_address }

Configures the SMS capability (SGd interface for SMS) in MME.

- preferred: Configures the SMS preference in MME.

- smsc-address smsc_address: Configures the SMSC address (ISDN identity) for the MME to send SMS on the SGd interface. smsc_address must be an integer from 1 to 15.

subscribe [ notify ue ]

Enables the Subscription Request for SMS services (via SGd) to HSS for all users.

- notify: Configures the notification to be sent to the users.
• **ue**: Sends SMS-Only indication to UE in Attach/TAU Accept message (only if HSS accepts SMS Registration for SGd).

**Usage Guidelines**

Use this command to configure SGd as the preferred SMS service and to configure the SMSC address.

**Example**

The following command configures the preferred SGd SMS option with SMSC address 91984599136 for a subscriber:

```
sms-in-mme preferred smsc-address 91984599136
```

**sms-mo**

Configures how mobile-originated (MO) short message service (SMS) messages are handled.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] sms-mo { { access-type { gprs | umts } { all-location-areas | location-area-list } | allow access-type { gprs | umts } | restrict access-type { gprs | umts } }
```

**remove**

Deletes the specified configuration.

**access-type type**

Access by SMS will be limited to SMS coming from this network type:

- **gprs**
- **umts**

**allow**

Allow either GPRS or UMTS type access for SMS.

**restrict**

Restrict either GPRS or UMTS type access for SMS.
location-area-list instance \textit{instance}

\textit{instance} must be an integer between 1 and 5. The value must identify an already defined location area code (LAC) list created with the \textit{location-area-list} command.

failure-code \textit{code}

\textit{code}: Must be an integer from 2 to 111.

Usage Guidelines

Configure filtering for SMS-MO messaging.

Example

\texttt{sms-mo access-type gprs all-location-areas failure-code 100}

**sms-mt**

This command configures how mobile-terminated (MT) short message service (SMS) messages are handled.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

\texttt{Exec > Global Configuration > Call Control Profile Configuration}

\texttt{configure > call-control-profile \textit{profile_name}}

Entering the above command sequence results in the following prompt:

\texttt{[local]host_name(config-call-control-profile-profile_name)#}

Syntax Description

\texttt{[ remove ] sms-mt \{ \{ access-type \{ gprs | umts \} \{ all-location-areas | location-area-list \} | allow access-type \{ gprs | umts \} | restrict access-type \{ gprs | umts \} \}}

\texttt{remove}

Deletes the specified configuration.

\texttt{access-type \textit{type}}

Access by SMS will be limited to SMS coming from this network type:

- \texttt{gprs}
- \texttt{umts}

\texttt{allow}

Allow either GPRS or UMTS type access for SMS.
restrict
Restrict either GPRS or UMTS type access for SMS.

location-area-list instance instance
instance must be an integer between 1 and 5. The value must identify an already defined LAC list created with the location-area-list command.

failure-code code
code: Must be an integer from 2 to 111.

Usage Guidelines
Configure filtering for SMS-MT messaging.

Example
sms-mt access-type gprs all-location-areas failure-code 100

srns-inter
Defines handling parameters for Inter-SRNS (Serving Radio Network Subsystem) relocation.

Product
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

Syntax Description
srns-inter ( all failure-code | allow { routing-area-list instance instance_id | location-area-list instance instance_id | location-area-list instance instance_id failure-code code| routing-area-list instance instance_id failure-code code| restrict location-area-list instance instance_id| routing-area-list instance instance_id } )
no srns-inter { allow location-area-list instance instance_id | routing-area-list instance instance_id | restrict location-area-list instance instance_id }
default srns-inter { all | location-area-list-instance instance_id | routing-area-list instance instance_id }

no
Deletes the inter-SRNS relocation configuration.
default

Resets the configuration to default values.

all failure-code code

Define the failure code that will apply to all inter-SRNS relocations.

*code* must be an integer from 2 to 111.

allow { location-area-list instance instance_id | routing-area-list instance instance_id }

Identifies the location area list Id (LAC Id) or routing area list Id (RAC Id) that will allow services in the defined area.

location-area-list instance instance

*instance*: Must be an integer between 1 and 5 that identifies the previously defined location area list created with the **location-area-list** command.

routing-area-list instance instance_id

Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the **routing-area-list** command.

*instance_id* must be an integer from 1 to 5.

restrict { location-area-list instance instance_id | routing-area-list instance instance_id }

Identifies the location area list Id (LAC Id) or routing area list Id (RAC Id) that indicates the areas where services will be restricted.

**Usage Guidelines**

This command defines the operational parameters for inter-SRNS relocation.

**Example**

The following command allows services in areas listed in LAC list #3:

```
srns-inter allow location-area-list instance 3
```

**srns-intra**

Defines handling parameters for intra-SRNS (Serving Radio Network Subsystem) relocation.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
(local)host_name(config-call-control-profile-profile_name)#
```
srns-intra { all failure-code | allow { routing-area-list instance instance_id | location-area-list instance instance_id | location-area-list instance instance_id | routing-area-list instance instance_id failure-code code | routing-area-list instance instance_id | restrict location-area-list instance instance_id | routing-area-list instance instance_id } }
no srns-intra { allow location-area-list instance instance_id | routing-area-list instance instance_id | restrict location-area-list instance instance_id | routing-area-list instance instance_id } 
default srns-intra { all | location-area-list-instance instance_id | routing-area-list instance instance_id } 

no
Deletes the intra-SRNS relocation configuration.

default
Resets the configuration to default values.

code
Define the failure code that will apply to all intra-SRNS relocations.

code: Must be an integer from 2 to 111.

allow { location-area-list instance instance_id | routing-area-list instance instance_id }
Identifies the location area list Id (LAC Id) or routing area list Id (RAC Id) that will allow services in the defined area.

location-area-list instance instance
instance: Must be an integer between 1 and 5 that identifies the previously defined location area list created with the location-area-list command.

routing-area-list instance instance_id
Instructs the SGSN to apply the command action to a specific routing area list. Routing area lists should already have been created with the routing-area-list command.

instance_id must be an integer from 1 to 5.

restrict { location-area-list instance instance_id | routing-area-list instance instance_id }
Identifies the location area list Id (LAC Id) or routing area list Id (RAC Id) that indicates the areas where services will be restricted.

Usage Guidelines
This command defines the operational parameters for intra-SRNS relocation.

Example
The following command restricts service in areas listed in the LAC list 1:

srns-intra restrict location-area-list instance 1
**srvcc exclude-stnsr-nanpi**

Configures the MME to not include the Nature of Address and Numbering Plan Indicator (NANPI) in the Session Transfer Number for Single Radio Voice Call Continuity (STN-SR) IE on Sv interface in PS to CS requests to the MSC server and Forward Relocation requests to the peer-SGSN-peer-MME.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```bash
[ remove ] srvcc exclude-stnsr-nanpi
```

**remove**

Deletes this configuration from the call control profile. This returns the MME to its default configuration where the NANPI is not included in the STN-SR IE.

**Usage Guidelines**

This command applies to Release 15.0 MR3 and higher.

In Release 15.0 MR3 and later releases, the encoding of the STN-SR IE on Sv interface now includes the NANPI from the HSS in PS to CS requests to the MSC server and Forward Relocation requests to the peer-SGSN-peer-MME. The value of NANPI sent by the MME is 0x11. This change in behavior is provided in support of TS 29.280 V10.1.0.

This command provides an option to maintain backward compatibility. When this command is issued, the MME excludes the NANPI from these requests, as was the default in releases prior to 15.0 MR3.

---

**Srvcc**

This command configures the basic SRVCC support on the MME.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call Control Profile Configuration

`configure > call-control-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```bash
[ remove ] srvcc unauthorized
```
remove

Deletes this configuration from the call control profile. This returns the MME to its default configuration where the SRVCC handovers are allowed.

unauthorized

Restricts the SRVCC handovers for a set of subscribers.

**Usage Guidelines**

This command is not enabled by default. The operator must enable unauthorized to restrict SRVCC handovers for a set of subscribers.

**subscriber multi-device**

Enable or disable the operator policy from allowing multiple PDN connections. When enabled, a maximum of 11 PDN connections are allowed for a subscriber.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

**Syntax Description**

[ no ] subscriber multi-device

no

If previously enabled, disables multiple PDN device connections for a subscriber.

**Usage Guidelines**

Use this command to enable or disable the operator policy from allowing multiple PDN connections for a subscriber. If this optional configuration is not enabled, only one PDN connection is allowed for a subscriber.

**Important**

The SaMOG Web Authorization feature is license dependent. Contact your Cisco account representative for more information on license requirements.

**Example**

The following command enables multiple device connections for a subscriber:

subscriber multi-device
**subscriber-control-inactivity**

Configures the subscriber-control inactivity timer. The system detects inactivity when no PDP context is activated and starts the timer.

### Product
SGSN

### Privilege
Security Administrator, Administrator

### Command Modes
Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name) #
```

### Syntax Description

```
subscriber-control-inactivity timeout minutes time detach { immediate | next-connection | reattach-time-period } { no | default } subscriber-control-inactivity
```

#### no
Deletes the timer configuration.

#### default
Resets the timer configuration to the default value of 7 days (10080 minutes).

#### timeout minutes time [ detach ]
Sets the number of minutes the SGSN monitors the connection after inactivity has been detected. When the timer expires, the subscribe will be detached.

*time*: Enter an integer from 1 to 20160 (two weeks).

#### detach [ immediate | next-connection | reattach-time-period ]
Instructs the SGSN to detach and can be configured to specify when the detach will occur after inactivity is detected. To fine-tune the detach instruction, include one of the following with the command:

- **immediate** - Instructs the SGSN to detach immediately after inactivity is detected. May combine with reattach-time-period.

- **next-connection** - Instructs the SGSN to wait for the next Iu connection after inactivity is detected and then detach. Any message except Attach on the next Iu is unconditionally rejected with cause code “GPRS services not allowed”.

---

**Important**

Supported for 3G SGSNs only.
• **reattach-time-period** *period [ action ]* - Specify the number of seconds the SGSN will monitor a new re-attach after the previous detach was due to inactivity. Also, you can define the action to be taken regarding new attaches.

  *period*: Enter an integer from 60 to 3600.

  *action* - Select an action:

  • deny
  • permit-and-stop-monitoring

---

**Usage Guidelines**

Use this command to configure the timeout timer. After this timer times out the subscriber is detached from the SGSN.

**Example**

The following command instructs the SGSN to monitor the connection for up to 360 minutes after inactivity is detected, or detach immediately after inactivity is detected:

```
subscriber-control-inactivity timeout minutes 360 detach immediate
```

---

**super-charger**

Enables or disables the SGSN to work with a super-charged network.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] super-charger
```

*remove*

Disables the super-charger functionality.

**Usage Guidelines**

By enabling the super charger functionality for 2G or 3G connections controlled by an operator policy, the SGSN changes the hand-off and location update procedures to reduce signalling traffic management.

**Example**

The following command enables the super charger feature:

```
super-charger
```
tau

Configure parameters for the tracking area update (TAU) procedure.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

 tau { imei-query-type { imei | imei-sv | none } [ verify-equipment-identity [ allow-on-eca-timeout | deny-greylisted | deny-unknown | verify-emergency ] ] | inter-rat { notify-request | security-ctxt { allow-mapped | native } } } remove tau { imei-query-type | inter-rat { notify-request | security-ctxt } }

remove

Deletes this TAU configuration from the call control profile.

imei-query-type { imei | imei-sv | none }

This keyword set is specific to the MME.
Sets the IMEI query-type if an IMEI (International Mobile Equipment Identity) is not already present.

• imei: Specifies that the MME is required to query the UE for its International Mobile Equipment Identity (IMEI).

• imei-sv: Specifies that the MME is required to query the UE for its International Mobile Equipment Identity - Software Version (IMEI-SV).

• none: Specifies that the MME does not need to query for IMEI or IMEI-SV.

verify-equipment-identity [ allow-on-eca-timeout | deny-greylisted | deny-unknown | verify-emergency ]

Specifies that the identification (IMEI or IMEI-SV) of the UE is to be performed by the Equipment Identity Register (EIR) over the S13 interface.

• allow-on-eca-timeout: Configures the MME to allow equipment that has timed-out on ECA during the attach procedure.

• deny-greylisted: Configures the MME to deny grey-listed equipment during the attach procedure.

• deny-unknown: Configures the MME to deny unknown equipment during the attach procedure.

• verify-emergency: Configures the MME to ignore the IMEI validation of the equipment during the attach procedure in emergency cases. This keyword is only supported in release 12.2 and higher.
inter-rat notify-request

Configure inter-RAT parameters for TAU. This keyword provides the operator with the option of sending Notify-Request to HSS from MME during 3G to 4G TAU/HO.

inter-rat security-ctxt { allow-mapped | native }

Configure inter-RAT parameters for TAU. This keyword provides the operator with the option of continuing with the mapped context or creating a new native context after an inter-RAT handover.

- **allow-mapped**: Configures inter-RAT security-context type as mapped. Mapped security context is allowed after inter-RAT handover. This is the default value.
- **native**: Configures inter-RAT security-context type as native only. Inter-RAT handover will always result in a native security context.

Usage Guidelines

Use this command to define tracking area update procedures such as inter-RAT security context and IMEI query-type.

Example

The following command sets the IMEI query type to IMEI-SV:

```
tau imei-query-type imei-sv verify-equipment-identity
```

tcp-maximum-segment-size

This command enables the operator to define a maximum segment size (MSS), that will be used to overwrite received TCP MSS values in uplink/downlink packets between UE and the server.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call Control Profile Configuration

```
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

Syntax Description

```
tcp-maximum-segment-size size
remove tcp-maximum-segment-size
```

- **remove**: Instructs the SGSN to forward the user data without changing the TCP MSS value.
- **size**: This entry specifies the maximum number of octets for a segment. Valid range is 1 to 1460.
Usage Guidelines

When configuring with this command, an additional Yes/No prompt is included due to the high impact of the MSS configuration.

Configure the MSS, helps the operator to avoid fragmentation. This command enables the operator to modify or overwrite the TCP MSS value exchanged between the UE and the server (for both 2G and 3G uplink/downlink traffic) if the requested value is more than the SGSN's locally configured value.

Example

Use a command similar to the following to define 1200 octets as the maximum segment size:

```
tcp-maximum-segment-size 1200
```
The SaMOG Web Authorization feature is license dependent. Contact your Cisco account representative for more information on license requirements.

**Example**

The following command sets a timeout value for clearing the MAC to IMSI mapping entry to 2000 minutes:

```plaintext
timeout imsi cache 2000
```

## treat-as-hplmn

Enables or disables the SGSN to treat an IMSI series as coming from the home PLMN.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Call Control Profile Configuration

```plaintext
configure > call-control-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-control-profile-profile_name)#
```

**Syntax Description**

```
[ remove ] treat-as-hplmn
```

**remove**

Deletes this configuration from the profile. This would disable this function and is the default.

**Usage Guidelines**

Use this command to enable or disable the SGSN to treat an IMSI series as coming from the home PLMN.

**Example**

The following command disables previously configured feature:

```plaintext
remove treat-as-hplmn
```

## vplmn-address

Enables/disables the SGSN to override the VPLMN address-allowed flag.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Call Control Profile Configuration

configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

vplmn-address { allowed | not-allowed }

remove vplmn-address

remove

Using remove disables the override behavior and the VPLMN-Address-Allowed flag is interpreted as it is in the subscription data.

allowed

Using allowed instructs the SGSN to set the VPLMN-Address-Allowed flag during GGSN selection - even if the flag was not received in the subscription data from the HLR.

not-allowed

Using not-allowed instructs the SGSN not to set the VPLMN-Address-Allowed flag during GGSN selection - even if the flag is received in the subscription data from the HLR.

Usage Guidelines

Use this command to override the VPLMN-Address-Allowed flag received in subscription data from HLR during GGSN selection. This flag is used to decide whether to use the VPLMN-OI received from a roaming subscriber to form the full-APN. The full-APN is then used in a DNS query to select a GGSN. This override enables the operator to control selection of a different GGSN for a roaming subscriber by using/not-using VPLMN-OI in full-APN.

Example

The following command instructs the SGSN to set the VPLMN-Address-Allowed flag during GGSN selection, even if the flag was not received in subscription data from the HLR:

vplmn-address allowed

The following command instructs the SGSN not to set the VPLMN-Address-Allowed flag during GGSN selection, even if the flag was received in subscription data from the HLR:

vplmn-address not-allowed

The following command instructs the SGSN not to override standard behavior regarding the VPLMN-Address-Allowed flag:

remove vplmn-address

zone-code

Configures a zone code listing of one or more location area code (LACs) included in the zone.

Product

SGSN
Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call Control Profile Configuration
configure > call-control-profile profile_name

Entering the above command sequence results in the following prompt:
[local]host_name(config-call-control-profile-profile_name)#

Syntax Description

```
zone-code  zc_id location-area-code  lac
no  zone-code  zc_id  [ location-area-code  lac  ]
```

no
Removes either a specific LAC from the zone code list. If the location-area-code parameter is not included in the command, then the entire zone code list definition is removed from configuration.

zc_id
Identifies an instance of a zone code list as an integer from 1 to 65535.

An unlimited number of zone code lists can be configured per Call Control Profile as the zone code lists are allocated dynamically.

location-area-code lac
Prompts for the location area-code(s), where the subscribers can roam, that are part of the zone. lac is an integer from 1 to 65535.

Repeat the zone-code command with this keyword to include up to 100 LACs in each zone code list.

Usage Guidelines

While there is no limit to the number of zone codes that can be created, only 100 LACs per zone code can be defined.

Use this command to define zone code restrictions. Regional subscription data at the home location register (HLR) is used to determine the regional subscription area in which the subscriber is allowed to roam. The regional subscription data consists of a list of zone codes. A zone code is comprised of one or more location areas (identified by a LAC) into which the subscriber is allowed to roam. Regional subscription data, if present in the insert subscriber data (ISD) request from the HLR, defines the subscriber's subscription area for the addressed SGSN. It contains the complete list (up to 10 zone codes) that apply to a subscriber in the currently visited PLMN.

During the GPRS Location Update procedure, the zone code list is received in the ISD request from the HLR. The zone code list from the HLR is validated against the configured values in the operator policy. If matched, then the ISD is allowed to proceed. If not matched, then the ISD response is that the Network Node Area is Restricted and the GPRS Location Update procedure fails. If no zone codes are included in the ISD (whether or not the zone codes are defined in the SGSN configuration), then checking is not done.

Example

The following command defines multiple LACs for zone code 1:
zone-code 1 lac 413 212 113
Call-Home Configuration Mode

The Call-Home Configuration Mode sets parameters for the Smart Call Home feature. Smart Call Home is a contracted service that sends real-time alerts, remediation, and personalized web-based reports to the Cisco Technical Assistance Center (TAC) and other configured receivers.

Exec > Global Configuration > Call-Home Configuration

configure > call-home

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-home)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- activate, on page 213
- alert-group, on page 214
- contact-email-addr, on page 215
- contract-id, on page 216
- customer-id, on page 217
- end, on page 218
- exit, on page 218
- mail-server, on page 218
- phone-number, on page 219
- profile, on page 220
- rate-limit, on page 221
- sender, on page 221
- site-id, on page 222
- street-address, on page 223

activate

Activates the Cisco Smart Call Home service.

Product

All
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call-Home Configuration

configure > call-home

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-home)#

Syntax Description

activate

[ default | no ] activate

default

Configures the call-home service.

no

Disables the call-home services.

activate

Enables the call-home services.

Usage Guidelines

Use this command to enable the call-home services.

Example

The following command disables the call-home service:

no activate

alert-group

Enables or disables the Smart Call Home alert-group.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call-Home Configuration

configure > call-home

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-home)#

Syntax Description

[ default | no ] alert-group { all | configuration | crashinfo | diagnostic

| environment | inventory | syslog }
default
Configures the alert-group back to default settings. The default is enabled.

no
Disables the alert-groups.

alert-group all
Enables an alert group for all categories.

alert-group configuration
Enables an alert group related to configuration.

alert-group crashinfo
Enables an alert group related to crashes.

alert-group diagnostics
Enables an alert group related to diagnostics.

alert-group environment
Enables an alert group related to environment. These typically include events related to power, fan, and temperature alarms.

alert-group inventory
Enables an alert group related to inventory. This is a non-critical event that could include notifications when cards are inserted or removed, or when the system is cold-booted.

alert-group syslog
Enables an alert group related to syslog. This includes events generated by the syslog PORT facility.

Usage Guidelines
An alert group is a predefined subset of Smart Call Home alerts that are supported on this device. Alert groups allow you to select the set of Smart Call Home alerts that you want to send to a predefined or custom destination profile.

Example
The following command enables alerts for all of the preconfigured Smart Call Home alerts:

alert-group all

call-home-conf mode
Sets the e-mail address of the person identified as the prime contact for this system.
contract-id

Configures the system's contract-identifier for Cisco AutoNotify.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call-Home Configuration

**Syntax Description**

```
[ no ] contact-email-addr email_addr
```

- **no**
  Removes the contact e-mail address.

- **contact-email-addr email_addr**
  Specifies the information for prime contact as an alphanumeric string in the format `local-part@domain`, where domain can be made up of a number of labels, each separated by a period and between 1 and 63 characters in length. The local-part can be 1-64 characters. The domain-label can be 1-63 characters. The domain can be 1 through 135 characters. The entire alphanumeric string can be a no larger than 200 characters.

**Usage Guidelines**

Use this command to set up the e-mail address for the person identified as the contact person for this device.

- **Important**
  You can enter any valid e-mail address. You cannot use spaces.

**Example**
The following command specifies e-mail address for the entity `notity.TAC@NOCservices.net`:

```
contact-email-addr notity.TAC@NOCservices.net
```
Syntax Description

\[ \text{default | no } \text{contract-id contractID} \]

**default**
Configures the call-home contract-id back to default settings.

**no**
Removes the call-home contract-id.

**contract-id contractID**
Specifies the call-home contract-id as an alphanumeric string of 1 through 64 characters that is case sensitive. If you include spaces in this string, you must enclose it in double quotation marks.

Usage Guidelines

Use this command to enter this system's AutoNotify contract ID.

Example

The following command specifies the contract-id as *Contract1234_ID*:

```
contract-id Contract1234_ID
```

**customer-id**

Configures the system's customer-identifier for Cisco AutoNotify.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

```
configure > call-home
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```

Syntax Description

\[ \text{default | no } \text{customer-id customerID} \]

**default**
Configures the call-home customer-id back to default settings.

**no**
Removes the call-home customer-id.

**customer-id customerID**
Specifies the call-home customer-id as an alphanumeric string of 1 through 64 characters that is case sensitive. If you include spaces in the string, you must enclose it in double quotation marks.
Usage Guidelines

Use this command to set up the system's customer ID for Cisco's AutoNotify.

Example

The following command specifies the customer-id as CustID_1234:

```
customer-id CustID_1234
```

end

Exits the current configuration mode and returns to the Exec mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

`end`

Usage Guidelines

Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

`exit`

Usage Guidelines

Use this command to return to the parent configuration mode.

mail-server

Configures the Smart Call Home mail-server.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

`Exec > Global Configuration > Call-Home Configuration`

`configure > call-home`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```
### Syntax Description

```
[ no ] mail-server server_name priority priority_num
```

- **no**
  Removes the call-home mail-server.

- **mail-server server_name**
  Identifies the mail server as an alphanumeric string of 1 through 64 characters. The server ID can take the form of a host name (DNS) or an IPv4 address in dotted-decimal notation.

- **priority**
  Sets the mail server priority order as an integer from 1 (highest) to 100 (lowest).

### Usage Guidelines

Use this command to set up the mail server for Smart Call Home. This configuration is mandatory when the user profile is configured to only send out e-mail messages.

### Example

The following command specifies the mail-server as `10.2.3.4` with a priority of 1:

```
mail-server 10.2.3.4 priority 1
```

### phone-number

Enables or disables the phone-number for the Smart Call Home contact person.

#### Product

All

#### Privilege

Security Administrator, Administrator

#### Command Modes

```
Exec > Global Configuration > Call-Home Configuration

configure > call-home
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```

#### Syntax Description

```
[ no | default ] phone-number phone-number-string
```

- **default**
  Configures the phone number back to default settings. The default is enabled.

- **no**
  Removes the call-home phone number.
phone-number phone-number-string

Specifies the phone number for the contact person for this system as an alphanumeric string that can only contain: + (plus sign), - (dash) and numbers. The total length of the string is 12 to 16 characters. If you include spaces, you must enclose the string in double quotation marks.

Usage Guidelines

Use this command to set up the phone number for Smart Call Home contact.

Example

The following command specifies the phone number as +866-111-2234:

```
phone-number 866-111-2234
```

profile

Creates the Smart Call Home profile.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call-Home Configuration

configure > call-home

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```

Syntax Description

[ no ] profile profile_name

no

Removes the call-home profile.

profile profile_name

Creates or modifies the profile name for this system as an alphanumeric string of 1 through 31 characters.

Usage Guidelines

Use this command to create a new profile or modify an existing profile. This command moves you to the Call-Home Profile Configuration mode.

Example

The following command creates a profile named Profile_1:

```
profile Profile_1
```
**rate-limit**

Enables or disables the message rate-limit for Smart Call Home features.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call-Home Configuration
configure > call-home

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```

**Syntax Description**
```
[ no | default ] rate-limit message_count
```

- **default**
  Sets the rate limit back to the default of 20 messages per minute.

- **no**
  Removes the call-home rate-limit.

- **rate-limit message_count**
  Sets the rate limit in messages per minute. `message_count` is an integer from 1 to 60. Default: 20

**Usage Guidelines**
Use this command to configure the call-home message rate limit per minute. The default is 20 messages per minute.

**Example**
The following command sets the call-home rate limit to 10:

```
rate-limit 10
```

**sender**

Specifies the Smart Call Home e-mail settings for the "from" address and "reply-to" address.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call-Home Configuration
configure > call-home
Entering the above command sequence results in the following prompt:

```
(host_name) host_name(config-call-home)#
```

### Syntax Description

```
[ no | default ] sender { from email_address | to email_address }
```

- **default**
  Sets the sender back to the default.

- **from email_address**
  Sets the sender's reply from address.

- **no**
  Removes the call-home sender.

- **to email_address**
  Sets the sender's reply-to address.

- **email_address**
  This is an alphanumeric string in the format `local-part@domain`, where domain can be made up of a number of labels, each separated by a period and between 1 and 63 characters in length. The local-part can be 1-64 characters. The domain-label can be 1-63 characters. The domain can be 1 through 135 characters. The entire alphanumeric string can be a no larger than 200 characters.

### Usage Guidelines

Use this command to specify the e-mail settings for the sender. This command sets the "to" and "from" fields in the e-mail.

### Example

The following command sets the from address to `notity.TAC@NOCServices.net` and the reply-to address to `support@cisco.com`:

```
sender from notity.TAC@NOCServices.net to support@cisco.com
```

---

**site-id**

Specifies the Smart Call Home site identifier for this system.

### Product

All

### Privilege

Security Administrator, Administrator

### Command Modes

- **configure > call-home**

  Entering the above command sequence results in the following prompt:
Syntax Description

[ default | no ] site-id siteID

default
Sets the site-id back to the default.

no
Removes the call-home site-id.

site-id siteID
Specifies the site ID as an alphanumeric string of 1 through 200 characters. If you include spaces, then you must enclose your entry in quotes.

Usage Guidelines
Use this command to specify the Smart Call Home site identifier for this system.

Example
The following command sets the site-id to NOC_Services_site_1011:

```
site id NOC_Services_site_1011
```

street-address

Specifies the Smart Call Home street address for the system.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Call-Home Configuration
configure > call-home

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-call-home)#
```

Syntax Description

[ default | no ] street-address streetADR

default
Sets the street-address back to the default.

no
Removes the call-home street-address.
street-address *streetADR*

Specifies e Smart Call Home street-address as an alphanumeric string of 1 through 200 characters. You can include the street address, City, State, and ZIP Code. If you include spaces, then you must enclose the string in double quotation marks.

**Usage Guidelines**

Use this command to set up the street address for the system.

**Example**

The following command sets the street address to *123 Main St., Chicago, IL 60000*:

```
street-address "123 Main St., Chicago, IL 60000"
```
CHAPTER 3

Call-Home Profile Configuration Mode

Command Modes

The Call-Home Profile Configuration Mode is used to create groups of users that will receive alerts when events occur. The Smart Call Home service sends real-time alerts, remediation, and personalized web-based reports to the Cisco Technical Assistance Center (TAC) and other configured receivers.

Exec > Global Configuration > Call-Home Configuration > Call-Home Profile Configuration

configure > call-home > profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-home-profile)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- active, on page 225
- destination, on page 226
- end, on page 228
- exit, on page 228
- subscribe-to-alert-group, on page 228

active

Activates this Smart Call Home profile.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Call-Home Configuration > Call-Home Profile Configuration

configure > call-home > profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-call-home-profile)#
Syntax Description

**active**
- default active
- no active

**default**
Configures the call-home profile back to default settings. By default, the profile is enabled.

**no**
Deletes the call-home profile.

**activate**
Activates this Smart Call Home profile.

Usage Guidelines
Use this command to activate or deactivate this call-home profile. By default, the profile is enabled.

Example
The following command disables the call-home profile:

```plaintext
no active
```

destination

Configures the message destinations for this Smart Call Home profile.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Call-Home Configuration > Call-Home Profile Configuration

```
configure > call-home > profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-call-home-profile)#
```

Syntax Description

```plaintext

default destination [ message-size-limit | preferred-msg-format | transport-method ]

```
address [ email email_address | http http_url ]

Configures an destination e-mail address or HTTP URL where short-text/long-text call-home message and XML-based call-home messages will be sent.

• email: Use this option to add an e-mail address to this profile. email_addr is an alphanumeric string of the form local-part@domain where domain can be made up of a number of labels, each separated by a period and between 1 and 63 characters in length. The local-part can be 1-64 characters. The domain-label can be 1-63 characters. The domain can be 1-135 characters. The entire alphanumeric string can be a no larger than 200 characters.

• http: Use this option to add an HTTP URL to this profile. http_url is an alphanumeric string of 1 through 200 characters.

default

Configures the call-home profile back to default settings. By default, the profile is enabled.

message-size-limit size

Specifies the message size (in bytes) for this profile as an integer from 50 to 3145728. The default is 3145728.

no

Deletes the call-home profile.

preferred-msg-format [ long-text | short-text | xml]

Specifies the message format for the profile. The default is xml.

• long-text: Use this option to set long-text messages as the preferred message format. The long message format has all the details related to the event, including information related to chassis, card, and outputs of show commands for the alert group.

• short-text: Use this option to set short-text messages as the preferred message format. The short message has information on the severity of event, a short description of the event, the event time, and the device ID.

• xml: Use this option to set XML as the preferred message format. (Default)

transport-method [ email email_address | http http_url ]

Specifies the transport-method for the messages. The default is e-mail. For the user profile, both e-mail and http can be enabled. If all are options are disabled, e-mail will be set for the profile.

For the Cisco TAC profile, only one transport method can be enabled. If the user enables a second transport method, the first one will be automatically disabled.

• email: Enables an e-mail address for this profile. This is the default.

• http: Enables an HTTP URL for this profile.

Usage Guidelines

Use this command to activate the current call-home profile. By default, the profile is enabled.
Example

The following command disables the call-home profile:

```plaintext
no destination
```

The following command sets the preferred message format for the profile to the call-home profile to short text:

```plaintext
destination preferred-msg-format short-text
```

end

Exits the current configuration mode and returns to the Exec mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Syntax Description</td>
<td>end</td>
</tr>
<tr>
<td>Usage Guidelines</td>
<td>Use this command to return to the Exec mode.</td>
</tr>
</tbody>
</table>

exit

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Syntax Description</td>
<td>exit</td>
</tr>
<tr>
<td>Usage Guidelines</td>
<td>Use this command to return to the parent configuration mode.</td>
</tr>
</tbody>
</table>

subscribe-to-alert-group

Subscribes this profile to the alert group for the call-home profile.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Call-Home Configuration &gt; Call-Home Profile Configuration configure &gt; call-home &gt; profile profile_name</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:
Syntax Description

```
subscribe-to-alert-group [ all {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | configuration { periodic [daily | monthly | weekly] } | crashinfo | diagnostic {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | environment {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | inventory { periodic [daily | monthly | weekly] } | syslog {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } ]
default subscribe-to-alert-group
no subscribe-to-alert-group [ all {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | configuration { periodic [daily | monthly | weekly] } | crashinfo | diagnostic {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | environment {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] } | inventory { periodic [daily | monthly | weekly] } | syslog {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ] [pattern pattern_to_match] } ]
```

all {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ]}

Enables call-home messages based for all group-types and severity for the profile. The following severities are supported:

- **catastrophic** – Level 1: catastrophic event, matches platform logging level critical.
- **disaster** – Level 2: disaster event, matches platform logging level critical.
- **fatal** – Level 3: fatal event, matches platform logging level critical.
- **critical** – Level 4: critical event, matches platform logging level critical.
- **major** – Level 5: major event, matches platform logging level error.
- **minor** – Level 6: minor event, matches platform logging level warning.
- **warning** – Level 7: warning event, matches platform logging level warning.
- **notification** – Level 8: notification event, matches platform logging level unusual.
- **normal** – Level 9: normal event, matches platform logging level info.

```
configuration { periodic [daily | monthly | weekly] }
```

Enables call-home messages based for configuration alert groups. The messages are sent at periodic intervals such as:

- **daily**: Sends a daily call-home message.
- **monthly**: Sends a monthly call-home message.
- **weekly**: Sends a weekly call-home message.
crashinfo
Configures the call-home profile back to default settings. By default, the profile is enabled.

default
Restores the parameter back to the default value.

diagnostic { severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ]}
Enables call-home messages based for diagnostic group-types and severity for the profile. The following severities are supported:
- **catastrophic** – Level 1: catastrophic event, matches platform logging level critical.
- **disaster** – Level 2: disaster event, matches platform logging level critical.
- **fatal** – Level 3: fatal event, matches platform logging level critical.
- **critical** – Level 4: critical event, matches platform logging level critical.
- **major** – Level 5: major event, matches platform logging level error.
- **minor** – Level 6: minor event, matches platform logging level warning.
- **warning** – Level 7: warning event, matches platform logging level warning.
- **notification** – Level 8: notification event, matches platform logging level unusual.
- **normal** – Level 9: normal event, matches platform logging level info.

environment {severity [catastrophic | disaster | fatal | critical | major | minor | warning | notification | normal ]}
Enables call-home messages based for environment group-types and severity for the profile. The following severities are supported:
- **catastrophic** – Level 1: catastrophic event, matches platform logging level critical.
- **disaster** – Level 2: disaster event, matches platform logging level critical.
- **fatal** – Level 3: fatal event, matches platform logging level critical.
- **critical** – Level 4: critical event, matches platform logging level critical.
- **major** – Level 5: major event, matches platform logging level error.
- **minor** – Level 6: minor event, matches platform logging level warning.
- **warning** – Level 7: warning event, matches platform logging level warning.
- **notification** – Level 8: notification event, matches platform logging level unusual.
- **normal** – Level 9: normal event, matches platform logging level info.
inventory { periodic [ daily | monthly | weekly ] }

Enables call-home messages based for inventory alert groups. The messages are sent at periodic intervals such as:

- **daily**: Sends a daily call-home message.
- **monthly**: Sends a monthly call-home message.
- **weekly**: Sends a weekly call-home message.

no

Deletes the alert groups.

syslog { severity [catastrophic | diasaster | fatal | critical | major | minor | warning | notification | normal ] [ pattern pattern_to_match ] }]

Enables and disables call-home messages based on severity and syslog string pattern match for the profile. The following severities are supported:

- **catastrophic** – Level 1: catastrophic event, matches platform logging level critical.
- **disaster** – Level 2: disaster event, matches platform logging level critical.
- **fatal** – Level 3: fatal event, matches platform logging level critical.
- **critical** – Level 4: critical event, matches platform logging level critical.
- **major** – Level 5: major event, matches platform logging level error.
- **minor** – Level 6: minor event, matches platform logging level warning.
- **warning** – Level 7: warning event, matches platform logging level warning.
- **notification** – Level 8: notification event, matches platform logging level unusual.
- **normal** – Level 9: normal event, matches platform logging level info.

*pattern_to_match* is an alphanumeric string of 1 through 80 characters.

---

**Note**

If no *pattern_to_match* is specified, the system will use a ".*" (dot asterisk) pattern.

---

**Usage Guidelines**

Use this command to enable or disable the call-home messages based on specified alert-groups and severities for the profile.

**Example**

The following command sets an alert group for the profile to send a daily inventory message:

```
subscribe-to-alert-group inventory periodic daily
```
subscribe-to-alert-group
CAMEL Service Configuration Mode Commands

CAMEL service enables operators of 2.5G/3G networks to provide operator-specific services (such as prepaid GPRS service and prepaid SMS service) to subscribers, even when the subscribers are roaming outside their home public land mobile network (HPLMN).

The CAMEL Service configuration mode provides a set of commands to define the parameters for the Customized Applications for Mobile networks Enhanced Logic (CAMEL) service functionality and the CAMEL interface - the Ge interface.

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-camel-service)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- associate-sccp-network, on page 233
- end, on page 234
- exit, on page 234
- tcap destination-address, on page 235
- timeout, on page 235

associate-sccp-network

Configure an association between this CAMEL service and a specified SCCP network.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > CAMEL Service Configuration

```
configure > context context_name > camel-service service_name
```

Entering the above command sequence results in the following prompt:

```
{context_name}@host_name(config-camel-service)#
```

### Syntax Description

- **associate-sccp-network** `sccp_network_id`
- **no associate-sccp-network**

- **no**
  - Removes the association with the CAMEL service configuration.

- **sccp_network_id**
  - Identifies an already defined SCCP network.
  - **sccp_network_id**: Enter an integer from 1 to 12.

### Usage Guidelines

The SCCP network must be configured prior to using this command.

CAMEL service will not function unless an SCCP network is associated.

### Example

Associate this CAMEL service with SCCP network configuration ID 2:

```
associate-sccp-network 2
```

### end

- Exits the current configuration mode and returns to the Exec mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator

### Usage Guidelines

- Use this command to return to the Exec mode.

### exit

- Exits the current mode and returns to the parent configuration mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator

### Syntax Description

- **exit**

### Usage Guidelines

- Use this command to return to the parent configuration mode.
**tcap destination-address**

Configure the gsmSCF address to be used to open TC dialogues.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CAMEL Service Configuration

```bash
configure > context context_name > camel-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-camel-service)#
```

**Syntax Description**

```bash
tcap destination-address { configured-address | received-address }
default tcap destination-address
```

- **configured-address**
  - Default.
  - Instructs the SGSN to use the SCF address from the GPRS-CSI.

- **received-address**
  - Instructs the SGSN to overwrite the gsmSCF address with the memorised gsmSCF address that was in the first response message to the InitialDPGPRS and then to use that gsmSCF address.

**Usage Guidelines**

This command enables the operator to determine which gsmSCF address is to be used to open new TC dialogues. In accordance with 3GPP 29.078, section 14.1.4.1.3, this command enables the SGSN to establish new TC dialogues within the context of a current GPRS dialogue, based on the operators choice:

- to use a 'received-address' where the gprsSSF learns the gsmSCF address used in the first response message to the InitialDPGPRS and uses it to open new TC dialogues, or

- to use a 'configured-address' where the gprsSSF uses the gsmSCF address from the GPRS-CSI to open new TC dialogues.

**Example**

Configure the SGSN to overwrite the SCF address and to use the gsmSCF address received in the response message:

```bash
tcap destination-address received-address
```

**timeout**

Configure a range of timers needed to support CAMEL service.
Product
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > CAMEL Service Configuration

configure > context context_name > camel-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-camel-service)#

Syntax Description

timeout \{ gprs-apply-charging-report-ack-timer seconds \ |
gprs-entity-release-ack-timer seconds \ |
gprs-event-report-ack-timer seconds \ |
gprs-tssf-timer seconds \ |
sms-event-report-ack-timer seconds \ |
sms-tssf-timer seconds \ |
tc-guard-timer seconds \}?

default timeout \{ gprs-apply-charging-report-ack-timer |
gprs-entity-release-ack-timer \ |
gprs-event-report-ack-timer \ |
gprs-tssf-timer \ |
sms-event-report-ack-timer \ |
sms-tssf-timer \ |
tc-guard-timer \}

default

Resets the timers to default values.

gprs-apply-charging-report-ack-timer seconds

Configure the TCAP invoke timer to set the length of time the SGSN waits for an acknowledgement after sending an ApplyChargingReportGPRS to the SCF.

seconds: Enter an integer from 1 to 20. Default: 4

Important

This timer value should be less than the value configured for the tc-guard-timer.

gprs-entity-release-ack-timer seconds

Configure the TCAP invoke timer to set the length of time the SGSN waits for an acknowledgement from the SCF after sending Entity Release information.

seconds: Enter an integer from 1 to 20. Default: 4


gprs-event-report-ack-timer seconds

Configure the TCAP invoke timer to set the length of time the SGSN waits for an acknowledgement from the SCF after the SGSN sends an event report.

seconds: Enter an integer from 1 to 20. Default: 4


gprs-tssf-timer seconds

Configure the GPRS TSSF timer to set the length of time the SGSN waits for an instructions from the SCF. On expiry the SGSN handles the transaction through the default handling specified in the corresponding CSI.

seconds: Enter an integer from 1 to 10. Default: 5
sms-event-report-ack-timer \textit{seconds}

Configure the TCAP invoke timer to set the length of time the SGSN waits for an acknowledgement from the SCF after the SGSN sends an event report for SMS.

\textit{seconds}: Enter an integer from 1 to 20. Default: 4

sms-tssf-timer \textit{seconds}

Configure the SMS TSSF timer to set the length of time the SGSN waits for an instructions from the SCF. On expiry the SGSN handles the transaction through the default handling specified in the corresponding CSI.

\textit{seconds}: Enter an integer from 1 to 10. Default: 5

tc-guard-timer \textit{seconds}

Configure the guard tier to start when the SGSN sends ApplyChargingReportGPRS to the SCF. On expiry the SGSN closes the TCAP dialogue if the GPRS Dialogue state is "monitoring". Default handling complies with 3GPP 23.078.

\textit{seconds}: Enter an integer from 1 to 10. Default: 5

\underline{Important}

This timer value should be greater than the value configured for the gprs-apply-charging-report-ack-timer.

\underline{Usage Guidelines}

The SCCP network must be configured prior to use this command.

CAMEL service will not function unless an SCCP network is associated.

Repeat the command to configure multiple timers.

\underline{Example}

Set the tc-guard timer for 4:

tc-guard-timer 4
timeout
Card Configuration Mode Commands

**Command Modes**

Use the Card configuration mode to create and manage the physical cards in the chassis.

Exec > Global Configuration > Card Configuration

```plaintext
configure > card card_number
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-card- slot_number)#
```

*Important*

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 239
- exit, on page 239
- link-aggregation, on page 240
- mode, on page 241
- shutdown, on page 242

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```plaintext
end
```

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.
link-aggregation

Configures system priority and toggle link settings for Link Aggregation. These parameters are usually changed to match the feature requirements of the remote Ethernet switch.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
exit

Usage Guidelines
Use this command to return to the parent configuration mode.

link-aggregation

Configures system priority and toggle link settings for Link Aggregation. These parameters are usually changed to match the feature requirements of the remote Ethernet switch.

Product
WiMAX
PDSN
HA
FA
GGSN
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Card Configuration

configure > card card_number

Entering the above command sequence results in the following prompt:

[local]host_name(config-card- slot_number)#

Syntax Description
link-aggregation \{ system-priority priority | toggle-link \} [-noconfirm ]
\{ default | no \} link-aggregation \{ system-priority | toggle-link \}
[-noconfirm ]

default

Resets the configuration to the default.

link-aggregation system-priority priority

This command sets the system priority used by Link Aggregation Control Protocol (LACP) to form the system ID.

priority is a hexadecimal value from 0x0000 through 0xFFFF. Default is 0x8000 (32768).

toggle-link

Sets the system to toggle link on port switch.
Executes the command without additional prompting for command confirmation.

**Usage Guidelines**

The system MAC address (6 bytes) and system priority (2 bytes) combine to form the system ID. A system consists of a packet processing card and its associated ASR 5500 MIO traffic ports. The highest system ID priority (the lowest number) handles dynamic changes.

For additional usage and configuration information for the link aggregation feature, refer to the *System Administration Guide*.

---

**Important**

Not supported on all platforms

---

**Example**

The following command configures the link aggregation system-priority to 10640 (0x2990):

```
link-aggregation system-priority 0x2990
```

**mode**

Sets the application processor card's current administrative state to active or standby.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Card Configuration

```
configure > card card_number
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-card- slot_number)#
```

**Syntax Description**

```
mode { active | standby } [ -noconfirm ]
default mode [ -noconfirm ]
```

**default**

Returns the mode to the default value appropriate to the card type.

The default administrative mode for line cards affects a single card and its mated line card. The default state for line cards in the top shelf is active. The default for line cards in the bottom shelf is standby.

The default administrative state for the SPIO in slot 24 is active and the SPIO in slot 25 is standby.

The default administrative mode for packet processing cards is standby.
This command results in a migration of processes if the default mode for a card is different than the current state of the card.

**active**
Defines which card type is to be switched from standby to active state. If a card is present in the slot, the packet processing card is automatically selected depending upon the type of card. If no card is present in the slot, a packet processing card is assumed.

**standby**
Sets the packet processing card in the slot to standby mode.

**Caution**
Switching an active packet processing card to standby deletes all port configurations, including bindings, for the attached line cards.

**-noconfirm**
Executes the command without additional prompting for command confirmation.

**Usage Guidelines**
Set the desired mode of mated cards. The card targeted for maintenance is placed in the standby state first. The setting of the mode determines which packet processing cards are to be active and which are to be the standby cards for redundancy. Use this command to configure the set of active and standby packet processing cards. The application processor card's standby priority is then used in conjunction with the set of standby packet processing cards to determine the order in which the standby cards are used for redundancy support.

**Important**
Not supported on all platforms

This command results in a migration of processes if the mode specified for the card is different than the current state of the card.

**Example**
The following commands set the state of a card to active and standby, respectively.

```
mode active
mode standby
```

**shutdown**
Configures a card for active service or terminates all processes on the card.
Product  
All

Privilege  
Security Administrator, Administrator

Command Modes  
Exec > Global Configuration > Card Configuration  
configure > card card_number

Entering the above command sequence results in the following prompt:  
[local]host_name(config-card- slot_number)#

Syntax Description  
[ no ] shutdown

- no

no shutdown enables the card.

- Enter only the shutdown keyword to shut the card down.

Usage Guidelines  
Shut down a card to remove it from service or to enable a card to put it into service.

- Important

Do not use this command to remove a card from service for maintenance. Use the command card halt to remove a card for service to avoid changing or deleting the active-mode configuration. See the Exec Mode chapter.

- Important

Not supported on all platforms

Example  
The following command shuts down the card:  
shutdown

The following command switches the card to online:  
no shutdown
shutdown
CBS Service Configuration Mode Commands

Important
In Release 20 and later, HNBGW is not supported. Commands in this configuration mode must not be used in Release 20 and later. For more information, contact your Cisco account representative.

The Cell Broadcasting Service (CBS) Configuration Mode is used to create and manage CBS service instances for the current context.

Command Modes
Exec > Global Configuration > Context Configuration > Cell Broadcasting Service Configuration
configure > context context_name cbs-service service_name

Entering the above command sequence results in the following prompt:

|context_name|host_name(config-cbs-service)>

- bind, on page 245
- cbc-address-validation, on page 246
- cbc-server, on page 247
- end, on page 248
- exit, on page 248
- sabp timer, on page 248
- sabp-class2-aggregation, on page 249
- tcp-keepalive, on page 249
- tcp-mode, on page 250

bind

This command binds the CBS service to the IP address of a logical interface.

Product
HNB-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Cell Broadcasting Service Configuration
configure > context context_name cbs-service service_name
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cbs-service)#
```

### Syntax Description

```plaintext
bind address ip_address port port_number
no bind address
```

- **no**
  - Removes a previously configured binding.

- **ip_address**
  - Specifies the IPv4 type IP address of CBS service. *ip_address* must be expressed in IPv4 dotted-decimal notation.

- **port**
  - Specifies the TCP port of the CBS service. *port_number* is an integer between 1 and 65535. Standard port used for service area broadcast protocol (SABP) is 3452 in case no other port is configured. It is an optional parameter.

### Usage Guidelines

Use this command to associate or tie a CBS service to a specific logical IP address previously configured in the current context and bound to a port.

### Example

The following command binds the CBS service to the interface with an IP address of 92.168.1.111 having port number 8888:

```
bind address 192.168.1.111 port 8888
```

---

**cbc-address-validation**

This command is used for validation of Cell Broadcasting Centre IP address.

### Product

HNB-GW

### Privilege

Security Administrator, Administrator

### Syntax Description

```
[ no ] cbc-address-validation
```

- **no**
  - Disables the validation of Cell Broadcasting Centre IP address.

### Usage Guidelines

Use this command to validate the Cell Broadcasting Centre IP address.

### Example

The following command validates the Cell Broadcasting Centre IP address:
**cbc-address-validation**

**cbc-server**

This command configures the CBC server for cell broadcasting service.

**Product**
HNB-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Cell Broadcasting Service Configuration

```
configure > context context_name cbs-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cbs-service)#
```

**Syntax Description**
```
cbc-server address ipv4_address [ port port_number ] [ secondary-address ipv4_address [ port port_number ] ]
no cbc-server address
```

**no**
Disables the previously configured CBC server.

**ipv4_address**
Specifies the IPv4 type IP address of CBC server. `ipv4_address` must be expressed in IPv4 dotted-decimal notation.

**port**
Specifies the TCP port of the CBS service. `port_number` is an integer between 1 and 65535. Standard port used for service area broadcast protocol (SABP) is 3452 in case no other port is configured. It is an optional parameter.

**secondary-address**
Specifies the address of other CBC server. `ipv4_address` is an IPv4 address, using dotted-decimal notation

**Usage Guidelines**
Use this command to configure the CBC server.

**Example**
The following command configures a CBC server with an IP address of 92.168.1.112 having default port number 3452::

```
cbc-server 92.168.1.112
```
**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`end`

**Usage Guidelines**
Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`exit`

**Usage Guidelines**
Use this command to return to the parent configuration mode.

**sabp timer**

Configures the Service Area Broadcast Protocol (SABP) procedure timer value.

**Product**
HNB-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Cell Broadcasting Service Configuration
`configure > context context_name cbs-service service_name`

Entering the above command sequence results in the following prompt:
`[context_name]host_name(config-cbs-service)#`

**Syntax Description**
`[ default | no ] sabp timer timer_value`

- **default**
  Restores the SABP timer value to the default: 10 seconds.

- **no**
  Disables the previously configured SABP timer value.
**sabp timer**

Configures the SABP timer which is the wait time for receiving the SABP response from a peer. *timer_value* is an integer value between 1 and 30.

**Usage Guidelines**

This command is used to set/restore the SABP timer value.

**Example**

The following command configures the SABP timer value to 25:

```
sabp timer 25
```

**sabp-class2-aggregation**

This command configures the SABP class-2 aggregation timeout.

**Product**

HNB-GW

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```
sabp-class2-aggregation timeout timeout_value
  [ default | no ] sabp-class2-aggregation timeout
```

**default**

Restores the SABP class-2 aggregation timeout value to the default: 2 seconds.

**no**

Disables the previously configured SABP class-2 aggregation timeout value.

**sabp-class2-aggregation timeout**

Configures the SABP class-2 aggregation timeout value. *timeout_value* is an integer value between 1 and 10.

**Usage Guidelines**

This command is used to configure the SABP class-2 aggregation timeout.

**Example**

The following command configures the SABP class-2 aggregation timeout value to 6:

```
sabp-class2-aggregation timeout 6
```

**tcp-keepalive**

This command is TCP Keepalive timer. It is used to check liveness of Cell Broadcasting Centre. The CBS service must be restarted after setting new values.
tcp-mode

This command configures the mode of TCP connection.

Product

HNB-GW

Privilege

Security Administrator, Administrator

Syntax Description

tcp-mode { client-server | server-only }

Example

The following command checks the liveness of Cell Broadcasting Centre with tcp-keepalive idle-timeout as 66 seconds, max-retransmission-count as 5 and interval as 15:

tcp-keepalive idle-timeout 66 max-retransmission-count 5 interval 15
**client-server**

This specifies that the HNBGW can act either as client or server.

**server-only**

This specifies that the HNBGW can act only as server.

**Usage Guidelines**

This command is used to configure the mode of TCP connection.

**Example**

The following command configures the HNBGW as Client and Server.

```
tcp-mode client-server
```
tcp-mode
The Cell Trace Module Configuration Mode provides the commands to configure real-time cell traffic trace parameters in a context.

**Command Modes**

Exec > Global Configuration > Context Configuration > Cell Trace Module Configuration

```
configure > context context_name > cell-trace-module
```

Entering the above command sequence results in the following prompt:

```
<context_name>host_name(config-cell-trace)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- cell-trace, on page 253
- do show, on page 255
- end, on page 256
- exit, on page 256
- file, on page 256

**cell-trace**

This command allows you to configure the Cell Traffic Trace transfer parameters.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Cell Trace Module Configuration

```
configure > context context_name > cell-trace-module
```

Entering the above command sequence results in the following prompt:

```
<context_name>host_name(config-cell-trace)#
```
Syntax Description

```plaintext
cell-trace { purge { { storage-limit storage_limit | time-limit time_limit } } [ max-files max_files ] } | push-interval interval | push-trigger { space-usage-percent usage_precent } | remove-file-after-transfer | transfer-mode { pull [ module-only ] | push primary { encrypted-url enc_url | url url [ module-only ] } | use-harddisk }
default cell-trace [ purge | push-interval | push-trigger | remove-file-after-transfer | transfer-mode | use-harddisk ]
no cell-trace [ purge | remove-file-after-transfer | use-harddisk ]
default
Configures this command with its default setting for the specified cell traffic trace parameters.

no
Deletes the specified cell traffic trace parameters.

purge { { storage-limit storage_limit | time-limit time_limit } [ max-files max_files ] }
Specifies to purge or delete the cell trace records based on "time" or "volume" to restrict hard-disk space usage for cell trace records.
storage-limit storage_limit: Specifies the storage space for the record files, in megabytes. storage_limit must be an integer from 10 to 143360.

time-limit time_limit: Specifies the time to delete record files, in seconds. time_limit must be an integer from 600 to 2592000.

max-files max_files: Specifies the maximum number of records to purge per iteration. max_files must be an integer 0 or ranging from 1000 to 10000. When value is set to 0, it deletes all records until purge limit is reached.

By default, no purge operation is performed by the VPNMGR module.

push-interval interval
Specifies the transfer interval in seconds to push cell traffic trace files to an external file server. interval must be an integer from 1 to 30.
Default: 1 second

push-trigger { space-usage-percent usage_precent }
Configures the disk utilization trigger for cell traffic trace files.

space-usage-percent usage_precent: Specifies the disk utilization percentage for triggering PUSH. usage_precent must be an integer from 10 to 80.

remove-file-after-transfer
Deletes the files from RAMFS after transfer to an external server. If the cell-trace use-harddisk command is not configured, it is recommended to use this command.
transfer-mode { pull [ module-only ] | push primary { encrypted-url enc_url | url url } [ module-only ] }

Configures the transfer mode for cell trace record files. Only one TCE address configuration is required and all files will be sent to this address irrespective of the TCE address received from eNodeB in SIAP cell tracing message. Both the addresses must be the same mostly.

**pull [ module-only ]**: Specifies that external storage pulls the cell trace files.

**push primary { encrypted-url enc_url | url url } [ module-only ]**: Specifies that ST pushes the cell trace files onto the configured external storage server. enc_url specifies the location where the cell trace files will be transferred and must be entered in encrypted format. url specifies the location where the cell trace files will be transferred and must be entered in the server URL format scheme://user:password@host:{port}/directory - string of size 1 to 1024.

If the `module-only` keyword is set, then the given configuration is applied only for the specific record type. The administrator can configure record transfer information for all record types separately or combined using the `module-only` keyword.

**pull [ module-only ]**: Server URL in the format: scheme://user:password@host:{port}/directory - string of size 1 to 1024

If the `module-only` keyword is set, then the given configuration is applied only for the specific record type. The administrator can configure record transfer information for all record types separately or combined using the `module-only` keyword.

use-harddisk

Moves the cell trace files from RAMFS to /hd-raid/ and then transferred to an external server. It is recommended to use this command to prevent space on RAMFS becoming full.

Use this command to configure the Cell Traffic Trace transfer parameters. The user must be in a non-local context when specifying the `cell-trace-module` command.

**Example**

The following command pushes the cell traffic trace files to an external file server in 20 seconds:

`cell-trace push-interval 20`

**do show**

Executes all `show` commands while in Configuration mode.

**Usage Guidelines**

Use this command to run all Exec mode `show` commands while in Configuration mode. It is not necessary to exit the Config mode to run a `show` command.

The pipe character | is only available if the command is valid in the Exec mode.
There are some Exec mode `show` commands which are too resource intensive to run from Config mode. These include: `do show support collection`, `do show support details`, `do show support record` and `do show support summary`. If there is a restriction on a specific `show` command, the following error message is displayed:

Failure: Cannot execute 'do show support' command from Config mode.

---

### end

Exits the current configuration mode and returns to the Exec mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Syntax Description</td>
<td><code>end</code></td>
</tr>
<tr>
<td>Usage Guidelines</td>
<td>Use this command to return to the Exec mode.</td>
</tr>
</tbody>
</table>

### exit

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Syntax Description</td>
<td><code>exit</code></td>
</tr>
<tr>
<td>Usage Guidelines</td>
<td>Use this command to return to the parent configuration mode.</td>
</tr>
</tbody>
</table>

### file

This command allows you to configure the file creation properties for cell trace records.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration &gt; Cell Trace Module Configuration configure &gt; context context_name &gt; cell-trace-module</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
<context_name>host_name(config-cell-trace) #
```
Syntax Description

```
file [ delete-timeout seconds | directory directory_name | field-separator { hyphen | omit | underscore } | rotation { num-records num_records | time rotation_time } | storage-limit storage_limit | trap-on-file-delete ]
```

default file [ delete-timeout | directory | field-separator | rotation | storage-limit | trap-on-file-delete ]

default

Configures this command with its default value for the specified parameters.

**file delete-timeout seconds**

Configures the time to delete the completed cell traffic trace files after specified number of seconds. `seconds` must be an integer from 3600 through 31536000.

**file directory directory_name**

Specifies a subdirectory to be generated in the default directory `/records/celltrace` in which to store EDR files. `directory_name` must be an alphanumeric string of 1 through 191 characters.

**file field-separator { hyphen | omit | underscore }**

 Specifies the field inclusion/exclusion type of separators between two fields of cell trace files.

- **hyphen**: Specifies to use "-" (hyphen) as the field separator between file format fields.
- **omit**: Excludes the field separator.
- **underscore**: Specifies to use "_" (underscore) as the field separator between file format fields.

**file rotation { num-records num_records | time rotation_time }**

Specifies the criteria to rotate the record file. CDRMOD will hold the cell trace records in buffer and write them to the XML file only when the criteria configured by this command are met.

- **num-records num_records**: Completes the file when the specified number of records are added. When the number of records in the buffer reaches the specified value, records will be written to the XML file. `num_records` must be an integer from 100 to 2000. Default: 1000.
- **time rotation_time**: Completes the file based on file duration, time after which records will be written to XML file. `num_records` must be an integer from 1 to 30. Default: 1 second.

**file storage-limit storage_limit**

Configures the total available storage space on RAMFS for cell trace files. `storage_limit` must be an integer from 10485760 to 134217728. When the storage space is full, the oldest files on RAMFS will be deleted first to create space for new files.

**file trap-on-file-delete**

Instructs the system to send an SNMP notification (starCDRFileRemoved) when a cell trace file is deleted due to lack of space.

**Usage Guidelines**

Use this command to configure the file creation properties for cell trace records.
Example

The following command configures the time to delete the cell trace files after 4000 seconds:

```
file delete-timeout 4000
```
CHAPTER 8

Certificate Policy Configuration Mode Commands

Configure the context level name to be used for the IKEv2 Security Association Certificate Policy for the current context.

**Command Modes**

Exec > Global Configuration > Context Configuration > Certificate Policy Configuration

configure > context context_name Certificate Policy Configuration service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-cert-policy)#

- do show, on page 259
- end, on page 260
- exit, on page 260
- id, on page 260

**do show**

Executes all `show` commands while in Configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
do show

Use this command to run all Exec mode `show` commands while in Configuration mode. It is not necessary to exit the Config mode to run a `show` command.

The pipe character `|` is only available if the command is valid in the Exec mode.

**Usage Guidelines**

There are some Exec mode `show` commands which are too resource intensive to run from Config mode. These include: do show support collection, do show support details, do show support record and do show support summary. If there is a restriction on a specific `show` command, the following error message is displayed:

Failure: Cannot execute 'do show support' command from Config mode.
end

Exits the current configuration mode and returns to the Exec mode.

Product: All
Privilege: Security Administrator, Administrator
Syntax Description: `end`
Usage Guidelines: Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

Product: All
Privilege: Security Administrator, Administrator
Syntax Description: `exit`
Usage Guidelines: Use this command to return to the parent configuration mode.

id

Configures ID for cert-entry.

Product: SecGW
Privilege: Security Administrator, Administrator
Command Modes: Exec > Global Configuration > Context
configure > context context_name ikev2-ikesa ikev2_sec_para

Entering the above command sequence results in the following prompt:

{local}host_name(config-cert-policy)#

Syntax Description:

```
epdg-s2b-gtpv2 send value match-criteria { common-name value | domain-name value }
```

- `id value`

  `value`: is an integer between 1 and 64.
**match-criteria**
Configures the match criteria to be configured and used for peer using cert as authorization for given Crypto Template.

**common-name value value**
Configures the entry with match criteria as common-name to be matched with CN in received Certificate.

*value:* is a string of size 1 through 64.

**domain-name value value**
Configure the entry with match criteria as domain name to be matched with domain in received Certificate.

*value:* is a string of size 1 through 64.

---

**Usage Guidelines**
Use this command to Enable/Disable the inclusion of the "UE Local IP Address" and "UE UDP Port" AVPs in the GTPv2 Create Session Request message from ePDG to PGW.

**Example**
Use the following command to configure ID for certificate entry as 4 with match criteria as domain name dom1.

```
id 4 match-criteria domain-name dom1
```
id
CHAPTER 9

CGW Service Configuration Mode Commands

**Command Modes**

Creates Convergence Gateway (CGW) service and enters CGW service configuration mode.

Exec > Global Configuration > Context Configuration > CGW Configuration

```
configure > context context_name > cgw-service cgw_service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cgw-service)#
```

Available commands or keywords/variables vary based on platform type, product version, and installed license(s).

- associate, on page 263
- bind, on page 265
- enable-bra-failure-handling, on page 267
- end, on page 267
- exit, on page 267
- gre sequence-numbers, on page 268
- reg-lifetime, on page 268
- revocation, on page 269
- session-delete-delay, on page 270
- timestamp-option-validation, on page 271
- timestamp-replay-protection, on page 271

**associate**

This command associates another service to this CGW service.

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > CGW Configuration

```
configure > context context_name > cgw-service cgw_service_name
```
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cgw-service)#
```

### Syntax Description

```
associate { egress-egtp-service egress_egtp_service [ context context_name ] |
ggsn-service ggsn_service | mag-service mag_service [ context context_name ] |
mrme-service mrme_service | pgw-service pgw_service | qci-qos-mapping
qci_qos_mapping | sgtp-service sgtp_service [ context context_name ] |
subscriber-map subscriber_map }
no associate { egress-egtp-service | ggsn-service | pgw-service |
ingress-lma-service | mag-service | qci-qos-mapping | sgtp-service |
subscriber-map }
```

**Note**

- **associate mrme-service** is not supported in this release.

**Note**

- **no ingress-lma-service** is not supported in this release.

**no**

Disables association to CGW service.

**egress-egtp-service egress_egtp_service [ context context_name ]**

Configures the egtp-service which provides S2A functionality to the CGW service.

`egress-egtp-service` is a string and the value must be between 1 and 63.

Use the `context` keyword to associate the egress egtp service from a different context in the CGW service. `context_name` must be an alphanumeric string of 1 through 79 characters.

**ggsn-service ggsn_service**

Configures the association of a GGSN service for this CGW service.

`ggsn_service` must be an alphanumeric string of 1 through 63 characters.

**mag-service mag_service [ context context_name ]**

Configures the association of a MAG service for this CGW service.

`mag_service` must be an alphanumeric string of 1 through 63 characters.

**Important**

This keyword is available only when the SaMOG General license (supporting both 3G and 4G) is configured. Contact your Cisco account representative for more information on license requirements.

- **context**: Defines the context in which the MAG service was created. If no context is specified, the current context will be used.

  `context_name` must be an alphanumeric string of 1 through 79 characters.
mrme-service mrme_service
Configures the association of egress MRME service for this CGW service.
mrme_service is a string and the value must be between 1 and 63.

pgw-service pgw_service
Configures the association of a PGW service for this CGW service.
pgw_service must be an alphanumeric string of 1 through 63 characters.

qci-qos-mapping qci-qos-mapping
Configuration related QCI to QoS mapping.
qci-qos-mapping is a string and the value must be between 1 and 63.

sgtp-service sgtp_service [ context context_name ]
Specifies the SGTP service instance to associate with this CGW service.
sgtp_service must be an alphanumeric string of 1 through 63 characters.
context: Defines the context in which the SGTP service was created. If no context is specified, the current context will be used.
context_name must be an alphanumeric string of 1 through 79 characters.

subscriber-map subscriber_map
Configures subscriber map association.
subscriber_map is a string and the value must be between 1 and 64.

Usage Guidelines

Use this command to associate another service to this CGW service.

Example

The following command is used to associate the configuration of egress EGTP service egts for this CGW service:

associate egress-egtp-service egts

Usage Guidelines

bind

This command allows you to bind an IPv4 and/or IPv6 address for the LMA driver.

Product
SaMOG

Privilege
Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > CGW Configuration

configure > context context_name > cgw-service cgw_service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-cgw-service)#

**Syntax Description**

[ no ] bind { ipv4-address ipv4_address | ipv6-address ipv6_address | ipv4-address ipv4_address | ipv6-address ipv6_address | ipv4-address ipv4_address | ipv6-address ipv6_address | ipv4-address ipv4_address }

**Usage Guidelines**

Use this command to bind an IPv4 and/or IPv6 address for the LMA driver.

**Example**

The following command binds an IPv4 address for Lma driver.

**bind ipv4-address** 192.130.30.14
enable-bra-failure-handling

This command enables the HAMGR to select the first session incase the Binding Revocation Ack (BRA) does not have required parameters and the session lookup fails.

**Product**
SaMOG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CGW Configuration

```
configure > context context_name > cgw-service cgw_service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cgw-service)#!
```

**Syntax Description**

```
[ no ] enable-bra-failure-handling
```

- **no**
  
  Disables Binding Revocation Ack failure handling.

**Usage Guidelines**

Use this command to enable Binding Revocation Ack failure handling.

**Example**

The following command enables Binding Revocation Ack failure handling.

```
enable-bra-failure-handling
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.
**gre sequence-numbers**

This command allows you to enable or disable the inclusion of sequence number bit and sequence number value in the GRE encapsulation header.

**Syntax Description**

```
[ no ] gre sequence-numbers
```

- **no**
  - Disables the inclusion of sequence number bit and sequence number value in the GRE encapsulation header.
  - **Default:** Disabled

**Usage Guidelines**

Use this command to enable or disable the inclusion of sequence number bit and sequence number value in the GRE encapsulation header for GRE tunneled packets.

**reg-lifetime**

Configures Mobile IPV6 session registration lifetime in seconds.

**Syntax Description**

```
reg-lifetime seconds
default reg-lifetime
```

**Product**

SaMOG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > CGW Configuration

```
configure > context context_name > cgw-service cgw_service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cgw-service)#
```
default
Configures Mobile IPV6 session registration lifetime, in seconds to its default value, 600.

reg-lifetime seconds
Configures Mobile IPV6 session registration lifetime.
seconds is the number of seconds, an integer value between 1 and 262140.

Usage Guidelines
Use this command to configure Mobile IPV6 session registration lifetime, in seconds.

Example
The following command configures Mobile IPV6 session registration lifetime to 500 seconds.
reg-lifetime 500

revocation
Configures Binding Revocation support for specific CGW service.

Product
SaMOG

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > CGW Configuration
configure > context context_name > cgw-service cgw_service_name
Entering the above command sequence results in the following prompt:
[context_name]host_name(config-cgw-service)#

Syntax Description
revocation { enable | max-retransmission max_retransmission | retransmission-timeout msecs }
default revocation { enable | max-retransmission | retransmission-timeout }
no revocation enable

default
Resets the revocation to its default value.

no
Disables revocation.

enable
Enables the Binding Revocation Support. Default is disabled.
max-retransmission `max_retransmission`
Confirms the maximum number of retransmissions.
`max_retransmission` must be an integer between 0 and 10.

retransmission-timeout `msecs`
Confirms the retransmission timeout in milli seconds.
`msecs` must be an integer between 500 and 10000.

**Usage Guidelines**
Use this command to configure Binding Revocation support for specific CGW service.

**Example**
The following command configures the retransmission timeout to 1000 milli seconds.
```
revocation retransmission-timeout 1000
```

### session-delete-delay

Confirms CGW to retain the session on receiving a termination request till configured delay time for session continuity in case of break-before-make scenario.

**Product**
SaMOG

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
session-delete-delay timeout delay_msecs
{ default | no } session-delete-delay timeout
```

**default**
Confirms session delate delay to its default value, disabled. Default timeout when enabled is 10000 msecs.

**no**
Enables / disables session delate delay to its default value.

**session-delete-delay timeout delay_msecs**

**timeout** : Configuration to retain session till configured time in msecs when enabled.
`delay_msecs` is the number of milli seconds, an integer value between 1000 and 60000.

**Usage Guidelines**
Use this command to configure CGW to retain the session on receiving a termination request till configured delay time for session continuity in case of break-before-make scenario.

**Example**
The following command configures CGW to retain the session timeout to 1500 milli seconds.
timestamp-option-validation

Configures validation of Timestamp Option in Binding Update messages. By default Timestamp option is mandatory.

**Syntax Description**

```timestamp-option-validation
{ default | no } timestamp-option-validation
```

- **default**
  Configures validation of Timestamp Option in Binding Update messages to its default value.

- **no**
  Disables the Timestamp Option in Binding Update messages.

**Usage Guidelines**

Use this command to configure validation of Timestamp Option in Binding Update messages.

**Example**

The following command configures validation of Timestamp Option in Binding Update messages.

```timestamp-option-validation```

timestamp-replay-protection

This command designates timestamp replay protection scheme as per RFC 4285.

**Syntax Description**

```timestamp-replay-protection tolerance seconds
default timestamp-replay-protection tolerance
no timestamp-replay-protection```

- **default**
  Designates default value to timestamp replay protection scheme. The default value of the acceptable difference in timing (between timestamps) before rejecting packet is 7 seconds.
no

Disables the timestamp replay protection scheme.

`timestamp-replay-protection  tolerance seconds`

`tolerance` : Defines the acceptable difference in timing (between timestamps) before rejecting packet, in seconds. `seconds` is the seconds, an integer between 0 and 65535.

**Usage Guidelines**

Use this command to designate timestamp replay protection scheme as per RFC 4285.

**Example**

The following command designates timestamp replay protection for 500 seconds.

```
timestamp-replay-protection  tolerance 500
```
CHAPTER 10

Cipher Suite Configuration Mode Commands

Command Modes

The Cipher Suite Configuration Mode is used to configure the building blocks for SSL cipher suites, including the encryption algorithm, hash function, and key exchange.

Exec > Global Configuration > Context Configuration > Cipher Suite Configuration

configure > context context_name > cipher-suite cipher_suite_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-ctx-cipher-suite)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- encryption, on page 273
- end, on page 274
- exit, on page 274
- hmac, on page 275
- key-exchange, on page 275

encryption

Specifies the encryption algorithm for the SSL cipher suite.

Product

SCM (P-CSCF, A-BG)

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Cipher Suite Configuration

configure > context context_name > cipher-suite cipher_suite_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-ctx-cipher-suite)#

Syntax Description

encryption { 3des | aes-128 | null | rc4 } default encryption
**default**

Sets the encryption option to its default value of RC4.

**encryption 3des | aes-128 | null | rc4**

Specifies the encryption algorithm.

- **3des**: Encryption algorithm 3DES (Triple Encryption Algorithm). 3DES applies the Data Encryption Standard (DES) cipher algorithm three times to each data block.
- **aes-128**: Encryption algorithm AES-128 (Advanced Encryption Standard-128). AES-128 is a symmetric-key encryption standard which has a 128-bit block size, with key size of 128.
- **null**: Encryption algorithm Null.
- **rc4**: Encryption algorithm RC4 (Rivest Cipher 4). RC4 is a stream cipher used with SSL protocol.

**Usage Guidelines**

Use this command to specify encryption for the SSL cipher suite.

**Example**

The following command sets the encryption option to its default value, which is RC4:

```
encryption rc4
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**end**

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**exit**

**Usage Guidelines**

Use this command to return to the parent configuration mode.
**hmac**

Specifies the HMAC (keyed-Hash Message Authentication Code) for the SSL cipher suite.

**Product**
SCM (P-CSCF, A-BG)

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Cipher Suite Configuration

```
configure > context context_name > cipher-suite cipher_suite_name
```

Entering the above command sequence results in the following prompt:

```
>[context_name]host_name(cfg-ctx-cipher-suite)#
```

**Syntax Description**

```
hmac { sha1 }
default hmac
```

default
Sets the HMAC option to its default value of SHA-1.

**hmac sha1**

Specifies the SHA-1 (Secure Hash Algorithm-1) HMAC for the SSL cipher suite. SHA-1 uses a 160-bit secret key and produces a 160-bit digest.

**Usage Guidelines**

Use this command to specify the SHA-1 HMAC for the SSL cipher suite. The default and only currently available option is SHA-1.

A keyed-Hash Message Authentication Code, or HMAC, is a type of message authentication code (MAC) calculated using a cryptographic hash function in combination with a secret key to verify both data integrity and message authenticity.

**Example**

The following command sets the HMAC option to its default value, which is SHA-1:

```
hmac sha1
```

**key-exchange**

Specifies the key exchange algorithm for the SSL cipher suite.

**Product**
SCM (P-CSCF, A-BG)

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Cipher Suite Configuration
configure > context context_name > cipher-suite cipher_suite_name

Entering the above command sequence results in the following prompt:
(context_name)host_name(cfg-ctx-cipher-suite)#

**Syntax Description**

key-exchange { rsa }

default key-exchange

**default**

Sets the key exchange option to its default value of RSA.

**key-exchange rsa**

Specifies the RSA (Rivest, Shamir, and Adleman) key exchange algorithm for the SSL cipher suite. With RSA, the secret key is encrypted with the receiver's public key, and a public-key certificate from the receiver's key must be made available.

**Usage Guidelines**

Use this command to specify the RSA key exchange for the SSL cipher suite. The default and only currently available option is RSA.

The key exchange algorithm provides the means by which the cryptographic keys for conventional encryption and MAC calculations are exchanged.

**Example**

The following command sets the key exchange option to its default value, which is RSA:

`key-exchange rsa`
CHAPTER 11

Class-Map Configuration Mode Commands

Class-Map is used to configure a packet classifier for the flow-based Traffic Policing feature within destination context. It filters egress and/or ingress packets of a subscriber session based on rules configured in a subscriber context.

**Command Modes**

Exec > Global Configuration > Context Configuration > Class-Map Configuration

```
configure > context context_name > class-map class_map_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-class-map)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 277
- exit, on page 278
- match any, on page 278
- match dst-ip-address, on page 279
- match dst-port-range, on page 279
- match ip-tos, on page 280
- match ipsec-spi, on page 281
- match packet-size, on page 282
- match protocol, on page 283
- match src-ip-address, on page 284
- match src-port-range, on page 285

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator
exit

Exits the current mode and returns to the parent configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
exit

Usage Guidelines
Use this command to return to the parent configuration mode.

match any

Allows all traffic types in this class map.

Product
PDSN
HA
ASN-GW
HSGW
P-GW
SAEGW
SCM

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Class-Map Configuration

configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-class-map)#

Syntax Description
match any

Usage Guidelines
Sets the match rule to allow all traffic flow for specific class map.

Example
The following command allows all packets going to a system with this class map.

match any
**match dst-ip-address**

Specifies a traffic classification rule based on the destination IP address of packets.

**Product**
- PDSN
- HA
- ASN-GW
- HSGW
- P-GW
- SAEGW
- SCM

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration > Class-Map Configuration
- `configure > context context_name > class-map class_map_name`

Entering the above command sequence results in the following prompt:

```plaintext
[context_name]host_name(config-class-map)#
```

**Syntax Description**

`match dst-ip-address dst_ip_address /subnet_mask`

`dst_ip_address/subnet_mask`

Specifies the destination IP address of the packets.

`dst_ip_address` must be entered in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. `subnet_mask` is an option that is entered in CIDR notation.

**Usage Guidelines**
Sets the match rule based on the destination IP address of packets for specific Class Map.

**Example**
The following command specifies the rule for packets going to a system having an IP address 10.1.2.6.

```plaintext
match dst-ip-address 10.1.2.6
```

**match dst-port-range**

Specifies a traffic classification rule based on the range of destination ports for L4 packets.

**Product**
- PDSN
- HA
- ASN-GW
match ip-tos

Specifies a traffic classification rule based on the IP Type of Service value in ToS field of packet.

Syntax Description:

match ip-tos

Usage Guidelines:

Sets the match rule based on the destination port number or range of ports of L4 packets for specific Class Map.

Example:

The following command specifies the rule for packets having destination port number from 23 to 88.

match dst-port-range 23 to 88
Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Class-Map Configuration
configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-class-map)#

Syntax Description
match ip-tos { service_value [ ip-tos-mask mask_value ] | tos-range low_value to high_value }

service_value
Specifies the IP Type-of-Service value to match inside the ToS field of packets as an integer from 0 to 255.

ip-tos-mask mask_value
Specifies the IP Type-of-Service mask value to match inside the ToS field of packets as an integer from 1 to 255.

tos-range low_value to high_value
Specifies a range that a ToS value in a received packet must fall within to be considered a match. low_value and high_value must be an integer from 0 to 255.

Usage Guidelines
Sets the match rule based on the IP ToS value in ToS field of packets for specific Class Map.

Example
The following commands specifies the IP ToS value of 3 is the value to match in a ToS field in received packets.

match ip-tos 3

match ipsec-spi

Specifies a traffic classification rule based on the IPSec Security Parameter Index (SPI) value in the SPI field of packet.

Product
PDSN
HA
ASN-GW
HSGW
P-GW
SAEGW
SCM

Privilege
Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Context Configuration > Class-Map Configuration

configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-class-map)#

Syntax Description

match ipsec-spi index_value

index_value

Specifies the IPSec SPI value to match inside the SPI field of packets as an integer from 1 to 65535.

Usage Guidelines

Sets the match rule based on the IPSec SPI value in SPI field of packets for specific Class Map.

Example

The following command specifies the IPSec SPI value as 1234 for the SPI field in packets.

match ipsec-spi 1234

match packet-size

Specifies a traffic classification rule based on the size of packet.

Product

PDSN
HA
ASN-GW
HSGW
P-GW
SAEGW
SCM

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Class-Map Configuration

configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-class-map)#

Syntax Description

match packet-size [ gt | lt ] size

[ gt | lt ] size

Specifies the packet length in bytes.

gt: indicates a packet size greater than the specified size.
**match protocol**

Specifies a traffic classification rule based on the protocol used for session flow.

**Product**
- PDSN
- HA
- ASN-GW
- HSGW
- P-GW
- SAEGW
- SCM

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration > Class-Map Configuration
- `configure > context context_name > class-map class_map_name`

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-class-map) #
```

**Syntax Description**

```
match protocol { gre | ip-in-ip | number | rtp | sip | tcp | udp }
```

- **gre**
  Sets the match rule for session flow using Generic Routing Encapsulation (GRE) Protocol. It matches the protocol field to GRE inside the packet.

- **ip-in-ip**
  Sets the match rule for session flow using IP-in-IP encapsulation protocol. It matches the protocol field to ip-in-ip inside the packet.
**number**
Sets the match rule for a session flow using Transmission Control Protocol (TCP). It matches the specified protocol field inside the packet.

**rtp**
Sets the match rule for a session flow using Real Time Protocol (RTP). It matches the specified protocol field inside the packet.

**sip**
Sets the match rule for a session flow using Session Initiation Protocol (SIP). It matches the specified protocol field inside the packet.

**tcp**
Sets the match rule for a session flow using Transmission Control Protocol (TCP). It matches the protocol field to TCP inside the packet.

**udp**
Sets the match rule for a session flow having User Datagram Protocol (UDP). It matches the protocol field to UDP inside the packet.

---

**Usage Guidelines**
Sets the match rule based on the protocol of packet flow for a specific Class Map.

**Example**
The following command specifies the rule for packet flow using IP-in-IP protocol.

```
match protocol ip-in-ip
```

---

**match src-ip-address**
Specifies a traffic classification rule based on the source IP address of packets.

**Product**
PDSN
HA
ASN-GW
HSGW
P-GW
SAEGW
SCM

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Class-Map Configuration
configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:

[context_name] host_name(config-class-map) #

Syntax Description

match src-ip-address src_ip_address / subnet_mask

src_ip_address/subnet_mask

Specifies the destination IP address of the packets.
src_ip_address must be entered in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.
subnet_mask is an option that is entered in CIDR notation.

Usage Guidelines

Sets the match rule based on the source IP address of packets for specific Class Map.

Example

The following command specifies the rule for packets coming from a system having an IP address 10.1.2.3.

match src-ip-address 10.1.2.3

match src-port-range

Specifies a traffic classification rule based on the range of source ports of L4 packets.

Product

PDSN
HA
ASN-GW
HSGW
P-GW
SAEGW
SCM

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Class-Map Configuration

configure > context context_name > class-map class_map_name

Entering the above command sequence results in the following prompt:

[context_name] host_name(config-class-map) #

Syntax Description

match src-port-range initial_port_number [ to last_port_number ]
match src-port-range

initial_port_number[to last_port_number]

Specifies the source port or range of ports of the L4 packets.

initial_port_number is the starting port number and must be an integer from 1 to 65535 but less than last_port_number, if specified.

last_port_number is the end port number and must be an integer from 1 to 65535 but more than initial_port_number.

Usage Guidelines
Sets the match rule based on source port number or range of ports of L4 packets for specific Class Map.

Example
The following command specifies the rule for packets having source port number from 23 to 88.

match src-port-range 23 to 88
CHAPTER 12

Congestion Action Profile Configuration Mode Commands

The Congestion Policy Configuration Mode is used to create and manage the action profiles to be associated with congestion control policies supporting MME configurations on the system.

**Command Modes**

Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration

`configure > lte-policy > congestion-action-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(congestion-action-profile)#
```

**Important**

Available commands or keywords/variables vary based on platform type, product version, and installed license(s).

- `ddn`, on page 287
- `drop`, on page 288
- `end`, on page 290
- `exclude-emergency-events`, on page 291
- `exclude-voice-events`, on page 291
- `exit`, on page 292
- `none`, on page 292
- `reject`, on page 294
- `report-overload`, on page 296

**ddn**

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration

`configure > lte-policy > congestion-action-profile profile_name`
Entering the above command sequence results in the following prompt:

```
[local]host_name(congestion-action-profile)#
```

---

### Syntax Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ddn sgw-throttling</code></td>
<td>Enables DDN throttling towards SGW.</td>
</tr>
<tr>
<td><code>throttle-factor</code></td>
<td>Specifies the total number of DDN requests to be processed. The number of DDN requests is indicated as a percentage value from 1 to 100.</td>
</tr>
<tr>
<td><code>delay</code></td>
<td>Specifies the total time for throttling in seconds. The delay value ranges from 2 to 1116000 seconds.</td>
</tr>
<tr>
<td><code>no</code></td>
<td>Removes the DDN Throttling configuration towards SGW.</td>
</tr>
</tbody>
</table>

---

### Usage Guidelines

Configures DDN Throttling towards SGW based on the configured throttling factor and throttling delay.

---

### Example

The following example shows DDN throttling with a throttling factor of 30 percent and a throttling delay of 100 seconds.

```
ddn sgw-throttling throttle-factor 30 delay 100
```

---

### drop

Specifies that incoming packets containing new session requests be dropped when a congestion control threshold has been reached.

---

### Product

- MME
- ePDG

### Privilege

- Administrator

### Command Modes

- Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration
configure > lte-policy > congestion-action-profile profile_name

Entering the above command sequence results in the following prompt:
[local]\host_name(congestion-action-profile)#

Syntax Description

`drop { addn-brr-requests | addn-pdn-connects | brr-ctxt-mod-requests | combined-attaches | handovers | ps-attaches | s1-setups | service-request | tau-request } [ lapi ] [ apn-based ]`

`addn-brr-requests`
Drops packets containing UE initiated bearer resource requests.
This keyword option will be available only if a valid license is installed.

`addn-pdn-connects`
Drops packets containing additional PDN context connections.
This keyword option will be available only if a valid license is installed.

`brr-ctxt-mod-requests`
Drops packets containing Bearer Context Modification requests.
This keyword option will be available only if a valid license is installed.

`combined-attaches`
Drops packets containing combined Attach requests.

`handovers`
Drops packets containing handover attempts.

`ps-attaches`
Drops packets containing packet switched Attach requests.

`s1-setups`
Drops packets containing S1 setup attempts.
This keyword option will be available only if a valid license is installed.

`service-request`
Drops packets containing all service requests.
This keyword option will be available only if a valid license is installed.

`tau-request`
Drops packets containing all Tracking Area Update requests.
These keyword options are available only if a valid license is installed.

When a congestion action profile is configured with the `drop <call-event> lapi` option, only requests with Low Access Priority Indication (LAPI) will be dropped for those call-events during congestion. However, if the call-event is configured without the `lapi` option, all LAPI and non-LAPI requests will be dropped.

If the congestion action profile is configured with the `drop <call-event> apn-based` option, only the requests for those APNs configured for congestion control in the Operator Policy will be dropped for those call-events during congestion. However, if the call-event is configured without the `apn-based` option, all requests will be dropped. Refer to the `apn network-identifier` command in the `Operator Policy Configuration Mode` chapter to enable congestion control for a specific APN.

If the congestion action profile is configured with both the `lapi` and `apn-based` options, the call-event will be dropped only if both conditions are matched.

**Usage Guidelines**

Creates a congestion action profile that drops packets containing a specified request when a threshold is reached.

Some keyword options are available only if a valid license is installed. For more information, contact your Cisco account representative.

**Example**

The following command drops packets containing Tracking Area Update (TAU) requests when a congestion threshold has been reached:

`drop tau-request`

The following command drops Additional PDN Context connection requests when a congestion threshold has been reached. Only those APNs specified for APN-based congestion in the Operator Policy configuration mode will be dropped. Note that APN-based congestion control functionality supports APN remapping via the APN Remap Table Configuration Mode. The APN to which it is remapped will be checked for the congestion-control configuration.

`drop addn-pdn-connects apn-based`

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`end`

**Usage Guidelines**

Use this command to return to the Exec mode.
**exclude-emergency-events**

Excludes emergency events when a congestion control threshold is reached. Emergency events continue to be processed when the threshold has been exceeded.

**Product**
ePDG
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration

configure > lte-policy > congestion-action-profile profile_name

Entering the above command sequence results in the following prompt:

[local]host_name(congestion-action-profile)#

**Syntax Description**

```text
[no] exclude-emergency-events
```

`no`

Removes the specified option from the system.

**Usage Guidelines**

Create a congestion action profile that allows emergency events to be processed when a congestion threshold has been reached.

When `exclude-emergency` is configured, congestion actions will not be applied for the following messages for emergency attached UEs:

- tau-request
- service-request
- handovers

When `exclude-emergency` is configured and addn-pdn-requests are configured for reject or drop actions, the reject or drop action on addn-pdn-requests for emergency PDN will not be applied.

**Example**

The following command allows emergency events to be processed:

```
exclude-emergency-events
```

---

**exclude-voice-events**

Excludes voice calls when a congestion control threshold is reached. Voice calls continue to be processed when the threshold has been exceeded.

**Product**
MME
ePDG
### Privilege
Administrator

### Command Modes
Exec > Global Configuration > LTE Policy Configuration >Congestion Action Profile Configuration

```bash
configure > lte-policy > congestion-action-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(congestion-action-profile)#
```

### Syntax Description

- `[no] exclude-voice-events`

  - `no`

  Removes the specified option from the system.

### Usage Guidelines
Create a congestion action profile that allows voice calls to be processed when a congestion threshold has been reached.

#### Example
The following command allows voice calls to be processed:

```bash
exclude-voice-events
```

### exit
Exits the current mode and returns to the parent configuration mode.

### Product
All

### Privilege
Security Administrator, Administrator

### Syntax Description
`exit`

### Usage Guidelines
Use this command to return to the parent configuration mode.

### none
Specifies that no congestion control action be taken on an incoming request when a congestion control threshold has been reached.

### Product
MME
ePDG

### Privilege
Administrator

### Command Modes
Exec > Global Configuration >LTE Policy Configuration >Congestion Action Profile Configuration

```bash
configure > lte-policy > congestion-action-profile profile_name
```
Entering the above command sequence results in the following prompt:

[local]host_name(congestion-action-profile)#

**Syntax Description**

```
none { addn-brr-requests | addn-pdn-connects | combined-attaches | handovers | ps-attaches | s1-setups | service-request | tau-request }
```

- **addn-brr-requests**
  No congestion control action is taken for additional bearer requests when a congestion threshold is reached.

- **addn-pdn-connects**
  No congestion control action is taken for additional PDN context connections when a congestion threshold is reached.

- **brr-ctxt-mod-requests**
  No congestion control action is taken for Bearer Resource Context Modification Requests when a congestion threshold is reached.

- **combined-attaches**
  No congestion control action is taken for combined Attach requests when a congestion threshold is reached.

- **handovers**
  No congestion control action is taken for handover attempts when a congestion threshold is reached.

- **ps-attaches**
  No congestion control action is taken for packet switched Attach requests when a congestion threshold is reached.

- **s1-setups**
  No congestion control action is taken for S1 setup attempts when a congestion threshold is reached.

- **service-request**
  No congestion control action is taken for service requests when a congestion threshold is reached.

- **tau-request**
  No congestion control action is taken for Tracking Area Update requests when a congestion threshold is reached.

**Usage Guidelines**

Specifies that no congestion control action be taken for the specified request when a threshold is reached. For all of the above requests, 'none' is the default action; requests are processed normally even when a congestion threshold has been reached.
Example

The following command configures the congestion action profile to take no Congestion Control action for Tracking Area Update (TAU) requests when a congestion threshold is reached, so TAU procedure proceeds normally:

```
none tau-request
```

reject

Processes a specified request when a congestion control threshold has been reached and responds with a reject message.

Product

MME
ePDG

Privilege

Administrator

Command Modes

Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration configure > lte-policy > congestion-action-profile profile_name

Entering the above command sequence results in the following prompt:

```
[local]host_name(congestion-action-profile)#
```

Syntax Description

```
reject { addn-brr-requests | addn-pdn-connects | brr-ctxt-mod-requests | combined-attaches | ddn [ arp-watermark | cause | lapi | service-request | tau-request ] | combined-attaches | ddn [ arp-watermark value | cause | lapi | service-request | tau-request ] [ lapi ] [ apn-based ]
```

addn-brr-requests

Rejects UE initiated bearer resource requests.

This keyword option will be available only if a valid license is installed.

addn-pdn-connects

Rejects additional PDN context connections.

This keyword option will be available only if a valid license is installed.

brr-ctxt-mod-requests

Rejects packets containing Bearer Context Modification requests.

This keyword option will be available only if a valid license is installed.
combined-attaches
Rejects combined Attach requests.

ddn [ arp-watermark | cause | lapi ]
The `ddn` keyword configures the action to be taken for all DDN requests. The operator can reject DDN requests based on ARP or LAPI values or both. Also, there is an option provided to reject all DDN requests without using ARP/LAPI values.

The `arp-watermark` keyword specifies that DDN reject is applicable for ARP values greater than or equal to the ARP specified. The ARP value ranges from 1 through 15.

The `cause` keyword rejects DDN with the specified cause value. The valid cause value ranges from 1 through 255. The default value is 90 with the display message “Unable to page ue”.

The `lapi` keyword for DDN specifies that DDN rejection is applicable for UEs with LAPI.

This keyword option will be available only if a valid license is installed.

none
Disables DDN configuration.

handovers
Rejects handover attempts.

ps-attaches
Rejects packet switched Attach requests.

s1-setups time-to-wait { 1 | 10 | 2 | 20 | 50 | 60 }
Rejects S1 setup attempts with an eNodeB after 1, 2, 10, 20, 50 or 60 seconds.

This keyword option will be available only if a valid license is installed.

service-request
Rejects all service requests.

This keyword option will be available only if a valid license is installed.

tau-request
Rejects all Tracking Area Update requests.

[ lapi ] [ apn-based ]
These keyword options are available only if a valid license is installed.

When a congestion action profile is configured with the `reject <call-event> lapi` option, only requests with Low Access Priority Indication (LAPI) will be rejected for those call-events during congestion. However, if the call-event is configured without the `lapi` option, all LAPI and non-LAPI requests will be rejected.

If the congestion action profile is configured with the `reject <call-event> apn-based` option, only the requests for those APNs configured for congestion control in the Operator Policy will be rejected for those call-events.
during congestion. However, if the call-event is configured without the \texttt{apn-based} option, all requests will be rejected. Refer to the \texttt{apn network-identifier} command in the \textit{Operator Policy Configuration Mode} chapter to enable congestion control for a specific APN.

If the congestion action profile is configured with both the \texttt{lapi} and \texttt{apn-based} options, the call-event will be rejected only if both conditions are matched.

\textbf{Usage Guidelines}

Creates a congestion action profile that rejects a specified request when a congestion threshold is reached.

Some keyword options are available only if a valid license is installed. For more information, contact your Cisco account representative.

\textbf{Example}

The following command rejects Tracking Area Update (TAU) requests when a congestion threshold has been reached:

\texttt{reject tau-request}

The following command rejects Additional PDN Context connection requests when a congestion threshold has been reached. Only those APNs specified for APN-based congestion in the Operator Policy configuration mode will be rejected. Note that APN-based congestion control functionality supports APN remapping via the APN Remap Table Configuration Mode. The APN to which it is remapped will be checked for the congestion-control configuration.

\texttt{reject addn-pdn-connects apn-based}

\textbf{report-overload}

Enables the MME to report overload conditions to eNodeBs to alleviate congestion scenarios.

\textbf{Usage Guidelines}

Enables the MME to report overload conditions to eNodeBs to alleviate congestion scenarios.

\textbf{Product}

MME

ePDG

\textbf{Privilege}

Administrator

\textbf{Command Modes}

Exec > Global Configuration > LTE Policy Configuration > Congestion Action Profile Configuration

\texttt{configure > lte-policy > congestion-action-profile \textit{profile_name}}

Entering the above command sequence results in the following prompt:

\texttt{[local]\textit{host_name}(congestion-action-profile)#}

\textbf{Syntax Description}

\begin{verbatim}
report-overload \{ permit-emergency-sessions-and-mobile-terminated-services |
                 permit-high-priority-sessions-and-mobile-terminated-services |
                 reject-delay-tolerant-access | reject-new-sessions |
                 reject-non-emergency-sessions \} enodeb-percentage \textit{percent}
\end{verbatim}

\begin{verbatim}
[no] report-overload
\end{verbatim}

\texttt{no}

Removes the 'report-overload' action from this congestion action profile.
permit-emergency-sessions-and-mobile-terminated-services
Speifies in the overload message to the eNodeB that only emergency sessions are allowed to access the MME during the overload period.

permit-high-priority-sessions-and-mobile-terminated-services
Speifies in the overload message to the eNodeB that only high-priority sessions and mobile-terminated services are allowed to access the MME during the overload period.

reject-delay-tolerant-access
Speifies in the overload message to the eNodeB that delay-tolerant access destined for the MME will be rejected during the overload period.

reject-new-sessions
Speifies in the overload message to the eNodeB that all new connection requests destined for the MME will be rejected during the overload period.

reject-non-emergency-sessions
Speifies in the overload message to the eNodeB that all non-emergency sessions will be rejected during the overload period.

enobeb-percentage percentage
Configures the percentage of known eNodeBs that will receive the overload report. 
percentage must be an integer from 1 through 100.

Usage Guidelines
Configures the MME to invoke the S1 overload procedure (using the S1AP OVERLOAD START message) to report overload conditions to the specified proportion of eNodeBs to which this MME has an S1 interface connection. The MME selects the eNodeBs at random, such that two overloaded MMEs in the same pool do not send overload messages to the same eNodeBs. When the MME has recovered and can increase its load, the it sends an OVERLOAD STOP message to the eNodeBs.

Important
The 'report-overload' option must be configured before the threshold is exceeded in order for the action to take place.

Example
The following command configures the MME to report an overload condition to 50% of all known eNodeBs and to request the eNodeBs to reject all non-emergency sessions to this MME until the overload condition is cleared:

report-overload reject-non-emergency-sessions enodeb-percentage 50
report-overload
CHAPTER 13

Connected Apps Configuration Mode Commands

The Connected Apps (CA) Configuration Mode is used to define CA client session parameters and High Availability (HA) settings for ASR 9000 VSMs supporting wsg-service virtual machines (VMs).

Important
The StarOS commands described in this chapter are only supported for VPC running within a VM on the ASR 9000 VSM.

Command Modes

Exec > Global Configuration > Connected Apps Configuration

configure > connectedapps

Entering the above command sequence results in the following prompt:

 contextual_name host_name(config-connectedapps)##

- activate, on page 299
- ca-certificate-name, on page 300
- end, on page 301
- exit, on page 301
- ha-chassis-mode, on page 301
- ha-network-mode, on page 302
- rri-mode, on page 303
- sess-ip-address, on page 304
- sess-name, on page 304
- sess-passwd, on page 305
- sess-userid, on page 306

activate

Initiates a ConnectedApps (CA) client session with the IOS-XR server on the ASR 9000.

Product
SecGW (WSG)

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Connected Apps Configuration
configure > connectedapps

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

### Syntax Description

- **activate**
- **no activate**

**no**

Disconnects an established CA session.

### Usage Guidelines

Use this command to establish or disconnect a ConnectedApps (CA) client session with the IOS-XR server on the ASR 9000. CA client session parameters must have been previously entered for this command to work.

### Example

The following command establishes a CA client session:

```
activate
```

---

### ca-certificate-name

Configures a ConnectedApps (CA) client session with the IOS-XR server using TLS (Transport Layer Security) and CA (Certification Authority) certificate. This is an IOS-XR 5.2.0 requirement.

#### Product

SecGW (WSG)

#### Privilege

Security Administrator, Administrator

#### Command Modes

- Exec > Global Configuration > Connected Apps Configuration
- `configure > connectedapps`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

#### Syntax Description

- **ca-certificate-name** `cert_name`

**cert_name**

Specifies a CA certificate name as an alphanumeric string of 1 through 125 characters.

#### Usage Guidelines

Use this command to configure a ConnectedApps client session with the IOS-XR server using TLS (Transport Layer Security) and a specified CA certificate.

#### Example

The following command configures a ConnectedApps session using a CA certificate named `ux1345perm`:

```
ca-certificate-name ux1345perm
```
ca-certificate-name ux1345perm

end

Exits the current configuration mode and returns to the Exec mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Syntax Description

end

Usage Guidelines

Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Syntax Description

exit

Usage Guidelines

Use this command to return to the parent configuration mode.

ha-chassis-mode

Sets the High Availability (HA) mode for wsg-service virtual machines on VSMs in an ASR 9000.

<table>
<thead>
<tr>
<th>Product</th>
<th>SecGW (WSG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Command Modes

Configure > Global Configuration > Connected Apps Configuration

configure > connectedapps

Entering the above command sequence results in the following prompt:

{context_name|host_name(config-connectedapps)#

Syntax Description

ha-chassis-mode { inter | intra | standalone }

no ha-chassis-mode

no

Disables the current HA chassis mode
{ inter | intra | standalone }

Specifies the type of chassis mode as:

- **inter** – HA is established between VSMs in two ASR 9000 chassis.
- **intra** – HA is established between VSMs in a single ASR 9000 chassis.
- **standalone** – This is a standalone card; HA cannot be enabled.

**Usage Guidelines**

Use this command to set or disable HA for VSMs within or across ASR 9000 chassis. To complete HA configuration you must also set its network mode.

**Example**

The following command sets HA mode between two ASR 9000 chassis:

```bash
ha-chassis-mode inter
```

### ha-network-mode

Sets the network mode for High Availability (HA) network configuration between VSMs in ASR 9000 chassis.

**Product**

SecGW (WSG)

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Connected Apps Configuration

```
configure > connectedapps
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

**Syntax Description**

```bash
ha-network mode { L2 | L3 | NA }
no ha-network mode
```

- **no**
  Deletes the current setting for HA network mode.

  ```bash
  { L2 | L3 | NA }
  ```

  Specifies the desired HA network mode as:

  - **L2** – Layer 2
  - **L3** – Layer 3
  - **NA** – Not Applicable (standalone VSM)

**Usage Guidelines**

Use this command to set the network mode for the HA network configuration between VSMs in ASR 9000 chassis.
**Example**
The following command sets the HA network mode to Layer 2:

```
ha-network-mode L2
```

---

### rri-mode

Configures Reverse Route Injection (RRI) mode. (VPC-VSM only)

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>SecGW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privilege</strong></td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Connected Apps Configuration

```
configure > connectedapps
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

**Syntax Description**

```
rri-mode { both | none | ras | s2s }
no rri-mode
```

- **no**
  
  Disables the current RRI mode setting.

- **both**
  
  Support RAS and S2S modes.

- **none**
  
  Support neither RAS nor S2S mode.

- **ras**
  
  Support Remote Access Service mode only.

- **s2s**
  
  Support Site-to-Site mode only.

**Usage Guidelines**

Use this command to set the RRI mode.

**Example**
The following command sets the RRI mode to RAS.

```
rri-mode ras
```
### sess-ip-address

Sets the IP address for a Connected Apps (CA) session.

**Product**
SecGW (WSG)

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Connected Apps Configuration

```
configure > connectedapps
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

**Syntax Description**

- **sess-ip-address**
  - `ip_address`
  - `no sess-ip-address`

- **no**
  - Deletes the current CA session IP address.

- **ip_address**
  - Specifies the IP address in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**Usage Guidelines**
Use this command to set the IP address for a Connected Apps (CA) session.

**Example**

The following command sets an IPv4 address for a CA session.

```
sess-ip-address 10.10.1.1
```

### sess-name

Sets the name for a CA session.

**Product**
SecGW (WSG)

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Connected Apps Configuration

```
configure > connectedapps
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)#
```

**Syntax Description**

- **sess-name**
  - `name`
  - `no sess-name`

- **no**
  - Deletes the current CA session name.

- **name**
  - Specifies the name for a CA session.

**Usage Guidelines**
Use this command to set the name for a Connected Apps (CA) session.

**Example**

The following command sets a name for a CA session.

```
sess-name mySession
```
**Syntax Description**

```
sess-name session_name
no sess-name
```

Deletesthecurrent CA session name.

```
session_name
```

Specifies the CA session name as an alphanumeric string of 1 through 125 characters.

Usage Guidelines

Use this command to set the name for a CA client session.

**Example**

The following command sets the CA session name to `vsm0-1`:

```
sess-name vsm0-1
```

**(sess-passwd**

Sets a password for a CA session.

**Product**

SecGW (WSG)

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > connectedapps
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-connectedapps)>
```

**Syntax Description**

```
sess-passwd { encrypted | password } password
no sess-passwd
```

Deletesthe current CA session password.

```
encrypted
```

This keyword is only used by StarOS when you save the configuration file. StarOS displays the encrypted keyword in the configuration file as a flag indicating that the variable following the keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

```
password
```

Specifies that the password will appear in plain text in the configuration file.
password

Specifies the password as an alphanumeric string of 1 through 63 characters that is case sensitive.

Usage Guidelines

Use this password to set a password for a CA session.

Example

The following command sets a plain text password for a CA session:

```
(sess-passwd password admin012
```


defines a user identifier (username) for the CA session.

**Usage Guidelines**

Use this command to define a user identifier (username) for the CA session.

**Example**

The following command sets the user identifier to vsm-admin02:

```
(sess-userid vsm-admin02
```
Content Filtering Policy Configuration Mode Commands

The Content Filtering Policy Configuration Mode allows you to configure analysis and action when Content Filtering (CF) matches a Content Filtering Category Policy Identifier.

**Command Modes**

Exec > ACS Configuration > CFP Configuration

```
active-charging service service_name > content-filtering category policy-id cf_policy_id
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-acs-content-filtering-policy) #
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- analyze, on page 307
- discarded-flow-content-id, on page 312
- end, on page 313
- exit, on page 313
- failure-action, on page 313
- timeout action, on page 315

**analyze**

Specifies the action to take for the indicated result after content filtering analysis.

**Product**

CF

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > CFP Configuration

```
active-charging service service_name > content-filtering category policy-id cf_policy_id
```

Entering the above command sequence results in the following prompt:
Syntax Description

In 12.2 and later releases:

```
analyze priority priority { all | category category | x-category string } 
action { allow | content-insert content_string | discard | redirect-url url 
| terminate-flow | www-reply-code-and-terminate-flow reply_code } 
[ reporting-edr reporting_edr_format_name ] 
no analyze priority priority
```

In 12.1 and earlier releases:

```
analyze priority priority { all | category category | x-category string } 
action { allow | content-insert content_string | discard | redirect-url url 
| terminate-flow | www-reply-code-and-terminate-flow reply_code } 
[ edr edr_format_name ] 
no analyze priority priority
```

no

Removes the specified analyze priority configuration.

**priority priority**

Specifies the precedence of a category in the content filtering policy.

*priority* must be an integer from 1 to 65535 that is unique in the content filtering policy.

**all**

Specifies the default action to take if the category returned after rating is not configured in the subscriber's content filtering policy. This has the lowest priority.

**category category**

Specifies the category.

*category* must be one of the following.

- ABOR
- ADULT
- ADVERT
- ANON
- ART
- AUTO
- BACKUP
- BLACK
- BLOG
- BUSI
• CAR
• CDN
• CHAT
• CMC
• CRIME
• CULT
• DRUG
• DYNAM
• EDU
• ENERGY
• ENT
• FIN
• FORUM
• GAMB
• GAME
• GLAM
• GOVERN
• HACK
• HATE
• HEALTH
• HOBBY
• HOSTS
• KIDS
• LEGAL
• LIFES
• MAIL
• MIL
• NEWS
• OCCULT
• PEER
• PERS
• PHOTO
Content can simultaneously match multiple categories, therefore specific priority must be used for required evaluation precedence.

**x-category string**

This keyword can be used to configure runtime categories not present in the CLI.

*string* specifies the unclassified category to be rated, and must be an alphanumeric string of 1 through 6 characters.

A maximum of 10 x-categories can be configured.

**action { allow | content-insert *content_string* | discard | redirect-url *url* | terminate-flow | www-reply-code-and-terminate-flow *reply_code* }**

Specifies the action to take for the indicated result of content filtering analysis.
allow: With static content filtering, this option allows the request for content. In dynamic content filtering it allows the content itself.

content-insert content_string: Specifies the content string to be inserted in place of the message returned from prohibited/restricted site or content server.

For static content filtering, content_string is used to create a response to the subscriber's attempt to get content. In dynamic content filtering, it is used to replace the content returned by a server.

content_string must be an alphanumeric string of 1 through 1023 characters.

discard: For static content filtering, this option discards the packet(s) that requested. In dynamic content filtering, it discards the packet(s) that contain(s) the content.

redirect-url url: Redirects the subscriber to the specified URL.

url must be an alphanumeric string of 1 through 1023 characters in the http://search.com/subtarg=#HTTP.URL# format.

terminate-flow: Terminates the TCP connection gracefully between the subscriber and server, and sends a TCP FIN to the subscriber and a TCP RST to the server.

www-reply-code-and-terminate-flow reply_code: Terminates the flow with the specified reply code.

reply_code must be a reply code that is an integer from 100 through 599.

---

Important

Static-and-Dynamic Content Filtering is only supported in 9.0 and later releases.

edr edr_format_name

Important

This option is available only in 12.1 and earlier releases. In 12.2 and later releases, it is deprecated and replaced by the reporting-edr option.

Generates separate EDRs for content filtering based on action and content category using a specified EDR file format name.

edr_format_name is the name of a pre-defined EDR file format name in the EDR Format Configuration Mode, and must be an alphanumeric string of 1 through 63 characters.

Important

EDRs generated through this keyword are different from charging EDRs generated for subscriber accounting and billing. For more information on generation of charging EDRs, refer to the ACS Rulebase Configuration Mode Commands chapter.

reporting-edr reporting_edr_format_name

Important

This option is available only in 12.2 and later releases.
Generates separate reporting EDRs for Content Filtering based on the action and content category using the specified EDR file format name.

`reporting_edr_format_name` must be an alphanumeric string of 1 through 63 characters.

**Usage Guidelines**

Use this command to specify the action and priorities for the indicated result of content filtering analysis. Up to 64 priorities and actions can be entered with this command.

**Example**

The following command sets priority 10 for category `ADULT` with action as `terminate-flow`:

```
analyze priority 10 category ADULT action terminate-flow
```

## discarded-flow-content-id

Accounts for packets discarded as a result of content filtering action.

**Product**

CF

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > ACS Configuration > CFP Configuration`

```
active-charging service service_name > content-filtering category policy-id cf_policy_id
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-acs-content-filtering-policy)#
```

**Syntax Description**

```
discarded-flow-content-id content_id
no discarded-flow-content-id
```

`content_id`

Specifies the content ID for discarded flows as an integer from 1 through 65535.

**Usage Guidelines**

Use this command in the configuration to account for packets discarded as a result of CF action.

A flow end-condition EDR would be generated as a charging EDR for content-filtered packets. No billing EDRs (even with flow-end) would be generated for a discarded packet as the flow will not end. Dual EDRs would exist for customers who want to use "flow end" to get EDRs for charging, plus CF-specific EDRs. The second EDR for charging comes from the `flow end-condition content-filtering` configuration in the Rulebase Configuration Mode.

The `discarded-flow-content-id` configuration can be used for accumulating statistics for UDR generation in case CF discards the packets. These statistics for UDR generation (based on the CF content ID) would also be accumulated in case of ACS error scenarios where the packets are discarded but the flow does not end.

If, in the Rulebase Configuration Mode, the `content-filtering flow-any-error` configuration is set to `deny`, then all the denied packets will be accounted for by the `discarded-flow-content-id` config. That is, the `content_id` will be used to generate UDRs for the denied packets in case of content filtering.
Example
Use the following command to set the accumulation of statistics for UDR generation based on the CF content ID 1003:

```
discarded-flow-content-id 1003
```

end

Exits the current configuration mode and returns to the Exec mode.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
discarded-flow-content-id

Usage Guidelines
Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
exit

Usage Guidelines
Use this command to return to the parent configuration mode.

failure-action

Specifies the failure action when the content filtering analysis results are not available to analyze.

Product
CF

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > CFP Configuration

```
active-charging service service_name > content-filtering category policy-id cf_policy_id
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-acs-content-filtering-policy)#
```
Syntax Description

failure-action { allow | content-insert content_string | discard | redirect-url url | terminate-flow | www-reply-code-and-terminate-flow reply_code } [ edr edr_format_name ]
default failure-action [ edr edr_format_name ]

default

Configures the default setting to terminate the flow.

allow

In static content filtering, this option allows the request for content. In dynamic content filtering it allows the content itself.

Important

Static-and-Dynamic Content Filtering is only supported in 9.0 and later releases.

content-insertion content_string

Specifies the content string to be inserted in place of the message returned from the content server due to connection timeout or when no category policy ID is available for the content.

For content filtering, the content_string is used to create a response to the subscriber's attempt to get content. In dynamic content filtering it replaces the content returned by a server.

content_string is an alphanumeric string of 1 through 1023 characters.

Important

Static-and-Dynamic Content Filtering is only supported in 9.0 and later releases.

discard

In static content filtering, specifies discarding the packet(s) that requested. In dynamic content filtering it discards the packet(s) that contain the content.

Important

Static-and-Dynamic Content Filtering is only supported in 9.0 and later releases.

redirect-url url

Redirects the subscriber to the specified URL.

url must be an alphanumeric string of 1 through 1023 characters, in the following format:
http://search.com/subtarg=#HTTP.URL#

terminate-flow

Terminates the TCP connection gracefully between the subscriber and external server and sends a TCP FIN to the subscriber and a TCP RST to the server. This is the default behavior.
**www-reply-code-and-terminate-flow reply_code**

Sets action as terminate-flow with a reply code that is a 3-digit integer from 100 through 599.

**edr edr_format_name**

Specifies the name of a pre-defined EDR format to be generated on the content filtering action as an alphanumeric string of 1 through 63 characters.

**Usage Guidelines**

Use this command to set the failure action to take when no content filtering analysis result is available to analyze for analyze priority priority category category_string command.

**Example**

The following command sets the failure action as discard:

```
failure-action discard
```

**timeout action**

This command has been deprecated, and is replaced by the command.
timeout action
CHAPTER 15

Content Filtering Server Group Configuration Mode Commands

Content Filtering Server Group Configuration Mode sets the parameters for interoperating with a group of external servers. It is accessed by entering the `content-filtering server-group` command in the Context Configuration Mode.

**Command Modes**

Exec > Global Configuration > Context Configuration > CFSG Configuration

`configure > context context_name > content-filtering server-group server_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-content-filtering)#`

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- connection retry-timeout, on page 317
- deny-response code, on page 318
- dictionary, on page 319
- end, on page 320
- exit, on page 321
- failure-action, on page 321
- header extension options, on page 323
- icap server, on page 324
- origin address, on page 326
- response-timeout, on page 326
- timeout action, on page 327
- url-extraction, on page 327

**connection retry-timeout**

Configures the TCP connection retry timer for Internet Content Adaptation Protocol (ICAP) server and client.
deny-response code

Configures the deny response message that is to be sent from the ICAP server to the subscribers.

**Product**
ICAP

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CFSG Configuration
configure > context context_name > content-filtering server-group server_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-content-filtering)#
```

**Syntax Description**

deny-response code { 200 message string | 403 }
{ default | no } deny-response code

Example

The following command sets the ICAP client and server connection retry timer to 120 seconds:

```bash
connection retry-timeout 120
```
default
Configures the default setting of deny-response code 200.

no
Removes previously configured deny response message setting.

deny-response code 200 message string
Specifies a text message that is to be returned to the subscriber in a code 200 deny response. as an alphanumeric string of 1 through 511 characters.
If deny-response code 200 is configured, the response sent to the subscriber will be of the form 200 OK with deny messages denied. If a message is configured for response code 200, that message will be used instead of "Access denied".

deny-response code 403
This keyword is used to set response code 403 for the deny response message.
When this keyword is configured, the deny response from the ICAP server will be sent "as is" to the subscriber.

Usage Guidelines
Use this command to define a text message that is returned to the subscriber in a deny response.

Example
The following command sets the text message to Not allowed in a deny response message:

deny-response code 200 message Not allowed

dictionary
Specifies the dictionary to use for requests to the server(s) in this Content Filtering Server Group (CFSG).

Product
CF

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > CFSG Configuration
configure > context context_name > content-filtering server-group server_name

Syntax Description
dictionary { custom1 | custom2 | custom3 | custom4 | standard }
{ default | no } dictionary

default
Sets the default dictionary.
Default: **default**

**no**

Removes the previously configured dictionary setting.

**custom1**

Specifies a custom-defined dictionary that conforms to TS 32.015 v 3.6.0 for R99. It provides proprietary header fields for MSISDN and APN/subscriber. Please contact your local Cisco representative for more information.

**custom2**

Custom-defined dictionary. Please contact your local Cisco representative for additional information.

**custom3**

Custom-defined dictionary. Please contact your local Cisco representative for additional information.

**custom4**

Specifies a custom-defined dictionary that conforms to RFC 3507. Please contact your local Cisco representative for additional information.

**standard**

Default: Enabled

This dictionary uses an HTTP Get Request to specify the URL. It conforms to TS 32.215 v 4.6.0 for R4 (and also R5 - extended QoS format).

Usage Guidelines

Use this command to specify the standard and customized encoding mechanism used for elements included messages.

**Example**

The following command configures the system to use standard dictionary to encode messages:

```plaintext
default dictionary
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**end**
**Usage Guidelines**
Use this command to return to the Exec mode.

**exit**
Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`exit`

**Usage Guidelines**
Use this command to return to the parent configuration mode.

---

**failure-action**
Specifies the actions to be taken when communication between ICAP endpoints within this Content Filtering Server Group (CFSG) fail.

**Product**
CF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CFSG Configuration
`configure > context context_name > content-filtering server-group server_name`

Entering the above command sequence results in the following prompt:
`
[context_name]host_name(config-content-filtering)#
`

**Syntax Description**
`failure-action { allow | content-insertion content_string | discard | redirect-url url | terminate-flow }
{ default | no } failure-action`

**default**
Configures the default setting of `terminate-flow`.

**no**
Removes previously configured failure action.

**allow**
For static content filtering, this option allows the request for content. In dynamic content filtering, it allows the content itself.

**content-insertion content_string**
Specifies the content string to be used for failure action.
For static content filtering, the specified text is used to create a response to the subscriber's attempt to get content. In dynamic content filtering, the specified text replaces the content returned by a server.

*content_string* must be an alphanumeric string of 1 through 128 characters.

**discard**

For static content filtering, this option discards the packet(s) requested. In dynamic content filtering, it discards the packet(s) that contain(s) the content.

**redirect-url url**

 Redirects the subscriber to the specified URL.

url must be an alphanumeric string of 1 through 128 characters in the following format:

http://search.com/subtarg=#HTTP.URL#

**terminate-flow**

For TCP, gracefully terminates the connection between the subscriber and external server, and sends a TCP FIN to the subscriber and a TCP RST to the server.

For WAP-Connection Oriented, the WSP session is gracefully terminated by sending WTP Aborts for each of the outstanding requests, and WSP Disconnect to the client and the server. For WSP-Connectionless, only the current WSP request is rejected.

---

**Usage Guidelines**

Use this command to set the actions on failure for server connection.

ICAP rating is enabled for retransmitted packets when the default ICAP failure action was taken on an ICAP request for that flow. ICAP default failure action is taken on the pending ICAP request for a connection when the connection needs to be reset and there is no other redundant connection available. For example, in the ICAP request timeout and ICAP connection timeout scenarios, the retransmitted packet in the uplink direction is sent for ICAP rating again.

For WAP CO, uplink retransmitted packets for the WAP transactions for which ICAP failure action was taken will be sent for ICAP rating. The WSP header of the retransmitted packet is not parsed by the WSP analyzer. The URL received in the previous packet for that transaction is used for ICAP rating. If failure action was taken on multiple WTP transactions for the same flow (case: WTP concatenated GET request), the uplink retransmitted packet for each of the transactions is sent for rating again.

For HTTP, uplink retransmitted packets for the HTTP flow on which ICAP failure action is taken are sent for ICAP rating. The URL present in the current secondary session (last uplink request) is used for ICAP rating. However, if there were multiple outstanding ICAP requests for the same flow (pipelined request), the retransmitted packet for the URL sent for rating will be that of the last GET request.

Retransmission in various cases of failure-action taken on retransmitted packets when the ICAP response is not received for the original request and the retransmitted request comes in:

- **WSP CO:**
  - Permit: The uplink packet is sent for ICAP rating and depending on the ICAP response the WTP transaction is allowed/blocked. It is possible that the WAP gateway sends the response for the permitted GET request. Hence, there is a race condition and the subscriber may be able to view the web page even though the rating was redirect or content insert.
  - Content Insert: The retransmitted packet is not sent for ICAP rating.
• Redirect: The retransmitted packet is not sent for ICAP rating.

• Discard: The uplink packet is sent for ICAP rating and depending on the ICAP response the WTP transaction is allowed/blocked.

• Terminate flow: The uplink packet is sent for ICAP rating and depending on the ICAP response the WTP transaction is allowed or blocked. The WAP gateway may send an Abort transaction for this GET request if the WSP disconnect packet sent while terminating the flow is received by the WAP gateway.

• HTTP:

• Permit: The uplink packet is sent for ICAP rating and depending on the ICAP response the last HTTP GET request. It is possible that the HTTP server sends the response for the permitted GET request. Hence there is a race condition and the subscriber may be able to view the web page even thought the rating was redirect or content insert.

• Content Insert: Retransmitted packets are dropped and not charged.

• Redirect: Retransmitted packets are dropped and not charged.

• Discard: The uplink packet is sent for ICAP rating and depending on the ICAP response the WTP transaction allowed/blocked.

• Terminate flow: Retransmitted packets will be dropped and not charged.

**Example**

The following command sets the failure action to terminate:

```
failure-action terminate-flow
```

**header extension options**

Configures the extension options for the ICAP header in the ICAP request message.

<table>
<thead>
<tr>
<th>Product</th>
<th>CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration &gt; CFSG Configuration</td>
</tr>
</tbody>
</table>

configure > context context_name > content-filtering server-group server_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-content-filtering)#
```

**Syntax Description**

```
header extension options { cipa-category cipa_category_name | subscriber-number subscriber_num_string }
no header extension options
```
When configured, CIPA category and subscriber number will not be inserted in the ICAP request message to ICAP server. The values are string names present in the ICAP request message.

**cipa-category cipa_category_name**

Specifies the CIPA category in the ICAP Request message.

*cipa_category_name* must be an alphanumeric string of 1 through 31 characters.

**subscriber-number subscriber_num_string**

Specifies the subscriber number in the ICAP Request message.

*subscriber_num_string* must be an alphanumeric string of 1 through 31 characters.

**Usage Guidelines**

Use this command to configure header extension options in the ICAP request header - CIPA category and Subscriber number.

**Example**

The following command configures the ICAP header with CIPA category *x-icap-cipa-category*:

```
header extension options cipa-category x-icap-cipa-category
```

**icap server**

Adds an Internet Content Adaptation Protocol (ICAP) server configuration to the current Content Filtering Server Group (CFSG).

**Important**

In 8.1 and later releases, a maximum of five ICAP servers can be configured per Content Filtering Server Group. In 8.0 and earlier releases, only one ICAP Server can be configured per Content Filtering Server Group.

**Product**

CF

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > CFSG Configuration

```
configure > context context_name > content-filtering server-group server_name
```

Entering the above command sequence results in the following prompt:

```
(config-content-filtering)#
```

**Syntax Description**

```
icap server ip_address [ port port_number ] [ max messages ] [ priority priority ] [ standby ]
no icap server ip_address [ port port_number ] [ priority priority ] [ standby ]
```
**no**
Removes the specified ICAP server configuration from the current Content Filtering Server Group.

**ip_address**
Specifies the ICAP server's IP address in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**port port_number**
Specifies the ICAP server's port number to use for communications as an integer from 1 to 65535. Default: 1344

**max messages**
Specifies the maximum number of unanswered outstanding messages that may be allowed to the ICAP server as an integer from 1 to 4096. Default: 256

---

**Important**
The maximum outstanding requests per ICAP connection is limited to one. Therefore the value configured using the `max` keyword will be ignored.

**priority priority**
Specifies priority of the ICAP server in the current Content Filtering Server Group. The priority is used in server selection to determine which standby server becomes active. `priority` must be an integer from 1 (highest priority) to 65535 (lowest priority). Default: 1

---

**Important**
The `priority` keyword is only available in 8.1 and later releases.

**standby**
Configures the ICAP server as standby. A maximum of ten active and standby servers per group can be configured.

**Usage Guidelines**
This command is used to add an ICAP server configuration to a Content Filtering Server Group with which the system is to communicate for content filtering communication.

In 8.0, the ICAP solution supports only one connection between ACS Manager and ICAP server.

In 8.1, multiple ICAP server connections are supported per manager. At any time only one connection is active with the other connections acting as standby. In case of a connection failure, based on its priority, a standby connection becomes active. Any pending ICAP requests are moved to the new active connection. If a standby connection is unavailable, failure action is taken on all pending ICAP requests. See the command.

In 8.1 and later releases, a maximum of five ICAP servers can be configured per Content Filtering Server Group with a priority associated with each server. Once configured, an ICAP server's priority cannot be changed. To change a server's priority, the server configuration must be removed, and added with the new priority.

In release 16.0, a maximum of ten active and standby servers per group can be configured.
Example
The following command sets the ICAP server IP address to 10.2.3.4 and port to 1024:

```
icap server 10.2.3.4 port 1024
```

The following command specifies an ICAP server with IP address 10.6.7.8, port number 1024, and priority 3:

```
icap server 10.6.7.8 port 1024 priority 3
```

origin address

Specifies a bind address for the Content Filtering Server Group (CFSG) endpoint.

**Product**
CF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CFSG Configuration

```
configure > context context_name > content-filtering server-group server_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-content-filtering)#
```

**Syntax Description**

```
origin address ip_address
no origin address
```

**no**
Disables/releases the binding address for the CFSG endpoint.

**ip_address**
Specifies the IP address to bind the CFSG endpoint in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**Usage Guidelines**
Use this command to set the bind address for the CFSG endpoint.

**Example**
The following command sets the origin address of 10.1.1.1:

```
origin address 10.1.1.1
```

response-timeout

Sets the response timeout for the ICAP connection between the ICAP server and client.
Content Filtering Server Group Configuration Mode Commands

**Product**
CF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CFSG Configuration

configure > context context_name > content-filtering server-group server_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-content-filtering)#

**Syntax Description**

response-timeout duration

{ default | no } response-timeout

default
Configures the default setting of 30 seconds.

no
Removes the response timeout configuration.

duration
Specifies the timeout duration (in seconds) as an integer from 1 to 300. Default: 30

**Usage Guidelines**

Use this command to set the ICAP connection response timeout, after which connection will be marked as unsuccessful between ICAP endpoint.

**Example**
The following command sets the ICAP connection response timeout to 100 seconds:

response-timeout 100

**timeout action**

This command has been deprecated, and is replaced by the failure-action, on page 321 command.

**url-extraction**

Enables configuration of ICAP URL extraction behavior.

**Product**
CF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > CFSG Configuration

configure > context context_name > content-filtering server-group server_name
Entering the above command sequence results in the following prompt:

```
{context_name}host_name(config-content-filtering)#
```

### Syntax Description

```
url-extraction { after-parsing | raw }
default url-extraction
```

- **default**
  
  Configures the default setting of **after-parsing**.

- **after-parsing**
  
  Specifies sending the parsed URI and host name. Percent-encoded hex characters in URLs sent from the ACF client to the ICAP server will be converted to corresponding ASCII characters before being sent.

  For example, the URL: `http://www.google.co.uk/?this%20is%20a%20test` will be sent to the ICAP server as: `http://www.google.co.uk/?this is a test`

- **raw**
  
  Specifies sending raw URI and host name. The URLs will contain percent-encoded hex characters "as is".

  For example, the URL `http://www.google.co.uk/?this%20is%20a%20test` will be sent to the ICAP server as: `http://www.google.co.uk/?this%20is%20a%20test`

---

**Important**

The raw URL configuration asserts that there are no changes in the URL before sending the request to ICAP. However, if there are spaces in the original URI then the same is forwarded to ICAP.

---

**Usage Guidelines**

Use this command to configure the ICAP URL extraction behavior. Percent-encoded hex characters—for example, space (%20) and the percent character (%25)—in URLs sent from the ACF client to the ICAP server can be sent either as percent-encoded hex characters or as their corresponding ASCII characters.

---

**Example**

The following command configures URLs sent from the ACF client to the ICAP server to contain the escape encoding as is:

```
url-extraction raw
```
CHAPTER 16

Context Configuration Mode Commands A-D

Command Modes

This section includes the commands **aaa accounting** through **domain service**.

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- aaa accounting, on page 330
- aaa authentication, on page 332
- aaa constructed-nai, on page 333
- aaa filter-id rulebase mapping, on page 335
- aaa group, on page 336
- aaa nai-policy, on page 337
- aaa tacacs+, on page 338
- access-list undefined, on page 339
- administrator, on page 339
- apn, on page 342
- asn-qos-descriptor, on page 344
- asn-service-profile, on page 345
- asn-gw-service, on page 346
- asn-pc-service, on page 347
- associate, on page 349
- bfd-protocol, on page 350
- bgp extended-asn-cap, on page 350
- bmsc-profile, on page 351
- busyout ip, on page 352
- busyout ipv6, on page 354
- cae-group, on page 355
- camel-service, on page 356
aaa accounting

This command enables/disables accounting for subscribers and context-level administrative users for the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
</tbody>
</table>

`configure > context context_name`
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```plaintext
aaa accounting { administrator radius-diameter | subscriber [ radius-diameter ] }
default aaa accounting { administrator | subscriber }
no aaa accounting { administrator | subscriber } [ radius-diameter ]
```

**default**

Configures the default setting.

Default: RADIUS

**no**

Disables AAA accounting per the options specified.

**radius-diameter**

Enables AAA accounting for context-level administrative users.

**subscriber**

Enables AAA accounting for subscribers.

**radius-diameter**

Enables RADIUS or Diameter accounting for subscribers.

### Usage Guidelines

Use this command to enable/disable accounting for subscribers and context-level administrative users for the current context.

To enable or disable accounting for individual local subscriber configurations refer to the `accounting-mode` command in the *Subscriber Configuration Mode Commands* chapter.

**Important**

The accounting parameters in the APN Configuration Mode take precedence over this command for subscriber sessions. Therefore, if accounting is disabled using this command but enabled within the APN configuration, accounting is performed for subscriber sessions.

### Example

The following command disables AAA accounting for context-level administrative users:

```
no aaa accounting administrator
```

The following command enables AAA accounting for context-level administrative users:

```
aaa accounting administrator radius-diameter
```
aaa authentication

This command enables/disables authentication for subscribers and context-level administrative users for the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```plaintext
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```plaintext
[ no ] aaa authentication { administrator | subscriber } { local | none | radius-diameter }
```

**default aaa authentication { administrator | subscriber }**

Configure the default setting for the specified parameter.

- **administrator**: local+RADIUS
- **subscriber**: RADIUS

**no**

Disables AAA authentication for administrator(s)/subscribers as specified.

- **local**: Disables local authentication for current context.
- **none**: Disables NULL authentication for current context, which enables both local and RADIUS-based authentication.
- **radius-diameter**: Disables RADIUS or Diameter-based authentication.

**administrator | subscriber**

- **administrator**: Enables authentication for administrative users.
- **subscriber**: Enables authentication for subscribers.

**local | none | radius-diameter**

Enables AAA authentication for administrator(s)/subscribers as specified.

- **local**: Enables local authentication for the current context.
- **none**: Disables authentication for the current context.
- **radius-diameter**: Enables RADIUS or Diameter-based authentication.
Usage Guidelines

Use this command to enable/disable AAA authentication during specific maintenance activities or during test periods. The authentication can then be enabled again for the entire context as needed.

Example

The following command disables RADIUS or Diameter-based authentication for subscribers for the current context:

```plaintext
no aaa authentication subscriber radius-diameter
```

The following command enables RADIUS or Diameter-based authentication for subscribers for the current context:

```plaintext
aaa authentication subscriber radius-diameter
```

aaa constructed-nai

This command configures the password used during authentication for sessions using a Constructed Network Access Identifier (NAI) or an APN-specified user name.

**Product**

- PDSN
- GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```plaintext
aaa constructed-nai authentication [ [ encrypted ] password user_password ]
use-shared-secret-password ]
no aaa constructed-nai authentication
```

**no**

Disables authentication based upon the constructed NAI.

[ encrypted ] password user_password

encrypted: Specifies that the user password should be encrypted.

password user_password: Specifies an authentication password for the NAI-constructed user.

In 12.1 and earlier releases, the user_password must be an alphanumeric string of 0 through 63 characters with or without encryption.

In 12.2 and later releases, the user_password must be an alphanumeric string of 0 through 63 characters without encryption, or 1 through 132 characters with encryption.
**use-shared-secret-password**

Specifies using RADIUS shared secret as the password. Default: No password

**Usage Guidelines**

This command configures passwords for user sessions that utilize a constructed NAI assigned via a PDSN service or a user name assigned via the APN configuration.

For simple IP sessions facilitated by PDSN services in which the `authentication allow-noauth` and `aaa constructed-nai` commands are configured, this command provides a password used for the duration of the session.

For PDP contexts using an APN in which the outbound user name is configured with no password, this command is used to provide the password. Additionally, this command is also used to provide a password for situations in which an outbound username and password are configured and the `authentication imsi-auth` command has been specified.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the `encrypted` keyword in the configuration file as a flag that the variable following the `password` keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

If a password is configured with this keyword, then the specified password is used. Otherwise, an empty user-password attribute is sent.

Note that this configuration works in a different way for GGSN services. If a password is configured with this keyword for GGSN service, the specified password is used. Otherwise, if an outbound password is configured, that password is used. If no outbound password is configured, the RADIUS server secret is used as the user-password string to compute the user-password RADIUS attribute.

The NAI-construction consists of the subscriber's MSID, a separator character, and a domain. The domain that is used is either the domain name supplied as part of the subscriber's user name or a domain alias.

---

**Important**

The domain alias can be set with the `nai-construction domain` command in the PDSN Service Configuration mode, or the `aaa default-domain subscriber` command in the Global Configuration mode for other core network services.

The domain alias is determined according to the following rules:

- If the domain alias is set by `nai-construction domain`, that value is always used and the `aaa default-domain subscriber` value is disregarded, if set. The NAI is of the form `<msid><symbol><nai-construction domain>`.

- If the domain alias is not set by `nai-construction domain`, and the domain alias is set by `aaa default-domain subscriber`, the `aaa default-domain subscriber` value is used. The NAI is of the form `<msid><symbol><aaa default-domain subscriber>`.

- If the domain alias is not set by `nai-construction domain` or `aaa default-domain subscriber`, the domain name alias is the name of the source context for the PDSN service. The NAI is of the form `<msid><symbol><source context of PDSN Service>`.

The special separator character can be one of the following six: @, -, %, \,-, /

The subscriber's MSID is constructed in one of the formats displayed in the following figure.
Example

The following command configures the authentication password for the NAI-constructed user.

`aaa constructed-nai authentication`

**aaa filter-id rulebase mapping**

This command configures the system to use the value of the Filter-Id AVP as the ACS rulebase name.

**Product**

ACS

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name] host_name(config-ctx)#`

**Syntax Description**

`[ no | default ] aaa filter-id rulebase mapping`

- **no**
  
  Disables the mapping of Filter-Id AVP and ACS rulebase name.

- **default**
  
  Configures the default setting. Default: Disabled

**Usage Guidelines**

Use this command to enable the mapping of Filter-Id attribute's value returned during RADIUS authentication as the ACS rulebase name.

This feature provides the flexibility for operator to transact between multi-charging-service support for postpaid and prepaid subscribers through Access Control Lists (ACLs) entered in AAA profiles in RADIUS server to single-charging-service system based on rulebase configuration for postpaid and prepaid subscribers.

This feature internally maps the received ACL in to rulebase name and configures subscriber for postpaid or prepaid services accordingly.

When this feature is enabled and ACS rulebase attribute is not received from RADIUS or not configured in local default subscriber template system copies the filter-id attribute value to ACS rulebase attribute.

This copying happens only if the filter-id is configured and received from RADIUS server and ACS rulebase is not configured in ACS or not received from RADIUS.

**Example**

The following command enables the mapping value of the Filter-Id attribute to ACS rulebase name:

`aaa filter-id rulebase mapping`
aaa group

This command enables/disables the creation, configuration or deletion of AAA server groups in the context.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
classify > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
aaa group group_name [ -noconfirm ]
no aaa group group_name

no
```

Deletes the specified AAA group.

**group_name**

Specifies name of the AAA group.

If the specified AAA group does not exist, it is created, and the prompt changes to the AAA Server Group Configuration Mode, wherein the AAA group can be configured.

If the specified AAA group already exists, the prompt changes to the AAA Server Group Configuration Mode, wherein the AAA group can be configured.

`group_name` must be an alphanumeric string of 1 through 63 characters.

**-noconfirm**

Executes the command without any prompt and confirmation from the user.

**Usage Guidelines**

Use this command to create/configure/delete AAA server groups within the context.

Entering this command results in the following prompt:

```
[context_name]hostname(config-aaa-group)#
```

AAA Server Group Configuration Mode commands are defined in the **AAA Server Group Configuration Mode Commands** chapter.

**Example**
The following command enters the AAA Server Group Configuration Mode for a AAA group named `test321`:

```
aaa group test321
```
aaa nai-policy

This command sets policies on how Network Access Identifiers (NAIs) are handled during the authentication process.

**Product**
- GGSN
- PDSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```
Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
[ default | no ] aaa nai-policy reformat-alg-hex-0-9
```
  - **default**
    Sets the NAI policy back to its default setting which is to remap hexadecimal digits in NAIs and accept calls with embedded 0x00 hexadecimal digits.
  - **no**
    Disable remapping of hexadecimal digits in the NAI and reject calls that have a 0x00 hexadecimal digit embedded in the NAI.

**reformat-alg-hex-0-9**
Default: Enabled
Controls remapping of NAIs that consist only of hex digits 0x00 through 0x09 or if a 0x00 hexadecimal digit is embedded in the NAI.
By default, the system remaps NAIs that consist solely of characters 0x00 through 0x09 to their ASCII equivalent. For example; 0x00 0x01 0x2 0x03 will get remapped to 123.
Also by default the system accepts an NAI containing one or more 0x00 characters within the NAI ignoring all characters after the first 0x00.
When this keyword is disabled NAIs are processed as follows:
- Remapping of hexadecimal digits 0x00 through 0x09 within the user-provided NAI is disabled.
- When the NAI has an embedded 0x00 character anywhere within it (including if there is an extra 0x00 character at the end) the call is rejected.

**Usage Guidelines**
Use this command to disable or re-enable remapping of hexadecimal digits in the NAI.
Example
The following command disables the remapping of hexadecimal digits in the NAI:

```text
no aaa nai-policy reformat-alg-hex-0-9
```

### aaa tacacs+

Enables and disables TACACS+ AAA services for this context

#### Product
All

#### Privilege
Security Administrator, Administrator

#### Command Modes
Exec > Global Configuration > Context Configuration

```text
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx) #
```

#### Syntax Description

```
[ default | no ] aaa tacacs+
```

- **default**
  
  Enables TACACS+ services for this context.
  
- **no**
  
  Disables TACACS+ services for this context.

#### Usage Guidelines

Use this command to disable or re-enable TACACS+ AAA services for this context.

**Important**
You must first enable TACACS+ services using the Global Configuration mode `aaa tacacs+` command. This command enables TACACS+ services for all contexts. You can then use the Context Configuration mode `no aaa tacacs+` command to selectively disable TACACS+ per context.

#### Example

The following command disables TACACS+ AAA services for this context:

```text
no aaa tacacs+
```
access-list undefined

Configures the behavior of access control for the current context when an undefined access control list is specified.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
access-list undefined \{ deny-all \| permit-all \} \{ default \| no \} access-list undefined

default
Configures the default setting.

no
Disables handling undefined access lists.

deny-all
Specifies to drop all packets when an undefined ACL is specified.

permit-all
Specifies to forward all packets when an undefined ACL is specified.

**Usage Guidelines**
Use this command to specify the default behavior when an ACL specified does not exist.
When the security policies require strict access control the deny-all handling should be configured.

**Example**
The following command sets the packet handling to ignore (drop) all packets when an undefined ACL is specified.

```
access-list undefined deny-all
```

administrator

Configures a user with Security Administrator privileges in the current context.
Product: All
Privilege: Security Administrator
Command Modes: Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description:

`administrator user_name [ encrypted ] [ nopassword ] password password | [ ecs ] [ expiry-date date_time ] [ ftp [ sftp-server sftp_name ] ] [ li-administration ] [ nocli ] [ noconsole ] [ noecs ] [ timeout-absolute timeout_absolute ] [ timeout-min-absolute timeout_min_absolute ] [ timeout-idle timeout_idle ] [ timeout-min-idle timeout_min_idle ]`

`no administrator user_name`

`no`

Removes Security Administrator privileges for the specified user name.

`user_name`

Specifies the username for which Security Administrator privileges must be enabled in the current context. `user_name` must be an alphanumeric string of 1 through 32 characters.

`[ encrypted ] password password`

Specifies password for the user name. Optionally, the `encrypted` keyword can be used to specify the password uses encryption.

`password` must be an alphanumeric string of 1 through 63 characters without encryption, and 1 through 132 characters with encryption.

The `encrypted` keyword is intended only for use by the system while saving configuration scripts. The system displays the `encrypted` keyword in the configuration file as a flag that the variable following the `password` keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

`[ nopassword ]`

This option allows you to create an administrator without an associated password. Enable this option when using ssh public keys (`authorized key` command in SSH Configuration mode) as a sole means of authentication. When enabled this option prevents someone from using an administrator password to gain access to the user account.

`ecs`

Permits the user to use ACS-specific configuration commands. Default: Permitted

`expiry-date date_time`

Specifies the date and time that this login account expires.
Enter the date and time in the YYYY:MM:DD:HH:mm or YYYY:MM:DD:HH:mm:ss format. Where YYYY is the year, MM is the month, DD is the day of the month, HH is the hour, mm is minutes, and ss is seconds.

**ftp**

Permits the user to use FTP and SFTP. Default: Not permitted

```
[sftp-server sftp_name]
```

Assigns an optional root directory and access privilege to this user. *sftp_name* must have been previously created via the SSH Server Configuration mode *subsystem sftp* command.

**li-administration**

Refer to the *Lawful Intercept Configuration Guide* for a description of this parameter.

**nocli**

Prevents the user from using the command line interface. Default: Permitted

**noconsole**

Disables user access to a Console line.

---

**Note**

The Global Configuration mode *local-user allow-aaa-authentication noconsole* command takes precedence in a normal (non-Trusted) StarOS build. In this case, all AAA-based users cannot access a Console line.

**noecs**

Prevents the user from accessing ACS-specific commands.

**timeout-absolute timeout_absolute**

This keyword is obsolete. It has been left in place for backward compatibility. If used, a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum time, in seconds, the Security Administrator may have a session active before the session is forcibly terminated. *timeout_absolute* must be an integer from 0 through 300000000.

The value 0 disables this timeout configuration.

Default: 0

**timeout-min-absolute timeout_min_absolute**

Specifies the maximum time (in minutes) the Security Administrator may have a session active before the session is forcibly terminated. *timeout_min_absolute* must be an integer from 0 through 525600. The value 0 disables this timeout configuration. Default: 0
timeout-idle timeout_idle

Important
This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum time, in seconds, the Security Administrator may have a session active before the session is terminated. timeout_idle must be an integer from 0 through 300000000.

The value 0 disables the idle timeout configuration.

Default: 0

timeout-min-idle timeout_min_idle

Specifies the maximum time, in minutes, the Security Administrator may have a session active before the session is terminated. timeout_min_idle must be an integer from 0 through 525600. The value 0 disables the idle timeout configuration. Default: 0

Usage Guidelines
Use this command to create new Security Administrators or modify existing user's settings.

Security Administrator users have read-write privileges and full access to all contexts and command modes. Refer to the Command Line Interface Overview chapter for more information.

Important
A maximum of 128 administrative users and/or subscribers may be locally configured per context.

Example
The following command creates a Security Administrator account named user1 with access to ACS configuration commands:

administrator user1 password secretPassword

The following removes the Security Administrator account named user1:

no administrator user1

apn

Creates or deletes Access Point Name (APN) templates and enters the APN Configuration Mode within the current context.

Product
GGSN
P-GW
SAEGW

Privilege
Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] apn apn_name [ -noconfirm ]
```

- **no**
  
  Deletes a previously configured APN template.

- **apn_name**
  
  Specifies a name for the APN template as an alphanumeric string of 1 through 62 characters that is case insensitive. It may also contain dots (.) and/or dashes (-).

- **-noconfirm**
  
  Executes the command without any additional prompt and confirmation from the user.

**Caution**

If this keyword option is used with the `no apn apn_name` command, the APN named `apn_name` will be deleted with all active/inactive subscribers without prompting any warning or confirmation.

**Usage Guidelines**

This command creates an APN within the system and causes the CLI to enter the APN Configuration Mode. The APN is a logical name for a packet data network and/or a service to which the system supports access. When a create PDP context request is received by the system, it examines the APN information element within the packet. The system determines if an APN with the identical name is configured. If so, the system uses the configuration parameters associated with that APN as a template for processing the request. If the names do not match, the request is rejected with a cause code of 219 (DBH, Missing or unknown APN).

APN templates should be created/configured within destination contexts on the system.

- Up to 1000 APNs can be configured in the GGSN.
- In StarOS v12.x and earlier, up to 1024 APNs can be configured in the P-GW.
- In StarOS v14.0 and later, up to 2048 APNs can be configured in the P-GW (SAEGW).

**Example**

The following command creates an APN template called `isp1`:

```
apn isp1
```
asn-qos-descriptor

Creates, deletes or manages the Quality of Service (QoS) descriptor table identifier for Access Service Node Gateway (ASN-GW) service and enters the ASN QoS Descriptor Table Identifier Configuration mode within the source context.

**Product**
ASN-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
asn-qos-descriptor id qos_table_id [ default ] dscp [ be | af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | ef ] [ -noconfirm ]
```

```
no asn-qos-descriptor qos_table_id [ default ] dscp [ be | af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | ef ] [ -noconfirm ]
```

```
no
```

Deletes a previously configured ASN QoS descriptor table identifier.

```
id qos_table_id
```

Specifies a unique identifier for ASN QoS descriptor table to create/configure. qos_table_id must be an integer from 1 through 65535.

```
[ default ] dscp
```

Specifies DSCP marking for this QoS descriptor.

```
[ be | af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | ef ]
```

The DSCP marking for this QoS descriptor. Default value is be (best effort).

```
-noconfirm
```

Executes the command without any additional prompt and confirmation from the user.

---

**Caution**

If this keyword option is used with `no asn-qos-descriptor id qos_table_id` command, the ASN QoS descriptor table with identifier qos_table_id will be deleted with all active/inactive configurations without prompting any warning or confirmation.
Usage Guidelines

Use this command to configure a QoS description table to manage QoS functionality for an ASN-GW service subscriber. This command creates and allows the configuration of QoS tables with in a context. This command is also used to remove previously configured ASN-GW services QoS descriptor table.

A maximum of 16 QoS Descriptor Tables can be configured per system.

Refer to the *ASN QoS Descriptor Configuration Mode Commands* chapter of this reference for additional information.

Example

The following command creates a QoS descriptor table with identifier 1234 for the ASN-GW service subscribers:

```
asn-qos-descriptor id 1234
```

### asn-service-profile

Creates, deletes or manages the Service Profiles Identifier for Access Service Node Gateway (ASN-GW) service subscribers and enters the ASN Service Profile Configuration mode within the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>ASN-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>
| Command Modes | Exec > Global Configuration > Context Configuration  
  `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```
asn-service-profile id asn_profile_id direction { bi-directional | downlink | uplink } [ activation-trigger { activate | admit | dynamic-reservation | provisioned } [ -noconfirm ]
no asn-service-profile id asn_profile_id [ -noconfirm ]
```

**no**

Deletes a precisely configured ASN service profile identifier.

**id asn-profile_id**

Specifies a unique identifier for ASN profile to create/configure.

**direction { bi-directional | downlink | uplink }**

Specifies the direction of data traffic to apply this service profile.

- **bi-directional**: Enables this service profile in both direction of uplink and downlink.
- **downlink**: Enables this service profile in downlink direction, towards the subscriber.
**asngw-service**

Creates, deletes or manages an Access Service Node Gateway (ASN-GW) service and enters the ASN Gateway Service Configuration Mode within the current context.

**Product**
ASN-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
asngw-service asngw_name [ -noconfirm ]
no asn-service asngw_name
```

**Context Configuration Mode Commands A-D**

**uplink**: Enables this service profile in uplink direction, towards the system.

**activation-trigger { activate | admit | dynamic-reservation | provisioned**

Use this option to configure the activation-trigger for the asn-service-profile. Default: provisioned | admit | activate

**-noconfirm**
Executes the command without any additional prompt and confirmation from the user.

---

**Caution**

If this keyword option is used with `no asn-service-profile id asn_profile_id` command, the ASN service profile with identifier `asn_profile_id` will be deleted with all active/inactive configurations without prompting any warning or confirmation.

---

**Usage Guidelines**

Use this command to configure a service profile to apply the ASN-GW service subscribers. This command creates and allows the configuration of service profiles with in a context. This command is also used to remove previously configured ASN-GW services profiles.

A maximum of 32 ASN Service Profiles can be configured per context.

Refer to the **ASN Service Profile Configuration Mode Commands** chapter of this reference for additional information.

**Example**
The following command creates an ASN Service Profile with identifier 1234 for the ASN-GW service subscribers:

```
asn-service-profile id 1234 direction uplink
```

---

**asngw-service**

Creates, deletes or manages an Access Service Node Gateway (ASN-GW) service and enters the ASN Gateway Service Configuration Mode within the current context.

**Product**
ASN-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
asngw-service asngw_name [ -noconfirm ]
no asn-service asngw_name
```
**no**

Deletes a previously configured ASN-GW service.

**asngw_name**

Specifies the name of the ASN-GW service to create/configure as an alphanumeric string of 1 through 63 characters that is case sensitive.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**Caution**

If this keyword option is used with `no as-service asnw_name` command, the ASN-GW service named `asngw_name` will be deleted with all active/inactive subscribers without prompting any warning or confirmation.

---

**Usage Guidelines**

Services are configured within a context and enable certain functionality. This command creates and allows the configuration of services enabling the system to function as an ASN Gateway in a WiMAX network. This command is also used to remove previously configured ASN-GW services.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

---

Refer to the *ASN Gateway Service Configuration Mode Commands* chapter of this reference for additional information.

---

**Example**

The following command creates an ASN-GW service name `asn-gwl`:

```
asngw-service asn-gwl
```

---

**asnpc-service**

Creates, deletes or manages an ASN Paging Controller service to manage the ASN paging controller service and enters the ASN Paging Controller Configuration mode within the current context.

---

**Product**

ASN-GW
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

[ no ] asnpc-service asnp_svc_name [ -noconfirm ]

no

Deletes a previously configured ASN paging controller service.

asnpc-service asnp_svc_name

Specifies the name of the ASN Paging Controller Service to create and enable as an alphanumeric string of 1 through 63 characters that is case sensitive.

Important

Service names must be unique across all contexts within a chassis.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Caution

If this keyword option is used with no asnpc-service asnp_svc_name command, the ASN Paging Controller service named asnp_svc_name will be deleted and disabled with all active/inactive paging groups and paging agents configured in a context for ASN paging controller service without prompting any warning or confirmation.

Usage Guidelines

Use this command to create and enable the ASN paging controller services in the system to provide functionality of an ASN Paging Controller service within a context. Additionally this command provides the access to the ASN Paging Controller Service Configuration mode and also used to remove previously configured ASN Paging Controller services.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Refer to the ASN Paging Controller Service Configuration Mode Commands chapter of this reference for additional information.
Example
The following command creates an ASN paging controller service name asnpc_1:

```
ASNpc-service asnpc_1
```

## associate

Associate a global QoS Level 2 mapping table to a VPN context.

### Product
- ePDG
- HSGW
- P-GW
- SAEGW
- S-GW

### Privilege
Administrator

### Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name (config) #
```

### Syntax Description

```
associate l2-mapping-table name map_table_name
default associate l2-mapping-table
```

**default**

 Associates the system-default table with this context.

**name map_table_name**

Specifies the name of an existing internal table from which to map QoS to L2 values.

*map_table_name* is an alphanumerical string of 0 through 80 characters.

### Usage Guidelines

This command is used to associate an internal QoS L2 mapping table to a VPN context. If no explicit association is created/configured, the system-default mapping table is used.

---

**Important**

- If an l2-mapping-table association is made at both the VRF and VPN level, the VRF level takes precedence.

- The mapping table is configured via the Global Configuration mode **qos l2-mapping-table** command.
**Example**
The following command associates an internal QoS L2 mapping table to a VPN context:

```
associate 12-mapping-table qostable1
```

### bfd-protocol

**Enables or disables Bidirectional Forwarding Detection (BFD) protocol and enters the BFD Configuration mode.**

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Syntax Description**

```
[ no ] bfd-protocol
```

**no**

If previously configured, disables BFD protocol.

**Usage Guidelines**

Use this command to set configuration parameters for detecting faults in paths established with BFD-enabled routers.

Refer to the *BFD Configuration Mode Commands* chapter for additional information.

**Example**
The following command enables BFD Configuration mode:

```
bfd-protocol
```

### bgp extended-asn-cap

**Enables or disables the router to send 4-octet ASN capabilities.**

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Syntax Description**

```
[ no ] bgp extended-asn-cap
```

**no**

Disables the ability of the router to send 4-octet ASN capabilities.
Example
The following command enables the router to send 4-octet ASN Capabilities:
```
bgp extended-asn-cap
```

**bmsc-profile**

Creates or deletes Broadcast Multicast Service Center (BM-SC) profiles and enters the BMSC Profile Configuration Mode within the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
</tbody>
</table>

**configure > context context_name**
Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
[ no ] bmsc-profile name bmsc_profile_name [ -noconfirm ]
```

**no**
Deletes a previously configured BM-SC profile.

**name bmsc_profile_name**
Specifies a name for the BM-SC profile as an alphanumeric string of 1 through 62 characters that is case insensitive. It may also contain dots (.) and/or dashes (-).

**-noconfirm**
Executes the command without any additional prompt and confirmation from the user.

---

**Caution**
If this keyword option is used with `no bmsc-profile name bmsc_profile_name` command, the BM-SC profile named `bmsc_profile_name` is deleted with all active/inactive subscribers without prompting any warning or confirmation.

**Usage Guidelines**
Use this command to create a BM-SC profile within the context and take the user to enter the BMSC Profile Configuration Mode.

The BM-SC profile is a logical name for a Broadcast Multicast Service Center in Multimedia Broadcast and Multicast service.

BM-SC profile should be created/configured within contexts on the system. Up to four BM-SC profiles can be configured.
Example
The following command creates a BM-SC Profile called mbms_sc_1:
```
bmsc-profile name mbms_sc_1
```

busout ip

Makes addresses from an IPv4 pool in the current context unavailable once they are free.

### Product
- GGSN
- HA
- NAT
- PDSN
- P-GW
- SAEGW

### Privilege
Security Administrator, Administrator

### Command Modes
- Exec > Global Configuration > Context Configuration
  - configure > context context_name

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

### Syntax Description
```
[ no ] busyout ip pool { all | all-dynamic | all-static | name pool_name }
[ address-range start_address end_address ]
[ lower-percentage percent ]
[ upper-percentage percent ]
```

- **no**
  - Disables the busyout command specified.

- **ip**
  - Configure IPv4 busyout information.

- **pool**
  - Configure IPv4 pool busyout information.

- **all**
  - Applies to all IPv4 pools in the current context.
**all-dynamic**
Applies to all dynamic IPv4 pools in the current context.

**all-static**
Applies to all static IPv4 pools in the current context.

**name pool_name**
Applies the named IP pool or IP pool group in the current context. pool_name must be the name of an existing IP pool or IP pool group in the current context.

**address-range start_address end_address**
Busyout all addresses from start_address through end_address. start_address: The beginning IP address of the range of addresses to busyout entered in IPv4 dotted-decimal notation.
end_address: The ending IP address of the range of addresses to busyout. This IP address must exist in the pool specified and entered in IPv4 dotted-decimal notation.

**lower-percentage percent**
Busyout the percentage of IPv4 addresses specified, beginning at the lowest numbered IP address. This is a percentage of all of the IP addresses in the specified IP pool. percent must be an integer from 1 through 100.

**upper-percentage percent**
Busyout the percentage of IPv4 addresses specified, beginning at the highest numbered IP address. This is a percentage of all of the IPv4 addresses in the specified IP pool. percent must be an integer from 1 through 100.

---

**Usage Guidelines**
Use this command to busyout IPv4 addresses when resizing an IPv4 pool.
Up to 32 instances of this command can be executed per context.
A single instance of this command can busy-out multiple IPv4 address pools in the context through the use of the all, all-static, or all-dynamic keywords.

**Example**
Assume an IPv4 pool named Pool10 with addresses from 192.168.100.1 through 192.168.100.254.
To busy out the addresses from 192.168.100.50 through 192.169.100.100, enter the following command:

```
busyout ip pool name Pool10 address-range 192.168.100.50 192.169.100.100
```

To restore the IPv4 addresses from the previous example and make them accessible again, enter the following command:

```
no busyout ip pool name Pool10 address-range 192.168.100.50 192.169.100.100
```
**busyout ipv6**

Makes addresses from an IPv6 pool in the current context unavailable once they are free.

**Product**
- GGSN
- HA
- NAT
- PDSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  - `configure > context context_name`
  - Entering the above command sequence results in the following prompt:
    ```
    [context_name]host_name(config-ctx)#
    ```

**Syntax Description**

```plaintext
[ no ] busyout ipv6 pool { all | all-dynamic | all-static | name pool_name }
  [ address-range start_address end_address | lower-percentage percent |
  upper-percentage percent ]
```

- **no**
  - Disables the busyout command specified.

- **ipv6**
  - Configure IPv6 busyout information.

- **pool**
  - Configure IPv6 pool busyout information.

- **all**
  - Applies to all IPv6 pools in the current context.

- **all-dynamic**
  - Applies to all dynamic IPv6 pools in the current context.

- **all-static**
  - Applies to all static IPv6 pools in the current context.
name pool_name
Applies the named IPv6 pool or IPv6 pool group in the current context. pool_name must be the name of an existing IPv6 pool or IPv6 pool group in the current context.

address-range start_address end_address
Busyout all addresses from start_address through end_address. start_address: The beginning IP address of the range of addresses to busyout entered in IPv6 colon-separated-hexadecimal notation.
end_address: The ending IP address of the range of addresses to busyout. This IP address must exist in the pool specified and entered in IPv6 colon-separated-hexadecimal notation.

lower-percentage percent
Busyout the percentage of IP addresses specified, beginning at the lowest numbered IPv6 address. This is a percentage of all of the IP addresses in the specified IP pool. percent must be an integer from 1 through 100.

upper-percentage percent
Busyout the percentage of IP addresses specified, beginning at the highest numbered IPv6 address. This is a percentage of all of the IP addresses in the specified IP pool. percent must be an integer from 1 through 100.

Usage Guidelines
Use this command to busyout IPv6 addresses when resizing an IPv6 pool.
Up to 32 instances of this command can be executed per context.
A single instance of this command can busy-out multiple IP address pools in the context through the use of the all, all-static, or all-dynamic keywords.

Example
Assume an IP pool named Pool12. To busyout the addresses from 2700:2010:8003:: through 2700:2010:8003::, enter the following command:

busyout ipv6 pool name Pool12 address-range 2700:2010:8003::
2700:2010:8003::

To restore the IPv6 addresses from the previous example and make them accessible again, enter the following command:

no busyout ipv6 pool name Pool10 address-range 2700:2010:8003::
2700:2010:8003::

cae-group
Creates a CAE group, which is a CAE server cluster that services TCP video requests from the Mobile Video Gateway. The Mobile Video Gateway uses the configured CAE group for CAE load balancing. The CAE (Content Adaptation Engine) is an optional component of the Mobile Videoscape.

Important
In release 20.0, MVG is not supported. This command must not be used in release 20.0. For more information, contact your Cisco account representative.
**Product**
MVG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] cae-group cae_group_name [ -noconfirm ]
```

- **no cae_group_name**
  Deletes the CAE group if previously configured.

- **cae_group_name**
  Creates the specified CAE group and enters the Video Group Configuration Mode. `cae_group_name` is an alphanumeric string of 1 through 79 characters.

- **-noconfirm**
  Executes the command without any prompt and confirmation from the user.

**Usage Guidelines**
Use this command to create a CAE group and enter the Video Group Configuration Mode. This command gets issued from the Context Configuration Mode.

**Example**
The following command creates a CAE group named `group_1` and enters the Video Group Configuration Mode:

```
cae-group group_1
```

## camel-service

Creates an instance of the Customized Applications for Mobile Enhanced Logic (CAMEL) service and enters the CAMEL service configuration mode. This mode configures or edits the configuration for the parameters which control the CAMEL functionality on the SGSN.

**Important**
For details about the commands and parameters, check the *CAMEL Service Configuration Mode* chapter.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
### Syntax Description

```
[ no ] camel-service srvc_name
```

- **no**
  - Remove the configuration for the specified SGSN service from the configuration of the current context.

- **srvc_name**
  - Creates a CAMEL service instance having a unique name expressed as an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Use this command to create, edit, or remove a CAMEL service.

**Example**

The following command creates a CAMEL service named `camel1` in the current context:

```
camel-service camel1
```

The following command removes the CAMEL service named `camel2` from the configuration for the current context:

```
no camel-service camel2
```

---

### cbs-service

**Important**

In Release 20, 21.0 and 21.1, HeNBGW is not supported. This command must not be used for HeNBGW in these releases. For more information, contact your Cisco account representative.

**Description**

Creates a new Cell Broadcasting Service (CBS) or specifies an existing CBS and enters the CBS Configuration Mode.

**Product**

HNB-GW

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
cbs-service

Syntax Description

[ no ] cbs-service name

no
Removes the specified CBS service from the context.

name
Specifies the name of a new or existing CBS service as an alphanumeric string of 1 through 63 characters that must be unique within the same context and across all contexts.

Important
Service names must be unique across all contexts within a chassis.

Usage Guidelines
Use this command to create a new CBS service or modify an existing one.

CBS Configuration Mode commands are defined in the CBS Configuration Mode Commands chapter of this guide.

Example
Following command creates a new CBS service names test-cbs in the context configuration mode:
cbs-service test-cbs

cipher-suite

Creates a new SSL cipher suite or specifies an existing cipher suite and enters the Cipher Suite Configuration Mode.

Product
SCM

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] cipher-suite name

no
Removes the specified SSL cipher suite from the context.
name

Specifies the name of a new or existing SSL cipher suite as a alphanumeric string of 1 through 127 characters that must be unique across all CSCF services within the same context and across all contexts.

Usage Guidelines

Use this command to create a new SSL cipher suite or modify an existing one.

Important

One SSL cipher suite can be created per SSL template.

A cipher suite contains the cryptographic algorithms supported by the client, and defines a key exchange and a cipher spec, which specifies the encryption and hash algorithms used during authentication. SSL cipher suites allow operators to select levels of security and to enable communication between devices with different security requirements.

Entering this command results in the following prompt:

\[context_name\]hostname(config-ctx-cipher-suite)#

Cipher Suite Configuration Mode commands are defined in the Cipher Suite Configuration Mode Commands chapter.

Example

The following command specifies the SSL cipher suite cipher_suite_1 and enters the Cipher Suite Configuration Mode:

cipher-suite cipher_suite_1

class-map

Creates or deletes a class map. If the class-map is newly created, the system enters the Class-Map Configuration Mode within the current destination context to configure the match rules for packet classification to flow-based traffic policing for a subscriber session flow.

Product

ASN-GW

HA

HSGW

PDSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] class-map name class_name [ match-all | match-any ]
no
Deletes configured Class-Map within the context.

class_name
Specifies the name of Class-Map rule as an alphanumeric string of 1 through 15 characters and is case sensitive.

match-all
Default: Enabled.
Enables AND logic for all matching parameters configured in specific Class-Map to classify traffic flow/packets. It indicates to match all classification rules in specific Class-Map to consider the specified Class-Map as a match.

match-any
Default: Disabled.
Enables OR logic for matching parameters configured in specific Class-Map to classify traffic flow/packets. It indicates to match any of the classification rule in specific Class-Map to consider the specified Class-Map as a match.

Usage Guidelines
Use this command to enter in Class-Map Configuration Mode to set classification parameters or filters in traffic policy for a subscriber session flow.

Important
In this mode classification rules added sequentially with match command to form a Class-Map. To change and/or delete or re-add a particular rule entire Class-Map is required to delete.

Example
Following command configures classification map class_map1 with option to match any condition in match rule.

class-map name class_map1 match-any

closedrp-rp handoff
Enables or disables session handoff between Closed-RP and RP connections. Default: Disabled

Product
PDSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
Syntax Description

[ default | no ] closedrp-rp handoff

default
Resets the command to its default setting of disabled.

no
Disables Closed-RP to RP session handoff.

Usage Guidelines

Use this command to enable a PDSN service to handoff sessions between Closed-RP and RP connections.

Example

To enable Closed-RP to RP handoffs, use the following command:

closedrp-rp handoff

To disable Closed-RP to RP handoffs, use the following command:

no closedrp-rp handoff

**config-administrator**

Configures a context-level configuration administrator account within the current context.

**Product**

All

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

**Syntax Description**

config-administrator user_name [ encrypted ] [ nopassword ] password password [ ecs ] [ expiry-date date_time ] [ ftp sftp-server sftp_name ] ] [ li-administration ] [ noconsole ] [ nocli ] [ noecs ] [ timeout-absolute abs_seconds ] [ timeout-min-absolute abs_minutes ] [ timeout-idle timeout_duration ] [ timeout-min-idle idle_minutes ]

no config-administrator user_name

no
Removes a previously configured context-level configuration administrator account.
user_name

Specifies the name for the account as an alphanumeric string of 1 through 32 characters.

[ encrypted ] password password

Specifies the password to use for the user which is being given context-level administrator privileges within the current context. The encrypted keyword indicates the password specified uses encryption.

password is an alphanumeric string of 1 through 63 characters without encryption, or 1 through 127 characters with encryption.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the password keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

[ nopassword ]

This option allows you to create a configuration administrator without an associated password. Enable this option when using ssh public keys (authorized key command in SSH Configuration mode) as a sole means of authentication. When enabled this option prevents someone from using a configuration administrator password to gain access to the user account.

ecs

Permits the user access to ACS-specific configuration commands. Default: Enhanced Charging Service (ECS / ACS) specific configuration commands allowed.

expiry-date date_time

Specifies the date and time that this account expires in the format YYYY:MM:DD:HH:mm or YYYY:MM:DD:HH:mm:ss.

Where YYYY is the year, MM is the month, DD is the day of the month, HH is the hour, mm is minutes, and ss is seconds.

ftp

Indicates the user gains FTP and SFTP access with the administrator privileges. Default: FTP and SFTP are not allowed.

[ sftp-server sftp_name ]

Assigns an optional root directory and access privilege to this user. sftp_name must have been previously created via the SSH Server Configuration mode subsystem sftp command.

li-administration

Refer to the Lawful Intercept Configuration Guide for a description of this parameter.

nocli

Indicates the user is not allowed to access the command line interface. Default: CLI access allowed.
noconsole
Disables user access to a Console line.

---

**Note**
The Global Configuration mode `local-user allow-aaa-authentication noconsole` command takes precedence in a normal (non-Trusted) StarOS build. In this case, all AAA-based users cannot access a Console line.

---

noecs
Prevents the specific user from accessing ACS-specific configuration commands.

---

**timeout-absolute abs_seconds**

This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum amount of time (in seconds) that the administrator may have a session active before the session is forcibly terminated. `abs_seconds` must be an integer from 0 through 300000000. The value 0 disables the absolute timeout. Default: 0

---

**timeout-min-absolute abs_minutes**

Specifies the maximum amount of time (in minutes) the context-level administrator may have a session active before the session is forcibly terminated. `abs_minutes` must be an integer from 0 through 525600 (365 days). The value 0 disables the absolute timeout. Default: 0

---

**timeout-idle timeout_duration**

This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum amount of idle time, in seconds, the context-level administrator may have a session active before the session is terminated. `timeout_duration` must be a value in the range from 0 through 300000000. The value 0 disables the idle timeout. Default: 0

---

**timeout-min-idle idle_minutes**

Specifies the maximum amount of idle time, in minutes, the context-level administrator may have a session active before the session is terminated. `idle_minutes` must be a value in the range from 0 through 525600 (365 days). The value 0 disables the idle timeout. Default: 0

---

**Usage Guidelines**

Create new context-level configuration administrators or modify existing administrator's options, in particular, the timeout values.

Configuration administrator users have read-write privileges and full access to all contexts and command modes except for security functions. Refer to the *Command Line Interface Overview* chapter of this guide for more information.
A maximum of 128 administrative users and/or subscribers may be locally configured per context.

**Example**

The following configures a context-level administration named *user1* with ACS parameter control:

```
config-administrator user1 password secretPassword ecs
```

The following command removes a context-level administrator named *user1*:

```
no config-administrator user1
```

---

**content-filtering**

Enables or disables the creation, configuration or deletion of Content Filtering Server Groups (CFSG).

**Product**

CF

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

**Syntax Description**

- **content-filtering server-group**
  - `cf_server_group_name`
  - `[-noconfirm]`

- **no content-filtering server-group**
  - `cf_server_group_name`

- **no**

Removes the specified CFSG previously configured in this context.

- **server-group**
  - `cf_server_group_name`

Specifies the name of the CFSG as an alphanumeric string of 1 through 63 characters.

- **-noconfirm**

Executes the command without any prompt and confirmation from the user.

**Usage Guidelines**

Use this command to create/configure/delete a CFSG.

**Example**

The following command creates a CFSG named *CF_Server1*:

```
content-filtering server-group CF_Server1
```
credit-control-service

Enables or disables the creation, configuration or deletion of credit-control services.

### Product
All

### Privilege
Security Administrator, Administrator

### Command Modes
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

- **credit-control-service**
  - `service_name`
  - `[ -noconfirm ]`
  - `no credit-control-service service_name`

  **no**
  Deletes the specified credit-control service.

  **service_name**
  Specifies name of the credit-control service as an alphanumeric string of 1 through 63 characters.
  If the named credit-control service does not exist, it is created, and the CLI mode changes to the Credit Control Service Configuration Mode wherein the service can be configured.
  If the named credit-control service already exists, the CLI mode changes to the Credit Control Service Configuration Mode wherein the service can be configured.

  **Important**
  Service names must be unique across all contexts within a chassis.

  **-noconfirm**
  Executes the command without any additional prompt and confirmation from the user.

### Usage Guidelines
Use this command to create, configure or delete credit-control services.

Entering this command results in the following prompt:

```
[context_name]hostname(config-credit-control-service)
```

Credit control Service Configuration commands are described in the Credit Control Service Configuration Mode Commands chapter.

### Example
The following command enters the Credit Control Service Configuration Mode for a credit-control service named test159:

```bash
```
crypto dns-nameresolver

Enables or disables the reverse DNS query from a Security Gateway to DNS.

**Product**

All IPsec security gateway products

---

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

---

**Privilege**

Security Administrator

---

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

---

**Syntax Description**

```
[ no ] crypto dns-nameresolver
```

- **no**
  - Disables the Reverse DNS query.

---

**Usage Guidelines**

Use this command to enable or disable the reverse DNS query from a WSG to DNS.

---

**Important**

You must configure the DNS client prior to enabling the Reverse DNS query.

---

**Example**

The following command enables the reverse DNS query:

```
crypto dns-nameresolver
```

---

**crypto group**

Creates or deletes a crypto group and enters the Crypto Configuration Mode allowing the configuration of crypto group parameters.

**Product**

- HA
- GGSN
crypto ipsec transform-set

Configures transform-sets on the system and enters the Crypto IPSec Transform Set Configuration Mode.

Product

PDSN
PDIF
HA
GGSN
SCM

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

Syntax Description
```
crypto ipsec transform-set transform_name [ ah { hmac { md5-96 | none | sha1-96 } | esp { hmac { { md5-96 | sha1-96 } | cipher { 3des-cbc | aes-cbc-128 | aes-cbc-256 | des-cbc } } } | none } } ]
```

```
no crypto ipsec transform-set transform_name
```

**no**
Removes a previously configured transform set

**transform_name**
Specifies the name of the transform set as an alphanumeric string of 1 through 127 characters that is case sensitive.

**ah hmac**
Configures the Authentication Header (AH) hash message authentication codes (HMAC) parameter for the transform set to one of the following:

- **md5-96**: Message Digest 5 truncated to 96 bits
- **sha1-96**: Secure Hash Algorithm-1 truncated to 96 bits

**esp hmac**
Configures the Encapsulating Security Payload (ESP) hash message authentication codes (HMAC) parameter for the transform set to one of the following:

- **md5-96**: Message Digest 5 truncated to 96 bits
- **none**: Disables the use of the AH protocol for the transform set.
- **sha1-96**: Secure Hash Algorithm-1 truncated to 96 bits

**cipher**
If ESP is enabled, this option must be used to set the encapsulation cipher protocol to one of the following:

- **3des-cbc**: Triple Data Encryption Standard (3DES) in chain block (CBC) mode.
- **aes-cbc-128**: Advanced Encryption Standard (AES) in CBC mode with a 128-bit key.
- **aes-cbc-256**: Advanced Encryption Standard (AES) in CBC mode with a 256-bit key.
- **des-cbc**: DES in CBC mode.
Usage Guidelines

Use this command to create a transform set on the system.

Transform Sets are used to define IPSec security associations (SAs). IPSec SAs specify the IPSec protocols to use to protect packets.

Transform sets are used during Phase 2 of IPSec establishment. In this phase, the system and a peer security gateway negotiate one or more transform sets (IPSec SAs) containing the rules for protecting packets. This negotiation ensures that both peers can properly protect and process the packets.

Example

Create a transform set that has the name tset1, no authentication header, an encapsulating security protocol header hash message authentication code of md5, and a bulk payload encryption algorithm of des-cbc with the following command:

```
crypto ipsec transform-set tset1 ah hmac none esp hmac md5 cipher des-cbc
```
name
Specifies the name of the crypto map as an alphanumeric string of 1 through 127 characters that is case sensitive.

ikev2-ipv6
Refer to the *Lawful Intercept Configuration Guide* for a description of this parameter.

ipsec-dynamic
Creates a dynamic crypto map and/or enters the Crypto Map Dynamic Configuration Mode.

ipsec-ikev1
Creates an IKEv1 crypto map and/or enters the Crypto Map IKEv1 Configuration Mode.

ipsec-manual
Creates a manual crypto map and/or enters the Crypto Map Manual Configuration Mode.

**Usage Guidelines**
Crypto Maps define the policies that determine how IPSec is implemented for subscriber data packets. There are several types of crypto maps supported by the system. They are:

- **Manual crypto maps**: These are static tunnels that use pre-configured information (including security keys) for establishment. Because they rely on statically configured information, once created, the tunnels never expire; they exist until their configuration is deleted.

---

**Important**
Because manual crypto map configurations require the use of static security keys (associations), they are not as secure as crypto maps that rely on dynamically configured keys. Therefore, it is recommended that they only be configured and used for testing purposes.

- **IKEv1 crypto maps**: These tunnels are similar to manual crypto maps in that they require some statically configured information such as the IP address of a peer security gateway and that they are applied to specific system interfaces. However, IKEv1 crypto maps offer greater security because they rely on dynamically generated security associations through the use of the Internet Key Exchange (IKE) protocol.

- **IKEv2-IPv6 cryptomaps**: Refer to the *Lawful Intercept Configuration Guide* for a description of this parameter.

- **Dynamic crypto maps**: These tunnels are used for protecting L2TP-encapsulated data between the system and an LNS/security gateway or Mobile IP data between an FA service configured on one system and an HA service configured on another.

---

**Important**
The crypto map type (dynamic, IKEv1, IKEv2-IPv6, or manual) is specified when the map is first created using this command.
Example
Create a dynamic crypto map named map1 and enter the Crypto Map Dynamic Configuration Mode by entering the following command:

```
crypto map map1 ipsec-dynamic
```
ikev2-vendor

Configures the Crypto Vendor Template to be used for IPSec functionalities.

Usage Guidelines

Use this command to create a new or enter an existing crypto template or crypto vendor template.

The Crypto Template Configuration Mode commands are defined in the Crypto Template Configuration Mode Commands chapter.

The Crypto Template IKEv2-Vendor Configuration Mode commands are defined in the Crypto Template IKEv2-Vendor Configuration Mode Commands chapter.

Example

The following command configures a IKEv2 dynamic crypto template called crypto1 and enters the Crypto Template Configuration Mode:

```
crypto template crypto1 ikev2-dynamic
```

crypto vendor-policy

Creates a new or specifies an existing crypto vendor policy and enters the Crypto Vendor Policy Configuration Mode.

Product

ePDG
HeNBGW
PDIF
SAEGW
S-GW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

Syntax Description

```
[ no ] crypto vendor-policy policy_name
```

- **no**
  - Removes the previously configured vendor policy.

  **policy_name**

  - **policy_name** must be an alphanumeric string of 1 through 127 characters.
Usage Guidelines

Use this command to create a new or specify an existing crypto vendor policy and enters the Crypto Vendor Policy Configuration Mode. A maximum of 32 vendor policies can be configured.

The Crypto Vendor Policy Configuration Mode commands are defined in the *Crypto Vendor Policy Configuration Mode Commands* chapter.

Example

The following command configures a crypto vendor policy called *vodvp1* and enters the Crypto Vendor Policy Configuration Mode:

```
crypto vendor-policy vodvp1
```

**css server**

In StarOS 9.0 and later releases, this command is obsolete. And, in earlier releases, this command is restricted.

**cups chunk-threshold-timer**

Configures CUPS IP pool chunk threshold timer for a context.

<table>
<thead>
<tr>
<th>Product</th>
<th>CUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
| Command Modes | Exec > Global Configuration > Context Configuration
```
configure > context context_name
```
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
cups chunk-threshold-timer threshold_timer_seconds
default cups chunk-threshold-timer
```

**default**

Sets the default value of 60 seconds.

```
threshold_timer_seconds
```

*threshold_timer_seconds* specifies the chunk threshold timer value in seconds, integer 30 to 300.

Usage Guidelines

Use this command to configure CUPS IP pool chunk threshold timer for a context.

Example

The following command configures CUPS IP pool chunk threshold timer for 120 seconds:

```
cups chunk-threshold-timer 120
```
**cups enabled**

Enables CUPS for a context.

**Product**

CUPS

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

`cups enabled`

**Usage Guidelines**

Use this command to enable CUPS for a context.

---

**cups max-user-planes**

Configures maximum number of User Planes expected to be functional in a system.

**Product**

CUPS

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

`cups max-user-planes value`

`default max-user-planes`

**default**

Sets the default maximum number of User Planes to 10.

**value**

The value should be in the range of 1 through 1000.

**Usage Guidelines**

Use this command to configure maximum number of User Planes expected to be functional in a system.

**Example**

The following command configures maximum number of User Planes to 15:

```
cups max-user-planes 15
```
cups max-user-planes 15

cups min-chunks-threshold-per-pool

Configures minimum percentage of chunks per pool in a context.

Product
CUPS

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description
cups min-chunks-threshold-per-pool threshold_percent
default min-chunks-threshold-per-pool

default
Sets the default percentage to 10.

threshold_percent
threshold_percent specifies minimum chunks in percentage of 0 to 50.

Usage Guidelines
Use this command to configure minimum percentage of chunks per pool in a context.

Example
The following command configures minimum percentage of chunks per pool in a context to 20%:
cups min-chunks-threshold-per-pool 20

cups-redundancy-protocol

Enables or disables CUPS Redundancy Protocol (CRP) and enters the CRP Configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Mode
Exec > Global Configuration > Context Configuration
configure > context context_name
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] cups-redundancy-protocol
```

- **no**
  - If previously configured, disables CRP.

**Usage Guidelines**

Enables or disables the CRP Configuration Mode on a chassis.

Entering this command results in the following prompt:

```
[context_name]hostname(config-crp)#
```

Refer to the *CRP Configuration Mode Commands* chapter for additional information.

**Example**

The following command enters CRP Configuration mode:

```
cups-redundancy-protocol
```

---

**description**

Allows you to enter descriptive text for this configuration.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```
description text
no description
```

- **no**
  - Clears the description for this configuration.

- **text**
  - Enter descriptive text as an alphanumeric string of 1 to 100 characters.

  If you include spaces between words in the description, you must enclose the text within double quotation marks (" "), for example, "AAA BBBB".

**Usage Guidelines**

The description should provide useful information about this configuration.

---

**dhcp-client-profile**

Adds a specified Dynamic Host Control Protocol (DHCP) client profile name to allow configuration of DHCP client profile to the current context and enters the configuration mode for that profile.
Product

GGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] dhcp-client-profile clnt_profile_name [ -noconfirm ]

no

Removes a previously configured DHCP client profile from the current context.

clnt_profile_name

Specifies the name of the DHCP client profile as an alphanumeric string of 1 through 63 characters that is case sensitive.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Caution

If this keyword option is used with no dhcp-client-profile clnt_profile_name command the DHCP client profile named clnt_profile_name is deleted with all active/inactive subscribers without prompting any warning or confirmation.

Usage Guidelines

Use this command to add a DHCP client profile to a context configured on the system and enter the DHCP Client Profile Configuration Mode.

Entering this command results in the following prompt:

[context_name]hostname(config-dhcp-client-profile)#

DHCP Client Profile Configuration Mode commands are defined in the DHCP Client Profile Configuration Mode Commands chapter.

Example

The following command creates a DHCP client profile called test_profile:

dhcp-client-profile test_profile
dhcp-server-profile

Adds a specified Dynamic Host Control Protocol (DHCP) server profile name to allow configuration of DHCP server profile to the current context and enters the configuration mode for that profile.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ]dhcp-server-profile srvr_profile_name [ -noconfirm ]
```

- **no**
  - Removes a previously configured DHCP server profile from the current context.

  **srvr_profile_name**
  - Specifies the name of the DHCP server profile as an alphanumeric string of 1 through 63 characters that is case sensitive.

  **-noconfirm**
  - Executes the command without any additional prompt and confirmation from the user.

**Caution**

If this keyword option is used with `no dhcp-server-profile srvr_profile_name` command the DHCP server profile named `srvr_profile_name` is deleted with all active/inactive subscribers without prompting any warning or confirmation.

**Usage Guidelines**

Use this command to add a DHCP server profile to a context configured on the system and enter the DHCP Server Profile Configuration Mode.

Entering this command results in the following prompt:

```
[context_name]host_name(config-dhcp-server-profile)#
```

DHCP Server Profile Configuration Mode commands are defined in the *DHCP Server Profile Configuration Mode Commands* chapter.
Example
The following command creates a DHCP server profile called test_server_profile:
```
dhcp-server-profile test_server_profile
```

dhcp-service

Adds a Dynamic Host Control Protocol (DHCP) service instance to the current context and enters the DHCP Service Configuration mode for that service.

<table>
<thead>
<tr>
<th>Product</th>
<th>ASN-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>eWAG</td>
</tr>
<tr>
<td></td>
<td>GGSN</td>
</tr>
<tr>
<td></td>
<td>HA</td>
</tr>
<tr>
<td></td>
<td>P-GW</td>
</tr>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Privilege</th>
<th>Security Administrator, Administrator</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Exec &gt; Global Configuration &gt; Context Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>configure &gt; context context_name</td>
<td>Entering the above command sequence results in the following prompt:</td>
</tr>
<tr>
<td></td>
<td>[context_name]host_name(config-ctx)#</td>
</tr>
</tbody>
</table>

Syntax Description
```
dhcp-service service_name [ -noconfirm ]
no dhcp-service service_name
```

- **no**
  Removes a previously configured DHCP service from the current context.

  **service_name**
  Specifies the name of the DHCP service as an alphanumeric string of 1 through 63 characters that is case sensitive.

Important
Service names must be unique across all contexts within a chassis.

- **-noconfirm**
  Executes the command without any additional prompt and confirmation from the user.
Usage Guidelines

Use this command to add a DHCP service to a context configured on the system and enter the DHCP Service Configuration Mode. A DHCP service is a logical grouping of external DHCP servers.

The DHCP Configuration Mode provides parameters that dictate the system's communication with one or more of these DHCP servers.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Refer to the DHCP Service Configuration Mode chapter of this reference for additional information.

Example

The following command creates a DHCP service called dhcp1 and enters the DHCP Service Configuration Mode:

dhcp-service dhcp1

dhcpv6-service

Creates a specified DHCPv6 service name to allow configuration of DHCPv6 service to the current context and enters the configuration mode for that service.

Product

GGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] dhcpv6-service service_name [ -noconfirm ]

no

Removes a previously configured DHCPv6 service from the current context.
**service_name**

Specifies the name of the DHCPv6 service as an alphanumeric string of 1 through 63 characters that is case sensitive.

> **Important**

Service names must be unique across all contexts within a chassis.

>-noconfirm

Executes the command without any additional prompt and confirmation from the user.

> **Caution**

If this keyword option is used with `no dhcpv6-service service_name` command the DHCPv6 service named `service_name` is deleted with all active/inactive subscribers without prompting any warning or confirmation.

**Usage Guidelines**

Use this command to add a DHCPv6 service to a context configured on the system and enter the DHCPv6 Service Configuration Mode.

The DHCPv6 Service Configuration Mode provides parameters that dictate the system's communication with one or more of these DHCPv6 servers.

Entering this command results in the following prompt:

```
[context_name]hostname(config-dhcpv6-service)#
```

DHCPv6 Service Configuration Mode commands are defined in the *DHCPv6 Service Configuration Mode Commands* chapter.

> **Important**

A maximum of 256 services (regardless of type) can be configured per system.

**Example**

The following command creates a DHCPv6 service called `dhcpv6` and enter the DHCPv6 Service Configuration Mode:

```
dhcpv6-service dhcpv6
```

**diameter accounting**

This command configures Diameter accounting related settings.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

diameter accounting { dictionary { aaa-custom1 | aaa-custom10 | aaa-custom2 |

aaa-custom3 | aaa-custom4 | aaa-custom5 | aaa-custom6 | aaa-custom7 |

aaa-custom8 | aaa-custom9 | dynamic-load | nasreq | rf-plus } | endpoint |

endpoint_name | hd-mode fall-back-to-local | hd-storage-policy | hd_policy | |

max-retries max_retries | max-transmissions transmissions | request-timeout |

duration | server host_name priority priority }

default diameter accounting { dictionary | hd-mode | max-retries | |

max-transmissions | request-timeout }

no diameter accounting { endpoint | hd-mode | hd-storage-policy | |

max-retries | max-transmissions | server host_name }

no diameter accounting { endpoint | hd-mode | hd-storage-policy | max-retries | max-transmissions | server |

host_name }

default diameter accounting { dictionary | hd-mode | max-retries | max-transmissions | server |

host_name }

dictionary: Sets the context’s dictionary to the default.

hd-mode: Sends records to the Diameter server, if all Diameter servers are down or unreachable, then copies records to the local HDD and periodically retries the Diameter server.

max-retries: 0 (disabled)

max-transmissions: 0 (disabled)

request-timeout: 20 seconds

dictionary { aaa-custom1 | aaa-custom10 | aaa-custom2 | aaa-custom3 | aaa-custom4 | aaa-custom5 |

aaa-custom6 | aaa-custom7 | aaa-custom8 | aaa-custom9 | dynamic-load | nasreq | rf-plus }

Specifies the Diameter accounting dictionary.

aaa-custom1 … aaa-custom10: Configures the custom dictionaries. Even though the CLI syntax supports several custom dictionaries, not necessarily all of them have been defined. If a custom dictionary that has not been implemented is selected, the default dictionary will be used.

dynamic-load: Configures the dynamically loaded Diameter dictionary. The dictionary name must be an alphanumeric string of 1 through 15 characters. For more information on dynamic loading of Diameter
dictionaries, see the **diameter dynamic-dictionary** in the *Global Configuration Mode Commands* chapter of this guide.

**nasreq:** nasreq dictionary—the dictionary defined by RFC 3588.

**rf-plus:** RF Plus dictionary.

**endpoint endpoint_name**

Enables Diameter to be used for accounting, and specifies which Diameter endpoint to use.

*endpoint_name* is an alphanumeric string of 1 through 63 characters.

**hd-mode fall-back-to-local**

Specifies that records be copied to the local HDD if the Diameter server is down or unreachable. CDF/CGF will pull the records through SFTP.

**hd-storage-policy hd_policy**

Specifies the HD Storage policy name.

*hd_policy* must be the name of a configured HD Storage policy, expressed as an alphanumeric string of 1 through 63 characters.

HD storage policies are configured through the Global Configuration Mode.

This and the **hd-mode** command are used to enable the storage of Rf Diameter Messages to HDD in case all Diameter Servers are down or unreachable.

**max-retries max_retries**

Specifies how many times a Diameter request should be retried with the same server, if the server fails to respond to a request.

*max_retries* specifies the maximum number of retry attempts. The value must be an integer from 1 through 1000.

Default: 0

**max-transmissions transmissions**

Specifies the maximum number of transmission attempts for a Diameter request. Use this in conjunction with the "**max-retries max_retries**" option to control how many servers will be attempted to communicate with.

*transmissions* specifies the maximum number of transmission attempts for a Diameter request. The value must be an integer from 1 through 1000. Default: 0

**request-timeout duration**

Specifies how long the system will wait for a response from a Diameter server before re-transmitting the request.

*duration* specifies the number of seconds the system will wait for a response from a Diameter server before re-transmitting the request. This value must be an integer from 1 through 3600. Default: 20
server host_name priority priority

Specifies the current context Diameter accounting server’s host name and priority.

host_name specifies the Diameter host name, expressed as an alphanumeric string of 1 through 63 characters.
priority specifies the relative priority of this Diameter host. The priority is used in server selection. The priority
must be an integer from 1 through 1000.

Usage Guidelines

Use this command to manage the Diameter accounting options according to the Diameter server used for the
color context.

Example

The following command configures the Diameter accounting dictionary as aaa-custom4:

diameter accounting dictionary aaa-custom4

The following command configures the Diameter endpoint named aaaa_test:

diameter accounting endpoint aaaa_test

diameter authentication

This command configures Diameter authentication related settings.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

diameter authentication { allow any-host | dictionary { aaa-custom1 | aaa-custom10 | aaa-custom11 | aaa-custom12 | aaa-custom13 | aaa-custom14 | aaa-custom15 | aaa-custom16 | aaa-custom17 | aaa-custom18 | aaa-custom19 | aaa-custom2 | aaa-custom20 | aaa-custom3 | aaa-custom4 | aaa-custom5 | aaa-custom6 | aaa-custom7 | aaa-custom8 | aaa-custom9 | dynamic-load | nasreq } | endpoint endpoint_name | max-retries max_retries | max-transmissions transmissions | redirect-host-avp { just-primary | primary-then-secondary } | request-timeout duration | server host_name priority priority }

default diameter authentication { dictionary | max-retries | max-transmissions | redirect-host-avp | request-timeout }

no diameter authentication { endpoint | max-retries | max-transmissions | server host_name }
no diameter authentication { allow any-host | endpoint | max-retries | max-transmissions | server host_name }

- **allow any-host**: Accept the response from any-host.
- **endpoint**: Removes the authentication endpoint. The default server configured in default AAA group will be used.
- **max-retries**: Disables the retry attempts for Diameter authentication in this AAA group.
- **max-transmissions**: Disables the maximum transmission attempts for Diameter authentication in this AAA group.
- **server host_name**: Removes the Diameter host host_name from this AAA server group for Diameter authentication.

default diameter authentication { dictionary | max-retries | max-transmissions | redirect-host-avp | request-timeout }

Configures default setting for specified parameter.

- **allow any-host**: Sets the default behaviour.
- **dictionary**: Sets the context's dictionary to the default.
- **max-retries**: Sets the retry attempts for Diameter authentication requests in this AAA group to default 0 (disable).
- **max-transmissions**: Sets the configured maximum transmission attempts for Diameter authentication in this AAA group to default 0 (disable).
- **redirect-host-avp**: Sets the redirect choice to default (just-primary).
- **request-timeout**: Sets the timeout duration, in seconds, for Diameter authentication requests in this AAA group to default (20).


Specifies the Diameter authentication dictionary.

**aaa-custom1 ... aaa-custom10, aaa-custom11 ... aaa-custom20**: Configures the custom dictionaries. Even though the CLI syntax supports several custom dictionaries, not necessarily all of them have been defined. If a custom dictionary that has not been implemented is selected, the default dictionary will be used.

**Important**

aaa-custom11 dictionary is only available in Release 8.1 and later. aaa-custom12 to aaa-custom20 dictionaries are only available in Release 9.0 and later releases.

**aaa-custom9**: Configures the STa standard dictionary.

**dynamic-load**: Configures the dynamically loaded Diameter dictionary. The dictionary name must be an alphanumeric string of 1 through 15 characters. For more information on dynamic loading of Diameter
dictionaries, see the **diameter dynamic-dictionary** in the *Global Configuration Mode Commands* chapter of this guide.

**nasreq**: nasreq dictionary—the dictionary defined by RFC 3588.

**endpoint endpoint_name**

Enables Diameter to be used for authentication, and specifies which Diameter endpoint to use.

*endpoint_name* is an alphanumeric string of 1 through 63 characters.

**max-retries max_retries**

Specifies how many times a Diameter authentication request should be retried with the same server, if the server fails to respond to a request.

*max_retries* specifies the maximum number of retry attempts, and must be an integer from 1 through 1000. Default: 0

**max-transmissions transmissions**

Specifies the maximum number of transmission attempts for a Diameter authentication request. Use this in conjunction with the "**max-retries max_retries**" option to control how many servers will be attempted to communicate with.

*transmissions* specifies the maximum number of transmission attempts, and must be an integer from 1 through 1000. Default: 0

**diameter authentication redirect-host-avp { just-primary | primary-then-secondary }**

Specifies whether to use just one returned AVP, or use the first returned AVP as selecting the primary host and the second returned AVP as selecting the secondary host.

*just-primary*: Redirect only to primary host.

*primary-then-secondary*: Redirect to primary host, if fails then redirect to the secondary host.

Default: **just-primary**

**request-timeout duration**

Specifies how long the system will wait for a response from a Diameter server before re-transmitting the request.

*duration* specifies the number of seconds the system will wait for a response from a Diameter server before re-transmitting the request, and must be an integer from 1 through 3600. Default: 20

**server host_name priority priority**

Specifies the current context Diameter authentication server's host name and priority.

*host_name* specifies the Diameter host name, expressed as an alphanumeric string of 1 through 63 characters.

*priority* specifies the relative priority of this Diameter host, and must be an integer from 1 through 1000. The priority is used in server selection.

**Usage Guidelines**

Use this command to manage the Diameter authentication configurations according to the Diameter server used for the context.
Example

The following command configures the Diameter authentication dictionary `aaa-custom14`:

```
diameter authentication dictionary aaa-custom14
```

The following command configures the Diameter endpoint named `aaau1`:

```
diameter authentication endpoint aaau1
```

## `diameter authentication failure-handling`

This command configures error handling for Diameter EAP requests.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

**Syntax Description**

```
diameter authentication failure-handling { authorization-request | eap-request | eap-termination-request } { request-timeout action { continue | retry-and-terminate | terminate } | result-code result_code { [ to end_result_code ] action { continue | retry-and-terminate | terminate } } } 
no diameter authentication failure-handling { authorization-request | eap-request | eap-termination-request } result-code result_code [ to end_result_code ]
default diameter authentication failure-handling { authorization-request | eap-request | eap-termination-request } request-timeout action
```

**no**

Disables Diameter authentication failure handling.

**default**

Configures the default Diameter authentication failure handling setting.

**authorization-request**

Specifies that failure handling is to be performed on Diameter authorization request messages (AAR/AAA).

**eap-request**

Specifies configuring failure handling for EAP requests.
**eap-termination-request**

Specifies configuring failure handling for EAP termination requests.

**request-timeout action { continue | retry-and-terminate | terminate }**

Specifies the action to be taken for failures:

- **continue**: Continues the session
- **retry-and-terminate**: First retries, if it fails then terminates the session
- **terminate**: Terminates the session

**result-code result_code{ [ to end_result_code ] action { continue | retry-and-terminate | terminate } }**

*result_code*: Specifies the result code, must be an integer from 1 through 65535.

*to end_result_code*: Specifies the upper limit of a range of result codes. *end_result_code* must be greater than *result_code*.

*action { continue | retry-and-terminate | terminate }*: Specifies action to be taken for failures:

- **continue**: Continues the session
- **retry-and-terminate**: First retries, if it fails then terminates the session
- **terminate**: Terminates the session

---

**Important**

For any failure encountered, the "continue" option terminates the call as with the "terminate" option for all Diameter dictionaries except aaa-custom15 dictionary. This behavior is true in releases prior to 20. In 20 and later releases, the "continue" option is applicable for all S6b dictionaries including aaa-custom15 dictionary.

---

**Usage Guidelines**

Use this command to configure error handling for Diameter EAP, EAP-termination, and authorization requests. Specific actions (continue, retry-and-terminate, or terminate) can be associated with each possible result-code. Ranges of result codes can be defined with the same action, or actions can be specific on a per-result code basis.

**Example**

The following commands configure result codes 5001, 5002, 5004, and 5005 to use *action continue* and result code 5003 to use *action terminate*:

```plaintext
diameter authentication failure-handling eap-request result-code 5002 to 5005 action continue
diameter authentication failure-handling eap-request result-code 5003 action terminate
```
**diameter dictionary**

This command is deprecated and is replaced by the `diameter accounting dictionary` and `diameter authentication dictionary` commands. See `diameter accounting` and `diameter authentication` commands respectively.

**diameter endpoint**

This command enables the creation, configuration or deletion of a Diameter endpoint.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

**Syntax Description**

```
[ no ] diameter endpoint endpoint_name [ -noconfirm ]
```

- **no**

Removes the specified Diameter endpoint.

---

**Important**

In 19.5, 21.0 and later releases, deleting the endpoint using the "no diameter endpoint" command throws the following warning message and prompts for user's confirmation:

Warning: It is not recommended to remove the diameter endpoint when there are active calls on the system. Hence, please adhere to the 'Method of Procedure' to remove the endpoint. Otherwise, the system behavior would be undefined.

Are you sure? [Yes|No]:

**Method of Procedure**: The following two steps should be performed in the same order to remove the Diameter endpoint:

1. To disable/breakdown the link/transport connections:
   
a. Disable all the peers in the endpoint using the `diameter disable endpoint endpoint_name peer peer-name` CLI command. Repeat this command for all the peers in the endpoint. This will trigger the Disconnect-Peer-Request (DPR) towards the peers with the configured disconnection cause, that is to indicate, graceful shut down.

   b. Remove the endpoint in the respective context, under Diameter configuration, by using the `no endpoint endpoint-name` CLI command.
2. To enable/bring up the transport connections, follow the standard procedure of adding the endpoints and corresponding peers in it.
   a. Add the endpoints with "use diamproxy" option. Else, the links will be established from Session Manager via diabase library.
   b. Add the corresponding peers in the endpoints.

**endpoint_name**

Specifies name of the Diameter endpoint as an alphanumeric string of 1 through 63 characters that should be unique within the system.

If the named endpoint does not exist, it is created, and the CLI mode changes to the Diameter Endpoint Configuration Mode wherein the endpoint can be configured.

If the named endpoint already exists, the CLI mode changes to the Diameter Endpoint Configuration Mode wherein the endpoint can be reconfigured.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**Usage Guidelines**

Use this command to create/configure/delete a Diameter origin endpoint.

Entering this command results in the following prompt:

```
[context_name]hostname(config-ctx-diameter)
```

Diameter origin endpoint configuration commands are described in the Diameter Endpoint Configuration Mode Commands chapter.

**Example(s)**

The following command changes to the Diameter Endpoint Configuration CLI mode for Diameter origin endpoint named test13:

```
diameter endpoint test13
```

The following command will throw the warning message and prompt for user's confirmation to remove the Diameter endpoint named test13. **Yes** will remove the endpoint test13. **No** will abort the action and the endpoint test13 will not be removed:

```
no diameter endpoint test13
```

Warning: It is not recommended to remove the diameter endpoint when there are active calls on the system. Hence, please adhere to the 'Method of Procedure' to remove the endpoint. Otherwise, the system behavior would be undefined.

Are you sure? [Yes|No]: No
Action aborted

The following command will remove the endpoint test13 without any additional prompt and confirmation from the user:

```
no diameter endpoint test13 -noconfirm
```
diameter-hdd-module

This command enables/disables the creation, configuration or deletion of the Hard Disk Drive (HDD) module in the context.

**Important**

This command is license dependent. For more information, contact your Cisco account representative.

**Product**

HA

P-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

**Syntax Description**

```plaintext
[ no ] diameter-hdd-module
```

**no**

Deletes the HDD module from the context.

**Usage Guidelines**

In cases where the Assume-Positive interim-quota is allocated, and CCR-T message is not reported/answered, the failed CCR-T message is written to a local file, and saved in the HDD. This local file and directory information can be passed to the customer, and can be fetched and parsed to account for the lost bytes/usage. The retrieval of the file can be done with the PULL mechanism.

**Important**

This feature requires a valid license to be installed prior to configuring this feature. Contact your Cisco account representative for more information on the licensing requirements.

The **diameter-hdd-module** CLI command is used to create the HDD module for the context, and configure the HDD module for storing the failed CCR-T messages.

Entering this command results in the following prompt:

```plaintext
[context_name]hostname(config-diameter-hdd)#
```

Diameter HDD Module Configuration Mode commands are defined in the Diameter HDD Module Configuration Mode commands chapter.

**Important**

This feature is applicable only when Assume Positive feature is enabled.
This feature is controlled through the **diameter hdd** CLI command introduced in the Credit Control Group configuration mode. For more information on the command, see the *Credit Control Configuration Mode Commands* chapter.

**Example**
The following command configures the Diameter HDD module in a context:

```
diameter hdd-module
```

### **diameter sctp**

This command configures Diameter SCTP parameters for all Diameter endpoints within the context. In 12.2 and later releases, this command is obsolete and replaced with **associate sctp-parameters-template** command in the Diameter Endpoint Configuration Mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
diameter sctp { heartbeat-interval interval | path max-retransmissions retransmissions }
default diameter sctp { heartbeat-interval | path max-retransmissions }
```

**Default**

Configures this command with the default settings.

- **heartbeat-interval**: Sets the heartbeat interval to the default value.
- **path max-retransmissions**: Sets the SCTP path maximum retransmissions to the default value.

**heartbeat-interval interval**

Specifies the time interval between heartbeat chunks sent to a destination transport address in seconds.

`interval` must be an integer from 1 through 255.

Default: 30 seconds

**path max-retransmissions retransmissions**

Specifies the maximum number of consecutive retransmissions over a destination transport address of a peer endpoint before it is marked as inactive.

`retransmissions` must be an integer from 1 through 10.


Default: 10

Usage Guidelines

Use this command to configure Diameter SCTP parameters for all Diameter endpoints within the context.

Example

The following command configures the heartbeat interval to 60 seconds:

```
diameter sctp hearbeat-interval 60
```

The following command configures the maximum number of consecutive retransmissions to 6, after which the endpoint is marked as inactive:

```
diameter sctp path max-retransmissions 6
```

**diameter origin**

This command is deprecated and is replaced by the **diameter endpoint** command.

**dns-client**

Creates a DNS client and/or enters the DNS Client Configuration Mode.

**Product**

ePDG  
MME  
P-GW  
SAEGW  
SCM  
SGSN  

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration  
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] dns-client name [ -noconfirm ]
```

**no**

Removes the specified DNS client from the context.

**dns-client name**

Specifies a name for the DNS client as an alphanumeric string of 1 through 63 characters.
Usage Guidelines

Use this command to create a new DNS client and enter the DNS Client Configuration Mode or enter the mode for an existing client.

Entering this command results in the following prompt:

```
[context_name]hostname(config-dns-client)#
```

DNS Client Configuration Mode commands are defined in the *DNS Client Configuration Mode Commands* chapter.

Example

The following command enters the DNS Client Configuration Mode for a DNS client named *dns1*:

```
dns-client dns1
```

---

**domain**

Configures a domain alias for the current context.

**Product**

HA

PDSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > Global Configuration > Context Configuration`

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```

**Syntax Description**

```
domain [ * ]domain_name [ default subscriber subscriber_template_name ]
no domain [ * ]domain_name
```

```
no
```

Indicates the domain specified is to be removed as an alias to the current context.

```
[ * ]domain_name
```

*domain_name* specifies the domain alias to create/remove from the current context. If the domain portion of a subscriber's user name matches this value, the current context is used for that subscriber.

*domain_name* must be an alphanumeric string of 1 through 79 characters. The domain name can contain all special characters, however note that the character * (wildcard character) is only allowed at the beginning of the domain name.

If the domain name is prefixed with * (wildcard character), and an exact match is not found for the domain portion of a subscriber's user name, subdomains of the domain name are matched. For example, if the domain portion of a subscriber's user name is abc.xyz.com and you use the domain command `domain *xyz.com` it matches. But if you do not use the wildcard (`domain xyz.com`) it does not match.
The domain alias specified must not conflict with the name of any existing context or domain names.

**default subscriber** `subscriber_template_name`

Specifies the name of the subscriber template to apply to subscribers using this domain alias. `subscriber_template_name` must be an alphanumeric string of 1 through 127 characters. If this keyword is not specified the default subscriber configuration in the current context is used.

**Usage Guidelines**

Use this command to configure a domain alias when a single context may be used to support multiple domains via aliasing.

**Example**

```
domain sampleDomain.net
no domain sampleDomain.net
```
CHAPTER 17

Context Configuration Mode Commands E-H

This section includes the commands `edr-module active-charging-service` through `hss-peer-service`.

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx) #
```

Important:
The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- eap-profile, on page 398
- edr-module active-charging-service, on page 399
- egtp-service, on page 400
- end, on page 402
- epdg-service, on page 402
- event-report-conn, on page 403
- event-notif-endpoint, on page 404
- exit, on page 405
- external-inline-server, on page 406
- fa-service, on page 406
- firewall max-associations, on page 407
- fng-service, on page 407
- ggsn-service, on page 408
- gprs-service, on page 409
- gs-service, on page 410
- gtpc high-throughput-sub , on page 411
- gtpc overload-protection egress, on page 412
- gtpc overload-protection ingress, on page 413
- gtpc peer-salvation , on page 418
- gtpc-system-param-poll interval, on page 419
- gtpp algorithm, on page 420
- gtpp attribute, on page 421
eap-profile

Creates a new, or specifies an existing, Extensible Authentication Protocol (EAP) profile and enters the EAP Configuration Mode.

**Product**

- ASN-GW
- ePDG
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] eap-profile name

no

Removes the specified EAP profile.

name

Specifies the name of a new or existing EAP profile as an alphanumeric string of 1 through 256 characters.

Usage Guidelines

Use this command to create a new or enter an existing EAP profile.

Entering this command results in the following prompt:

[context_name]host_name(config-ctx-eap-profile)#

EAP Configuration Mode commands are defined in the EAP Configuration Mode Commands chapter.

Example

The following command configures an EAP profile called eap1 and enters the EAP Configuration Mode:

eap-profile eap1

edr-module active-charging-service

Enables the creation, configuration, or deletion of the Event Data Record (EDR) module for this context. In releases prior to 15.0, the SGSN re-used the existing "EDR" module for generating event logs which is primarily used for charging records. But from release 15.0 onwards, the session-event module is used by SGSN for event logging. For more information see the session-event-module command.

Product

ACS

GGSN

HA

LNS

PDSN

SGSN
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] edr-module active-charging-service [ charging | reporting ]

no

Removes the EDR module configuration for the current context.

charging

Enables the EDR module for charging EDRs that are stored in the /records/edr directory.

reporting

Enables the EDR module for reporting EDRs that are stored in the /records/redr directory.

Usage Guidelines

Use this command to create the EDR module for the context, and configure the EDR module for active charging service records. You must be in a non-local context when specifying this command, and you must use the same context when specifying the UDR module command.

If this CLI command is configured without the charging or reporting keywords, by default the EDR module is enabled for charging EDRs.

On entering the command with the charging keyword or without any keywords, the CLI prompt changes to:

[context_name]hostname(config-edr)#

On entering the command with the reporting keyword, the CLI prompt changes to:

[context_name]hostname(config-redr)#

Example

The following command creates the EDR module for the context for charging EDRs, and enters the EDR Module Configuration Mode:

edr-module active-charging-service

egtp-service

Creates an eGTP service or specifies an existing eGTP service and enters the eGTP Service Configuration Mode for the current context.

Product

MME

P-GW
SAEGW
SGSN
S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

Syntax Description

`[ no ] egtp-service service_name [ -noconfirm ]`

**egtp-service service_name**

Specifies the name of the eGTP service as an alphanumeric string of 1 through 63 characters. If `service_name` does not refer to an existing service, the new service is created if resources allow.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**no egtp-service service_name**

Removes the specified eGTP service from the context.

---

Usage Guidelines

Enter the eGTP Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

---

Entering this command results in the following prompt:

`[context_name]host_name(config-egtp-service)#`

eGTP Service Configuration Mode commands are defined in the *eGTP Service Configuration Mode Commands* chapter.

Use this command when configuring the following GTP SAE components: MME, P-GW, and S-GW. Also use this command when configuring an S4-SGSN. Once the eGTP service has been created on the S4-SGSN, the eGTP service must be configured using the `gtpc`, `validation-mode` and `interface-type` commands in *eGTP*.
Service Configuration Mode. Once the service is created and configured, it then must be associated with the 2G and/or 3G services configured on the S4-SGSN using the `associate` command in Call Control Profile Configuration Mode.

Important

If you modify the `interface-type` command, the parent service (service within which the eGTP/GTP-U service is configured) will automatically restart. Service restart results in dropping of active calls associated with the parent service.

Example

The following command enters the existing eGTP Service Configuration Mode (or creates it if it does not already exist) for the service named `egtp-service1`:

```
egtp-service egtp-service1
```

The following command will remove `egtp-service1` from the system:

```
no egtp-service egtp-service1
```

end

Exits the current configuration mode and returns to the Exec mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Syntax Description</td>
<td>end</td>
</tr>
<tr>
<td>Usage Guidelines</td>
<td>Use this command to return to the Exec mode.</td>
</tr>
</tbody>
</table>

epdg-service

Creates Evolved Packet Data GateWay service and enters EPDG service configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>ACS, ePDG, GGSN, HA, LNS, PDSN, SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
### Command Modes

Exec > Global Configuration > Context Configuration

**configure** > **context** **context_name**

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

### Syntax Description

```
[ no ] epdg-service **name** [ -noconfirm ]
```

- **no**
  
  Indicates the evolved packet data gateway service specified is to be removed.

- **name**
  
  Specifies the name of the ePDG service to configure as an alphanumeric string of 1 through 63 characters. If `name` does not refer to an existing service, the new service is created if resources allow.

#### Important

Service names must be unique across all contexts within a chassis.

- **-noconfirm**
  
  Executes the command without any additional prompt and confirmation from the user.

### Usage Guidelines

Enter the ePDG Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

#### Example

The following command will enter the ePDG Service Configuration Mode creating the service `sampleService`, if necessary.

```
epdg-service sampleService
```

The following command will remove `sampleService` as being a defined ePDG service.

```
no epdg-service sampleService
```

---

### event-report-conn

Configures a GMPC Event Report Connection.

**Product**

- MME
- SGSN

**Privilege**

- Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

**configure** > **context** **context_name**
Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx) #
```

**Syntax Description**

```
[ no ] event-report-conn  event_report_conn_name  [ -noconfirm ]
```

- **no**
  Indicates the event report connection name that is specified is to be removed.

- **name**
  Specifies the name of the event-report-conn to configure as an alphanumeric string of 1 to 32 characters. If `event-report-conn name` does not refer to an existing configuration, then new configuration is created if resources allow.

---

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Enter the event-report-conn name for a newly defined configured connection. This command is also used to remove an existing connection.

**Example**

The following command will create the `event-report-conn name Config`

```
event-report-conn name Config
```

The following command will remove `event-report-conn name Config` as being a defined event-report-conn service.

```
no event-report-conn name Config
```

---

**event-notif-endpoint**

Enables creation, configuration or deletion of an Event Notification collection server endpoint.

**Product**

IPCF

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx) #
```

**Syntax Description**

```
[ no ] event-notif-endpoint  en_node_name
```
no

Removes the specified Event Notification collection server endpoint.

en_node_name

Specifies name of the Event Notification collection server endpoint as an alphanumeric string of 1 through 31 characters.

If the named endpoint does not exist, it is created, and the CLI mode changes to the Event Notification Interface Endpoint Configuration Mode wherein the endpoint can be configured.

If the named endpoint already exists, the CLI mode changes to the Event Notification Interface Endpoint Configuration Mode wherein the endpoint can be reconfigured.

Usage Guidelines

Use this command to create/configure/delete an Event Notification collection server endpoint.

Only 1 Event Notification interface across a chassis can be configured on a system.

Entering this command results in the following prompt:

```
[context_name]hostname(config-ntfyintf-endpoint)#
```

The commands configured in this mode are defined in the Event Notification Interface Endpoint Configuration Mode Commands chapter of Command Line Interface Reference.

Caution

This is a critical configuration. The PCC Event notification can not be collected on a server without this configuration. Any change to this configuration would lead to the loss of event notifications from PCC service on IPCF node.

Example

The following command creates an Event Notification Interface Endpoint named event_intfc_3:

```
event-notif-endpoint event_intfc_3
```

exit

Exits the current mode and returns to the parent configuration mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

exit

Usage Guidelines

Use this command to return to the parent configuration mode.
This is a restricted command.

**fa-service**

Creates or deletes a foreign agent (FA) service or specifies an existing FA service for which to enter the FA Service Configuration Mode for the current context.

**Product**

- ASN-GW
- PDSN
- FA

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration

  ```
  configure > context context_name
  ```

  Entering the above command sequence results in the following prompt:

  ```
  [context_name]host_name(config-ctx)#
  ```

**Syntax Description**

```
[ no ] fa-service name [ -noconfirm ]
```

- **no**
  - Indicates the foreign agent service specified is to be removed.

- **name**
  - Specifies the name of the FA service to configure as an alphanumeric string of 1 through 63 characters. If `name` does not refer to an existing service, the new service is created if resources allow.

**Important**

Service names must be unique across all contexts within a chassis.

- **-noconfirm**
  - Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Enter the FA Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.
Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Example

The following command will enter the FA Service Configuration Mode creating the service sampleService, if necessary.

   fa-service sampleService

The following command will remove sampleService as being a defined FA service.

   no fa-service sampleService

firewall max-associations

This command is obsolete.

fng-service

Creates a new, or specifies an existing FNG service and enters the FNG Service Configuration Mode. A maximum of 16 FNG services can be created. This limit applies per ASR 5000 chassis and per context.

Product

FNG

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

   configure > context context_name

Entering the above command sequence results in the following prompt:

   [context_name]host_name(config-ctx)#

Syntax Description

   fng-service name [ -noconfirm ]
   no fng-service name

   fng-service name

   Specifies the name of a new or existing FNG service as an alphanumeric string of 1 through 63 characters that must be unique across all FNG services within the same context and across all contexts.

Important

   Service names must be unique across all contexts within a chassis.
Usage Guidelines

Use this command in Context Configuration Mode to create a new FNG service or modify an existing one. Executing this command enters the FNG Service Configuration Mode.

Example

The following command configures an FNG service named fng1 and enters the FNG Service Configuration Mode:

```
fng-service fmg1
```

---

**ggsn-service**

Creates or deletes a Gateway GPRS Support Node (GGSN) service and enters the GGSN Service Configuration Mode within the current context to configure it.

**Product**

GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ggsn-service svc_name [ -noconfirm ]
no ggsn-service svc_name
```

- **no**
  
  Deletes a previously configured GGSN service.

- **svc_name**
  
  Specifies the name of the GGSN service to create/configure as an alphanumeric string of 1 through 63 characters that is case sensitive.

- **Important**

  Service names must be unique across all contexts within a chassis.

- **-noconfirm**

  Executes the command without any additional prompt and confirmation from the user.
Usage Guidelines

Services are configured within a context and enable certain functionality. This command creates and allows the configuration of services enabling the system to function as a GGSN in a GPRS or UMTS network. This command is also used to remove previously configured GGSN services.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Example

The following command creates a GGSN service named ggsn1:

```
ggsn-service ggsn1
```

**gprs-service**

Creates a GPRS service instance and enters the GPRS Service Configuration Mode. This mode configures all of the parameters specific to the operation of an SGSN in a GPRS network.

Important

For details about the commands and parameters for this mode, check the *GPRS Service Configuration Mode* chapter.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
/context_name/host_name(config-ctx)#
```

Syntax Description

```
gprs-service srvc_name [ -noconfirm ]
no gprs-service srvc_name
```

no

Removes the configuration for the specified IGPRS service from the configuration for the current context.

srvc_name

Specifies the name of the GPRS service as a unique alphanumeric string of 1 through 63 characters.
Service names must be unique across all contexts within a chassis.

**-noconfirm**
Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**
Use this command to create or remove a GPRS service. Entering this command will move the system to the GPRS Service Configuration Mode and change the prompt to:

```
[context_name]hostname(config-gprs-service)#
```

**Example**
The following command creates an GPRS service named *gprs1*:

```
gprs-service gprs1
```
The following command removes the GPRS service named *gprs1*:

```
no gprs-service gprs1
```

**gs-service**

Creates a Gs service instance and enters the Gs Service Configuration Mode. This mode configures the parameters specific to the Gs interface between the SGSN and the MSC/VLR.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
gs-service svc_name [ -noconfirm ]
no gs-service svc_name
```

*no*

Remove the configured Gs service from the current context.

*svc_name*

Specifies the Gs service as a unique alphanumeric string of 1 through 63 characters.
Service names must be unique across all contexts within a chassis.

-noconfirm
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines
Use this command to create, edit, or remove a Gs service.
A maximum of 32 Gs service can be configured in one context/system. This limit is subject to maximum of 256 services (regardless of type) can be configured per system.

Important
For details about the commands and parameters for this mode, refer Gs Service Configuration Mode chapter.

Example
The following command creates an Gs service named gs1:

    gs-service gs1

The following command removes the Gs service named gs1:

    no gs-service gs1

gtpc high-throughput-sub
This command enables the GTPC configuration for high throughput subscribers.

Product
P-GW
SAEGW
S-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

    configure > context context_name
    [context_name]host_name(config-ctx)#

Syntax Description
[ no ] gtpc high-throughput-sub dcnr-based sessmgr-select round-robin

no
Disables the GTPC configuration for high throughput subscribers.
dcnr-based
Applies this configuration to all Create Session Requests that have a DCNR flag.

sessmgr-select
Specifies the method to select a session manager for a DCNR session.

round-robin
Selects the session managers for a high throughput session using the round-robin method.

Usage Guidelines
Use this command to enable the GTPC configuration for high throughput subscribers.

The gateway – S-GW, SAEGW or P-GW, classifies a session as a high throughput session based on a DCNR flag present in the IE: FLAGS FOR USER PLANE FUNCTION (UPF) SELECTION INDICATION, in the Create Session Request. This DCNR flag is check-pointed and recovered by the gateway.

A high throughput session is placed on a session manager that has no other high throughput session. If all session manager are handling a high throughput session then these sessions are allocated using the Round-Robin method.

gtpc overload-protection egress

Configures the overload protection of GGSN/P-GW by throttling outgoing GTPv1 and GTPv2 control messages over Gn/Gp(GTPv1) or S5/S8 (GTPv2) interface using rate-limiting-function (RLF) template for services configured in a context.

Product
GGSN
P-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-ctx)#

Syntax Description

gtpc overload-protection egress [ rlf-template rlf_template_name | throttling-override-policy throttling_override_policy_name ]

[no] gtpc overload-protection egress

no
Disables the GTP Outgoing Control Message Throttling for GGSN/P-GW services in this context.

rlf-template rlf_template_name
Associates a pre-configured Rate-Limiting-Function (RLF) template for throttling the GTP outgoing control messages for the GGSN/P-GW services in this context. This is a mandatory parameter to enable throttling.
Use the **rlf-template** command in Global Configuration mode to configure an RLF template.

### Important

**throttling-override-policy**

**throttling_override_policy_name**

Associates a pre-configured GTP-C Throttling Override Policy to selectively bypass throttling for a specific message type. This is a mandatory parameter to bypass enabled throttling.

Use the **throttling-override-policy** command in Global Configuration mode to configure a GTP-C Throttling Override Policy.

### Important

**Usage Guidelines**

Use this command to enable the GTP Outgoing Control Message Throttling for GGSN/P-GW services configured in the same context. The RLF template associated with this command controls the throttling parameters.

Associating a GTP-C Throttling Override Policy determines which message types can bypass the rate limiting function.

### Example

The following command enables the outgoing GTP control messages in a context using rlf-template gtpc_1:

```plaintext
gtpc overload-protection egress rlf-template gtpc_1
```

---

**gtpc overload-protection ingress**

Configures the over-load protection of GGSN/PGW/SAEGW/S-GW by throttling incoming new call GTPv1 and GTPv2 control messages over Gn/Gp (GGSN GTPv1) or S5/S8 (PGW GTPv2) or S4/S11 (S-GW GTPv2) interface with other parameters for GGSN/PGW/S-GW/SAEGW services configured in the same context.

### Product

- GGSN
- P-GW
- SAEGW
- S-GW

### Privilege

Security Administrator, Administrator

### Command Modes

- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```
Syntax Description


gtpc overload-protection ingress { msg-rate msg_rate } delay-tolerance dur [ queue-size size ] [ exclude { sgw-interface [ priority-message ] } | { priority-message [ sgw-interface ] } ]
[default] gtpc overload-protection ingress

**ingress**

Configures throttling parameters for incoming new call GTPC messages for GGSN, PGW, SGW, and SAEGW services in this context.

**default**

Resets the GTP incoming control message throttling parameters of msg-rate, delay-tolerance, and queue-size to their default values for GGSN, P-GW, SAEGW, and S-GW services.

**msg-rate msg_rate**

Defines the number of GTP incoming messages that can be processed per second.

`msg_rate` is an integer with a minimum value of 100 and maximum value that is dependent on the chassis or card used as shown in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Chassis/Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>SSI SMALL</td>
</tr>
<tr>
<td>3000</td>
<td>SSI MEDIUM</td>
</tr>
<tr>
<td>20000</td>
<td>SSI LARGE</td>
</tr>
<tr>
<td>12000</td>
<td>SCALE MEDIUM</td>
</tr>
<tr>
<td>20000</td>
<td>SCALE LARGE</td>
</tr>
<tr>
<td>12000</td>
<td>ASR5000 PSC</td>
</tr>
<tr>
<td>2000</td>
<td>ASR5000 PSC2</td>
</tr>
<tr>
<td>20000</td>
<td>ASR5000 PSC3</td>
</tr>
<tr>
<td>20000</td>
<td>ASR5000 PPC</td>
</tr>
<tr>
<td>20000</td>
<td>ASR5500 DPC</td>
</tr>
<tr>
<td>20000</td>
<td>ASR5500 DPC2</td>
</tr>
<tr>
<td>3000</td>
<td>SSI FORGE</td>
</tr>
</tbody>
</table>

The default value of `msg_rate` is 0, which implies that it is disabled.

**delay-tolerance dur**

Defines the maximum number of seconds a incoming GTP message can be queued before it is processed. After exceeding this, the message is dropped.

`dur` is an integer between 1 through 10. The default value is 5.
queue-size size
Defines the maximum size of the queue to be maintained for incoming GTPC messages. If the queue exceeds the defined size size, any new incoming messages will be dropped.

size is an integer between 100 through 10000. The default value is 10000.

exclude
Excludes the specified interface.

sgw-interface resets the incoming throttling parameters "msg-rate" and "queue-size" to their default values for GTPC incoming new call messages at SGW ingress interface (S4, S11). “delay-tolerance” continues to be applied as the configured value for the GTPC messages on the SGW interface (S4, S11). The message queue size considered for Congestion Control feature for PGW/SGW/GGSN is reset to default value of 10K, if this keyword is configured.

priority-message enables bypassing of demux incoming throttling for incoming GTPC request messages that have the Message Priority (MP) flag set as “1” and Message Priority value set as “0” in the GTP header.

Note
The priority-message" keyword is applicable only for the P-GW.

Usage Guidelines
Use this command to enable the GTP incoming control message throttling for GGSN/PGW/SAEGW/S-GW services configured in the same context.

New keywords exclude and sgw-interface have been added to the CLI command gtpc overload-protection ingress to disable throttling exclusively for S-GW ingress GTPC interfaces (S4, S11).

1. When gtpc overload-protection ingress CLI is configured without the exclude sgw-interface option, the configured values of msg rate, delay tolerance and queue-size are enabled on new call messages at S-GW ingress interface (S4, S11).

2. When exclude sgw-interface is configured for the GTPC messages on the S-GW interface (S4, S11), below are the values taken by different parameters:

3. If exclude sgw-interface is configured, GTPC ingress messages throttling is applied (with the configured values of msg rate, delay tolerance and queue-size) to the external interfaces of P-GW and GGSN such as S5, S8, S2b, Gn/Gp, only to the new call create messages incoming from outside of the ASR5k. GTPC ingress message throttling is also applied (with the configured values of msg-rate, delay-tolerance, and queue-size) to the internal interfaces of the SAEGW such as the S5/S8 interfaces, only to the new call create messages received at the local P-GW of the SAEGW.

4. If ingress throttling is configured using gtpc overload-protection ingress with exclude sgw-interface, then for congestion control calculation for P-GW/S-GW/GGSN/SAEGW demuxmgr based on message queue size, the default queue size value of 10K is used.

If ingress throttling is configured using gtpc overload-protection ingress without exclude sgw-interface, then for congestion control calculation for P-GW/S-GW/GGSN/SAEGW demuxmgr based on message queue size, the configured queue-size value will be used.

The following table describes various scenarios of the configuration:
In Release 21.4, the **priority-message** keyword is added to the existing gtpc overload-protection ingress CLI to enable bypassing of demux incoming throttling for incoming GTPC request messages where the “MP” flag is set as 1 and Message Priority value set as 0 in the GTP header.

This keyword is disabled by default.

If the new **exclude priority-message** CLI keyword is configured, it applies the following behaviour to bypass incoming throttling for high priority messages:

- High priority messages, the default configuration for “msg-rate” and “queue-size” of demux are applicable (even if they are configured with a different value). The default value for “msg-rate” is 0, which implies that High Priority setting is disabled. The default value for “queue-size” is 10000.

- There is no throttling applied due to the “delay-tolerance” parameter for High Priority messages.

- Also High Priority Create Session Request (CSReq) messages are prioritized over other messages. However, High Priority CSReq messages are processed in sequence.

- When a High Priority message is received and the queue is overloaded then a Low Priority message is discarded from the queue to accommodate the High Priority message.

- In a rare scenario where all the messages in the queue are High Priority and the queue is overloaded, then the new High Priority message may get dropped.
• If ingress throttling is configured using "gtpc overload-protection ingress" with "exclude priority-message" option, then for congestion control calculation for P-GW, S-GW, GGSN, and SAEGW demux manager based on the demux message queue size, the default queue size value of 10,000 is used. (This is the same behaviour if exclude sgw-interface is selected.)

• If ingress throttling is configured using "gtpc overload-protection ingress" without the "exclude" option, then for congestion control calculation for P-GW, S-GW, GGSN, and SAEGW demux manager based on demux message queue size, the configured queue-size value is used.

The following table describes the behavior when the exclude priority-message is configured:

<table>
<thead>
<tr>
<th>GTPC Incoming Throttling Demux Queue-size Configuration (100 to 10000)</th>
<th>Is “exclude priority-message” configured</th>
<th>Demux Queue-size used for GTPC Incoming Throttling for S-GW/GGSN/“Low Priority” P-GW messages</th>
<th>Demux Queue-size used for “High Priority messages” P-GW messages</th>
<th>Queue-size considered for Congestion Control Threshold for P-GW/GGSN/S-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No configuration/Default configuration</td>
<td>No</td>
<td>10000 (default)</td>
<td>10000 (default)</td>
<td>Configured_congestion_threshold * 10000 (default)</td>
</tr>
<tr>
<td>No configuration/Default configuration</td>
<td>Yes</td>
<td>10000 (default)</td>
<td>10000 (default)</td>
<td>Configured_congestion_threshold * 10000 (default)</td>
</tr>
<tr>
<td>5000 (or any configured value from 100 to 10000)</td>
<td>No</td>
<td>5000 (or the configured value)</td>
<td>5000 (or the configured value)</td>
<td>Configured_congestion_threshold * 5000 (default)</td>
</tr>
<tr>
<td>5000 (or any configured value from 100 to 10000)</td>
<td>Yes</td>
<td>5000 (or the configured value)</td>
<td>10000 (because “exclude priority-message” is configured)</td>
<td>Configured_congestion_threshold * 10000 (this is the behavior change for congestion control, if “exclude priority-message” is configured)</td>
</tr>
</tbody>
</table>

**Example**

The following command enables the throttling of incoming new call GTP control messages in a context using message rate 1000 per second with message queue size 10000 and delay tolerance of 1 second:

```
gtpc overload-protection ingress msg-rate 1000 delay-tolerance 1 queue-size 10000
```

**Example**

The following command bypasses incoming throttling for high priority messages.
gtpc peer-salvation

Configures peer salvation for inactive GTPv2 peers for EGTP services in this context.

**Product**
P-GW  
SAEGW  
S-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] gtpc peer-salvation { min-peers value | timeout value }
```

**no**

Disables peer salvation for inactive GTPv2 peers for EGTP services in the context.

**min-peers value**

Configures the minimum number of accumulated GTPv2 peers across all EGTP services to start salvaging the inactive peers. The value ranges from 2000 to 12000.

**timeout value**

Configures the peer salvation timeout. The peer that is inactive for salvation time is salvaged, in hours. The value ranges from 1 to 48 hours.

**Usage Guidelines**

Use this command to enable peer salvation for inactive GTPv2 peers for EGTP services in this context. The `peer-salvation` keyword is introduced in the Context Configuration Mode. Minimum peers and timeout values can be provided with this CLI, which will be per egtpmgr (separate for egtpmgr and egtpegmgr) and across all the egtp-services configured in that context.

This command is disabled by default.
Important

- When the **peer-salvation** keyword is enabled at the context level, but not enabled at egtp-service level, then peer salvation does not occur.

- All the information (peer statistics/recovery counter and so on) of the particular peer is lost after it is salvaged.

- The context level configuration is applied to egtpinmgr and egtpemgr separately.

- The **min-peers** value should be applied judiciously to ensure that the Session Manager in a fully loaded chassis does not go into warn/over state with many peer records. If the Session Manager goes into a warn/over state, then it is recommended to configure a lesser value for min-peers to ensure that the peers are salvaged.

- **min-peers** configuration is not considered during a new peer creation.

- Only peers with zero number of sessions are salvaged for the configured timeout value. Non-zero number of sessions is not salvaged even if there are few.

---

**Example**

The following command specifies the number of peers to be salvaged and the timeout value.

```
gtpc peer-salvation min-peers 4000 timeout 5
```

---

**gtpc-system-param-poll interval**

Sets the time period over which to monitor the chassis level CPU, Memory and Session count information from the resource manager.

**Product**

- P-GW
- SAEGW
- S-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtpc-system-param-poll interval seconds
default gtpc-system-param-poll interval
```

**default**

Returns the GTP-C system parameter polling interval to the default setting of 30 seconds.
**gtpc-system-param-poll interval seconds**

Sets the time period over which to monitor the chassis level CPU, Memory and Session count information from the resource manager.

Valid entries are from 15 to 300 seconds.

The default setting is 30 seconds.

---

**Caution**

Setting the time interval to a low value may impact system performance.

---

**Usage Guidelines**

In capacity testing and also in customer deployments it was observed that the chassis load factor for the R12 Load and Overload Support feature was providing incorrect values even when the sessmgr card CPU utilization was high. The root cause is that when the load factor was calculated by taking an average of CPU utilization of sessmgr and demux cards, the demux card CPU utilization never increased more than the sessmgr card CPU utilization. As a result, the system did not go into the overload state even when the sessmgr card CPU utilization was high.

This feature has been enhanced to calculate the load factor based on the higher value of similar types of cards for CPU load and memory. If the demux card's CPU utilization value is higher than the sessmgr card's CPU utilization value, then the demux card CPU utilization value is used for the load factor calculation.

This CLI command is introduced to configure different polling intervals for the resource manager so that the demuxmgr can calculate the load factor based on different system requirements.

**Example**

The following command sets the GTP-C system parameter polling interval to 40 seconds:

```
gtpc-system-param-poll interval 40
```

---

**gtpp algorithm**

Configures GTPP routing algorithms for the current context. This command is deprecated but available for backward compatibility.

**Product**

- GGSN
- P-GW
- SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration
  - `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
/context_name/host_name(config-ctx) #
```
Syntax Description

gtpp algorithm { first-server | round-robin | first-n count }

first-server

Specifies that accounting data is sent to the first available charging gateway function (CGF) based upon the relative priority of each configured CGF. Default: Enabled

round-robin

Specifies that accounting data is transmitted in a circular queue fashion such that data is sent to the highest priority CGF first, then to the next available CGF of the highest priority, and so on. Ultimately, the queue returns to the CGF with the highest configured priority. Default: Disabled

first-n count

Specifies that the AGW must send accounting data to count (more than one) CGFs based on their priority. Response from any one of the count CGFs would suffice to proceed with the call. The full set of accounting data is sent to each of the count CGFs.

count is the number of CGFs to which accounting data will be sent, and must be an integer from 2 through 65535. Default: 1 (Disabled)

Usage Guidelines

Use this command to control how G-CDR/P-CDR accounting data is routed among the configured CGFs.

Example

The following command configures the system to use the round-robin algorithm when transmitting G-CDR/P-CDR accounting data:

```bash
gtpp algorithm round-robin
```

gtpp attribute

Allows the specification of the optional attributes to be present in the Call Detail Records (CDRs) that the GPRS/PDN/UMTS access gateway generates. It also defines that how the information is presented in CDRs by encoding the attribute field values.

Product

GGSN
SGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)>
```
gtpp attribute { apn-ambr [ include-for-all-bearers | include-for-default-bearer | include-for-non-gbr-bearers ] | apn-ni | apn-selection-mode | charging-characteristic-selection-mode | camel-info | cell-plmn-id | { ciot-cp-optind | ciot-unipdu-cponly } | diagnostics [ abnormal-release-cause ] | direct-tunnel | duration-ms | dynamic-flag | dynamic-flag-extension | furnishing-charging-information | imei | imsi-unauthenticated-flag | lapi last-ms-timezone | last-uli | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | node-id-suffix STRING | pdn-connection-id | pdp-address | pdp-type | pgw-ipv6-addr | pgw-plmn-id | plmn-id | qos max-length | rat | record-extension | record-extensions rat | record-type { sgsnpdprecord | sgwrecord } | served-mnai | served-pdp-pdn-address-extension | served-pdp-pdn-address-prefix-length | sgsn-change | sms { destination-number | recording-entity | service-centre } | sgw-ipv6-addr | sna-ipv6-addr | sponsor-id | start-time | stop-time | twanuli | uli | user-csg-information } +
default gtpp attribute { apn-ambr [ include-for-all-bearers | include-for-default-bearer | include-for-non-gbr-bearers ] | apn-ni | apn-selection-mode | charging-characteristic-selection-mode | camel-info | cell-plmn-id | { ciot-cp-optind | ciot-unipdu-cponly } | diagnostics [ abnormal-release-cause ] | direct-tunnel | duration-ms | dynamic-flag | dynamic-flag-extension | furnishing-charging-information | imei | imsi-unauthenticated-flag | lapi last-ms-timezone | last-uli | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | node-id-suffix STRING | pdn-connection-id | pdp-address | pdp-type | pgw-ipv6-addr | pgw-plmn-id | plmn-id | qos max-length | rat | record-extension | record-extensions rat | record-type { sgsnpdprecord | sgwrecord } | served-mnai | served-pdp-pdn-address-extension | served-pdp-pdn-address-prefix-length | sgsn-change | sms { destination-number | recording-entity | service-centre } | sgw-ipv6-addr | sna-ipv6-addr | sponsor-id | start-time | stop-time | twanuli | uli | user-csg-information } +
no gtpp attribute { apn-ambr [ include-for-all-bearers | include-for-default-bearer | include-for-non-gbr-bearers ] | apn-ni | apn-selection-mode | charging-characteristic-selection-mode | camel-info | cell-plmn-id | { ciot-cp-optind | ciot-unipdu-cponly } | diagnostics [ abnormal-release-cause ] | direct-tunnel | duration-ms | dynamic-flag | dynamic-flag-extension | furnishing-charging-information | imei | imsi-unauthenticated-flag | lapi last-ms-timezone | last-uli | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | node-id-suffix STRING | pdn-connection-id | pdp-address | pdp-type | pgw-ipv6-addr | pgw-plmn-id | plmn-id | qos max-length | rat | record-extension | record-extensions rat | record-type { sgsnpdprecord | sgwrecord } | served-mnai | served-pdp-pdn-address-extension | served-pdp-pdn-address-prefix-length | sgsn-change | sms { destination-number | recording-entity | service-centre } | sgw-ipv6-addr | sna-ipv6-addr | sponsor-id | start-time | stop-time | twanuli | uli | user-csg-information } +
default
Sets the default GTPP attributes in the generated CDRs. It also sets the default presentation of attribute values in generated CDRs.

no
Removes the configured GTPP attributes from the CDRs.

apn-ambr [ include-for-all-bearers | include-for-default-bearer | include-for-non-gbr-bearers ]
Default: Disabled
This keyword controls the inclusion of the optional field "apn-ambr" in the PGW-CDRs in the custom24 GTPP dictionary.

---
**Important**
This keyword option will be available only if a valid license is installed. For more information, contact your Cisco account representative.

The APN Aggregate Maximum Bit Rate (AMBR) is a subscription parameter stored per APN. It limits the aggregate bit rate that can be expected to be provided across all non-GBR bearers and across all PDN connections of the same APN. Each of these non-GBR bearers potentially utilize the entire APN AMBR, e.g. when the other non-GBR bearers do not carry any traffic. The APN AMBR is present as part of QoS information.

In 15.0 and later releases, this CLI command should be configured along with the following additional options to support APN-AMBR reporting in SGW-CDRs in all GTPP dictionaries.

- **include-for-all-bearers**: Includes the APN-AMBR information in SGW-CDRs for all bearers (GBR and NON-GBR)
- **include-for-default-bearer**: Includes APN-AMBR information in SGW-CDRs only for default bearer.
- **include-for-non-gbr-bearers**: Includes APN-AMBR information for non-gbr-bearers.

This feature is required to enable post-processing of CDRs to verify MVNO subscribers actual QoS against invoicing systems.

---
**Important**
This CLI command and the associated options are not available for products other than S-GW and P-GW. The option "non-gbr-bearers-only" is available in S-GW and P-GW but the other options are available in S-GW only.

In the P-GW implementation, if the CLI command "gtppp attribute apn-ambr" is configured, it will be treated as "gtppp attribute apn-ambr non-gbr-bearers-only". In case of S-GW/P-GW combo if any of the options is configured, it will be considered that the attribute is available.

apn-ni
Default: Enabled
This keyword controls the inclusion of the optional field "APN" in the x-CDRs.
apn-selection-mode
Default: Enabled
This keyword controls the inclusion of the optional field "APN Selection Mode" in the x-CDRs.

camel-info
SGSN only
Enter this keyword to include CAMEL-specific fields in SGSN CDRs. Default: Disabled

cell-plmn-id
SGSN only
Enter this keyword to enable the system to include the Cell PLMN ID field in the M-CDR. Default: Disabled

charging-characteristic-selection-mode
Default: Enabled
This keyword controls the inclusion of the optional field "Charging Characteristic Selection Mode" in the x-CDRs.

ciot-cp-optind
Includes optional field "CP CIoT EPS optimisation indicator" in the CDR.

ciot-unipdu-cponly
Includes optional field "UNI PDU CP Only Flag" in the CDR.

diagnostics [ abnormal-release-cause ]
Default: Disabled
Enables the system to include the Diagnostic field in the CDR that is created when PDP contexts are released. The field will include one of the following values:

- **26** - For GGSN: if the GGSN sends "delete PDP context request" for any other reason (e.g., the operator types "clear subscribers" on the GGSN). For SGSN: The SGSN includes this cause code in the S-CDR to indicate that a secondary PDP context activation request or a PDP context modification request has been rejected due to insufficient resources.

- **36** - For GGSN: this cause code is sent in the G-CDR to indicate the PDP context has been deactivated in the GGSN due to the SGSN having sent a "delete PDP context request" to the GGSN. For SGSN, this cause code is used to indicate a regular MS or network-initiated PDP context deactivation.

- **37** - when the network initiates a QoS modification, the SGSN sends in the S-CDR to indicate that the MS initiation deactivate request message has been rejected with QoS not accepted as the cause.

- **38** - if the GGSN sends "delete PDP context request" due to GTP-C/GTP-U echo timeout with SGSN. If the SGSN sends this cause code, it indicates PDP context has been deactivated due to path failure, specifically GTP-C/GTP-U echo timeout.

- **39** - SGSN only - this code indicates the network (GGSN) has requested a PDP context reactivation after a GGSN restart.
• 40 - if the GGSN sends "delete PDP context request" due to receiving a RADIUS Disconnect-Request message.

**abnormal-release-cause**: This keyword controls the inclusion of abnormal bearer termination information in diagnostics field of SGW-CDR. Note that the CLI command "gtpp attribute diagnostics" will disable abnormal-release-cause and enable the diagnostics field. The no gtpp attribute diagnostics command will disable both abnormal-release-cause and diagnostics field.

---

**Important**

The Abnormal Bearer Termination feature is currently applicable only to custom34 and custom35 GTPP dictionaries. That is, the bearer termination cause is populated in SGW-CDR for custom34 and custom35 dictionaries, and PGW-CDRs for custom35 GTPP dictionary when the cause for record closing is "Abnormal Release".

---

**direct-tunnel**

Default: Disabled

Includes the Direct Tunnel field in PGW-CDR/eG-CDRs.

This keyword is applicable for GGSN, P-GW and S-GW only.

**duration-ms**

Specifies that the information contained in the mandatory Duration field be reported in milliseconds instead of seconds (as the standards require). Default: Disabled

**dynamic-flag**

Default: Enabled

This keyword controls the inclusion of the optional field "Dynamic Flag" in the x-CDRs.

**dynamic-flag-extension**

Default: Enabled

This keyword controls the inclusion of the optional field "Dynamic Address Flag Extension" in the x-CDRs. This field is seen in the CDR when the IPv4 address is dynamically assigned for a dual PDP context. This extension field is required in the 3GPP Release 10 compliant CDRs so that the Dual Stack Bearer support is available.

**furnish-charging-information**

Default: Disabled

This keyword controls the inclusion of the optional field "pSFurnishChargingInformation" in the eG-CDRs and PGW-CDRs.

---

**Important**

The Furnish Charging Information (FCI) feature is applicable to all GTPP dictionaries compliant to 3GPP Rel.7 and 3GPP Rel.8 except custom43 dictionary. This keyword option will be available only if a valid license is installed. For more information, contact your Cisco account representative.
PGW-CDR and eG-CDR will contain FCI only if it is enabled at command level, i.e. using the `gtpp attribute furnish-charging-information` command in GTPP Server Group Configuration mode.

Whenever FCI changes, a new Free-Format-Data (FFD) value is either appended to existing FFD or overwritten on the existing FDD depending on Append-Free-Format-Data (AFFD) flag. CDR is not generated upon FCI change.

FCI is supported in main CDR as well as in LOSDV. Whenever a trigger (volume, time, RAT, etc.) happens current available FFD at command level is added to the main body of the CDR. The same FFD at command level is added to the main body of the next CDRs until it is not appended or overwritten by next Credit-Control-Answer message at command level.

In the case of custom43 dictionary, the FCI implementation will be as follows:

- Whenever FCI changes PGW-CDR will generate CDR i.e close old bucket and will have old FCI details in the generated CDR.
- Translation for the PS-Free-Format-Data in CDR will be conversion of hexadecimal values in ASCII format (for numbers 0 to 9) to decimal values as integers.
- PS-Append-Free-Format-Data always OVERWRITE.

### `imei`

**Default:** Disabled

For SGSN: includes the IMEI value in the S-CDR.

For GGSN: includes the IMEISV value in the G-CDR.

### `imsi-unauthenticated-flag`

**Default:** Enabled

This keyword controls the inclusion of the optional field "IMSI Unauthenticated Flag" in the x-CDRs.

When the served IMSI is not authenticated, this field "IMSI Unauthenticated Flag" if configured, will be present in the P-GW CDR record for custom35 dictionary. This field is added per 3GPP TS 32.298 v10.7.

### `lapi`

**Default:** Disabled

Includes the Low Access Priority Indicator (LAPI) field in the CDRs. This field is required to support MTC feature.

When UE indicates low priority connection, then the "lowPriorityIndicator" attribute will be included in the CDR.

### `last-ms-timezone`

**Default:** Disabled

Sets the "Last MS-Timezone" in the CDR field. This option would be disabled when the default option is used.

### `last-uli`

**Default:** Disabled
Sets the "Last ULI" in the CDR field. This option would be disabled when the default option is used.

**local-record-sequence-number**

Default: Disabled

This keyword provides both the local record sequence number and the Node ID. In the x-CDRs, this field indicates the number of CDRs generated by the node and is unique within the session manager.

The Node ID field is included in the x-CRD for any of several reasons, such as when PDP contexts are released or if partial-CDR is generated based on configuration. The field will consist of an AAA Manager identifier automatically appended to the name of the SGSN or GGSN service.

The name of the SGSN or GGSN service may be truncated, because the maximum length of the Node ID field is 20 bytes. Since each AAA Manager generates CDRs independently, this allows the Local Record Sequence Number and Node ID fields to uniquely identify a CDR.

---

**Important**

If the **gtpp single-source centralized-lrsn** is configured, the 'Node-ID' field consists of only the specified NodeID-suffix. If NodeID-suffix is not configured, GTPP group name is used. For default GTPP groups, GTPP context-name is used. If the **gtpp single-source centralized-lrsn** is not configured, then node-id format for CDRs generated by Sessmgr is as follows: <1-byte Sessmgr restart-value><3-byte Sessmgr instance number><node-id-suffix>. If the **gtpp single-source centralized-lrsn** is not configured, then node-id format for CDRs generated by ACSmgr is as follows: <1-byte ACSmgr restart-value><3-byte ACSmgr instance number><Active charging service-name>.

---

**losdv**

Default: Enabled

This keyword controls the inclusion of the optional field "List of Service Data" in the x-CDRs.

**ms-timezone**

Default: Enabled

This keyword controls the inclusion of the optional field "MS-Timezone" in the x-CDRs.

**msisdn**

Default: Enabled

This keyword controls the inclusion of the optional field "MSISDN" in the x-CDRs.

**node-id**

Default: Enabled

This keyword controls the inclusion of the optional field "Node ID" in the x-CDRs.

**node-id-suffix STRING**

Default: Disabled

Specifies the configured Node-ID-Suffix to use in the NodeID field of GTPP CDRs as an alphanumeric string of 1 through 16 characters. Each Session Manager task generates a unique NodeID string per GTPP context.
The NodeID field is a printable string of the \textit{n}dddd\textit{STRING} format: \textit{n}: The first digit is the Sessmgr restart counter having a value between 0 and 7. \textit{ddd}: The number of sessmgr instances. Uses the specified NodeID-suffix in all CDRs. The "Node-ID" field consists of sessMgr Recovery counter (1 digit) \textit{n} + AAA Manager identifier (3 digits) \textit{ddd} + the configured Node-Id-suffix (1 to 16 characters) \textit{STRING}. If the centralized LRSN feature is enabled, the "Node-ID" field will consist of only the specified NodeID-suffix (NodeID-prefix is not included). If this option is not configured, then GTPP group name will be used instead (For default GTPP groups, context-name will be used).

Important

If this \texttt{node-id-suffix} is not configured, the GGSN uses the GTPP context name as the Node-id-suffix (truncated to 16 characters) and the SGSN uses the GTPP group named as the node-id-suffix.

\textbf{pdn-connection-id}

Default: Enabled

This keyword controls the inclusion of the optional field "PDN Connection ID" in the x-CDRs.

\textbf{pdp-address}

Default: Enabled

This keyword controls the inclusion of the optional field "PDP Address" in the x-CDRs.

\textbf{pdp-type}

Default: Enabled

This keyword controls the inclusion of the optional field "PDP Type" in the x-CDRs.

\textbf{pgw-ipv6-addr}

Default: Disabled

Specifying this option allows to configure the P-GW IPv6 address.

Important

This attribute can be controllably configured in custom24 and custom35 SGW-CDR dictionaries.

\textbf{pgw-plmn-id}

Default: Enabled

This keyword controls the inclusion of the optional field "PGW PLMN-ID" in the x-CDRs.

\textbf{plmn-id [ unknown-use ]}

Default: Enabled

For SGSN, reports the SGSN PLMN Identifier value (the RAI) in the S-CDR provided if the dictionary supports it.
For GGSN, reports the SGSN PLMN Identifier value (the RAI) in the G-CDR if it was originally provided by the SGSN in the GTP create PDP context request. It is omitted if the SGSN does not supply one.

Normally when SGSN PLMN-id information is not available, the attribute sgsnPLMNIIdentifier is not included in the CDR. This keyword enables the inclusion of the sgsnPLMNIIdentifier with a specific value when the SGSN PLMN-id is not available.

```
unknown-use hex_num: is a hexadecimal number from 0x0 through 0xFFFFFFFF that identifies a foreign SGSN that has not provided a PLMN-id. For GGSN only.
```

**qos max-length**

Default: Disabled

Specifying this option will change the parameters related to QoS sent in S-CDR and SaMOG CDR. The `max-length` option is used to modify the length of QoS sent in CDR. The `qos_value` must be an integer from 4 through 24.

This feature is introduced to support Rel.7+ QoS formats.

**rat**

Default: Enabled

For SGSN: includes the RAT (identifies the radio access technology type) value in the S-CDR.

For GGSN: includes the RAT (identifies the radio access technology type) value in the G-CDR.

**recordextension**

Default: Disabled

This keyword controls the inclusion of the optional field "RecordExtension" in the x-CDRs.

**record-extensions rat**

Default: Disabled

Enables network operators and/or manufacturers to add their own recommended extensions to the CDRs according to the standard record definitions from 3GPP TS 32.298 Release 7 or higher.

**record-type { sgsnpdprecord | sgwrecord }**

This keyword is available only when the SaMOG Mixed Mode license (supporting both 3G and 4G) is configured.

Default: sgwrecord

Specifies the SaMOG CDR type to use.

For an SaMOG 3G license, this keyword will not be available. However, sgsnpdprecord type will be used as the default record type.

**served-mnai**

Default: Disabled
This keyword controls the inclusion of the optional field "Served MNAI" in the x-CDRs.

**served-pdp-pdn-address-extension**

Default: Disabled

In support of IPv4v6 dual-stack PDP address types, this keyword causes the service to include IPv4v6 address information in the CDR. The IPv4 address goes in the Served PDP PDN Address Extension field and the IPv6 address goes in the Served PDP Address or Served PDP PDN Address field.

---

**Important**

This attribute will not be displayed if the GTPP dictionary is set to custom34.

---

**Note**

For SGSN, on enabling `served-pdp-pdn-address-extension` all custom S-CDR dictionaries will support the CDR field "Served PDP/ PDN Address extension" except for the following dictionaries:

- custom17
- custom18
- custom23
- custom42
- custom41

---

**served-pdp-pdn-address-prefix-length**

Default: Enabled

In support of IPv6 prefix delegation, this keyword causes the service to include this field "Served PDP PDN Address" in the x-CDRs.

If this field is configured, the servedPDPPDNAddress field will support reporting the IPv6 prefix length as outlined in 3GPP 32.298. The prefix length will only be reported if:

- it is configured
- it is not the default length of 64
- it is an IPv6 or IPv4v6 call

**sgsn-change**

Default: Enabled

This keyword is specific to SGSN and is license restricted.

This keyword controls the inclusion of the S-CDR attribute "SGSN Change" in the S-CDRs. It is enabled by default and the attribute "SGSN Change" is included in the S-CDRs by default.

---

**Note**

For SGSN specific custom33 dictionary, it is recommended to disable this keyword before an upgrade to prevent billing issues.
sgw-ipv6-addr
Default: Disabled
Specifying this option allows to configure the S-GW IPv6 address.

Important
This attribute can be controllably configured in custom24 and custom35 SGW-CDR dictionaries.

sms { destination-number | recording-entity | service-centre }
This keyword is specific to the SGSN.
Entering this keyword causes the inclusion of an SMS-related field in the SMS-MO-CDR or SMS-MT-CDR.
destination-number: Includes the "destinationNumber" field in the SMS-MO-CDR or SMS-MT-CDR.
recording-entity: Includes the "recordingEntity" field in the SMS-MO-CDR or SMS-MT-CDR.
service-centre: Includes the "serviceCentre" field in the SMS-MO-CDR or SMS-MT-CDR.

sna-ipv6-addr
Default: Disabled
Specifying this option allows to configure the Serving Node IPv6 Address (SNAV6).

Important
This attribute can be controllably configured in custom24 and custom35 SGW-CDR dictionaries.

sponsor-id
Default: Disabled
Includes the Sponsor ID and Application-Service-Provider-Identity fields in PGW-CDR.
Note that the "Sponsor ID" and "Application-Service-Provider-Identity" attributes will be included in PGW-CDR if the PCEF supports Sponsored Data Connectivity feature or the required reporting level is sponsored connectivity level as described in 3GPP TS 29.212.
This feature is implemented to be in compliance with Release 11 3GPP specification for CDRs. So, this behavior is applicable to all GTPP dictionaries that are Release 11 compliant, i.e. custom35.

start-time
Default: Enabled
This keyword controls the inclusion of the optional field "Start-Time" in the x-CDRs.

stop-time
Default: Enabled
This keyword controls the inclusion of the optional field "Stop-Time" in the x-CDRs.
**twanuli**
Default: Disabled
This keyword controls the inclusion of the optional field "TWAN User Location Information" in the CDRs.

**uli**
Default: Enabled
This keyword controls the inclusion of the optional field "User Location Information" in the x-CDRs.

**user-csg-information**
Default: Disabled
This keyword controls the inclusion of the optional field "User CSG Information" in the x-CDRs.

---

**Important**
Currently, UCI values are only supported for SGW-CDRs.
This attribute will not be displayed if the GTPP dictionary is set to custom11, custom34, or custom35.

**+**
Indicates that this command can be entered multiple times to configure multiple attributes.

---

**Usage Guidelines**
Use this command to configure the type of optional information fields to include in generated CDRs (M-CDRs, S-CDRs, S-SMO-CDR, S-SMT-CDR from SGSN and G-CDRs, eG-CDRs from GGSN) by the AGW (SGSN/GGSN/P-GW/SAEGW). In addition, it controls how the information for some of the mandatory fields are reported.

Fields described as optional by the standards but not listed above will always be present in the CDRs, except for Record Extensions (which will never be present).

---

**Important**
This command can be repeated multiple times with different keywords to configure multiple GTPP attributes.

---

**Example**
The following command configures the system to present the time provided in the Duration field of the CDR is reported in milliseconds:

```
gtpp attribute duration-ms
```

---

**gtpp charging-agent**
Configures the IP address and port of the system interface within the current context used to communicate with the Charging Gateway Function (CGF).

---

**Product**
GGSN
SGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```plaintext
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```plaintext
gtpp charging-agent address ip_address [ port port ]
no gtpp charging-agent
```

- **no**
  Removes a previously configured charging agent address.

- **address ip_address**
  Specifies the IP address of the interface configured within the current context that is used to transmit CDR records (G-CDR/eG-CDR/M-CDR/S-CDR) to the CGF. *ip_address* must be entered using IPV4 dotted-decimal notation.

- **port port**
  Specifies the Charging Agent UDP port as an integer from 1 through 65535.
  If *port* is not defined, IP will take the default port number 49999.

**Important**
Configuring gtpp charging-agent on port 3386 may interfere with a ggsn-service configured with the same ip address.

**Usage Guidelines**

This command establishes a Ga interface for the system. For GTPP accounting, one or more Ga interfaces must be specified for communication with the CGF. These interfaces must exist in the same context in which GTPP functionality is configured (refer to the gtpp commands in this chapter).

This command instructs the system as to what interface to use. The IP address supplied is also the address by which the GSN is known to the CGF. Therefore, the IP address used for the Ga interface could be identical to one bound to a GSN service (a Gn interface).

If no GSN service is configured in the same context as the Ga interface, the address configured by this command is used to receive unsolicited GTPP packets.

**Example**
The following command configures the system to use the interface with an IP address of 192.168.13.10 as the accounting interface with port 20000 to the CGF:
gtpp charging-agent address 192.168.13.10 port 20000

gtpp data-record-format-version

Encodes the data record format version. The version indicates the 3GPP release version.

**Product**

Important

In releases prior to 18, this is applicable only to custom24 and custom35 GTPP dictionaries for S-GW. In 18 and later releases, this command is applicable to all GTPP dictionaries for all products including GGSN, P-GW, S-GW and SGSN.

<table>
<thead>
<tr>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGSN</td>
</tr>
<tr>
<td>P-GW</td>
</tr>
<tr>
<td>SGSN</td>
</tr>
<tr>
<td>S-GW</td>
</tr>
</tbody>
</table>

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[(context_name)host_name(config-ctx)]#

**Syntax Description**

[ no ] gtpp data-record-format-version string

**no**

Specifies that the default data record format will be encoded based on the GTPP dictionary being used.

**gtpp data-record-format-version string**

Specifies the 3GPP release version to be encoded. *string* must be in the format a.b (for example 10.10). The entry can be from 1 to 1023 alphanumeric characters.

**Usage Guidelines**

Use this command to support a configurable multiple data record format version only for custom24 and custom35 dictionaries in releases prior to 18, and all GTPP dictionaries in release 18 and beyond. The entry can be from 1 to 1023 alphanumeric characters. This is useful when the value of the data record format version is taken according to the dictionary being used. If only the default configuration is used, a version mismatch causes the GTPP request to be discarded while using R10 attributes.

**Example**

This example configures the data record format version 10.10 to be encoded.

* gtpp data-record-format-version 10.10
gtpp data-request sequence-numbers

Configures the range of sequence numbers to be used in the GTPP data record transfer record (DRT). Use this command to set the start value for the sequence number.

**Product**
- GGSN
- SGSN
- P-GW
- SAEGW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  
  `configure > context context_name`

  Entering the above command sequence results in the following prompt:
  
  `[context_name]host_name(config-ctx)#`

**Syntax Description**

```plaintext
gtpp data-request sequence-numbers start { 0 | 1 }
default gtpp data-request sequence-numbers start

default
Default is 0 (zero).

{ 0 | 1 }
Specifies the value of the start sequence number for the GTPP Data Record Transfer Request. Default: 0
  - 0: Designates the start sequence number as 0.
  - 1: Designates the start sequence number as 1.
```

**Usage Guidelines**

When the GGSN/P-GW (SAEGW)/SGSN is configured to send GTPP echo request packets, the SGSN always uses 0 as the sequence number in those packets. Re-using 0 as a sequence number in the DRT packets is allowed by the 3GPP standards; however, this CLI command ensures the possibility of inter-operating with CGFs that can not properly handle the re-use of sequence number 0 in the echo request packets.

**Example**

The following command sets the sequence to start at 1.

```
gtpp data-request sequence-numbers start 1
```

**gtpp dead-server suppress-cdrs**

Enables or disables CDR archiving when a dead server is detected.
This command is customer specific. For more information please contact your local Cisco service representative.

**Product**
GGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

**Syntax Description**

- `[ default | no ] gtpp dead-server suppress-cdrs`

  - `default`
    - Configures the default setting.
    - Default: Disabled

  - `no`
    - Re-enables CDR archiving.

**Usage Guidelines**
Use this command to enable/disable CDR archiving when a dead server is detected. With this CLI, once a server is detected as down, requests are purged. Also the requests generated for the period when the server is down are purged.

---

**gtpp deadtime**

Configures the amount of time to wait before attempting to communicate with a Charging Gateway Function (CGF) that was previously marked as unreachable.

**Product**
GGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```
gtpp detect-dead-time

default gtpp detect-dead-time

default
Configures this command with the default setting.
Default: 120 seconds

time
Specifies the amount of time (in seconds) that must elapse before the system attempts to communicate with a CGF that was previously unreachable. time is an integer from 1 through 65535.

Usage Guidelines
If the system is unable to communicate with a configured CGF, after a pre-configured number of failures the system marks the CGF as being down.
This command specifies the amount of time that the system waits prior to attempting to communicate with the downed CGF.
Refer to the gtpp detect-dead-server and gtpp max-retries commands for additional information on the process the system uses to mark a CGF as down.

Example
The following command configures the system to wait 60 seconds before attempting to re-communicate with a CGF that was marked as down:

gtpp detect-dead-time 60

gtpp detect-dead-server

Configures the number of consecutive communication failures that could occur before the system marks a Charging Gateway Function (CGF) as down.

Product
GGSN
P-GW
SAEGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description

gtpp detect-dead-server consecutive-failures max_number
default gtpp detect-dead-server consecutive-failures
**default**

Configures this command with the default setting.

Default: 0

**consecutive-failures max_number**

Specifies the number of failures that could occur before marking a CGF as down. *max_number* is an integer from 0 through 1000.

**Usage Guidelines**

This command works in conjunction with the `gtpp max-retries` parameter to set a limit to the number of communication failures that can occur with a configured CGF.

The `gtpp max-retries` parameter limits the number of attempts to communicate with a CGF. Once that limit is reached, the system treats it as a single failure. The `gtpp detect-dead-server` parameter limits the number of consecutive failures that can occur before the system marks the CGF as down and communicate with the CGF of next highest priority.

If all of the configured CGFs are down, the system ignores the detect-dead-server configuration and attempt to communicate with highest priority CGF again.

---

**Important**

When the `gtpp detect-dead-server consecutive-failures` CLI command is used in the CDR streaming mode, the CDRs will not be written to the HDD even when all the CGF servers are inactive. The CDR records will be archived at AAA manager and then purged when the archival limit is reached.

If the system receives a GTPP Node Alive Request, Echo Request, or Echo Response message from a CGF that was previously marked as down, the system immediately treats it as being active.

Refer to the `gtpp max-retries` command for additional information.

**Example**

The following command configures the system to allow 8 consecutive communication failures with a CGF before it marks it as down:

```
gtpp detect-dead-server consecutive-failures 8
```

---

**gtpp dictionary**

Designates a dictionary used by GTPP for a specific context.

**Product**

- GGSN
- SGSN
- PDG/TTG
- P-GW
- SAEGW
- S-GW
Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name] host_name(config-ctx)#

Syntax Description

gtpp dictionary { custom1 | custom10 | custom11 | custom12 | custom13 | custom14 | custom15 | custom16 | custom17 | custom18 | custom19 | custom20 | custom21 | custom22 | custom23 | custom24 | custom25 | custom26 | custom27 | custom28 | custom29 | custom3 | custom30 | custom31 | custom32 | custom33 | custom34 | custom35 | custom36 | custom37 | custom38 | custom39 | custom4 | custom40 | custom41 | custom42 | custom43 | custom44 | custom45 | custom46 | custom47 | custom48 | custom49 | custom5 | custom50 | custom51 | custom52 | custom53 | custom54 | custom55 | custom56 | custom57 | custom58 | custom59 | custom6 | custom60 | custom7 | custom8 | custom9 | standard }
default gtpp dictionary
default
Configures the default dictionary.
custom1
This is a custom-defined dictionary that conforms to TS 32.015 v 3.6.0 for R99. It supports the encoding of IP addresses in text format for G-CDRs.
custom2
Custom-defined dictionary.
custom3
This is a custom-defined dictionary that conforms to TS 32.015 v 3.6.0 for R99 except that it supports the encoding of IP addresses in binary format for G-CDRs.
custom4
This is a custom-defined dictionary that conforms to TS 32.015 v 3.6.0 for R99 except that:
- IP addresses are encoded in binary format.
- The Data Record Format Version information element contains 0x1307 instead of 0x1308.
- QoS Requested is not present in the LoTV containers.
- QoS negotiated is added only for the first container and the container after a QoS change.
custom5
Custom-defined dictionary.
custom6
This is a custom-defined dictionary for eG-CDR encoding.

custom7 ... custom30
These custom-defined dictionary have default behavior or "standard" dictionary.

custom31
This is a custom-defined dictionary for S-CDR encoding that is based on 3GPP TS 32.298 v6.4.1 with a special field appended for the PLMN-ID.

custom33
This ia a custom-defined dictionary for S-CDR encoding that is based on the 3GPP TS 32.298v6.4.1 with the following exceptions:
  • Proprietary PLMN-ID field is present.
  • It is a SEQUENCE and not a SET.
  • Diagnostics and SGSN-Change fields are not supported.
  • Indefinite length encoding is used.
  • Booleans are encoded as 0x01(3GPP it is 0xff).
  • IMEISV shall be sent if available else IMEI should be sent.
  • Record Sequence Number is Mandatory.
  • APN OI and NI part is length encoded.
  • Cause for Record closure should be "RAT Change" instead of "intra-SGSNinter-system".

standard
Default: Enabled
This dictionary conforms to TS 32.215 v 4.6.0 for R4 (and also R5 - extended QoS format).

Usage Guidelines
Use this command to designate specific dictionary used by GTPP for specific context.

Important
Note that the following warning message will be displayed whenever an existing GTPP dictionary is being changed or a new GTPP dictionary is configured irrespective of whether or not the calls are active on the system.
Warning: It is not recommended to change the dictionary when the system has active calls.
Are you sure? [Yes|No]: n

Important
This change will require user's input on the CLI console for GTPP dictionary configuration / change.
Example

The following command configures the system to use custom3 dictionary to encode IP address in Binary format in G-CDRs:

```
gtp p dictionary custom3
```

g**tpp duplicate-hold-time**

Configures the number of minutes to hold on to CDRs that are possibly duplicates while waiting for the primary Charging Gateway Function (CGF) to come back up.

**Product**

GGSN
SGSN
P-GW
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtp p duplicate-hold-time minutes
default gtp p duplicate-hold-time
```

**default**

Configures this command with the default setting.

Default: 60 minutes

**minutes**

Specifies the number of minutes to hold on to CDRs that may be duplicates whenever the primary CGF is down, minutes must be an integer from 1 through 10080.

**Usage Guidelines**

Use this command to configure how long to hold on to CDRs that are possibly duplicates while waiting for the primary CGF to come back up. If the GGSN/P-GW (SAEGW) determines that the primary CGF is down, CDRs that were sent to the primary CGF but not acknowledged are sent by the GSN to the secondary CGF as "possibly duplicates". When the primary CGF comes back up, the GSN uses GTPP to determine whether the possibly duplicate CDRs were received by the primary CGF. Then the secondary CGF is told whether to release or cancel those CDRs. This command configures how long the system should wait for the primary CGF to come back up. As soon as the configured time expires, the secondary CGF is told to release all of the possibly duplicate CDRs.
Example
Use the following command to set the amount of time to hold on to CDRs to 2 hours (120 minutes);

```
gtpp duplicate-hold-time 120
```

gtpp echo-interval

Configures the frequency at which the system sends GTPP echo packets to configured CGFs.

**Product**

- GGSN
- SGSN
- P-GW
- SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtpp echo-interval time
{ default | no } gtpp echo-interval
```

**default**

Configures the default setting for this command,

Default: 60 seconds

**no**

Disables the use of the echo protocol except for the scenarios described in the Usage section for this command.

**time**

Specifies the time interval (in seconds) for sending GTPP echo packets as an integer from 60 through 2147483647. Default: 60

**Usage Guidelines**

The GTPP echo protocol is used by the system to ensure that it can communicate with configured CGFs. The system initiates this protocol for each of the following scenarios:

- Upon system boot
- Upon the configuration of a new CGF server on the system using the **gtpp server** command as described in this chapter
• Upon the execution of the `gtp test accounting` command as described in the `Exec Mode Commands` chapter of this reference

• Upon the execution of the `gtp sequence-numbers private-extensions` command as described in this chapter

The echo-interval command is used in conjunction with the gtp max-retries and gtp timeout commands as described in this chapter.

In addition to receiving an echo response for this echo protocol, if we receive a GTPP Node Alive Request message or a GTPP Echo Request message from a presumed dead CGF server, we will immediately assume the server is active again.

The alive/dead status of the CGFs is used by the AAA Managers to affect the sending of CDRs to the CGFs. If all CGFs are dead, the AAA Managers will still send CDRs, (refer to the `gtpp deadtime` command), albeit at a slower rate than if a CGF were alive. Also, AAA Managers independently determine if CGFs are alive/dead.

**Example**

The following command configures an echo interval of 120 seconds:

```plaintext
gtpp echo-interval 120
```

---

gtpp egcdr

Configures the eG-CDR and P-CDR (P-GW CDR) parameters and triggers.

**Product**

GGSN  
P-GW  
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```plaintext
gtpp egcdr closure-reason admin-disconnect [management-intervention | normal-release] | final-record [ [include-content-ids {all | only-with-traffic} ] [closing-cause {same-in-all-partials | unique} ] ] | losdv-max-containers max_lods_v_containers | lotdv-max-containers max_lots_v_containers | dynamic-path ddl-path | rulebase-max-length rulebase_name max_length | service-data-flow threshold {interval interval | volume {downlink bytes [uplink bytes] | total bytes | uplink bytes [downlink bytes]}]} | service-idle-timeout {0 | service_idle_timeout}
```

default gtpp egcdr closure-reason admin-disconnect | dynamic-path | final-record include-content-ids only-with-traffic closing-cause same-in-all-partials | losdv-max-containers | lotdv-max-containers |
service-idle-timeout 0 }  
no gtpp egcdr { dynamic-path | rulebase-max-length | service-data-flow  
threshold { interval | volume { downlink [ uplink ] | total | uplink [  
downlink ] } } } } 

closure-reason admin-disconnect [ management-intervention | normal-release ] 

Controls the configuration of "causeForRecordClosing" in PGW-CDR when a call is cleared from the chassis.  
Releases prior to 14.1, when a call is cleared from the chassis the field "causeForRecordClosing" in a PGW-CDR  
shows "Normal Release". In 15.0 and later releases, the behavior has changed to comply with the 3GPP  
specifications. That is, the default "causeForRecordClosing" in PGW-CDR will be "Management Intervention".  

Important  
This behavioral change is limited to PGW-CDR Release 8 dictionaries only.  

**closing-reason:** Configures the record closing reason for PGW-CDR.  

- **management-intervention:** Specifies to send Management-Intervention as causeForRecordClosing in  
  PGW-CDRs. By default, Management-Intervention will be sent as the record closure reason for  
  PGW-CDRs.  

- **normal-release:** Specifies to send Normal Release as causeForRecordClosing in PGW-CDRs.  

**final-record** [[ include-content-ids { all | only-with-traffic } ] [ closing-cause { same-in-allpartials | unique  
}]]  

Enables configuration of the final eG-CDR/P-CDR.  
Default: Restores the GTPP eG-CDR/P-CDR final record to the default setting to include content IDs with  
some data to report are included. Also, sets the closing cause to the default of using the same closing cause  
for multiple final eG-CDR/P-CDRs.  

- **include-content-ids:** Controls which content IDs are being included in the final eG-CDR/P-CDR.  
  - **all:** Specifies that all content IDs be included in the final eG-CDR/P-CDR.  
  - **only-with-traffic:** Specifies that only content-IDs with traffic be included in the final  
    eG-CDR/P-CDRs.  

- **closing-cause:** Configures closing cause for the final eG-CDR/P-CDR.  
  - **same-in-allpartials:** Specifies that the same closing cause is to be included for multiple final  
    eG-CDR/P-CDRs  
  - **unique:** Specifies that the closing cause for final eG-CDR/P-CDRs is to be unique.  

**losdv-max-containers max_losdv_containers**  
The maximum number of List of Service Data Volume (LoSDV) containers in one eG-CDR/P-CDR.  

*max_losdv_containers* must be an integer from 1 through 255.  

Default: 10
**lotdv-max-containers max_lotdv_containers**

The maximum number of List of Traffic Data Volume (LoTDV) containers in one eG-CDR/P-CDR.

`max_lotdv_containers` must be an integer from 1 through 8.

Default: 8

**dynamic-path ddl-path**

This keyword activates a new and extensible framework to enable field defined (customer created) eGCDR/PGW-CDR generation. This option enables the user to load the customized or modified dictionary. The dictionary configured through this CLI command takes precedence over existing the `gtpp dictionary` CLI command.

This new framework is implemented to define a GTTP dictionary in a structured format using a "Dictionary Definition Language (DDL)". Using this language, customers can clearly define fields, triggers and behaviors applicable for a particular GTTP dictionary.

DDL file will be parsed at compilation time and metadata will be populated to generate eGCDR and PGW-CDR. This metadata makes the new framework more modular and maintainable. This will help in faster turnaround time in supporting any new enhancements.

When customer wants to add/modify/remove a field, this information has to be updated in DDL. The DDL file is processed dynamically and the field reflects in CDR. This framework works only for eGCDR and PGW-CDR.

`ddl-path`: Specifies the path of dictionary DDL. The path must be a string of size 0 through 127. This is to support field-loadable dds. The DDL file will be parsed to populate metadata required to generate eGCDR/PGW-CDR.

---

**Important**

It is not recommended to enable `gtpp egcdr dynamic-path` when there are active calls.

In this release, both current and new framework are functional to enable field defined (customer created) eGCDR/PGW-CDR generation. By default, the new framework is disabled.

**rulebase-max-length rulebase_name_max_length**

Specifies the maximum character length of charging rulebase name in LOSDVs of eG-CDR/P-CDR.

`rulebase_name_max_length` must be an integer from 0 through 63. Zero (0) means the rulebase name is added as-is.

Default: None. That is, full (un-truncated) charging rulebase name will go in LOSDVs of eG-CDR/P-CDR.

**service-data-flow threshold { interval interval | volume { downlink bytes | uplink bytes } | total bytes | uplink bytes [ downlink bytes ] }**

Configures the thresholds for closing a service data flow container within an eG-CDR/P-CDR.

- `interval interval`: Specifies the time interval, in seconds, to close the eG-CDR/P-CDR if the minimum time duration thresholds for service data flow containers satisfied in flow-based charging.

  `interval` must be an integer from 60 through 40000000.

  Default: Disabled
• **volume { downlink bytes [ uplink bytes ] | total bytes [ uplink bytes [ downlink bytes ] ] }**: Specifies the volume octet counts for the generation of the interim G-CDR/P-CDRs to service data flow container in FBC.
  - **downlink bytes**: specifies the limit for the number of downlink octets after which the eG-CDR/P-CDR is closed.
  - **total bytes**: Specifies the limit for the total number of octets (uplink+downlink) after which the eG-CDR/P-CDR is closed.
  - **uplink bytes**: specifies the limit for the number of uplink octets after which the eG-CDR/P-CDR is closed.
  - **bytes** must be an integer from 10000 through 400000000.

A service data flow container has statistics for an individual content ID. When the threshold is reached, the service data flow container is closed.

**service-idle-timeout { 0 | service_idle_timeout }**

Specifies a time period where if no data is reported for a service flow, the service container is closed and added to eG-CDR/P-CDR (as part of LOSDV container list) with service condition change as ServiceIdleOut.

*service_idle_timeout* must be an integer from 10 through 86400.

0: Specifies no service-idle-timeout trigger.
Default: 0

---

### Usage Guidelines

Use this command to configure individual triggers for eG-CDR/P-CDR generation.

Use the **service-data-flow threshold** option to configure the thresholds for closing a service data flow container within an eG-CDR (eG-CDRs for GGSN and P-CDRs for PGW) during flow-based charging (FBC). A service data flow container has statistics regarding an individual content ID.

Thresholds can be specified for time interval and for data volume, by entering the command twice (once with interval and once with volume). When either configured threshold is reached, the service data flow container will be closed. The volume trigger can be specified for uplink or downlink or the combined total (uplink + downlink) byte thresholds.

When the PDP context is terminated, all service data flow containers will be closed regardless of whether the thresholds have been reached.

An eG-CDR/P-CDR will have at most ten service data flow containers. Multiple eG-CDR/P-CDRs will be created when there are more than ten.

### Example

Use the following command to set the maximum number of LoSDV containers to 7:

```
gtpp egcdr losdv-max-containers 7
```

The following command sets an eG-CDR threshold interval of 6000 seconds:

```
gtpp egcdr service-data-flow threshold interval 6000
```
**gtpp error-response**

Configures the response when the system receives an error response after transmitting a DRT (data record transfer) request.

**Product**
- GGSN
- SGSN
- P-GW
- SAEGW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  
  `configure > context context_name`

  Entering the above command sequence results in the following prompt:

  `[context_name]host_name(config-ctx)#`

**Syntax Description**

```
gtpp error-response { discard-cdr | retry-request }
default gtpp error-response
```

- **default**
  - Configures this command with the default setting.
  - Default: `retry-request`

- **discard-cdr**
  - Instructs the system to purge the request upon receipt of an error response and not to retry.

- **retry-request**
  - Instructs the system to retry sending a DRT after receiving an error response. This is the default behavior.

**Usage Guidelines**

This command configures the system's response to receiving an error message after sending a DRT request.

**Example**

```
gtpp error-response discard-cdr
```

---

**gtpp group**

Configures GTPP server group in a context for the Charging Gateway Function (CGF) accounting server(s) that the system is to communicate with.

**Product**
- ePDG
GGSN
SGSN
P-GW
SAEGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description
[ no ] gtpp group group_name [ -noconfirm ]

group_name
Specifies the name of GTPP server group that is used for charging and/or accounting in a specific context. 
group_name must be an alphanumeric string of 1 through 63 character.

A maximum of eight GTPP server groups (excluding system created default GTPP server group "default") 
can be configured with this command in a context.

no
Removes the previously configured GTPP group within a context.

When a GTPP group is removed accounting information is not generated for all calls using that group and all 
calls associated with that group are dropped. A warning message displays indicating the number of calls that 
will be dropped.

-noconfirm
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines
This feature provides the charging gateway function (CGF) accounting server configurable for a group of 
servers. Instead of having a single list of CGF accounting servers per context, this feature configures multiple 
GTPP accounting server groups in a context and each server group is consist of list of CGF accounting servers.

In case no GTPP server group is configured in a context, a server group named "default" is available and all 
the CGF servers configured in a specific context for CGF accounting functionality will be part of this "default" 
server group.

Example
The following command configures a GTPP server group named star1 for CGF accounting 
functionality. This server group is available for all subscribers within that context.

gtpp group star1
**gtpp max-cdrs**

Configures the maximum number of charging data records (CDRs) included per packet.

**Product**
- GGSN
- P-GW
- SAEGW
- SGSN

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtpp max-cdrs max_cdrs [ wait-time wait_time ]
default gtpp max-cdrs
```

**default**
Configures this command with the default setting.
Default: One CDR per packet; disables `wait-time`

**max_cdrs**
Specifies the maximum number of CDRs to be inserted in a single packet as an integer from 1 through 255.
Default: 1

**wait-time wait_time**
Specifies the number of seconds the system waits for CDRs to be inserted into the packet before sending it.
`wait_time` must be an integer from 1 through 300. Default: Disabled

---

**Important**
If the `wait-time` expires, the packet is sent as this keyword over-rides `max_cdrs`.

**Usage Guidelines**
CDRs are placed into a GTPP packet as the CDRs close. The system stops placing CDRs into a packet when either the maximum `max_cdrs` is met, or the `wait-time` expires, or the value for the `gtpp max-pdu-size` command is met.

**Example**
The following command configures the system to place a maximum of 10 CDRs in a single GTPP packet before transmitting the packet:
**sgtpp max-pdu-size**

Configures the maximum payload size of a single GTPP packet that could be sent by the system.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-GW</td>
</tr>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
<tr>
<td></td>
<td>SGSN</td>
</tr>
</tbody>
</table>

| Privilege             | Security Administrator, Administrator |

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Exec &gt; Global Configuration &gt; Context Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>configure &gt; context context_name</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- `gtpp max-pdu-size pdu_size`
- `default gtpp max-pdu-size`

**default**

Configures this command with the default setting.

Default: 65400 bytes

**pdu_size**

Specifies the maximum payload size (in octets) of the GTPP packet as an integer from 1024 to 65400. The payload includes the CDR and the GTPP header.

⚠️ **Caution**

This command is effective only when GTPP single-source is configured, otherwise this command has no effect.

**Usage Guidelines**

The GTPP packet contains headers (layer 2, IP, UDP, and GTPP) followed by the CDR. Each CDR contains one or more volume containers. If a packet containing one CDR exceeds the configured maximum payload size, the system creates and send the packet containing the one CDR regardless.

The larger the packet data unit (PDU) size allowed, the more volume containers that can be fit into the CDR.

The system performs standard IP fragmentation for packets that exceed the system's maximum transmission unit (MTU).
The maximum size of an IPv4 PDU (including the IPv4 and subsequent headers) is 65,535. However, a slightly smaller limit is imposed by this command because the system's max-pdu-size doesn't include the IPv4 and UDP headers, and because the system may need to encapsulate GTPP packets in a different/larger IP packet (for sending to a backup device).

**Example**

The following command configures a maximum PDU size of 2048 octets:

```
gtp max-pdu-size 2048
```

**gtp max-retries**

Configures the maximum number of times the system attempts to communicate with an unresponsive Charging Gateway Function (CGF).

**Product**

GGSN  
P-GW  
SAEGW  
SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration  
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtp max-retries max_attempts
default gtp max-retries
```

**default**

Configures this command with the default setting.  
Default: 4

**max_attempts**

Specifies the number of times the system attempts to communicate with a CGF that is not responding.  
`max_attempts` is an integer from 1 through 15.

**Usage Guidelines**

This command works in conjunction with the `gtpp detect-dead-server` and `gtpp timeout` parameters to set a limit to the number of communication failures that can occur with a configured CGF.
When the value specified by this parameter is met, a failure is logged. The gtpp detect-dead-server parameter specifies the number of consecutive failures that could occur before the server is marked as down.

In addition, the gtpp timeout command controls the amount of time between re-tries.

If the value for the max-retries is met, the system begins storing CDRs in Random Access Memory (RAM). The system allocates memory as a buffer, enough to store one million CDRs for a fully loaded chassis (a maximum of one outstanding CDR per PDP context). Archived CDRs are re-transmitted to the CGF until they are acknowledged or the system's memory buffer is exceeded.

Refer to the gtpp detect-dead-server and gtpp timeout commands for additional information.

**Example**

The following command configures the maximum number of re-tries to be 8:

```
  gtpp max-retries 8
```

---

**gtpp node-id**

Configures the GTPP Node ID for all CDRs.

**Product**

- ePDG
- GGSN
- P-GW
- SAEGW
- SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
  configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
  gtpp node-id node_id
  no gtpp node-id
```

- **no**
  - Removes the previous gtpp node ID configuration.

- **node_id**
  - Specifies the node ID for all CDRs as an alphameric string of 1 through 16 characters.

**Usage Guidelines**

Use this command to configure the GTPP Node ID for all CDRs.
Example
The following command configures the GTPP Node ID as test123:

gtpp node-id test123

gtpp redirection-allowed

Configures the system to allow or disallow the redirection of CDRs when the primary Charging Gateway Function (CGF) is unavailable.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-GW</td>
</tr>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
<tr>
<td></td>
<td>SGSN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Privilege</th>
<th>Security Administrator, Administrator</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Exec &gt; Global Configuration &gt; Context Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>configure &gt; context context_name</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>gtpp redirection-allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>{ default</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>default</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Configures this command with the default setting. Default: Enabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deletes the command from the configuration.</td>
</tr>
</tbody>
</table>

Usage Guidelines
This command allows operators to better handle erratic network links, without having to remove the configuration of the backup server(s) via the no gtpp server command.

This functionality is enabled by default.

If the no gtpp redirection-allowed command is executed, the system only sends CDRs to the primary CGF. If that CGF goes down, we will buffer the CDRs in memory until the CGF comes back or until the system runs out of buffer memory. In addition, if the primary CGF announces its intent to go down (with a GTPP Redirection Request message), the system responds to that request with an error response.
gtpp redirection-disallowed

This command has been obsoleted and is replaced by the \texttt{gtpp redirection-allowed} command.

\textbf{gtpp server}

Configures the Charging Gateway Function (CGF) accounting server(s) with which the system will communicate.

\begin{tabular}{|l|}
\hline
\textbf{Product} & ePDG \\
& GGSN \\
& P-GW \\
& SAEGW \\
& SGSN \\
\hline
\textbf{Privilege} & Security Administrator, Administrator \\
\hline
\textbf{Command Modes} & Exec > Global Configuration > Context Configuration \\
& \texttt{configure > context context\_name} \\
\hline
\textbf{Syntax Description} & \texttt{gtpp server ip\_address [ max\_messages ] [ priority priority ] [ port port ] [ node-alive { enable | disable } ] [ -noconfirm ]} \\
& \texttt{no gtpp server ip\_address} \\
\hline
\end{tabular}

\texttt{no}

Deletes a previously configured CGF.

\texttt{ip\_address}

Specifies the IP address of the CGF in IPv4 dotted-decimal or IPV6 colon-separated-hexadecimal notation.

\texttt{max max\_messages}

Default: 256

Specifies the maximum number of outstanding or unacknowledged GTPP packets (from any one AAA Manager task) allowed for this CGF before the system begins buffering the packets.

\texttt{max\_messages} can be configured as an integer from 1 through 256.
In release 16.0, a warning message is displayed if the user tries to configure a value greater than 100 and the max-outstanding is configured as 100. This is because there is an internal limit of up to 100 max outstanding requests that can be configured.

**priority priority**

Default: 1000

Specifies the relative priority of this CGF. When multiple CGFs are configured, the priority is used to determine which CGF server to send accounting data to.

*priority* can be configured as an integer from 1 through 1000. When configuring two or more servers with the same priority you will be asked to confirm that you want to do this. If you use the `-noconfirm` option, you are not asked for confirmation and multiple servers could be assigned the same priority.

**port port**

Default: 3386

Specifies the port the CGF is using. *port* can be configured as an integer from 1 through 65535. Default value for port is 3286.

The *port* keyword option has been modified from *udp-port* to make it a generic command. The *udp-port* keyword can still be used, however, it will be in concealed mode and will not be shown in auto-complete or help for the command.

**node-alive { enable | disable }**

Default: Disable.

This optional keyword allows operator to enable/disable GSN to send Node Alive Request to GTPP Server (i.e. CGF). This configuration can be done per GTPP Server basis.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

Use this command to configure the CGF(s) that the system sends CDR accounting data to.

Multiple CGFs can be configured using multiple instances of this command. Up to 12 CGF scan be configured per system context. Each configured CGF can be assigned a priority. The priority is used to determine which server to use for any given subscriber based on the routing algorithm that has been implemented. A CGF with a priority of "1" has the highest priority.

The configuration of multiple CGFs with the same IP address but different port numbers is not supported.

Each CGF can also be configured with the maximum allowable number of unacknowledged GTPP packets. Since multiple AAA Manager tasks could be communicating with the same CGF, the maximum is based on
any one AAA Manager instance. If the maximum is reached, the system buffers the packets Random Access Memory (RAM). The system allocates memory as a buffer, enough to store one million CDRs for a fully loaded chassis (a maximum of one outstanding CDR per PDP context).

**Example**

The following command configures a CGF with an IP address of 192.168.2.2 and a priority of 5.

```plaintext
gtpp server 192.168.2.2 priority 5
```

The following command deletes a previously configured CGF with an IP address of 100.10.35.7:

```plaintext
no gtpp server 100.10.35.7
```

**gtpp source-port-validation**

Toggles port checking for node alive/echo/redirection requests from the CGF.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```
[ default | no ] gtpp source-port-validation
```

**default**

Configures this command with the default setting.

Default: Enabled

**no**

Disables CGF port checking. Only the IP address will be used to verify CGF requests.

**Usage Guidelines**

This command is for enabling or disabling port checking on node alive/echo/redirection requests from the CGF. If the CGF sends messages on a non-standard port, it may be necessary to disable port checking in order to receive CGF requests. On the default setting, both IP and port are checked.

**Example**

The following command disables port checking for CGF requests:
no gtpp source-port-validation

**gtpp storage-server**

Configures information for the GTPP back-up storage server.

<table>
<thead>
<tr>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>ePDG</td>
</tr>
<tr>
<td>GGSN</td>
</tr>
<tr>
<td>P-GW</td>
</tr>
<tr>
<td>SAEGW</td>
</tr>
<tr>
<td>SGSN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Privilege</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Context Configuration

**configure > context context_name**

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] gtpp storage-server ip-address port port-num
```

**no**

Removes a previously configured back-up storage server.

**ip-address**

Specifies the IP address of the back-up storage server expressed in IPv4 dotted-decimal notation.

**port port-num**

Specifies the UDP port number over which the GSN communicates with the back-up storage server. Default: 3386

**Usage Guidelines**

This command configures the information for the server to which GTPP packets are to be backed up to if all the CGFs are unreachable.

One backup storage server can be configured per system context.

---

**Important**

This command only takes affect if **gtpp single-source** in the Global Configuration Mode is also configured. Additionally, this command is customer specific. Please contact your local sales representative for additional information.
Example

The following command configures a back-up server with an IP address of 192.168.1.2:

gtpp storage-server 192.168.1.2

**gtpp storage-server local file**

Configures the parameters for GTPP files stored locally on the GTPP storage server. This command is available for both ASR 5000 and 5500 platforms.

**Product**

GGSN
P-GW
SAEGW
SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

    configure > context context_name

Entering the above command sequence results in the following prompt:

    [context_name]host_name(config-ctx) #

**Syntax Description**

```
gtpp storage-server local file { compression { gzip | none } | format { custom1 | custom2 | custom3 | custom4 | custom5 | custom6 | custom7 | custom8 } | name { format string [ max-file-seq-num seq_number ] | prefix prefix } | purge-processed-files [ file-name-pattern file_pattern | purge-interval purge_dur ] | push { encrypted-url url | url url } [ encrypted-secondary-url url | secondary-url url ] [ via-local-context ] | rotation { cdr-count count | time-interval time [ force-file-rotation ] | volume mb size } | start-file-seq-num seq_num [ recover-file-seq-num ] } default gtpp storage-server local file { compression | format | name { format | prefix } | purge-processed-files | rotation { cdr-count | time-interval | volume } | start-file-seq-num } no gtpp storage-server local file { purge-processed-files | push | rotation { cdr-count | time-interval } }
```

**default**

Configures default setting for the specified parameter.

**no**

Removes a previously configured parameters for local storage of CDR files on HDD on SMC card.
compression \{ gzip | none \}

Configures the type of compression to be used on the files stored locally.

- gzip: Enables Gzip file compression.
- none: Disables Gzip file compression - this is the default value.

Default: Disabled

format \{ custom-n \}

Configures the file format to be used to format files to be stored locally.

**custom1**: File format custom1—this is the default value.

**custom2**: File format custom2.

**custom3**: File format custom3.

**custom4**: File format custom4.

**custom5**: File format custom5.

**custom6**: File format custom6 with a block size of 8K for CDR files.

**custom7**: File format custom7 is a customer specific CDR file format.

**custom8**: File format custom8 is a customer specific CDR file format. It uses `node-id-suffix_date_time_fixed-length-seq-num` format for file naming.

Default: **custom1**

name \{ format | prefix prefix \}

Allows the format of the CDR filenames to be configured independently from the file format so that the name format contains the file name with conversion specifications.

**prefix** — Enter an alphanumeric string of 1 through 127 characters. The string **must begin** with the % (percent sign).

- %y: year as a decimal number without century (range 00 to 99).
- %Y: year as a decimal number with century.
- %m: month as a decimal number (range 01 to 12).
- %d: day of the month as a decimal number (range 01 to 31).
- %H: hour as a decimal number 24-hour format (range 00 to 23).
- %h: hour as a decimal number 12-hour format (range 01 to 12).
- %M: minute as a decimal number (range 00 to 59).
- %S: second as a decimal number (range 00 to 60). (The range is up to 60 to allow occasional leap seconds.)
- %Q: File sequence number. Field width may be specified between the % and the Q. If the natural size of the field is smaller than this width, then the result string is padded (on the left) to the specified width with 0s.
• \%N: No of CDRs in the file. Field width may be specified between the % and the N. If the natural size of the field is smaller than this width, then the result string is padded (on the left) to the specified width with 0s

• max-file-seq-no: This can be configured optionally. It indicates the maximum value of sequence number in file name (starts from 1). Once the configured max-file-seq-no limit is reached, the sequence number will restart from 1. If no max-file-seq-no is specified then file sequence number ranges from 1 – 4294967295.

By default the above keyword is not configured (default gtpp storage-server local filename format). In which case the CDR filenames are generated based on the file format as before (maintains backward compatibility).

```
purge-processed-files [ file-name-pattern file_pattern | purge-interval purge_dur ]
```

Enables the GSN to periodically (every 4 minutes) delete locally processed (*.p) CDR files from the HDD on the SMC card. Default: Disabled

This keyword also deletes the processed push files (tx.*, under $CDR_PATH/TX/tx.*) a well when purging is enabled instead of "*.p:*.*P".

Important

This option is available only when GTPP server storage mode is configured for local storage of CDRs with the `gtpp storage-server mode local` command.

Optional keyword `file-name-pattern file_pattern` provides an option for user to control the pattern of files. `file_pattern` must be mentioned in "*.p:*.*P:tx.*" format in a string of size 1 through 127, which is also the default format. Wildcards * and (synonymous to |) are allowed.

Optional keyword `purge-interval purge_dur` provides an option for user to control the purge interval duration (in minutes). `purge_dur` must be an integer from 1 through 259200. Default value 60.

```
push { encrypted-url encrypted_url | url url }[ encrypted-secondary-url encrypted_url | secondary-url url ][ via-local-context ]
```

Enables push method to transfer local CDR files to remote system.

- `encrypted-url`: Defines use of an encrypted url.
- `encrypted_url` must be an alphanumeric string of 1 through 8192 characters in SFTP format.
- `url`: Location where the CDR files are to be transferred.
- `url` must be an alphanumeric string of 1 through 1024 characters in the format:
- scheme://user:password@host

- `encrypted_url` must be an alphanumeric string of 1 through 8192 characters in SFTP format.
- `secondary-url`: Secondary location where the CDR files are to be transferred, in case primary is unreachable.
- `url` must be an alphanumeric string of 1 through 1024 characters in the format:
- scheme://user:password@host
When a file transfer to primary fails four times, the transfer of files will automatically be failed over to the secondary server. The transfer will switch back to the original primary after 30 minutes, or if there are four transfer failures to the secondary server.

**Important**

**via-local-context:** Pushes the CDR files via SPIO in the local context.

Default: Pushes via the group's context.

If the push is done through gtpp context, then the push rate is lesser compared to via local context as the HDD is attached to the local context.

**Important**

**rotation \{ cdr-count count \| time-interval time \| volume mb size \}**

Specifies rotation related configuration for GTPP files stored locally.

- **cdr-count count:** Configures the CDR count for the file rotation as an integer from 1000 through 65000. Default value 10000.
- **time-interval time:** Configures the time interval (in seconds) for file rotation as an integer from 30 through 86400. Default value 3600 (1 hour).
- **volume mb size:** Configure the file volume (in MB) for file rotation. Enter an integer from 2 to 40. This trigger cannot be disabled. Default value is 4MB.

**start-file-seq-num seq_num \[ recover-file-seq-num \]**

Specifies the start sequence number. The sequence number goes on incrementing until ULONG_MAX (or max-seq-num configured in file name format) and then it would rollover. If **recover-file-seq-num** is configured, every time the system is rebooted (or aaprox recovery/ planned/ unplanned packet service card migration), the file sequence number continues from the last sequence number and during rollover it starts from first-sequence number.

- **seq_num:** Configures the sequence number. Enter an integer from 1 through 4294967295.
- **recover-file-seq-num:** Configures the recovery of file sequence number. This is an optional field and if configured, every time the machine rebooted, the file sequence number continues from the last sequence number.

**Usage Guidelines**

This command configures the parameters for storage of GTPP packets as files on the local server—meaning the hard disk.

**Example**

The following command configures rotation for every 1.5 hours (5400 seconds) for locally stored files.

```
gtpp storage-server local file rotation time-interval 5400 start-file-seq-num 20 recover-file-seq-num
```
gtpp storage-server max-retries

Configures the maximum number of times the system attempts to communicate with an unresponsive GTPP back-up storage server.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  - configure > context context_name

Entering the above command sequence results in the following prompt:

```
{context_name}host_name(config-ctx)#
```

**Syntax Description**

```
gtpp storage-server max-retries max_attempts
default gtpp storage-server max-retries
```

**default**

Configures this command with the default setting.

Default: 2

**max_attempts**

Specifies the number of times the system attempts to communicate with a GTPP back-up storage server that is not responding. *max_attempts* enter an integer from 1 through 15.

**Usage Guidelines**

This command works in conjunction with the `gtpp storage-server timeout` parameters to set a limit to the number of communication failures that can occur with a configured GTPP back-up storage server.

The `gtpp storage-server timeout` command controls the amount of time between re-tries.

**Example**

The following command configures the maximum number of re-tries to be 8:

```
gtpp storage-server max-retries 8
```

---

**gtpp storage-server mode**

Configures storage mode, local or remote, for CDRs. Local storage mode is available with ASR 5000 platforms only.

**Product**
- GGSN
P-GW
SAEGW
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

**Syntax Description**
```
gtpp storage-server mode { local | remote | streaming }
default gtpp storage-server mode
```

- **default**
  Configures this command with the default setting.
  Default: `remote`

- **local**
  Default: Disabled
  Specifies the use of the hard disk on the SMC for storing CDRs

- **remote**
  Specifies the use of an external server for storing CDRs. This is the default value.

- **streaming**
  Default: Disabled
  Allows the operator to configure "streaming" mode of operation for GTPP group. When this keyword is supplied the CDRs will be stored in following fashion:
  
  - When GTPP link is active with CGF, CDRs are sent to a CGF via GTPP and local hard disk is NOT used as long as every record is acknowledged in time.
  
  - If the GTPP connection is considered to be down, all streaming CDRs will be saved temporarily on the local hard disk and once the connection is restored, unacknowledged records will be retrieved from the hard disk and sent to the CGF.

**Usage Guidelines**
This command configures whether the CDRs should be stored on the hard disk of the SMC or remotely, on an external server.

**Example**
The following command configures use of a hard disk for storing CDRs:

```
gtpp storage-server mode local
```
gtpp storage-server timeout

Configures the amount of time that must pass with no response before the system re-attempts to communicate with the GTPP back-up storage server.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```
gtpp storage-server timeout duration
default gtpp storage-server timeout
```

**default**
Configures this command with the default setting.

Default: 30 seconds

**duration**
Specifies the maximum amount of time (in seconds) the system waits for a response from the GTPP back-up storage server before assuming the packet is lost. *duration* is an integer from 30 through 120.

**Usage Guidelines**
This command works in conjunction with the **gtpp storage-server max-retries** command to establish a limit on the number of times that communication with a GTPP back-up storage server is attempted before a failure is logged. This parameter specifies the time between retries.

**Example**
The following command configures a retry timeout of 60 seconds:

```
gtpp storage-server timeout 60
```

**gtpp suppress-cdrs zero-volume**

This command suppresses the CDRs with zero byte data count. The CDRs can be classified as Final-cdrs, Internal-trigger-cdrs, and External-trigger-cdrs. This command allows the selection of CDRs to be suppressed and it is disabled by default.
Use of the Zero Volume CDR Suppression feature requires that a valid ECS license key be installed. Contact your Cisco account representative for information on how to obtain a license.

**Product**
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```bash
gtpp suppress-cdrs zero-volume { external-trigger-cdr | final-cdr | internal-trigger-cdr }
default gtpp suppress-cdrs zero-volume
no gtpp suppress-cdrs zero-volume
```

- `default`
  Configures this command with the default setting.

- `no`
  Disables suppression of the CDRs with zero byte data count.

**Usage Guidelines**
This command suppresses the CDRs with zero byte data count. This command provides an option to select the CDRs to be suppressed.

**Example**
To suppress only final zero volume CDRs use:

```bash
gtpp suppress-cdrs zero-volume final-cdr
```

To suppress final zero Volume CDRs and interim zero volume CDRs due to internal triggers use:

```bash
gtpp suppress-cdrs zero-volume final-cdr internal-trigger-cdr
```

To suppress final zero volume CDRs and interim zero volume CDRs due to internal and external triggers use:

```bash
gtpp suppress-cdrs zero-volume final-cdr internal-trigger-cdr external-trigger-cdr
```

To suppress interim zero volume CDRs due to internal and external triggers use:

```bash
gtpp suppress-cdrs zero-volume internal-trigger-cdr external-trigger-cdr
```

To suppress interim zero volume CDRs due to external triggers use:

```bash
gtpp suppress-cdrs zero-volume external-trigger-cdr
```
gtpp suppress-cdrs zero-volume-and-duration

Suppresses the CDRs created by sessions having zero duration and/or zero volume. By default this mode is disabled.

**Product**
- GGSN
- P-GW
- SAEGW
- SGSN

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  - `configure > context context_name`

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
gtpp suppress-cdrs zero-volume-and-duration { gcdrs [ egcdrs ] | egcdrs [ gcdrs ] }
default gtpp suppress-cdrs zero-volume-and-duration
default
```

- `default`
  Configures this command with the default setting.
  Default: Disabled.

- `gcdrs [ egcdrs ]`
  Suppresses G-CDRs before eG-CDRs.

- `egcdrs [ gcdrs ]`
  Suppresses eG-CDRs before G-CDRs.

**Usage Guidelines**
Use this command to suppress the CDRs (G-CDRs and eG-CDRs) which were created when zero-duration sessions and zero-volume sessions are encountered due to any reason. By default this command is disabled and system will not suppress any CDR.

**Example**
The following command configures the system to suppress the eG-CDRs created for a zero duration session or zero volume session:
```
gtpp suppress-cdrs zero-volume-and-duration egcdrs gcdrs
```
gtpp timeout

Configures the amount of time that must pass with no response before the system re-attempts to communicate with the Charging Gateway Function (CGF).

**Product**
- GGSN
- SGSN
- P-GW
- SAEGW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
- `configure > context <context_name>`

Entering the above command sequence results in the following prompt:
```
[<context_name>] host_name(config-ctx) #
```

**Syntax Description**

- `gtpp timeout time`
- `default gtpp timeout`

- **default**
  - Configures this command with the default setting. Default: 20 seconds

- **time**
  - Specifies the maximum amount of time (in seconds) the system waits for a response from the CGF before assuming the packet is lost. `time` is an integer from 1 through 60.

**Usage Guidelines**

This command works in conjunction with the `gtpp max-retries` command to establish a limit on the number of times that communication with a CGF is attempted before a failure is logged.

This parameter specifies the time between retries.

**Example**

The following command configures a retry timeout of 30 seconds:
```
gtpp timeout 30
```

**gtpp trigger**

This command is left in place for backward compatibility. To disable and enable GTPP triggers you should use the `gtpp trigger` command in GTPP Server Group Configuration Mode.
gtpp transport-layer

Selects the transport layer protocol for the Ga interface for communication between the access gateways (GSNs) and GTPP servers.

Product
- GGSN
- P-GW
- SAEGW
- SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description
- gtpp transport-layer { tcp | udp }
- default gtpp transport-layer

default
Configures this command with the default setting.
Default: udp

tcp
Default: Disabled
Enables the system to implement TCP as transport layer protocol for communication with GTPP server.

udp
Default: Enabled
Enables the system to implement UDP as transport layer protocol for communication with GTPP server.

Usage Guidelines
Use this command to select the TCP or UDP as the transport layer protocol for Ga interface communication between GTPP servers and AGWs (GSNs).

Example
The following command enables TCP as the transport layer protocol for the GSN's Ga interface.

gtpp transport-layer tcp
gtpu-service

Creates a GTP-U service or specifies an existing GTP-U service and enters the GTP-U Service Configuration Mode for the current context.

**Product**

- GGSN
- P-GW
- SAEGW
- S-GW

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
gtpu-service service_name [ -noconfirm ]
no gtpu-service service_name
```

**gtpu-service service_name**

Specifies the name of the GTP-U service. If `service_name` does not refer to an existing service, a new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

**no gtpu-service service_name**

Removes the specified GTP-U service from the context.

**Usage Guidelines**

Enter the GTP-U Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.
Entering this command results in the following prompt:

```
[context_name]hostname(config-gtpu-service)#
```

GTP-U Service Configuration Mode commands are defined in the *GTP-U Service Configuration Mode Commands* chapter.

**Example**

The following command enters the existing GTP-U Service Configuration Mode (or creates it if it does not already exist) for the service named *gtpu-service1*:

```
gtpu-service gtpu-service1
```

The following command will remove *gtpu-service1* from the system:

```
no gtpu-service gtpu-service1
```

---

**gtpu peer statistics threshold**

Specifies the maximum number of GTP-U peers for which statistics will be maintained.

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>P-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAEGW</td>
</tr>
<tr>
<td></td>
<td>S-GW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Privilege</strong></th>
<th>Security Administrator, Administrator</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Command Modes</strong></th>
<th><strong>configure &gt; stats-profile &gt;stats_profile_name</strong></th>
</tr>
</thead>
</table>

Entering the above command sequence results in the following prompt:

```
[local]hostname(config-stats-profile)#
```

<table>
<thead>
<tr>
<th><strong>Syntax Description</strong></th>
<th><strong>gtpu peer statistics threshold value</strong></th>
</tr>
</thead>
</table>

```
gtpu peer statistics threshold value
```

Specifies the number of GTP-U peers for which the node will maintain statistics.

Valid entries are from 16000 to 128000.

The default setting is 16000.

The threshold cannot be configured to a lower value than the current value. For example if the threshold value is set to 18000, it can no longer be set to any value below 18000.

**Usage Guidelines**

Use this command to specify the number of GTP-U peers for which the node will maintain statistics.
Example

The following command specifies that the node will maintain GTP-U peer statistics for 50000 GTP-U peers:

```
gtpu peer statistics threshold 50000
```

**ha-service**

Creates/deletes a home agent service or specifies an existing HA service for which to enter the Home Agent Service Configuration Mode for the current context.

**Product**

HA

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ha-service name [ -noconfirm ]
no ha-service name
```

**no**

Indicates the home agent service specified is to be removed.

**name**

Specifies the name of the HA service to configure. If name does not refer to an existing service, the new service is created if resources allow. name is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Enter the HA Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.
Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Example

The following command will enter, or create and enter, the HA service sampleService:

```
ha-service sampleService
```

The following command will remove sampleService as being a defined HA service:

```
no ha-service sampleService
```

hexdump-module

Enter the Hexdump Service Configuration Mode to configure hexdump records creation and other related parameters.

**Product**
ePDG
SaMOG

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

**Syntax Description**

```
hexdump-module
no hexdump-module
```

```
no
```

Disables creation of hexdump records.

**Usage Guidelines**
Enter the Hexdump Service Configuration Mode to configure hexdump records creation and other related parameters.
**hnbgw-service**

**Important**
In Release 20 and later, HNBGW is not supported. This command must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

Creates or removes an Home Node B Gateway (HNB-GW) service or configures an existing HNB-GW service and enters the HNB-GW Service Configuration Mode for Femto UMTS access networks configuration in the current context.

**Product**
HNB-GW

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
hnbgw-service hnbgw_svc_name [ -noconfirm ]
no hnbgw-service hnbgw_svc_name
```

- `no`
  Removes the specified HNB-GW service from the context.

  **hnbgw_svc_name**

  Specifies the name of the HNB-GW service. If *service_name* does not refer to an existing service, the new service is created if resources allow. *hnbgw_svc_name* is an alphanumeric string of 1 through 63 characters.

  **Important**
  Service names must be unique across all contexts within a chassis.

- `-noconfirm`
  Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Use this command to enter the HNB-GW Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of one HNB-GW service which is further limited to a maximum of 256 services (regardless of type) can be configured per system.
Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name] hostname(config-hnbgw-service)#
```

The commands available in this mode are defined in the *HNB-GW Service Configuration Mode Commands* chapter of *Command Line Interface Reference*.

---

Caution

This is a critical configuration. The HNB-GW service can not be configured without this configuration. Any change to this configuration would lead to restarting the HNB-GW service and removing or disabling this configuration will stop the HNB-GW service.

---

**Example**

The following command enters the existing HNB-GW Service Configuration Mode (or creates it if it does not already exist) for the service named *hnb-service1*:

```
hnbgw-service hnb-service1
```

The following command will remove *hnb-service1* from the system:

```
no hnbgw-service hnb-service1
```

---

### hsgw-service

Creates an HSGW service or specifies an existing HSGW service and enters the HSGW Service Configuration Mode for the current context.

**Product**

HSGW

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

**Syntax Description**

```
hsgw-service service_name [ -noconfirm ]
no hsgw-service service_name

no
```

Removes the specified HSGW service from the context.
**service_name**

Specifies the name of the HSGW service. If *service_name* does not refer to an existing service, the new service is created if resources allow. *service_name* is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**Usage Guidelines**

Enter the HSGW Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-hsgw-service) #
```

HSGW Service Configuration Mode commands are defined in the *HSGW Service Configuration Mode Commands* chapter.

Use this command when configuring the following eHRPD components: HSGW.

---

**Example**

The following command enters the existing HSGW Service Configuration Mode (or creates it if it does not already exist) for the service named *hsgw-service1*:

```
hsgw-service hsgw-service1
```

The following command will remove *hsgw-service1* from the system:

```
no hsgw-service hsgw-service1
```

---

**hss-peer-service**

Creates a Home Subscriber Service (HSS) peer service or configures an existing HSS peer service and enters the HSS Peer Service configuration mode.

---

**Product**

- MME
- SGSN
Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

hss-peer-service service_name [ -noconfirm ]

no hss-peer-service service_name

no

Removes the specified HSS peer service from the context.

service_name

Specifies the name of the HSS peer service. If service_name does not refer to an existing service, a new service is created if resources allow. service_name is an alphanumeric string of 1 through 63 characters.

Important

Service names must be unique across all contexts within a chassis.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Enter the HSS Peer Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

The maximum number of HSS Peer Services that can be created and configured for the SGSN is 16.

The maximum number of HSS Peer Services that can be created and configured for the MME is 64.

Caution

On a PSC2 setup, all diamproxy tasks might go into a warning state if the number of hss-peer-services configured are more than 64 since the memory usage may exceed the allocated value.

Important

In some cases, two diameter endpoints (S6a and S13) can be configured for a single HSS Peer Service. To ensure peak system performance, we recommend that the total of all Diameter endpoints should be taken into consideration and limited to 64 endpoints.

Caution

A maximum of 256 services (regardless of type) can be configured per system. Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.
Entering this command results in the following prompt:

```
{context_name}\hostname{config-hss-peer-service}#
```

HSS Peer Service Configuration Mode commands are defined in the *HSS Peer Service Configuration Mode Commands* chapter.

**Example**

The following command enters the existing HSS Peer Service Configuration Mode (or creates it if it does not already exist) for the service named `hss-peer1`:

```
hss-peer-service hss-peer1
```

The following command will remove `hss-peer1` from the system:

```
no hss-peer-service hss-peer1
```
CHAPTER 18

Context Configuration Mode Commands I-M

This section includes the commands \texttt{ikev1 disable-initial-contact} through \texttt{multicast-proxy} service.

Exec > Global Configuration > Context Configuration

\texttt{configure > context context_name}

Entering the above command sequence results in the following prompt:

\texttt{[context_name]host_name(config-ctx)#}

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- \texttt{ikev1 disable-initial-contact}, on page 481
- \texttt{ikev1 disable-phase1-rekey}, on page 482
- \texttt{ikev1 keepalive dpd}, on page 482
- \texttt{ikev1 policy}, on page 484
- \texttt{ikev2-ikesa}, on page 485
- \texttt{ims-auth-service}, on page 487
- \texttt{ims-sh-service}, on page 489
- \texttt{inspector}, on page 490
- \texttt{interface}, on page 492
- \texttt{ip access-group}, on page 494
- \texttt{ip access-list}, on page 495
- \texttt{ip arp}, on page 496
- \texttt{ip as-path access-list}, on page 497
- \texttt{ip community-list}, on page 498
- \texttt{ip dns-proxy source-address}, on page 500
- \texttt{ip domain-lookup}, on page 501
- \texttt{ip domain-name}, on page 501
- \texttt{ip extcommunity-list}, on page 502
- \texttt{ip forward}, on page 503
- \texttt{ip guarantee}, on page 504
- \texttt{ip identification packet-size-threshold}, on page 505
- \texttt{ip igmp profile}, on page 506

Command Line Interface Reference, Modes C - D, StarOS Release 21.20
- ip localhost, on page 506
- ip name-servers, on page 507
- ip pool, on page 509
- ip prefix-list, on page 523
- ip prefix-list sequence-number, on page 524
- ip route, on page 525
- ip routing maximum-paths, on page 528
- ip routing overlap-pool, on page 529
- ip rri, on page 530
- ip rri-route, on page 531
- ip sri-route, on page 532
- ip vrf, on page 533
- ip vrf-list, on page 534
- ipms, on page 535
- ipne-service, on page 536
- ipsec replay, on page 537
- ipsec transform-set, on page 538
- ipsg-service, on page 539
- ipv6 access-group, on page 540
- ipv6 access-list, on page 541
- ipv6 dns-proxy, on page 542
- ipv6 neighbor, on page 543
- ipv6 pool, on page 544
- ipv6 prefix-list, on page 548
- ipv6 prefix-list sequence-number, on page 549
- ipv6 route, on page 550
- ipv6 route-access-list, on page 552
- ipv6 rri, on page 553
- ipv6 rri-route, on page 554
- ipv6 sri-route, on page 556
- isakmp disable-phase1-rekey, on page 557
- isakmp keepalive, on page 557
- isakmp policy, on page 557
- lups-service, on page 557
- l2tp peer-dead-time, on page 558
- lac-service, on page 559
- lawful-intercept, on page 560
- lawful-intercept dictionary, on page 560
- limit ipsecmgr ikev1 max, on page 560
- lma-service, on page 561
- lns-service, on page 562
- location-service, on page 563
- logging, on page 564
- mag-service, on page 567
- map-service, on page 568
- max-sessions, on page 569
ikev1 disable-initial-contact

Disables the sending of the INITIAL-CONTACT message in the IKEv1 protocol after the node creates a new Phase1 SA, caused either by Dead Peer Detection or by a rekey.

**Product**
GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ikev1 disable-initial-contact
```

`no`

Disables this command, which re-enables the sending of the INITIAL-CONTACT message.

**Usage Guidelines**
Use this command to disable the sending of the INITIAL-CONTACT message in the IKE v1 protocol.

**Example**

The following command disables the sending of the INITIAL-CONTACT message:

```
ikev1 disable-initial-contact
```
ikev1 disable-phase1-rekey

Configures the rekeying of Phase1 SA when the Internet Security Association and Key Management Protocol (ISAKMP) lifetime expires in Internet Key Exchange (IKE) v1 protocol.

Product
- PDSN
- HA
- GGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx) #

Syntax Description
[ no ] ikev1 disable-phase1-rekey

no
Re-enables Phase 1SAs when the ISAKMP lifetime expires.

Usage Guidelines
Use this command to disable the rekeying of Phase 1 SAs when the ISAKMP lifetime expires in IKE v1 protocol.

Example
The following command disables rekeying of Phase1 SAs when the lifetime expires:
ikev1 disable-phase1-rekey

ikev1 keepalive dpd

Configures the ISAKMP IPSec Dead Peer Detection (DPD) message parameters for IKE v1 protocol.

Product
- PDSN
- HA
- GGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
Syntax Description

[ no ] ikev1 keepalive dpd interval interval timeout time num-retry retries

no

Deletes previously configured IPSec DPD Protocol settings.

dpd interval interval

Specifies the time interval (in seconds) at which IPSec DPD Protocol messages are sent. interval is an integer from 10 through 3600.

timeout time

Specifies the amount of time (in seconds) allowed for receiving a response from the peer security gateway prior to re-sending the message. time is an integer from 10 through 3600.

num-retry retries

Specifies the maximum number of times that the system should attempt to reach the peer security gateway prior to considering it unreachable. retries is an integer from 1 through 100.

Usage Guidelines

Use this command to configure the ISAKMP dead peer detection parameters in IKE v1 protocol.

Tunnels belonging to crypto groups are perpetually kept "up" through the use of the IPSec Dead Peer Detection (DPD) packets exchanged with the peer security gateway.

Important

The peer security gateway must support RFC 3706 in order for this functionality to function properly.

This functionality is for use with the Redundant IPSec Tunnel Fail-over feature and to prevent IPSec tunnel state mismatches between the FA and HA when used in conjunction with Mobile IP applications.

Regardless of the application, DPD must be supported/configured on both security peers. If the system is configured with DPD but it is communicating with a peer that does not have DPD configured, IPSec tunnels still come up. However, the only indication that the remote peer does not support DPD exists in the output of the show crypto isakmp security associations summary dpd command.

Important

If DPD is enabled while IPSec tunnels are up, it will not take affect until all of the tunnels are cleared.

Example

The following command configures IPSec DPD Protocol parameters to have an interval of 15, a timeout of 10, to retry each attempt 5 times:

ikev1 keepalive dpd interval 15 timeout 10 num-retry 5
**ikev1 policy**

Configures or creates an ISAKMP policy with the specified priority and enters ISAKMP Configuration Mode for IKE v1 protocol.

**Product**
- PDSN
- HA
- GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  - `configure > context context_name`
  - Entering the above command sequence results in the following prompt:
    - `(context_name)host_name(config-ctx)#`

**Syntax Description**

```
[ no ] ikev1 policy priority
```

- **no**
  - Removes a previously configured ISAKMP policy for IKE v1 protocol.

- **priority**
  - Specifies the priority of an ISAKMP policy as an integer from 0 through 100. ISAKMP policies for IKE v1 protocol with lower priority numbers take precedence over policies with higher priorities. "0" is the highest priority. Default: 0

**Usage Guidelines**

Use this command to create ISAKMP policies to regulate how IPSec key negotiation is performed for IKE v1 protocol.

Internet Security Association Key Management Protocol (ISAKMP) policies are used to define Internet Key Exchange (IKE) SAs. The IKE SAs dictate the shared security parameters (i.e. which encryption parameters to use, how to authenticate the remote peer, etc.) between the system and a peer security gateway.

During Phase 1 of IPSec establishment, the system and a peer security gateway negotiate IKESAs. These SAs are used to protect subsequent communications between the peers including the IPSec SA negotiation process.

Multiple ISAKMP policies can be configured in the same context and are used in an order determined by their priority number.

**Example**

Use the following command to create an ISAKMP policy with the priority 1 and enter the ISAKMP Configuration Mode:

```
ikev1 policy 1
```
**ikev2-ikesa**

Creates a new, or specifies an existing, IKEv2 security association parameters and enters the IKEv2 Security Association Configuration Mode.

---

**Important**

In Release 20, 21.0 and 21.1, HeNBGW is not supported. This command must not be used for HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

- ePDG
- HeNBGW
- PDIF

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```

{ default | no } ikev2-ikesa dh-group reuse

default

Sets the IKEv2 IKESA Diffie-Hellman related parameter to its default value.

Default: 14

no

Removes the entered IKEv2 security association parameters.

**auth-method-set auth_method_set_name**

Configure an IKEv2 IKE Security Association Auth-Method Set. Applicable for IKEv2 subscriber-mode based products, This object encapsulates various Authentication methods.

*auth_method_set_name* is the context level name to be used for the IKEv2 IKE Security Association Authentication methods Set, which is a string of size 1 to 127.
certificate policy policy_name

**certificate**: Configures certificate related configuration to be associated to crypto template.

**policy**: Configures certificate policy to be used for certificate related auth method.

*policy_name* is the context level name to be used for the IKEv2 Security Association Cert Policy, which is a string of size 1 to 127.

ddos

Configures the IKEv2 DDoS mitigation Parameters.

**blacklist ip-address ipv4_address | ipv6_address**

Configures the source IPv4 or IPv6 address to be blacklisted.

**init-flood**

Configures the IKEv2 DDoS mitigation parameters for INIT Floods.

**udp-error**

Configures the IKEv2 DDoS mitigation parameters for UDP errors.

dh-group

Configures the IKEv2 IKESA Diffie-Hellman related parameters.

1

Configures the Diffie-Hellman Group 1, 768-bit MODP Group.

14

Configures the Diffie-Hellman 14, 2048-bit MODP Group.

2

Configures the Diffie-Hellman 2, 1024-bit MODP Group.

5

Configures the Diffie-Hellman 5, 1546-bit MODP Group.

**reuse**

Configures the reuse responders key-pair for DH group(s).

+  

Indicates that more than one of the previous keywords can be entered within a single command.

**source-based threshold-upper threshold_upper_value threshold-lower threshold_lower_value poll-timer-duration poll_timer_duration_value**

Configures the IKEv2 DDoS mitigation parameters for INIT Floods applicable at source IP address level.

**threshold-upper threshold_upper_value**: Configures upper threshold value for INIT floods, after which alarm will be raised. *threshold_upper_value* must be an integer from 100 to 4294967295. Default: 10000.

**threshold-lower threshold_lower_value**: Configures lower threshold value for INIT floods, after which alarm will be cleared. *threshold_lower_value* must be an integer from 50 to 4294967294. Default: 5000.
**poll-timer-duration** `poll_timer_duration_value`:
Configures IKEv2 DDoS INIT Floods timer duration in seconds. `poll_timer_duration_value` must be an integer from 30 to 3600. Default: 60 seconds.

**system-based threshold-upper** `threshold_upper_value` **threshold-lower** `threshold_lower_value` **poll-timer-duration** `poll_timer_duration_value`:
Configures the IKEv2 DDoS mitigation parameters for INIT Floods applicable at system level.

**threshold-upper** `threshold_upper_value`:
Configures the upper threshold value for INIT floods, after which alarm will be raised. `threshold_upper_value` must be an integer from 1000 to 4294967295. Default: 100000.

**threshold-lower** `threshold_lower_value`:
Configures the lower threshold value for INIT floods, after which alarm will be cleared. `threshold_lower_value` must be an integer from 500 to 4294967294. Default: 50000.

**poll-timer-duration** `poll_timer_duration_value`:
Configures the IKEv2 DDoS INIT floods timer duration in seconds. `poll_timer_duration_value` must be an integer from 60 to 3600. Default: 60 seconds.

**transform-set** `transform_set_name`:
Configure an IKEv2 IKE Security Association Transform Set. This object encapsulates various IKEv2 IKE algorithm configurations which are required for establishing and IKEv2 IKE Security Association with a remote peer.

`transform_set_name` is the context level name to be used for the IKEv2 IKE Security Association Transform Set, which is a string of size 1 to 127.

---

**Usage Guidelines**
Use this command to create a new or enter an existing IKEv2 security association parameters set. A list of up to four separate transform-sets and three separate authentication method sets can be created.

Entering the command `transform-set transform_set_name` results in the following prompt:

```
[context_name]hostname(cfg-ctx-ikev2ikesa-tran-set)#
```

IKEv2 Security Association Configuration Mode commands are defined in the *IKEv2 Security Association Configuration Mode Commands* chapter.

---

**Example**
The following command configures an IKEv2 security association transform set called *ikesa3* and enters the IKEv2 Security Association Configuration Mode:

```
ikev2-ikesa transform-set ikesa3
```

---

**ims-auth-service**
This command enables the creation, configuration or deletion of an IMS authorization service in the current context.

**Product**
- GGSN
- HA
- IPSG
- PDSN
**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]hostname(config-ctx)#
```

**Syntax Description**

```
ims-auth-service auth_svc_name [ -noconfirm ]
{ no | default } ims-auth-service auth_svc_name
```

- **no**
  
  Deletes the specified IMS authorization service within the current context.

- **default**
  
  Restores default state of IMS authorization service, disabled for a specific context.

- **auth_svc_name**
  
  Specifies name of the IMS authorization service as a unique alphanumeric string of 1 through 63 characters.

  In releases prior to 18, a maximum of 16 authorization services can be configured globally in the system. There is also a system limit for the maximum number of total configured services. In 18 and later releases, up to a maximum of 30 IMS authorization service profiles can be configured within the system.

**Important**

Service names must be unique across all contexts within the system.

- **-noconfirm**
  
  Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Use this command to create/configure/delete an IMS authorization service for Gx interface support in the current context.

Entering this command results in the following prompt:

```
[context_name]hostname(config-imsa-service)
```

IMS authorization Service Configuration commands are described in the *IMS Authorization Service Configuration Mode Commands* chapter.
Whenever a new ims-auth-serv is configured using an endpoint that is used by another ims-auth-serv, then the diabase callbacks are overwritten with values of the new IMSA service. This is a limitation on the system to register only one application per endpoint. So, multiple IMSA services registering with same endpoint may not work properly. If such scenario occurs, configure a different endpoint name for the IMSA service being used and then remove and re-configure the IMSA service used.

**Example**

The following command configures an IMS authorization service named `ims_interface1` within the current context:

```
ims-auth-service ims_interface1
```

---

**ims-sh-service**

Creates the specified IP Multimedia Subsystem (IMS) Sh service name to allow configuration of an Sh service.

**Product**

PDIF

SCM

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ims-sh-service name
no ims-sh-service name
```

- **no**
  - Removes a previously configured IMS-Sh-service.

- **name**
  - Specifies the name of the IMS-Sh-service to be configured as an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

The IMS-Sh-service is named in the pdif-service and/or cscf-service. Use this command to enter the IMS Sh Service Configuration Mode.

Entering this command results in the following prompt:
[context_name]hostname(config-ims-sh-service)#

IMS Sh Service Configuration Mode commands are defined in the *IMS Sh Service Configuration Mode Commands* chapter in this guide.

**Example**

The following example creates or enters an IMS Sh service named *ims-1*:

```
ims-sh-service ims-1
```

**inspector**

Configures a context-level inspector account within the current context.

**Product**

All

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]hostname(config-ctx)#
```

**Syntax Description**

```
inspector user_name [ encrypted ] [ nopassword ] password password [ ecs | noecs ] [ expiry-date date_time ] [ li-administration ] [ noconsole ] [ noecs ] [ timeout-absolute abs_seconds ] [ timeout-min-absolute abs_minutes ] [ timeout-idle timeout_duration ] [ timeout-min-idle idle_minutes ]
```

**no inspector user_name**

Removes a previously configured inspector account.

**user_name**

Specifies a name for the context-level inspector account as an alphanumeric string of 1 through 32 characters.

**[ encrypted ] password password**

Specifies the password to use for the user which is being given context-level inspector privileges within the current context. The encrypted keyword indicates the password specified uses encryption.

*password* is an alphanumeric string of 1 through 63 characters without encryption, or 1 through 127 characters with encryption.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the password keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.
This option allows you to create an inspector without an associated password. Enable this option when using ssh public keys (authorized key command in SSH Configuration mode) as a sole means of authentication. When enabled this option prevents someone from using an inspector password to gain access to the user account.

**ecs | noecs**
Default: noecs

ecs: Permits the specific user to access ACS-specific configuration commands.
noecs: Prevents the specific user to access ACS-specific configuration commands.

**expiry-date date_time**
Specifies the date and time that this account expires. Enter the date and time in the format YYYY:MM:DD:HH:mm or YYYY:MM:DD:HH:mm:ss.
Where YYYY is the year, MM is the month, DD is the day of the month, HH is the hour, mm is minutes, and ss is seconds.

**li-administration**
Refer to the Lawful Intercept Configuration Guide for a description of this parameter.

**noconsole**
Disables user access to a Console line.

---

**Note**
The Global Configuration mode local-user allow-aaa-authentication noconsole command takes precedence in a normal (non-Trusted) StarOS build. In this case, all AAA-based users cannot access a Console line.

---

**timeout-absolute abs_seconds**
This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum amount of time (in seconds) the context-level inspector may have a session active before the session is forcibly terminated. abs_seconds must be an integer from 0 through 300000000. The value 0 disables the absolute timeout. Default: 0

**timeout-min-absolute abs_minutes**
Specifies the maximum amount of time (in minutes) the context-level inspector may have a session active before the session is forcibly terminated. abs_minutes must be an integer from 0 through 525600 (365 days). The value 0 disables the absolute timeout. Default: 0

**timeout-idle timeout_duration**
This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.
Specifies the maximum amount of idle time (in seconds) the context-level inspector may have a session active before the session is terminated. \textit{timeout\_duration} must be an integer from 0 through 300000000. The value 0 disables the idle timeout. Default: 0

\textbf{timeout-min-idle} \textit{idle\_minutes}

Specifies the maximum amount of idle time (in minutes) the context-level inspector may have a session active before the session is terminated. \textit{idle\_minutes} must be an integer from 0 through 525600 (365 days). The value 0 disables the idle timeout. Default: 0

\textbf{Usage Guidelines}

Create new context-level inspector or modify existing inspector's options, in particular, the timeout values. Inspector users have minimal read-only privileges. Refer to the \textit{Command Line Interface Overview} chapter for more information.

\textbf{Important}

A maximum of 128 administrative users and/or subscribers may be locally configured per context.

\textbf{Example}

The following command creates a context-level inspector account named \textit{user1}:

\begin{verbatim}
inspector user1 password secretPassword
\end{verbatim}

The following command removes a context-level inspector account named \textit{user1}:

\begin{verbatim}
no inspector user1
\end{verbatim}

\textbf{interface}

Creates or deletes an interface or specifies an existing interface. By identifying an interface, the mode changes to configure this interface in the current context.

\textbf{Product}

All

\textbf{Privilege}

Security Administrator, Administrator

\textbf{Command Modes}

Exec > Global Configuration > Context Configuration

\begin{verbatim}
configure > context context_name
\end{verbatim}

Entering the above command sequence results in the following prompt:

\begin{verbatim}
<context_name> host_name(config-ctx)#
\end{verbatim}

\textbf{Syntax Description}

\begin{verbatim}
interface name [ broadcast | loopback | point-to-point | tunnel | unnumbered ]
no interface name
\end{verbatim}

\begin{verbatim}
no
\end{verbatim}

Removes the specified interface.
name

Specifies the name of the interface to configure. If name does not refer to an existing interface, the new interface is created if resources allow. name is an alphanumeric string of 1 through 79 characters.

broadcast

Creates an Ethernet broadcast (IP) interface and enters the Ethernet Configuration Mode. Default: Enabled

Important

Refer to the Ethernet Interface Configuration Mode Command chapter for more information.

loopback

Creates an internal IP address that is always UP, is not bound to any physical card/port, and can be reached by any interface configured in the current context. As a loopback interface uses all available physical ports, this type of interface is particularly useful for load-balancing. The interface must be configured for loopback when configuring Interchassis Session Recovery (ICSR). A total of 256 loopback interfaces can be configured. Default: Disabled

This loopback option is not used to setup a diagnostic test port so it should not be confused with the loopback option used in the various card/port configuration modes.

Important

Refer to the Loopback Interface Configuration Mode Command chapter for more information.

tunnel

Creates a tunnel interface to support the various tunnel interfaces. Currently only IPv6-over-IPv4 and GRE tunnel interfaces are supported.

Important

Refer to the Tunnel Interface Configuration Mode Commands chapter for more information.

unnumbered

Creates an unnumbered IP interface within the context. An unnumbered interface enables IP processing without assigning an explicit IP address to the interface. In StarOS this type of interface supports an untagged BFD port. The only parameter for this type of interface is a text description.
Refer to the *Unnumbered Interface Configuration Mode Commands* chapter for more information.

**Usage Guidelines**

Use this command to enter or create the interface configuration mode for an existing interface or for a newly defined interface. This command is also used to remove an existing interface when it longer is needed.

If no keyword is specified, broadcast is assumed and the interface is Ethernet by default.

For IPv6-over-IPv4 or GRE tunneling, you need to specify the interface type as *tunnel*.

**Example**

The following command enters the Ethernet Interface Configuration Mode creating the interface *sampleService*, if necessary:

```
interface sampleInterface
```

The following command removes *sampleService* as being a defined interface:

```
no interface sampleInterface
```

The following command enters the Tunnel Interface Configuration Mode creating the interface *GRE_tunnel1*, if necessary:

```
interface GRE_tunnel1 tunnel
```

### ip access-group

Configures an access group with an Access Control List (ACL) for IP traffic for the current context. The Context-level ACL is applied only to outgoing packets.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- `ip access-group name [ in | out ] [ priority_value ]`
- `no ip access-group name [ in | out ]`
- `no`

Indicates the specified ACL rule is to be removed from the group.
name
Specifies the ACL rule to be added/removed from the group.
In Release 8.1 and later, name is an alphanumeric string of 1 through 47 characters.
In Release 8.0, name is an alphanumeric string of 1 through 79 characters.

---

Important
Up to eight ACLs can be applied to a group provided that the number of rules configured within the ACL(s) does not exceed the 256-rule limit for the context.

---

in | out
The in and out keywords are deprecated and are only present for backward compatibility. The Context-level ACL are applied only to outgoing packets.

priority_value
Specifies the priority of the access group. 0 is the highest priority. If priority_value is not specified, the priority is set to 0. priority_value must be an integer from 0 through 4294967295. Default: 0
If access groups in the list have the same priority, the last one entered is used first.

Usage Guidelines
Use this command to add IP access lists (refer to the ip access-list command) configured with in the same context to an ACL group.
Refer to the Access Control Lists appendix of the System Administration Guide for more information on ACLs.

Example
The following commands add sampleGroup to the context-level ACL with a priority of 0:
```
ip access-group sampleGroup 0
```

---

ip access-list
Create, configure, or delete an IP Access List in the current context.

---

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Syntax Description
```
ip access-list name
{ default | no } ip access-list name
```
default
Sets the context's default access control list to that specified by name.

no
Removes the specified access list.

name
Specifies the access list name.
name is an alphanumeric string of 1 through 47 characters.

If the named access list does not exist, it is created, and the CLI mode changes to the ACL Configuration Mode, wherein the access list can be configured.

If the named access list already exists, the CLI mode changes to the ACL Configuration Mode, wherein the access list can be reconfigured.

Usage Guidelines
Executing this command enters the ACL Configuration Mode in which rules and criteria are defined for the ACL.

Important
A maximum of 256 rules (21.4 and higher releases) or 128 rules (releases prior to 21.4) can be configured per ACL. The maximum number of ACLs that can be configured per context is limited by the amount of available memory in the VPN Manager software task; it is typically less than 200.

Refer to the Access Control Lists appendix of the System Administration Guide for more information on ACLs.

Example
The following command creates an access list named sampleList, and enters the ACL Configuration Mode:

ip access-list sampleList

ip arp

Configures the allocation retention priority (ARP) options for the current context.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#
Syntax Description

```
ip arp ip_address mac_address [ vrf vrf_name ]
noc ip arp ip_address mac_address
```

- **no**
  - Removes the ARP configuration data for the specified IP address from the configuration.

- **ip_address**
  - Specifies the IP address for which to configure the ARP options where `ip_address` is an IP address expressed in IPv4 dotted-decimal notation.

- **mac_address**
  - Specifies the media-specific access control layer address for the IP address. `mac_address` must be specified as a 6-byte hexadecimal number with each byte separated by a colon, for example, "AA:12:bb:34:f5:0E".

- **vrf vrf_name**
  - Associates a Virtual Routing and Forwarding (VRF) context with this static ARP entry.

  `vrf_name` is name of a preconfigured virtual routing and forwarding (VRF) context configured in `Context Configuration Mode` via the `ip vrf` command.

Usage Guidelines

Manage the IP address mapping which is a logical/virtual identifier to the more lower layer addressing used for address resolution in ICMP messages.

For tunnel-based interface, network IP pool can have overlapping ip-addresses across Verve. To manage it adding a preconfigured VRF context is required to associate with an static ARP entry. By default, the ARP is added in the given context. If the VRF name is specified, then the ARP is added to the VRF ARP table.

Example

The following commands set the IP and MAC address for the current context then remove it from the configuration:

```
ip arp 10.2.3.4 F1:E2:D4:C5:B6:A7
no ip arp 10.2.3.4
```

The following commands set the IP and MAC address for a VRF context `vrf1` in the configuration:

```
ip arp 10.2.3.4 F1:E2:D4:C5:B6:A7 vrf vrf1
```

**ip as-path access-list**


<table>
<thead>
<tr>
<th>Product</th>
<th>HA</th>
</tr>
</thead>
</table>

| Privilege | Security Administrator, Administrator |

| Command Modes | Exec > Global Configuration > Context Configuration |
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

[ no ] ip as-path access-list list_name [ { deny | permit } reg_expr ]

no

Remove the specified regular expression from the AS path access list.

list_name

Specifies the name of an AS path list as an alphanumeric string of 1 through 79 characters.

{ deny | permit }

deny: Denies access to AS paths that match the regular expression.

permit: Allows access to AS paths that match the regular expression.

reg_expr

A regular expression to define the AS paths to match. reg_expr is an alphanumeric string of 1 through 254 characters.

Important

The ? (question mark) character is not supported in regular expressions for this command.

Usage Guidelines

Use this command to define AS path access lists for the BGP router in the current context. The chassis supports a maximum of 64 access lists per context.

Example

The following command creates an AS access list named ASlist1 and permits access to AS paths:

ip as-path access-list ASlist1 permit

ip community-list

Configures filtering via a BGP community list. To filter by a BGP community, you must then match the community in a route-map.

Product

All products supporting BGP routing

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```
ip community-list { named named_list | standard identifier } { deny | permit }
{ internet | local-AS | no-advertise | no-export | value AS-community_number AS-community_number AS-community_number ...
{ internet | local-AS | no-advertise | no-export | value AS-community_number AS-community_number AS-community_number ...
{ internet | local-AS | no-advertise | no-export | value AS-community_number AS-community_number AS-community_number ...

no ip community-list { named named_list | standard identifier } { deny | permit }
{ internet | local-AS | no-advertise | no-export | value AS-community_number

no
```

Entering `no ip community-list` with a permit/deny clause deletes the matching community-list entry. Entering `no ip community-list` without a permit/deny clause deletes all the entries belonging to a community-list.

#### named named_list

Specifies the name of a community list as an alphanumeric string of 1 through 79 characters.

#### standard identifier

Specifies the name of a community list as an integer from 1 through 99.

```
{ deny | permit }
```

Specifies whether this community will deny or permit access to a specified destination.

```
{ internet | local-AS | no-advertise | no-export | value AS-community_number
```

Specifies the destinations to deny or permit for the community.

- `internet` – Advertise this route to the internet community, and any router that belongs to it.
- `local-AS` – Use in confederation scenarios to prevent sending packets outside the local autonomous system (AS).
- `no-advertise` – Do not advertise this route to any BGP peer, internal or external.
- `no-export` – Do not advertise to external BGP (eBGP) peers. Keep this route within an AS.
- `value AS-community_number` – Specifies a community string in AS:NN format, where AS = 2-byte AS-community hexadecimal number and NN = 2-byte hexadecimal number (1 to 11 characters).

You can enter multiple destinations and AS community numbers separated by spaces.

### Usage Guidelines

Configures filtering via a BGP community list. To filter by a BGP community, you must then match the community in a route-map.

Multiple community-list entries can be attached to a community-list by adding multiple permit or deny clauses for various community strings. Up to 64 community-lists can be configured in a context.

The communities-list is a way to group destinations into communities and apply routing decisions based on the communities. This method simplifies the configuration of a BGP speaker that controls distribution of routing information.
A community is a group of destinations that share some common attribute. Each destination can belong to multiple communities. Autonomous system administrators define to which communities a destination belongs.

Example
The following command specifies that community list number 5 will permit access to AS destination 200:5.

\[ \text{ip community-list standard 5 permit value 200:5} \]

**ip dns-proxy source-address**

Enables the proxy DNS functionality and identifies this context as the destination context for all redirected DNS requests.

### Important
This command must be entered in the destination context for the subscriber. If there are multiple destination contexts for different subscribers, the command must be entered in each context.

<table>
<thead>
<tr>
<th>Product</th>
<th>HA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
<tr>
<td>configure &gt; context context_name</td>
<td></td>
</tr>
<tr>
<td>Entering the above command sequence results in the following prompt:</td>
<td></td>
</tr>
<tr>
<td>[context_name]host_name(config-ctx)#</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**

\[ [ \text{no} ] \text{ip dns-proxy source-address} \text{ ip_address} \]

**no**

Removes the address in this context as a destination for redirected DNS packets.

**ip_address**

Specifies an interface in this context used for redirected DNS packets. *ip_address* must be entered using IPv4 dotted-decimal notation.

**Usage Guidelines**

Use this command to identify the interface in this context where redirected DNS packets are sent to the home DNS. The system uses this address as the source address of the DNS packets when forwarding the intercepted DNS request to the home DNS server. For a more detailed explanation of the proxy DNS intercept feature, see the *proxy-dns intercept-list* command.
Example
The following command identifies an interface with an address of 10.23.255.255 in a destination context where the system forwards all intercepted DNS requests:

```
ip dns-proxy source-address 10.23.255.255
```

**ip domain-lookup**

Enables or disables domain name lookup via domain name servers for the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- `ip domain-lookup`
- `no ip domain-lookup`
- `no`

Disables domain name lookup.

**Usage Guidelines**

Domain name lookup is necessary if the subscribers configured for the context are to be allowed to use logical host names for services which requires the host name resolution via DNS.

**Example**

```
ip domain-lookup
no ip domain-lookup
```

**ip domain-name**

Configures or removes a logical domain name for the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
</tbody>
</table>

...
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ip domain-name name
```

**no**

Indicates the logical domain name for the current context is to be removed.

**name**

Specifies the logical domain name to use for domain name server address resolution. *name* is an alphanumeric string of 1 through 1023 characters formatted to be a valid IP domain name.

**Usage Guidelines**

Set a logical domain name if the context is to be accessed by logical domain name in addition to direct IP address.

**Example**

```
ip domain-name sampleName.org
```

### ip extcommunity-list

Configures route target filtering via a BGP extended community list. To filter by a BGP extended community, you must then match the extended community in a route-map.

**Product**

All products supporting BGP routing

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ip extcommunity-list { named named_list | standard identifier } { deny | permit } rt rt_number rt_number rt_number ...
no ip extcommunity-list { named named_list | standard identifier } { deny | permit } rt rt_number
```

**no**

Entering **no ip extcommunity-list** with a permit/deny clause deletes the matching extended community-list entry. Entering **no ip extcommunity-list** without a permit/deny clause deletes all the entries belonging to an extended community-list.
named named_list
Specifies the name of an extended community list as an alphanumeric string of 1 through 79 characters.

standard identifier
Specifies the name of an extended community list as an integer from 1 through 99.

{ deny | permit }
Specifies whether this community will deny or permit access to a specific route target.

rt rt_number
Specifies a Route Target as a string in AS:NN format, where AS = 2-byte AS-community hexadecimal number and NN = 2-byte hexadecimal number (1 to 11 characters). You can enter multiple route targets separated by spaces.

Usage Guidelines
Configures filtering via a BGP extended community list. To filter by a BGP extended community, you must then match the community in a route-map.

A BGP extended community defines a route target. MPLS VPNs use a 64-bit Extended Community attribute called a Route Target (RT). An RT enables distribution of reachability information to the correct information table.

Multiple extended community-list entries can be attached to an extended community-list by adding multiple permit or deny clauses for various extended community strings. Up to 64 extended community-lists can be configured in a context.

Example
The following command specifies that extended community list number 78 will deny access to route target 200:5:

    ip extcommunity-list standard 78 deny rt 200:20

ip forward
Configures an IP forwarding policy to forward outgoing pool packets whose flow lookup fails to the default-gateway.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

    [context_name]host_name(config-ctx)#
### Syntax Description

```
[ no ] ip forward outbound unused-pool-dest-address default-gateway
```

- **no**
  Disables forwarding to the default gateway.

- **outbound unused-pool-dest-address default-gateway**
  Enables forwarding to the default gateway.

### Usage Guidelines

Use this command to set an IP forwarding policy that forwards outgoing pool packets whose flow lookup fails to the default gateway. By default, the behavior is to either send an ICMP Unreachable message or to discard the packet depending on the configuration of the IP pool.

Pool packets coming from the line card or MIO card whose flow lookup fails are discarded or ICMP unreachable is sent irrespective of whether this command is configured or not.

### Note

While this CLI is available on the ASR 5500, its functionality is not supported. Therefore, if the CLI is configured, it does not affect or alter the IP forwarding behaviour.

### Example

To enable this functionality, enter the following command:

```
ip forward outbound unused-pool-dest-address default-gateway
```

To disable this functionality, enter the following command:

```
no ip forward outbound unused-pool-dest-address default-gateway
```

## ip guarantee

Enables and disables local switching of framed route packets.

### Product

- GGSN
- P-GW
- SAEGW

### Privilege

Administrator

### Command Modes

- Exec > Global Configuration > Context Configuration
  ```
  configure > context context_name
  ```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

### Syntax Description

```
[ no ] ip guarantee framed-route local-switching
```
no
Disables local switching of framed route packets.

framed-route local-switching
Enables local switching of framed route packets. By default, this functionality is disabled.

Usage Guidelines
Use this command to enable and disable local switching of framed route packets. This functionality will be applicable only when there are some NEMO/framed route sessions in a context.

Example
The following command enables local switching of framed route packets:

```
ip guarantee framed-route local-switching
```

**ip identification packet-size-threshold**

Configures the packet size above which system will assign unique IP header identification.

**Product**
PDSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```
Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
ip identification packet-size-threshold size
default ip identification packet-size-threshold
```

**default**
Restores default value of 576 bytes to IP packet size for fragmentation threshold.

**size**
Specifies the size of IP packet in bytes above which system will assign unique IP header identification for system generated IP encapsulation headers (such as MIP data tunnel). `size` is an integer from 0 through 2000. Default: 576

**Usage Guidelines**
This configuration is used to set the upper limit of the IP packet size. All packets above that size limit will be considered "fragmentable", and an unique non-zero identifier will be assigned.
Example
The following commands set the IP packet size to 1024 bytes as threshold. Above this limit system will assign unique IP header identification for system generated IP encapsulation headers:

```
ip identification packet-size-threshold 1023
```

**ip igmp profile**

Configures an Internet Group Management Protocol (IGMP) profile and moves to the IGMP Profile Configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDSN</td>
</tr>
<tr>
<td>GGSN</td>
</tr>
<tr>
<td>SGSN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Privilege</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
<tr>
<td>configure &gt; context context_name</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ip igmp profile name
```

**no**

Removes the specified IGMP profile.

**name**

Specifies the name of an IGMP profile as an alphanumeric string of 1 through 63 characters. If this is not the name of an existing profile, you are prompted to create the new profile.

**Usage Guidelines**

Configure and existing IGMP profile or create a new one. When this command is executed you are moved to the IGMP Profile Configuration mode. For additional information, refer to the IGMP Profile Configuration Mode Commands chapter.

**Example**

```
ip igmp profile default
```

**ip localhost**

Configures or removes the static local host logical name to IP address mapping for the current context.
Context Configuration Mode Commands I-M

ip name-servers

Modifies the list of domain name servers the current context may use for logical host name resolution.

Syntax Description:

\[ \text{ip name-servers} \]

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Usage Guidelines
Avoid excessive DNS lookups across the network by statically mapping the logical host name to the local host's context.

Example

\[
\text{ip localhost localhostName 10.2.3.4}
\]

\[
\text{no ip localhost localhostName 10.2.3.4}
\]
**Syntax Description**

```
ip name-servers  ip_address secondary_ip_address[third_ip_address]
no ip name-servers  ip_address
```

**no**

Indicates the name server specified is to be removed from the list of name servers for the current context.

**ip_address**

Specifies the IP address of a domain name server using IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**secondary_ip_address**

Specifies the IP address of a secondary domain name server using either IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**third_ip_address**

Specifies the IP address of a third domain name server using either IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. (VPC only)

**Usage Guidelines**

Manage the list of name servers the current context may use in resolving logical host names.

When this CLI configuration is changed, the DNS client is reinitialized and the `cache ttl negative` value is reset to the default value if `no cache ttl negative` is configured for the DNS client in the context. Therefore, check and reconfigure the `no cache ttl negative` CLI after the `ip name-servers` CLI configuration is changed on the node.

The DNS can be specified at the Context level in Context configuration as well as at the APN level in APN Configuration Mode with `dns` and `ipv6 dns` commands, or it can be received from AAA server.

When DNS is requested in PCO configuration, the following preference will be followed for DNS value:

1. DNS Values received from LNS have the first preference.
2. DNS values received from RADIUS Server has the second preference.
3. DNS values locally configured with APN with `dns` and `ipv6 dns` commands has the third preference.
4. DNS values configured at context level has the last preference.

**Important**

The same preference would be applicable for the NBNS servers to be negotiated via ICPC with the LNS.

**Example**

```
ip name-servers 10.2.3.4
```
**ip pool**

Enables creation, configuration or deletion of IP address pools in the current context.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

**Syntax Description**

```
ip pool pool_name { ip_address/subnet_mask | ip_address_mask_combo | range start_ip_address end_ip_address | address-hold-timer address_hold_timer | address-quarantine-timer seconds | advertise-if-used | alert-threshold [ group-available | pool-free | pool-hold | pool-release | pool-used | low_thresh [ clear high_thresh ] ] | explicit-route-advertise | [ group-name group_name ] | include-nw-bcast | napt-users-per-ip-address users_per_ip | alert-threshold { ( pool-free | pool-hold | pool-release | pool-used | low_thresh [ clear high_thresh ] ) + } | max-chunks-per-user max_chunks_per_user | nat-binding-timer | nat-pkt-drop-threshold high_thresh [ clear low_thresh ] | next-hop-forwarding-address ip_address | on-demand | port-chunk-size port_chunk_size | send-nat-binding-update [ + ] [ nat-priority ] | nat-one-to-one | alert-threshold { ( pool-free | pool-hold | pool-release | pool-used | low_thresh [ clear high_thresh ] ) + } | nat-binding-timer nat_binding_timer | nat-pkt-drop-threshold high_thresh [ clear low_thresh ] | next-hop-forwarding-address ip_address | on-demand | ( send-nat-binding-update [ + ] ) [ nat-realm users-per-nat-ip-address users_on-demand [ address-hold-timer address_holder_timer ] ] | next-hop-forwarding-address ip_address [ overlap vlanid vlan_id ] | respond-icmp-echo ip_address ] | nw-reachability server server_name ] [ policy allow-static-allocation ] [ framed-route-vrf-list vrf_list_name ] [ pool-route ip_address/ip_mask | [ private priority ] [ public priority ] [ resource priority ] [ send-icmp-dest-unreachable ] | [ skip-nat-subscriber-ip-check ] [ srp-activate ] [ subscriber-gw-address ip_address ] [ static | suppress-switchover-arps ] | [ tag { none | pdif-setup-addr } ] [ unicast-gratuitous-arp-address ip_address ] [ vrf vrf_name [ [ mpls-label input in_label_value | output out_label_value1 | output_label_value2 ] ] ] [ framed-route-vrf-list ] + ]
```
**tag** { none | pdif-setup-addr } [ unicast-gratuitous-arp-address ] + [ send-nat-binding-update ] [ framed-route-vrflist ]

**no**
Removes the specified IP address pool from the current context's configuration, or disables the specified option(s) for the specified IP pool.

**no alert-threshold**
This command without any optional keywords disables all alert thresholds.

**name**
Specifies the logical name of the IP address pool. name must be an alphanumeric string of 1 through 31 characters.

---

**Important**
An error message displays if the ip pool name and the group name in the configuration are the same. An error message displays if the ip pool name or group name are already used in the context.

**ip_address**
Specifies the beginning IP address of the IP address pool using IPv4 dotted-decimal.

**subnet_mask**
Specifies the IP address mask bits to determine the number of IP addresses in the pool. ip_mask must be specified using IPv4 dotted-decimal notation.

1 bits in the ip_mask indicate that bit position in the ip_address must also have a value of 1.

0 bits in the ip_mask indicate that bit position in the ip_address does not need to match – the bit can be either a 0 or a 1.

For example, if the IP address and mask are specified as 172.168.10.0 and 255.255.255.224, respectively, the pool will contain IP addresses in the range 172.168.10.0 through 172.168.10.31 for a total of 32 addresses.

**ip_address_mask_combo**
Specifies a combined IP address subnet mask bits to indicate what IP addresses the route applies to. ip_address_mask_combo must be specified using CIDR notation where the IP address is specified using IPv4 dotted-decimal notation and the mask bits are a numeric value which is the number of bits in the subnet mask.

**range start_ip_address end_ip_address**
Specifies the IP addresses for the IP pool as a range of addresses.

start_ip_address specifies the beginning of the range of addresses for the IP pool.

end_ip_address specifies the end of the range of addresses for the IP pool.

The IP address range must be specified using IPv4 dotted-decimal notation.
For example, if start_ip_address is specified as 172.168.10.0 and end_ip_address is specified as 172.168.10.31 the IP pool will contain addresses in the range 172.168.10.0 through 172.168.10.31 for a total of 32 addresses.

**private [ priority ]**
Address pool may only be used by mobile stations which have requested an IP address from a specified pool. When private pools are part of an IP pool group, they are used in a priority order according to the precedence setting. priority must be an integer from 0 through 10 with 0 being the highest priority. The default value is 0.

**public [ priority ]**
Address pool is used in priority order for assigning IP addresses to mobile stations which have not requested a specific address pool. priority must be an integer from 0 through 10 with 0 being the highest priority. The default value is 0.

**static**
Designates local IP address pool to statically assign pooled addresses.

---

**Important**
The keyword static must be used for DHCP served IP addresses.

---

**tag { none | pdif-setup-addr }**
Default: none

**none**: default tag for all IP address pools

**pdif-setup-addr**: pool with this tag should only be used for PDIF calls.

**address-hold-timer seconds**
When this is enabled, and an active subscriber is disconnected, the IP address is held or considered still in use, and is not returned to the free state until the address-hold-timer expires. This enables subscribers who reconnect within the length of time specified (in seconds) to obtain the same IP address from the IP pool.

seconds is the time in seconds and must be an integer from 0 through 31556926.

---

**Important**
For releases prior to 20.0, a change made to the IP pool hold timer takes immediate effect on existing addresses currently on hold. Timeouts are adjusted to align with the new value. For releases after 20.0, the new timeout value will only be applied to addresses which are put on hold in the future. Timeouts for addresses currently in the hold state are not modified. They will timeout using the original timeout value.

---

**Important**
Currently, the address-hold-timer only supports IPv4 addresses.
address-quarantine-timer seconds

Specifies the timer value in seconds for an address quarantine timer as an integer from 20 through 86400. This timer cannot be configured with an address-hold-timer in the same pool.

The IP pool address-quarantine-timer is a mechanism to busy out a released IP address for a specified interval. This prevents an IP address from being reused until the quarantine timer expires.

Each IP pool can be configured with a timer value that determines how long a recently released address will be held in quarantine before being freed. When the timer has expired, the address is returned to the list of free addresses, to be allocated again to a new subscriber. Any address that has been released, but for which the address-quarantine-timer has not expired, is still considered to be in use for the purposes of allocation. If a subscriber tries to reconnect while the address-quarantine timer is armed, even though it is the same subscriber ID, the subscriber does not get the same address.

advertise-if-used

Advertises to the peer routes only if addresses are being used in pool.

alert-threshold { group-available | pool-free | pool-hold | pool-release | pool-used } low_thresh [ clear high_thresh ]

Default: All thresholds are disabled.

Configures IP address pool-level utilization thresholds. These thresholds take precedence over context-level IP pool thresholds.

group-available: Set an alert based on the available percentage of IP addresses for the entire IP pool group.

pool-free: Set an alert based on the percentage of IP addresses that are unassigned in this IP pool.

pool-hold: Set an alert based on the percentage of IP addresses from this IP pool that are on hold.

pool-release: Set an alert based on the percentage of IP addresses from this IP pool that are in the release state.

pool-used: This command sets an alert based on the percentage of IP addresses that have been assigned from this IP pool.

---

Important

Refer to the threshold available-ip-pool-group and threshold monitoring commands in this chapter for additional information on IP pool utilization thresholding.

---

low_thresh: The IP pool utilization percentage that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer between 0 and 100.

clear high_thresh: The IP pool utilization percentage that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm is generated. It may be configured as an integer between 0 and 100.

---

Important

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.
**group-name group_name**

Assigns one or more preconfigured IP pools to the IP pool group. `group_name` is case sensitive and must be an alphanumeric string of 1 through 31 characters. One or more IP pool groups are assigned to a context and one IP pool group consists one or more IP pool(s).

IP pool group name is used in place of an IP pool name. When specifying a desired pool group in a configuration the IP pool with the highest precedence is used first. When that IP pool's addresses are exhausted the pool with the next highest precedence is used.

**include-nw-bcast**

Allows pools to include the classful network and broadcast addresses that are usually excluded when a pool crosses the classful network boundaries.

To remove the `include-nw-bcast` option from the ip pool, use the `no ip pool test include-nw-bcast` command.

**napt-users-per-ip-address users_per_ip [ alert-threshold { { pool-free | pool-hold | pool-release | pool-used } low_thresh [ clear high_thresh ] } + ] [ max-chunks-per-user max_chunks_per_user [ nat-binding-timer nat_binding_timer ] [ nat-pkt-drop-threshold high_thresh [ clear low_thresh ] ] | next-hop-forwarding-address ip_address ] [ on-demand ] [ port-chunk-size port_chunk_size ] [ port-chunk-threshold port_chunk_threshold ] [ send-nat-binding-update ] +

---

**Important**

In UMTS deployments this keyword is available in 9.0 and later releases. In CDMA deployments this keyword is available in 8.3 and later releases.

---

**Important**

In UMTS deployments, on upgrading from Release 8.1 to Release 9.0, and in CDMA deployments, on upgrading from Release 8.1 to 8.3, all NAT realms configured in Release 8.1 using the `nat-realm` keyword must be reconfigured using either the `nat-one-to-one` (for one-to-one NAT realms) or the `napt-users-per-ip-address` (for many-to-one NAT realms) keywords.

Configures many-to-one NAT realms.

- **users_per_ip**: Specifies how many users can share a single NAT IP address.
  
  In 18 and earlier releases, `users_per_ip` must be an integer from 2 through 2016.
  
  In 19 and later releases: `users_per_ip` must be an integer from 2 through 8064.

- **alert-threshold**: Specifies the alert threshold for the pool:

---

**Important**

Thresholds configured using the `alert-threshold` keyword are specific to the pool that they are configured in. Thresholds configured using the `threshold ip-pool-*` commands in the Context Configuration Mode apply to all IP pools in that context, and override the threshold configurations set within individual pools.

- **pool-free**: Percentage free alert threshold for this pool

- **pool-hold**: Percentage hold alert threshold for this pool
- **pool-release**: Percentage released alert threshold for this pool
- **pool-used**: Percentage used alert threshold for this pool
  - **low_thresh**: The IP pool utilization percentage that must be met or exceeded within the polling interval to generate an alert or alarm. **low_thresh** must be an integer from 0 through 100.
  - **clear high_thresh**: The IP pool utilization percentage that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm is generated. **high_thresh** must be an integer from 0 through 100.

---

**Important**

The **high_thresh** value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.

---

- **max-chunks-per-user max_chunks_per_user**: Specifies the maximum number of port chunks to be allocated per subscriber in the many-to-one NAT pool.
  - In 18 and earlier releases: **max_chunks_per_user** must be an integer from 1 through 2016.
  - In 19 and later releases: **max_chunks_per_user** must be an integer from 1 through 8064.
  - Default: 1
- **nat-binding-timer binding_timer**: Specifies NAT Binding Timer for the NAT pool. **timer** must be an integer from 0 through 31556926. If set to 0, is disabled. Default: 0
- **nat-pkt-drop-threshold high_thresh [ clear low_thresh ]**: Specifies the NAT packet drop threshold in percentage (%).
  - **high_thresh** specifies the high NAT packet drop percentage threshold, and must be an integer from 0 through 100. Default: 0
  - **clear low_thresh** specifies the low NAT packet drop percentage threshold, and must be an integer from 0 through 100. Default: 0
- **nexthop-forwarding-address address**: Specifies the nexthop forwarding address for this pool. **address** must be an IPv4 or IPv6 address. If configured for a NAT pool, packets that are NATed using that NAT pool will be routed based on the configured nexthop address.

---

**Important**

The **nexthop-forwarding-address** support for NAT IP pools is functional only in later releases of Release 9.0 and in 10.0 and later releases.

---

- **on-demand**: Specifies allocating IP when matching data traffic begins.
- **port-chunk-size size**: Specifies NAT port chunk size (number of NAT ports per chunk) for many-to-one NAT pool.
  - In 18 and earlier releases: **size** must be an integer from 32 through 32256 (in multiples of 32).
  - In 19 and later releases: **size** must be an integer from 8 through 32256 (in multiples of 8).
The **port-chunk-size** configuration is only available for many-to-one NAT pools.

The **port-chunk-size** must be a minimum of 64 with systems configured as an A-BG or P-CSCF.

- **port-chunk-threshold** chunk_threshold: Specifies NAT port chunk threshold in percentage of number of chunks for many-to-one NAT pool. chunk_threshold must be an integer from 1 through 100. Default: 100%

The **port-chunk-threshold** configuration is only available for many-to-one NAT pools.

- **send-nat-binding-update**: Specifies sending NAT binding updates to AAA for this realm. Default: Disabled

**send-nat-binding-update** is supported for both one-to-one and many-to-one realms.

The following IP pool configuration keywords can also be used in the many-to-one NAT pool configuration:

- **group-name** group_name: Specifies the pool group name. The grouping enables to bind discontiguous IP address blocks in individual NAT IP pools to a single pool group.

  This keyword is available for NAT pool configuration only in Release 10.0 and later.

  NAT pool and NAT pool group names must be unique.

  group_name is an alphanumeric string of 1 through 31 characters that is case sensitive.

- **srp-activate**

  Activates the IP pool for Interchassis Session Recovery (ICSR).

**nat priority**

Designates the IP address pool as a Network Address Translation (NAT) address pool.

priority specifies the priority of the NAT pool. 0 is the highest priority. If priority is not specified, the priority is set to 0.

Must be a value from 0 (default) to 10.

This functionality is currently supported for use with systems configured as an A-BG or P-CSCF.
**nat-one-to-one** [ alert-threshold ({ pool-free | pool-hold | pool-release | pool-used } low_thresh [ clear high_thresh ] + ) ] [ nat-binding-timer nat_binding_timer ] [ nat-pkt-drop-threshold high_thresh [ clear low_thresh ] ][ nexthop-forwarding-address ip_address][ on-demand ][ send-nat-binding-update ]

**Important**
In UMTS deployments this keyword is available in Release 9.0 and later releases. In CDMA deployments this keyword is available in Release 8.3 and later releases.

**Important**
In UMTS deployments, on upgrading from Release 8.1 to Release 9.0, and in CDMA deployments, on upgrading from Release 8.1 to Release 8.3, all NAT realms configured in Release 8.1 using the **nat-realm** keyword must be reconfigured using either the **nat-one-to-one** (for one-to-one NAT realms) or the **napt-users-per-ip-address** (for many-to-one NAT realms) keywords.

**Important**
Configures one-to-one NAT realm.

- **alert-threshold**: Specifies alert threshold for this pool:

  **Important**
  Thresholds configured using the **alert-threshold** keyword are specific to the pool in which they are configured. Thresholds configured using the **thresholdip-pool** commands in the Context Configuration Mode apply to all IP pools in the context, and override the threshold configurations set within individual pools.

  - **pool-free**: Percentage free alert threshold for this pool
  - **pool-hold**: Percentage hold alert threshold for this pool
  - **pool-release**: Percentage released alert threshold for this pool
  - **pool-used**: Percentage used alert threshold for this pool
  - **low_thresh**: The IP pool utilization percentage that must be met or exceeded within the polling interval to generate an alert or alarm. **low_thresh** must be an integer from 0 through 100.
  - **clear high_thresh**: The IP pool utilization percentage that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm is generated. **high_thresh** must be an integer from 0 through 100.

  **Important**
The **high_thresh** value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.

  - **nat-binding-timer nat_binding_timer**: Specifies NAT Binding Timer for the NAT pool. **binding_timer** must be an integer from 0 through 31556926. If set to 0, is disabled.

    **Important**
    For many-to-one NAT pools, the default NAT Binding Timer value is 60 seconds. For one-to-one NAT pools, it is 0. By default, the feature is disabled—the IP addresses/ port-chunks once allocated will never be freed.
• **nat-pkt-drop-threshold** `high_thresh [ clear low_thresh ]`: Specifies the NAT packet drop threshold in percentage (%).

  - `high_thresh` specifies the high NAT packet drop percentage threshold, and must be an integer from 0 through 100. Default: 0
  - `clear low_thresh` specifies the low NAT packet drop percentage threshold, and must be an integer from 0 through 100. Default: 0

• **nexthop-forwarding-address** `ip_address`: Specifies the nexthop forwarding address for this pool. `ip_address` must be an IPv4 or IPv6 address. If configured for a NAT pool, packets that are NATed using that NAT pool will be routed based on the configured nexthop address.

  重要 The **nexthop-forwarding-address** support for NAT IP pools is functional only in later releases of Release 9.0 and in Release 10.0 and later releases.

• **on-demand**: Specifies allocating IP address when matching data traffic begins.

• **send-nat-binding-update**: Specifies sending NAT binding updates to AAA for this realm. Default: Disabled

  重要 **send-nat-binding-update** is supported for both one-to-one and many-to-one realms.

The following IP pool configuration keywords can also be used in the one-to-one NAT pool configurations:

• **address-hold-timer** `address_hold_timer`

• **group-name** `group_name`: specifies the pool group name. The grouping enables to bind discontiguous IP address blocks in individual NAT IP pools to a single pool group. NAT pool and NAT pool group names must be unique. `group_name` is an alphanumeric string of 1 through 31 characters that is case sensitive. This keyword is available for NAT pool configuration only in StarOS 10.0 and later releases.

• **srp-activate**: Activates the IP pool for Interchassis Session Recovery (ICSR).

```

nat-realm users-per-nat-ip-address users [ on-demand [ address-hold-timer address_hold_timer ] ]
```

  重要 In UMTS deployments, the **nat-realm** keyword is only available in Release 8.1.

  重要 In Release 8.1, the NAT On-demand feature is not supported.

  重要 This functionality is currently supported for use with systems configured as an A-BG or P-CSCF.

Designates the IP address pool as a Network Address Translation (NAT) realm pool.
**users-per-nat-ip-address**

*users*: specifies the number of users sharing a single NAT IP address as an integer from 1 through 5000.

**on-demand**

Specifies to allocate IP when matching data traffic begins.

**address-hold-timer**

*address_hold_timer*: Specifies the address hold timer (in seconds) for this pool as an integer from 0 through 31556926. If set to 0, the address hold timer is disabled.

---

**Important**

Currently, the address-hold-timer only supports IPv4 addresses.

---

**next-hop-forwarding-address**

*ip_address*

A subscriber that is assigned an IP address from this pool is forwarded to the next hop gateway with the specified IP address.

**overlap vlan id**

*vlan_id*

When a next-hop forwarding address is configured, this keyword can be configured to enable overlapping IP address pool support and associates the pool with the specified virtual LAN (VLAN). *vlan_id* is the identification number of a VLAN assigned to a physical port and can be configured to any integer from 1 through 4095.

For more information on configuring VLANs, refer to the *System Administration Guide*.

---

**Important**

This functionality is currently supported for use with systems configured as an HA, or as a PDSN for Simple IP, or as a GGSN. This keyword can only be issued for pools of type private or static and must be associated with a different next-hop forwarding address and VLAN. A maximum of 256 overlapping pools can be configured per context and a maximum of 256 overlapping pools can be configured per HA or simple IPPDSN. For GGSNs, the total number of pools is limited by the number of VLANs defined but the maximum number per context is 256. Additional network considerations and configuration outside of the system may be required.

**nw-reachability server**

*server_name*

Binds the name of a configured network reachability server to the IP pool and enables network reachability detection for the IP pool. This takes precedence over any network reachability server settings in a subscriber configuration.

*server_name*: Specifies the name of a network reachable server that has been defined in the current context, expressed as an alphanumeric string of 1 through 16 characters.

---

**Important**

Also see the following commands for more information: Refer to the **policy nw-reachability-fail** command in the HA Configuration Mode to configure the action that should be taken when network reachability fails. Refer to the **nw-reachability server** command in this chapter to configure network reachability servers. Refer to the **nw-reachability-server** command in the Subscriber Configuration Mode to bind a network reachability server to a specific subscriber.
respond-icmp-echo ip_address
Pings the first IP address from overlapping IP address pools.

Important
In order for this functionality to work, all of the pools should contain an initial IP address that can be pinged.

resource
Specifies this IP pool as a resource pool. The IP addresses in resource pools may have IP addresses that also exist in other resource pools. IP addresses from a resource pool should not be used for IP connectivity within the system where the pool is defined. These IP addresses should be allocated for sessions which are L3 tunneled through the system (IP-in-IP or GRE). It is possible for resource pools in the same context to have overlapping addresses when the terminating network elements for the L3 tunnels are in different VPNs. Default: Disabled

Also refer to the Subscriber Configuration Mode Commands chapter for a description of the l3-to-l2-tunnel address-policy command.

send-icmp-dest-unreachable
When enabled, this generates an ICMP destination unreachable PDU when the system receives a PDU destined for an unused address within the pool.

Default: Disabled

skip-nat-subscriber-ip-check
When enabled, this is configured to skip private IP address check for non-NAT pools. This can be configured only for non-NAT pools during call-setup if NAT is enabled for the subscriber. If NAT is disabled, this value is not considered.

Default: Disabled (subscriber IP check is done).

explicit-route-advertise
When enabled, the output of show ip pool verbose includes the total number of explicit host routes. Default: Enabled

srp-activate
Activates the IP pool for Interchassis Session Recovery (ICSR).

subscriber-gw-address ip_address
Configures the subscriber gateway address for this pool.

Important
Using this keyword might give a message as "busyout configured". This indicates that one ip address is reserved as subscriber-gw-address and not the entire pool.
**suppress-switchover-arp**
Suppress corresponding gratuitous ARP generation when a line card or MIO card switchover occurs. Default: Disabled

**unicast-gratuitous-arp-address ip_address**
Perform a unicast gratuitous ARP to the specified IP address rather than broadcast gratuitous ARP when gratuitous ARP generation is required. Default: Perform broadcast gratuitous ARP.

**vrf vrf_name [ mpls-label input in_label_value | output out_label_value1 | out_label_value2 ]**
Associates a preconfigured Virtual Routing and Forwarding (VRF) instance with this IP pool and configures MPLS label parameters.

---

**Important**
This command must be used with next-hop parameters.

**vrf_name** is name of a preconfigured virtual routing and forwarding (VRF) context configured in Context Configuration Mode through ip vrf command.

- **in_label_value** is the MPLS label that identifies the inbound traffic destined for this pool.
- **out_label_value1** and **out_label_value2** identify the MPLS labels to be added to the outgoing packets sent for subscribers from this pool. Where **out_label_value1** is the inner output label and **out_label_value2** is the outer output label.

MPLS label values must be an integer from 16 through 1048575.

By default, the pools configured are bound to the default VRF unless specified with a VRF name.

---

**Important**
You cannot have overlapping pool addresses using the same VRF. Also you cannot have two pools using different VRFs but the same in-label irrespective of whether or not the pools overlap. The pool must be private or static in-order to be associated with a certain VRF. If the VRF with such a name is not configured, you are prompted to add the VRF before configuring a pool.

---

**policy allow-static-allocation**
Configures static address allocation policy for dynamic IP pool. This keyword enables a dynamic IP pool to accept a static address for allocation.

---

**Important**
In static allocation scenario, the pool group name is returned by AAA in the attribute SN1-IP-Pool-Name, and the IP address to use will be returned in the Framed-IP-Address attribute.

---

**framed-route-vrf-list vrf_list_name**
Configures a vrf-list in order for NVSE VRF authorization.
**pool-route ip_address/ip_mask**

Configures the IP pool route instead of generating by-default. The address followed by the `pool-route` keyword can be an IPv4 or IPv6 address with the mask value.

+ Indicates that more than one of the previous keywords can be entered within a single command.

---

**Usage Guidelines**

Define one or more pools of IP addresses for the context to use in assigning IPs to mobile stations. This command is also useful in resizing existing IP pools to expand or contract the number of addresses allocated. If you resize an IP pool, the change is effective immediately.

When using the `ip pool` command to resize an IP pool, the type must be specified since by default the command assumes the type as public. In other words, the CLI syntax to resize an IP pool is the same syntax used to create the pool. See examples below.

```
ip pool pool1 100.1.1.0/24 static
```

The syntax to resize that pool would be:

```
ip pool pool1 100.1.1.0/25 static
```

A pool which is deleted will be marked as such. No new IP addresses will be assigned from a deleted pool. Once all assigned IP addresses from a deleted pool have been released, the pool, and all associated resources, are freed.

---

**Important**

If an IP address pool is matched to a ISAKMP crypto map and is resized, removed, or added, the corresponding security association must be cleared in order for the change to take effect. Refer to the `clear crypto` command in the Exec mode for information on clearing security associations.

---

**Over-lapping IP Pools:** The system supports the configuration of over-lapping IP address pools within a particular context. Over-lapping pools are configured using either the resource or overlap keywords.

The `resource` keyword allows over-lapping addresses tunneled to different VPN end points.

The `overlap` keyword allows over-lapping addresses each associated with a specific virtual LAN (VLAN) configured for an egress port. It uses the VLAN ID and the nexthop address to determine how to forward subscriber traffic with addresses from the pool thus resolving any conflicts with overlapping addresses.

Note that if an overlapping IP Pool is bound to an IPSec Tunnel (refer to the `match ip pool` command in the Crypto Group Configuration Mode chapter), that tunnel carries the traffic ignoring the nexthop configuration. Therefore, the IPSec Tunnel takes precedence over the nexthop configuration. (Thus, one can configure the overlapping IP Pool with fake VLAN ID and nexthop and still be able to bind it to an IPSec Tunnel for successful operation.

The `overlap` keyword allows over-lapping addresses each associated with a specific VLAN can only be issued for pools of type private or static and must be associated with a different nexthop forwarding address and VLAN. A maximum of 128 over-lapping pools can be configured per context and a maximum of 256 over-lapping pools can be configured per system.
Overlapping IP address functionality is currently supported for use with systems configured as an HA for Mobile IP, or as a PDSN for Simple IP, or as a GGSN. For deployments in which subscriber traffic is tunneled from the FA to the HA using IP-in-IP, a separate HA service must be configured for each overlapping pool.

**IP Pool Address Assignment Method:** IP addresses can be dynamically assigned from a single pool or from a group of pools. The addresses are placed into a queue in each pool. An address is assigned from the head of the queue and, when released, returned to the end. This method is known as least recently used (LRU).

When a group of pools have the same priority, an algorithm is used to determine a probability for each pool based on the number of available addresses, then a pool is chosen based on the probability. This method, over time, allocates addresses evenly from the group of pools.

Note that setting different priorities on each individual pool in a group can cause addresses in some pools to be used more frequently.

In NAT IP pool configurations, the minimum number of public IP addresses that must be allocated to each NAT pool must be greater than or equal to the number of Session Managers (SessMgrs) available on the system. On the ASR 5000, it is \( \geq 84 \) public IP addresses. This can be met by a range of 84 host addresses from a single Class C. The remaining space from the Class C can be used for other allocations.

**Example**

The following commands define a private IP address pool, a public IP address pool, and a static address pool, respectively.

```
ip pool samplePool1 1.2.3.0 255.255.255.0 private
ip pool samplePool2 1.3.0.0 255.255.0.0 public
ip pool samplePool3 1.4.5.0 255.255.255.0 static
```

The following command defines a private IP pool specified with a range of IP addresses. The pool has 101 addresses.

```
ip pool samplePool4 range 10.5.5.0 10.5.5.100 private
```

The following command sets the address hold timer on the pool to 60 minutes (3600 seconds):

```
ip pool samplePool4 address-hold-timer 3600
```

The following command removes the IP address pool from the configuration:

```
no ip pool samplePool1
```

The following command creates a static IP pool:

```
ip pool pooll 100.1.1.0/24 static
```

The following command resizes the static IP pool created in the previous example:

```
ip pool pooll 100.1.1.0/25 static
```
**ip prefix-list**

Creates an IP prefix list for filtering routes.

### Product
- PDSN
- HA
- GGSN

### Privilege
Security Administrator, Administrator

### Command Modes
- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

- `ip prefix-list name list_name [ seq seq_number ] { deny | permit } { any | network_address/net_mask [ ge ge_value ] [ le le_value ] }
- `no ip prefix-list list_name [ seq seq_number ] { deny | permit } { any | network_address/net_mask [ ge ge_value ] [ le le_value ] }
- `no`

Delete the specified prefix-list entry.

- `name list_name`
  Specifies a name for the prefix list as an alphanumeric string of 1 through 79 characters.

- `seq seq_number`
  Assigns the specified sequence number to the prefix list entry as an integer from 1 through 4294967295.

- `deny`
  Specifies prefixes to deny.

- `permit`
  Specifies prefixes to permit.

- `any`
  Matches any prefix.

- `network_address/net_mask [ ge ge_value ] [ le le_value ]`
  Specifies the prefix to match.
*network_address/net_mask*: the IP address and the length, in bits, of the network mask that defines the prefix. The IP address and mask must be entered in IPv4 dotted-decimal notation. When neither `ge` (greater than or equal to) or `le` (less than or equal to) are specified an exact match is assumed.

`ge ge_value`: Specifies the minimum prefix length to match as an integer from 0 through 32. If only the `ge` value is specified, the range is from the `ge` value to 32. The `ge` value must be greater than `net_mask` and less than the `le` value.

`le le_value`: Specifies the maximum prefix length to match as an integer from 0 through 32. If only the `le` value is specified, the range is from the `net_mask` to the `le` value. The `le` value must be less than or equal to 32.

The following equation describes the conditions that `ge` and `le` values must satisfy:

```
net_mask < ge_value < le_value <= 32
```

**Usage Guidelines**

Use this command to filter routes by their IP prefix.

**Example**

```
ip prefix-list name prelist10 seq 5 permit 192.168.100.0/8 ge 12 le 24
```

### ip prefix-list sequence-number

Enables or disables the inclusion of IP prefix list sequence numbers in the configuration file. This option is enabled by default.

**Product**

- PDSN
- HA
- GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ip prefix-list sequence-number
```

**no**

Disables the listing of IP prefix list sequence numbers in the configuration file.

**Usage Guidelines**

Use this command to enable and disable the inclusion of IP prefix list sequence numbers in the configuration file.
Example
To disable the inclusion of IP prefix list sequence numbers in the configuration file, enter the following command:

```
no ip prefix-list sequence-number
```

**ip route**

Adds or removes routing information from the current context's configuration.

**Product**

All

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ip route { ip_address/ip_mask | ip_address ip_mask } { gateway_ip_address | next-hop next_hop_ip_address | point-to-point | tunnel } egress_intrfc_name [ cost cost ] [ fall-over bfd multihop mhsess_name ] [ precedence precedence ] [ vrf vrf_name [ cost value ] [ fall-over bfd multihop mhsess_name ] [ precedence precedence ] ]

[ no ] ip route static bfd if_name remote-endpt_ipv4_address
[ no ] ip route static multihop bfd mhbfd_sess_name local_endpt_ipaddr remote_endpt_ipaddr

[ no ] ip route kernel ip_address/ip_address_mask_combo egress_intrfc_name cost number
[ no ] ip route kernel ip_address/ip_address_mask_combo egress_intrfc_name cost number blackhole
```

**no**

Indicates the route specified by this options is to be removed from the configuration.

**kernel**

Allows static route in the kernel routing table options.

**ip_address/ip_mask | ip_address/ip_mask**

Specifies a destination IP address or group of addresses that will use this route.

**ip_address/ip_mask**:

Specifies a combined IP address subnet mask bits to indicate what IP addresses to which the route applies. **ip_address** must be entered using IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. **ip_mask** is entered using CIDR notation; the mask bits are a numeric value which is the number of bits in the subnet mask.
ip_address/ip_mask: Specifies an IP address and the networking (subnet) mask pair which is used to identify the set of IP addresses to which the route applies. ip_address must be specified using the standard IPv4 dotted decimal notation. ip_mask must be specified using the standard IPv4 dotted decimal notation as network mask for subnets.

The mask as specified by ip_mask or resulting from ip_address/ip_mask is used to determine the network for packet routing.

0's in the resulting mask indicate the corresponding bit in the IP address is not significant in determining the network for packet routing.

1's in the resulting mask indicate the corresponding bit in the IP address is significant in determining the network.

ip_address/ip_address_mask_combo

Specifies a combined IP address subnet mask bits to indicate what IP addresses the route applies to. ip_address_mask_combo must be specified using CIDR notation where the IP address is specified using IPv4 dotted-decimal notation and the mask bits are a numeric value, which is the number of bits in the subnet mask.

gateway_ip_address | next-hop next_hop_ip_address | point-to-point | tunnel

Specifies which device or network to use when forwarding packets.

gateway_ip_address: Specifies the IP address of the network gateway to which to forward packets. The address must be entered in IPv4 dotted-decimal notation (###.###.###.###).

next-hop next_hop_ip_address: Specifies the next-hop IP address to which packets are to be forwarded. The address must be entered in IPv4 dotted-decimal notation.

point-to-point: Specifies that the egress port is an ATM point-to-point interface.

tunnel: Sets the static route for this egress interface as tunnel type, such as IPv6-over-IPv4 or GRE.

egress_intrfc_name

Specifies the name of the egress (out-bound) interface name in the current context as an alphanumeric string of 1 through 79 characters. For a blackhole route, the default is “*”, that is, a wildcard interface.

cost cost

Specifies the relative cost of the route. cost must be an integer from 0 through 255 where 255 is the most expensive. Default: 0

cost number

Defines the number of hops to the next gateway. The cost must be an integer from 0 through 255 where 255 is the most expensive. The default is 0.

blackhole

Defines blackhole route to install in the kernel to block or drop packets.
**fall-over bfd multihop mhsess_name**

Enables fall-over BFD functionality for the specified multihop session. The *fall-over bfd* option uses BFD to monitor neighbor reachability and liveliness. When enabled it will tear down the session if BFD signals a failure. Specify *mhsess_name* as an alphanumeric string of 1 through 19 characters.

**precedence precedence**

Specifies the selection order precedence for this routing information. *precedence* must be an integer from 1 through 254 where 1 is the highest precedence. Default: 1

**vrf vrf_name**

Associates a Virtual Routing and Forwarding (VRF) context with this static route configuration. *vrf_name* is the name of a preconfigured VRF context configured in *Context Configuration Mode* via the `ip vrf` command.

**static bfd if_name remote-endpt_ipv4_address**

Creates a static IP route that will be associated with Bidirectional Forwarding Detection (BFD). For additional information, see the *BFD Configuration Mode Commands* chapter.

*if_name*: Specifies the name of the interface to which the static BFD neighbor is bound as an alphanumeric string of 1 through 79 characters.

*remote_endpt_ipv4_address*: Specifies the gateway address of the BFD neighbor in IPv4 dotted-decimal notation.

**static multihop bfd mhbfd_sess_name local_endpt_ipaddr remote_endpt_ipaddr**

Creates a static multihop BFD route with local and remote endpoints.

*mhbfd_sess_name*: Specifies the multihop BFD session name as an alphanumeric string of 1 through 79 characters.

*local_endpt_ipaddress*: Specifies the local endpoint address in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

*remote_endpt_ipaddress*: Specifies the remote endpoint address in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**Usage Guidelines**

Use this command to configure IP route parameters. precedence and cost options for the route selections such that routes of the same precedence are grouped together then lowest cost is selected first. This results in route's being selected first by lower precedence then the cost is used if multiple route's are defined with the same precedence.

This command also configures static IP routes when implementing Bidirectional Forwarding Detection (BFD).

---

**Important**

A maximum of 1,200 static routes may be configured per context.

Virtual Routing and Forwarding (VRF) context can be associated with static IP route for BGP/MPLS, GRE, or IPSec tunnel support.
SNMP traps are generated when BFD sessions go up and down (BFDSessUp and BFDSessDown).

Important
Use the `ip route kernel ip_address/ip_address_mask Combo interface interface_name cost number` to add the special route to any of two packet processing interfaces (SF cards) defined in the context configuration. Use the `[ no ] ip route kernel ip_address/ip_address_mask Combo interface interface_name cost number blackhole` to block or drop packets going out of the node.

Example
The following command adds a route using the combined IP address and subnet mask form:

```
ip route 10.2.3.0/32 192.168.1.2 egressSample1 precedence 160
```

The following configures route options for a route specified using the distinct IP address and subnet mask form:

```
ip route 10.2.3.4 255.224.0.0 10.1.2.3 egressSample2 cost 43
```

The following deletes the two routes configured above:

```
no ip route 10.2.3.0/32 192.168.1.2 egressSample1 precedence 160
no ip route 10.2.3.4 255.224.0.0 10.1.2.3 egressSample2 cost 43
```

The following command adds a route using the combined IP address and subnet mask form and specifies the egress interface as tunnel type:

```
ip route 10.2.3.0/32 tunnel egressSample1 precedence 160 vrf vrf1
```

**ip routing maximum-paths**

Enables Equal Cost Multiple Path (ECMP) routing support and specifies the maximum number of ECMP paths that can be submitted by a routing protocol in the current context.

**Product**
All products that support Cost Multiple Path (CMP)

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ip routing maximum-paths [ max_num ]
[ default | no ] ip routing maximum-paths

default
```

Resets the command to its default setting of 4.
Disables ECMP for the current context.

**max_num**
The maximum number of ECMP paths that can be submitted by a routing protocol. *max_num* must be an integer within the following ranges:

- For ASR5000: 1 through 10
- For ASR5500: 1 through 24
- For VPC-DI: 1 through 32 (*for Releases prior to 21.4*)
- For VPC-DI: 1 through 64 (*for Release 21.4+

Default: 4

**Usage Guidelines**
Use this command to enable ECMP for routing and set the maximum number of ECMP paths that can be submitted by a routing protocol.

**Example**
To enable ECMP and set the maximum number of paths that may be submitted by a routing protocol in the current context to 10, enter the following command:

```
ip routing maximum-paths 10
```

To disable ECMP in the current context, enter the following command:

```
no ip routing maximum-paths
```

### ip routing overlap-pool

Configures the routing behavior for overlap-pool addresses.

**Product**
PDSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no | default ] ip routing overlap-pool
```

**default**
Resets the command to its default setting of disabled.
no
Disables the routing behavior for overlap-pool addresses for the current context.

Usage Guidelines
Use this command configuration to advertise overlap-pool addresses in dynamic routing protocols when overlap pools are configured using vlan-ids. If the \"ip routing overlap-pool\" is configured, then the overlap-addresses are added as interface addresses and advertised.

**ip rri**

Configures Reverse Route Injection (RRI) egress clear port IPv4 parameters. (VPC-VSM only)

**Product**
SecGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description

```
ip rri { ip_address | next-hop nexthop_address } interface interface_name [ vrf vrf_name ]
no ip rri { ip_address | next-hop nexthop_address } interface interface_name [ vrf vrf_name ]
```

no
Disables the specified RRI egress parameters.

**ip_address**
Specified in IPv4 dotted-decimal notation.

**next-hop nexthop_address**
Next hop address specified in IPv4 dotted-decimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

**interface interface_name**
Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

**vrf vrf_name**
Specifies the name of an existing VRF as an alphanumerical string of 1 through 63 characters.

Usage Guidelines
Use this command to configure RRI egress clear port IPv4 parameters.
ip rri-route

Configures High Availability (HA) IPv4 routing parameters for Reverse Route Injection (RRI). (VPC-VSM only)

Product
SecGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

ip rri-route network-mode { L2 | L3 } { clear_loopback_ip | rri-ip virtual_ip_address } { ip_address | next-hop nexthop_address } interface interface_name

[ vrf vrf_name ]

no ip rri-route network-mode { L2 | L3 } { clear_loopback_ip | rri-ip virtual_ip_address } { ip_address | next-hop nexthop_address } interface interface_name

[ vrf vrf_name ]

no

Disables the specified RRI route.

network-mode { L2 | L3 }

Specifies the RRI route network mode type as Layer 2 (L2) or Layer 3 (L3).

clear_loopback_ip

Specifies the loopback address for clear traffic in IPv4 dotted-decimal notation.

rri-ip virtual_ip_address

Specifies the use of a virtual IP address on both Primary and Secondary for RRI. virtual_ip_address is expressed in IPv4 dotted-decimal notation.

ip_address

Specified in IPv4 dotted-decimal notation.
**next-hop nexthop_address**

Next hop address specified in IPv4 dotted-decimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

**interface interface_name**

Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

**vrf vrf_name**

Specifies the name of an existing VRF as an alphanumerical string of 1 through 63 characters.

**Usage Guidelines**

Use this command to configure HA IPv4 routing parameters for RRI.

**Example**

```
ip rri-route network-mode L3 rri-ip 10.1.1.23 next-hop 10.1.1.25 interface rriroute04
```

**ip sri-route**

Configures Layer 3 (L3) High Availability (HA) IPv4 routing parameters for Service Route Injection (SRI). (VPC-VSM only)

**Product**

The `ip sri-route` CLI command is deprecated, and not supported in 19.0 and later releases.

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```configure > context context_name```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ip sri-route sri-ip network_address next hop nexthop_address interface interface_name [ vrf vrf_name ]
no ip sri-route sri-ip network_address next hop nexthop_address interface interface_name [ vrf vrf_name ]

no
```

Disables the specified SRI route.
sri-ip network_address
Specifies the IPv4 address associated with the SRI route.

next hop nexthop_address
Next hop address specified in IPv4 dotted-decimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

interface interface_name
Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

tunnel fib
Specifies the name of an existing VRF as an alphanumerical string of 1 through sixty-three characters.

Usage Guidelines
Use this command to configure L3 HA routing parameters for SRI.

Example
ip sri-route sri-ip 10.1.1.21 next-hop 10.1.1.23 interface sri23

ip vrf

Creates a Virtual Routing and Forwarding (VRF) context instance, assigns a VRF identifier, and configures the VRF parameters for BGP/MPLS VPN, GRE tunnel, and IPSec interface configuration.

Important
IKEv2 ACL VRF is not supported.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
configure > context context_name
Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description
ip vrf vrf_name
no ip vrf

no
Disables IP Virtual Routing and Forwarding (VRF) parameters.
**vrf_name**

Specifies the name of the virtual routing and forwarding interface as an alphanumeric string of 1 through 63 characters.

**Usage Guidelines**

Use this command to create a VRF context and assign a VRF identifier for BGP/MPLS VPN, IPSec, GRE tunnel configuration in this context instance. This command is used when the system works as a BGP router with MPLS VPN and binds an MPLS VPN to the system or to facilitate GRE or IPSec tunnelling. The addresses assigned to this interface are visible in the VRF routing table.

This command switches the command mode to IP VRF Context Configuration Mode:

```
{context_name}>host_name(config-context-vrf)#
```

If required, this command creates an IP VRF Context Configuration Mode instance.

When using this command please note of the following:

- A VRF context instance must be created and configured before referring, associating, or binding the same with any command or mode.
- If the interface binding to a VRF context instance is changed or any IP address assigned to the interface is deleted, a warning is displayed.
- All interfaces bound with a VRF context instance will be deleted when that VRF is removed/deleted.
- An interface can be bound to only one VRF context instance.
- A maximum of 100 VRF context instances can be configured on a system.

Refer to the *IP VRF Context Configuration Mode Commands* chapter for parameter configuration.

**Example**

The following command configures the virtual routing and forwarding context instance *vrf1* in a context:

```
ip vrf vrf1
```

**ip vrf-list**

Creates a VRF list and adds VRFs to the list. The VRFs must have been previously created via the *ip vrf* command.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
{context_name}host_name(config-ctx)#
```
Syntax Description

`ip vrf-list list_name permit vrf_name`
`no ip vrf-list list_name [ permit vrf_name ]`

`no`
Deletes a VRF list or delete VRFs from this list. If `permit` and `vrf-name` are not specified, the entire list of VRFs is deleted. Otherwise, the specified VRF(s) is deleted from the list.

`list_name`
Specifies the name of the VRF list as an alphanumerical string of 1 through 63 characters.

`vrf_name`
Specifies the name of the virtual routing and forwarding interface as an alphanumerical string of 1 through 63 characters.

Usage Guidelines

Create a VRF list and add VRFs to the list. The VRFs must have been previously created via the `ip vrf` command. This command supports multiple VRFs over NEMO.

Example

The following command creates a VRF list named `corp103` and adds a VRF named `vrf3567`:

```
ip vrf-list corp103 permit vrf3567
```

ipms

Enables/disables/manages an intelligent packet monitoring system (IPMS) client service and enters the IPMS Client Configuration Mode within the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>IPMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Exec &gt; Global Configuration &gt; Context Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>configure &gt; context context_name</code></td>
<td>Entering the above command sequence results in the following prompt:</td>
</tr>
<tr>
<td></td>
<td><code>[context_name]host_name(config-ctx)#</code></td>
</tr>
</tbody>
</table>

Syntax Description

```
[ no ] ipms [ -noconfirm ]
```

`no`
Deletes a previously configured IPMS client service.

`-noconfirm`
Executes the command without any additional prompt and confirmation from the user.
If this keyword option is used with `no ipms` command, the IPMS client service will be deleted with all active/inactive IPMS sessions without prompting any warning or confirmation.

**Usage Guidelines**

Use this command to enable/disable/manage the IPMS client service within a context and configure certain functionality. This command enables and allows the configuration of service enabling the system to function as an IPMS-enabled Access Gateway in a network. This command is also used to remove previously configured IPMS client service.

A maximum of 1 IPMS client can be configured per system.

**Important**

The IPMS is a license enabled external application support. Refer to the *IPMS Installation and Administration Guide* for more information on this product.

Refer to the *IPMS Installation and Administration Guide* and *IPMS Configuration Mode* chapter of this reference for additional information.

**Example**

The following command creates an IPMS client service name within the context:

```
ipms
```

**ipne-service**

Create and/or configure an IPNE service.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name] host_name (config)#
```

**Syntax Description**

```
[ no ] ipne-service   ipne_service
```

**no**

Included as a prefix of the command, `no` causes the system to disable IPNE service when it has been created with this command and removes the IPNE service definition from the MME's configuration.

**ipne_service**

Enter 1 to 63 alphanumeric characters to create a unique name for an IPNE service instance.
This command creates an instance of an IPNE service in the context. It is recommended that the IPNE Service be configured in the same context in which the MME Service has been configured.

This command also accesses the commands in the IPNE service configuration mode to configure the IPNE service.

If an IPNE service is to be removed and the service has active handles, then the handles are deleted using a timer-based approach and then the IPNE service is removed.

Example
Create an IPNE service called IPNEserv1:

```
ipne-service IPNEserv1
```

Use a command similar to the following to disable and remove the IPNE service configuration for the IPNE service called ipneserv:

```
no ipne-service ipneserv
```

**ipsec replay**

Configures IKEv2 IPSec specific anti-replay.

**Product**
ePDG
PDIF
SCM

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ipsec replay [ window-size window_size ]
```

**no**
Disables this option.

**replay**
Configures IKEv2 IPSec anti-replay.

**window-size window_size**
Configures anti-replay window size.

`window_size` is the window size 32, 64 (default), 128, 256, 384, 512, an integer value between 32..512
Usage Guidelines

Use this command to configure IKEv2 IPSec specific anti-replay.

Example

The following command sets the window size to 256:

```
ipsec replay window-size 256
```

**ipsec transform-set**

Creates a new or specifies an existing IPSec transform set and enters the IPSec Transform Set Configuration Mode for the current context.

**Product**
ePDG
PDIF
SCM

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
{ no } ipsec transform-set transform_set_name
```

- **no**
  
  Removes an existing transform set from the system.

- **transform-set name**
  
  Specifies the name of a new or existing transform set as an alphanumeric string of 1 through 127 characters.

**Usage Guidelines**

Use this command to Configure IKEv2 IPsec child security association transform set parameters. Up to four transform-sets can be created.

Entering this command results in the following prompt:

```
[context_name]hostname(cfg-ctx-ipsec-tran-set)#
```

This command applies to IKEv2. Please check **crypto ipsec transform-set** command for ipsec transform-set configuration for IKEv1.

**Example**

The following command configures an IPSec transform set called *ipsec12* and enters the IPSec Transform Set Configuration Mode:

```
```
ipsec transform-set ipsec12

**ipsg-service**

This command allows you to create/modify/delete an IP Services Gateway (IPSG) service in the current context.

**Product**
eWAG
IPSG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ipsg-service ipsg_service_name [ mode { radius-server [ ewag ] | radius-snoop } ] [ -noconfirm ]
no ipsg-service ipsg_service_name [ mode { radius-server [ ewag ] | radius-snoop } ]
```

**no**
If previously configured, deletes the specified IPSG service.

**ipsg_service_name**

Specifies the name of the IPSG service.

`ipsg_service_name` must be an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

**mode { radius-server [ ewag ] | radius-snoop }**

Configures the IPSG to perform as either a RADIUS server or as a device to extract user information from RADIUS accounting request messages (snoop). If the optional keyword `mode` is not entered, the system defaults to `radius-server`.

- **radius-server**: Creates the named IPSG RADIUS Server service in the current context and/or enters the IPSG RADIUS Server Configuration Mode.
- **radius-server ewag**: Enables the eWAG service (IPSG service in eWAG mode), and enters the IPSG RADIUS Server Configuration Mode, which is common for the eWAG and IPSG services.
- **radius-snoop**: Creates the named IPSG RADIUS Snoop service in the current context and/or enters the IPSG RADIUS Snoop Configuration Mode.
Usage Guidelines

A maximum of one IPSG service can be configured per context.

IPSG service commands are defined in the IPSG RADIUS Snoop Configuration Mode Commands chapter and the IPSG RADIUS Server Configuration Mode Commands chapters.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

A large number of services greatly increases the complexity of system management and may impact overall system performance (i.e., resulting from system handoffs). Do not configure a large number of services unless your application requires it. Contact your Cisco account representative for more information.

Important

IP Services Gateway functionality is a license-controlled feature. A valid feature license must be installed prior to configuring an IPSG service. Contact your Cisco account representative for more information.

Example

The following command configures an IPSG RADIUS Snoop service named ipsgl and enters the IPSG RADIUS Snoop Configuration Mode:

```
ipsg-service ipsgl mode radius-snoop
```

The following command enables the eWAG service (IPSG service in eWAG mode), and enters the IPSG RADIUS Server Configuration Mode, which is common for the eWAG and IPSG services:

```
ipsg-service ipsg2 mode radius-server ewag
```
Command Modes

Exec > Global Configuration > Context Configuration
config > context context_name

Entering the above command sequence results in the following prompt:
[context_name] host_name(config-ctx)#

Syntax Description

ipv6 access-group group name { priority_value }

- **group_name**
  Specifies the name of the access group as an alphanumeric string of 1 through 79 characters.

- **priority_value**
  Specifies the priority of the access group. 0 is the highest priority. If `priority_value` is not specified the priority is set to 0. `priority_value` must be an integer from 0 through 4294967295. Default: 0
  If access groups in the list have the same priority, the last one entered is used first.

Usage Guidelines

Use this command to specify IPv6 access group name and priority. Use a lower value to indicate a higher priority for the group.

Example

```
ipv6 access-group group_1
```

**ipv6 access-list**

Create, configure, or delete an IPv6 Access List in the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
config > context context_name

Entering the above command sequence results in the following prompt:
[context_name] host_name(config-ctx)#

**Syntax Description**

- `[ no ]` ipv6 access-list name

- `no`
  Removes the specified access list.

- `name`
  Specifies the access list name.
**Usage Guidelines**

Executing this command enters the IPv6 ACL Configuration Mode in which rules and criteria are defined for the ACL.

**Important**

A maximum of 256 rules can be configured per ACL. The maximum number of ACLs that can be configured per context is limited by the amount of available memory in the VPN Manager software task; it is typically less than 200.

Refer to the Access Control Lists appendix of the System Administration Guide for more information on ACLs.

**Example**

```
ipv6 access-list samplelist
no ipv6 access-list samplelist
```

### ipv6 dns-proxy

Configures the domain name server proxy for the context.

**Product**

PDSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ipv6 dns-proxy source-ipv4-address ip_address
```

**no**

Removes the predefined IP address for local interface in the destination context.

**ip_address**

Specifies the IPv4 address of one of the local interface in the destination context to configure the IPv6 DNS proxy where *ip_address* must be specified using IPv4 dotted-decimal notation.

**Usage Guidelines**

The IPv6 DNS proxy source IPv4 address is used as the source IP address for the DNS proxy transaction.
Example
The following command provides an example of configuring a IPv6 DNS proxy of 192.168.23.1:

```
ipv6 dns-proxy source-ipv4-address 192.168.23.1
```

**ipv6 neighbor**

Adds a static IPv6 neighbor entry into the neighbor discovery table.

**Product**
PDIF

**Privilege**
Administrator, Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ipv6 neighbor ipv6_address hardware_address
```

**no**
Removes the specified address.

```
ipv6_address hardware_address
```

*ipv6_address* is the IP address of node to be added to the table.

*hardware_address* is the associated 48-bit MAC address.

**Usage Guidelines**

Add a static IPv6 neighbor entry into the neighbor discovery table.

**Important**
On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

**Example**
Add the ipv6 address fe80::210:83ff:feff7:7a9d::/24 and associated 48 bit MAC address 0:10:83:7a:9d to the table.

```
ipv6 neighbor fe80::210:83ff:feff7:7a9d::/24 0:10:83:7a:9d
```
ipv6 pool

Modifies the current context's IP address pools by adding, updating or deleting a pool. This command also resizes an existing IP pool.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-ctx)#

Syntax Description
ipv6 pool name { 6to4 local-endpoint ipv4_address [ default-relay-router router_address ] | alert threshold | group-name name | policy { allow-static-allocation | dup-addr-detection } | prefix ip_address/len [ 6to4-tunnel local-endpoint ip_address | default-relay-router router_address ] | range start_address end_address | suppress-switchover-arps } [ prefix-length prfx_length ] [ private priority ] [ public priority ] [ shared priority ] [ static priority ] [ group-name name ] [ vrf vrf-name ]

no ipv6 pool name

no
Deletes the previously configured IPv6 pool.

name
Specifies the logical name of the IP address pool as an alphanumeric string of 1 through 31 characters.

6to4-tunnel local-endpoint ip_address
Specifies the IPv4 address of the local interface to be used for IPv6-to-IPv4 compatible pool address construction.

alert threshold { 6to4 local-endpoint ipv4_address | alert threshold | group-available | group-name name | policy { allow-static-allocation | dup-addr-detection } | pool-free | pool-used | prefix | range start_address end_address }

Default: All thresholds are disabled.

Configures IP address pool-level utilization thresholds. These thresholds take precedence over context-level IPv6 pool thresholds.

• 6to4: Sets an alert based on the IPv6 Pool for an IPv6-to-IPv4 compatible address type.
• alert-threshold: Sets an alert based on the percentage free alert threshold for this group.
• group-available: Sets an alert based on the percentage free alert threshold for this group.
• **group-name**: Sets an alert based on the IPv6 Pool Group.

• **policy allow-static-allocation**: Sets an alert based on the address allocation policy.

• **pool-free**: Sets an alert based on the percentage free alert threshold for this pool.

• **pool-used**: Sets an alert based on the percentage used alert threshold for this pool.

• **prefix**: Sets an alert based on the IPv6 Pool address prefix.

• **range**: Sets an alert based on the IPv6 address pool range of addresses.

• **suppress-switchover-arps**: Sets an alert based on the Suppress Gratuitous ARPs when performing a line card or an MIO switchover.

**group name name**

IPv6 Pool Group.

The following options are available:

• **6to4**: IPv6 Pool for IPv6-to-IPv4 compatible address type

• **alert-threshold**: Percentage free alert threshold for this group

• **group-name**: IPv6 Pool Group

• **policy**: Configure an address allocation policy

• **prefix**: IPv6 Pool address prefix

• **range**: Configures IPv6 address pool to use a range of addresses

• **suppress-switchover-arps**: Suppress gratuitous ARPs when performing a line card or an MIO switchover.

**ipv4_address**

Specifies the beginning IPv4 address of the IPv4 address pool. *ipv4_address* must be specified using IPv4 dotted-decimal notation.

**default-relay-router router address**

Specifies the default relay router for the tunnel.

**policy allow-static-allocation**

Allows a dynamic pool to accept a static address allocation.

The following options are available:

• **6to4**: IPv6 Pool for IPv6- to-IPv4 compatible address type

• **alert-threshold**: Percentage free alert threshold for this group

• **group-name**: IPv6 Pool Group

• **policy**: Configure an address allocation policy

• **prefix**: IPv6 Pool address prefix
• **range**: Configure IPv6 address pool to use a range of addresses

• **suppress-switchover-arps**: Suppress gratuitous ARPs when performing a line card or an MIO switchover

**policy dup-addr-detection**

This command is valid for IPv6 shared pools only (Sample syntax: `ipv6 pool name prefix ip_address/len shared policy dup-addr-detection`). When this policy is enabled, the IPv6 shared pool allows a prefix to be shared in different call sessions with different interface IDs for an IPv6 address. This allows the tracking of interface IDs per prefix and the detection of duplicate IDs.

With this policy disabled, the IPv6 shared pool will allow a prefix to be shared across different call sessions. The interface ID is not considered for any duplicate address detection. Default: Disabled

The following options are available:

• **6to4**: IPv6 pool for IPv6-to-IPv4 compatible address type

• **alert-threshold**: Percentage free alert threshold for this group

• **group-name**: IPv6 pool group

• **policy**: Configure an address allocation policy

• **prefix**: IPv6 pool address prefix

• **range**: Configures IPv6 address pool to use a range of addresses

• **suppress-switchover-arps**: Suppress gratuitous ARPs when performing a line card or an MIO switchover

**prefix ip_address/len**

Specifies the beginning IPv6 address of the IPv6 address pool. `ip_address/len` must be specified using IPv6 colon-separated-hexadecimal. `len` is an integer that indicates the number bits of prefix length.

---

**Important**

If the `prefix ip_address/len` specified is less than /40, then a `prefix-length prfx_length` must be specified. Options are 48, 52, or 58 bits of `prefix-length`.

---

**Important**

On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

**range start_address end_address**

Configures an IPv6 address pool to use a range of addresses.

`start_address` specifies the beginning of the range of addresses for the IPv6 pool. It must be specified using IPv6 colon-separated-hexadecimal notation.

`end_address` specifies the end of the range of addresses for the IPv6 pool. It must be specified using IPv6 colon-separated-hexadecimal notation.
**suppress-switchover-arps**
Suppresses gratuitous ARPs when performing a line card switchover.

The following options are available:

- **6to4**: IPv6 Pool for IPv6-to-IPv4 compatible address type
- **alert-threshold**: Percentage free alert threshold for this group
- **group-name**: IPv6 Pool Group
- **policy**: Configure an address allocation policy
- **prefix**: IPv6 Pool address prefix
- **range**: Configures IPv6 address pool to use a range of addresses
- **suppress-switchover-arps**: Suppress gratuitous ARPs when performing a line card or an MIO switchover

**prefix-length prfx_length**
Specifies a configured length of prefixes. `prfx_length` can be 48, 52, 56 or 64 bits of prefix (Default = 64). This option supports S-GW/P-GW validation of fixed-length addresses via DHCPv6 (TS 29.274 – 7.2.2 and 8.14).

---

**Important**
If the `prefix ip_address/len` specified is less than /40, then a `prefix-length prfx_length` must be specified. Options are 48, 52, or 58 bits of `prefix-length`.

---

**Important**
On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

**private priority** | **public priority** | **shared priority** | **static priority**
Default: **public**

**private priority**: Specifies that the address pool may only be used by mobile stations which have requested an IP address from a specified pool. When private pools are part of an IP pool group, they are used in a priority order according to the precedence setting. `priority` must be an integer from 0 through 10 with 0 being the highest. The default is 0.

**public priority**: Specifies that the address pool is used in priority order for assigning IP addresses to mobile stations which have not requested a specific address pool. `priority` must be an integer from 0 through 10 with 0 being the highest and with a default of 0.

**shared priority**: Specifies that the address pool that may be used by more than one session at any time. `priority` must be an integer from 0 through 10 with 0 being the highest and with a default of 0.

**static priority**: Specifies that the address pool is used for statically assigned mobile stations. Statically assigned mobile stations are those with a fixed IP address at all times. `priority` must be an integer from 0 through 10 with 0 being the highest and with a default of 0.
**group-name name**
Groups the IPv6 pools into different groups. The subscribers/domain can be configured with the group-name instead of the prefix-pool names. *name* is the name of the group by which the IPv6 pool is to be configured expressed as an alphanumerical string of 1 through 79 characters.

**vrf vrf-name**
Associates the pool with the VRF specified as an alphanumerical string of 1 through 63 characters. By default, the configured IPv6 pool will be associated with the global routing domain.

**Usage Guidelines**
Use this command to modify the current context's IP address pools by adding, updating or deleting a pool. Also use this command to resize an existing IP pool.

**Example**
The following command adds an IPv6 pool named *ip6Star*:
```
ipv6 pool ip6Star
```

**ipv6 prefix-list**
Creates an IPv6 prefix list for filtering routes.

**Product**
PDSN
HA
GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```
Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
ipv6 prefix-list name list_name [ seq seq_number ] { deny | permit } { any | network_address/net_mask [ ge ge_value ] [ le le_value ] } 
no ipv6 prefix-list list_name [ seq seq_number ] { deny | permit } { any | network_address/net_mask [ ge ge_value ] [ le le_value ] } 
no
```

*no*
Delete the specified prefix-list entry.

*name list_name*
Specifies a name for the prefix list as an alphanumerical string of 1 through 79 characters.
**seq seq_number**
Assigns the specified sequence number to the prefix list entry as an integer from 1 through 4294967295.

**deny**
Specifies prefixes to deny.

**permit**
Specifies prefixes to permit.

**any**
Matches any prefix.

**network_address/net_mask [ ge ge_value ][ le le_value ]**
Specifies the prefix to match.

`network_address/net_mask`: the IPv6 address and the length, in bits, of the network mask that defines the prefix. The IP address and mask must be entered in IPv6 colon-separated-hexadecimal notation. When neither `ge` (greater than or equal to) or `le` (less than or equal to) are specified an exact match is assumed.

---

**Important**
On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

`ge ge_value`: Specifies the minimum prefix length to match as an integer from 0 through 128. If only the `ge` value is specified, the range is from the `ge` value to 128. The `ge` value must be greater than `net_mask` and less than the `le` value.

`le le_value`: Specifies the maximum prefix length to match as an integer from 0 through 128. If only the `le` value is specified, the range is from the `net_mask` to the `le` value. The `le` value must be less than or equal to 128.

The following equation describes the conditions that `ge` and `le` values must satisfy:

```
net_mask < ge_value < le_value <= 128
```

**Usage Guidelines**
Use this command to filter routes by their IPv6 prefix.

**Example**
```
ipv6 prefix-list name prelistv6-10 seq 5 permit 2002::123.45.67.89/32
```

---

**ipv6 prefix-list sequence-number**
Enables or disables the inclusion of IPv6 prefix list sequence numbers in the configuration file. This option is enabled by default.

**Product**
PDSN
**ipv6 route**

Configures a static IPv6 route to the next-hop router.

**Product**
All

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] ipv6 route ipv6_address/prefix_length { interface name | next-hop ipv6_address interface name } [ cost cost ] [ fall-over bfd multihop mhsess_name ] [ precedence precedence ] [ vrf vrf_name [ cost value ] ] [ fall-over bfd multihop mhsess_name ] [ precedence precedence ]
```

```
[ no ] ipv6 route static bfd if_name remote-endpt_ipv6address
[ no ] ipv6 route static multihop bfd mhbfd_sess_name local_endpt_ipv6addr remote_endpt_ipv6addr
```
no
Removes the specified static route.

`ipv6_address/prefix_length`
Specifies a destination IPv6 address or group of addresses that will use this route.
`ipv6_address/prefix_length` must be specified using IPv6 colon-separated-hexadecimal with CIDR notation.

**Important**
On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

`interface name`
Specifies the name of the interface on this system associated with the specified route or next-hop address. `name` must be an existing interface name on the system expressed as an alphanumeric string of 1 through 79 characters.

`next-hop ipv6_address`
The IPv6 address of the directly connected next hop device in IPv6 colon-separated-hexadecimal notation.

`cost cost`
Defines the number of hops to the next gateway as an integer from 0 through 255. Default: 0

`fall-over bfd multihop mhsess_name`
Enables fall-over BFD functionality for the specified multihop session. The `fall-over bfd` option uses BFD to monitor neighbor reachability and liveness. When enabled it will tear down the session if BFD signals a failure. Specify `mhsess_name` as an alphanumeric string of 1 through 19 characters.

`precedence precedence`
Indicates the administrative preference of the route. A low precedence specifies that this route takes preference over the route with a higher precedence. `precedence` must be an integer from 1 through 254. Default: 1

`vrf vrf_name`
Associates a Virtual Routing and Forwarding (VRF) context with this static route configuration.
`vrf_name` is the name of a preconfigured VRF context configured in `Context Configuration Mode` via the `ip vrf` command.

`static bfd if_name remote-endpt_ipv6address`
Creates a static IP route that will be associated with Bidirectional Forwarding Detection (BFD). For additional information, see the `BFD Configuration Mode Commands` chapter.
`if_name`: Specifies the name of the interface to which the static BFD neighbor is bound as an alphanumeric string of 1 through 79 characters.
remote_endpt_ipv6address: Specifies the gateway address of the BFD neighbor in IPv6 colon-separated-hexadecimal notation.

static multihop bfd mhbfd_sess_name local_endpt_ipv6addr remote_endpt_ipv6addr

Creates a static multihop BFD route with local and remote endpoints.

mhbfd_sess_name: Specifies the multihop BFD session name as an alphanumeric string of 1 through 79 characters.

local_endpt_ipv6addr: Specifies the local endpoint address in IPv6 colon-separated-hexadecimal notation.

remote_endpt_ipv6addr: Specifies the remote endpoint address in IPv6 colon-separated-hexadecimal notation.

Usage Guidelines

Use this command to configure IPv6 route parameters, precedence and cost options for the route selections such that routes of the same precedence are grouped together then lowest cost is selected first. This results in route's being selected first by lower precedence then the cost is used if multiple route's are defined with the same precedence.

This command also configures static IP routes when implementing Bidirectional Forwarding Detection (BFD).

Important

A maximum of 1,200 static routes may be configured per context.

Virtual Routing and Forwarding (VRF) context can be associated with static IP route for BGP/MPLS, GRE, or IPSec tunnel support.

Important

SNMP traps are generated when BFD sessions go up and down (BFDSessUp and BFDSessDown).

Example

The following example configures a static route with IPv6 prefix/length 2001:0db8:3c4d:0015:0000:0000:abcd:ef12/24 to the next hop interface egress1:

```
ipv6 route 2001:0db8:3c4d:0015:0000:0000:abcd:ef12/24 interface egress1
```

ipv6 route-access-list

Configures an IPv6 route access list for filtering routes.

Product

GGSN
HA
PDSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

**Syntax Description**

```plaintext
ipv6 route-access-list named list_name] { deny | permit }
  network_address/net_mask [ exact-match ]
no ipv6 prefix-list list_name] { deny | permit }{ any | network_address/net_mask
  [ exact-match ]

no

Delete the specified prefix-list entry.

name list_name

Specifies a name for the prefix list as an alphanumeric string of 1 through 79 characters.

deny

Specifies prefixes to deny.

permit

Specifies prefixes to permit.

network_address/net_mask [ exact-match ]

Specifies the prefix to match.

network_address/net_mask: the IPv6 address and the length, in bits, of the network mask that defines the prefix. The IP address and mask must be entered in IPv6 colon-separated-hexadecimal notation.

**Important**

On the ASR 5000, routes with IPv6 prefix lengths less than /12 and between the range of /64 and /128 are not supported.

exact-match le_value: Specifies that only an exact match will initiate access list deny/permit function.

**Usage Guidelines**

Use this command to filter routes by their IPv6 prefix.

**Example**

```plaintext
ipv6 route-access-list name routelistv6 seq 5 permit 2002::123.45.67.89/24
```

**ipv6 rri**

Configures Reverse Route Injection (RRI) egress clear port IPv6 parameters. (VPC-VSM only)
ipv6 rri-route

Configures High Availability (HA) IPv6 routing parameters for Reverse Route Injection (RRI). (VPC-VSM only)

Product
SecGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-ctx)#

Syntax Description

ipv6 rri { ipv6_address | next-hop nexthop_address } interface interface_name [ vrf vrf_name ]

no ipv6 rri { ipv6_address | next-hop nexthop_address } interface interface_name [ vrf vrf_name ]

no

Disables the specified RRI egress route.

ipv6_address
Specified in IPv6 colon-separated-hexadecimal notation.

next-hop nexthop_address
Next hop address specified in IPv6 colon-separated-hexadecimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

interface interface_name
Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

vrf vrf_name
Specifies the name of an existing VRF as an alphanumerical string of 1 through 63 characters.

Usage Guidelines
Use this command to configure IPv6 RRI egress clear port IPv6 parameters.

Example
ipv6 rri 2001:4A2B::1f3F interface rri03
ipv6 rri-route

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

ipv6 rri-route network-mode { L2 | L3 } { clear_loopback_ip | rri-ip
virtual_ipv6_address } { ipv6_address | next-hop nexthop_address } interface

interface_name [ vrf vrf_name ]

no ipv6 rri-route network-mode { L2 | L3 } { clear_loopback_ip | rri-ip
virtual_ipv6_address } { ipv6_address | next-hop nexthop_address } interface

interface_name [ vrf vrf_name ]

no

Disables the specified RRI route.

network-mode { L2 | L3 }

Specifies the RRI route network mode type as Layer 2 (L2) or Layer 3 (L3).

clear_loopback_ip

Specifies the loopback address for clear traffic in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

rri-ip virtual_ipv6_address

Specifies the use of a virtual IP address on both Primary and Secondary for RRI. virtual_ipv6_address is expressed in IPv6 colon-separated-hexadecimal notation.

ipv6_address

Specified in IPv6 colon-separated-hexadecimal notation.

next-hop nexthop_address

Next hop address specified in IPv6 colon-separated-hexadecimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

interface interface_name

Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

vrf vrf_name

Specifies the name of an existing VRF as an alphanumerical string of 1 through 63 characters.

Usage Guidelines

Use this command to configure HA IPv6 routing parameters for RRI.

Example

ipv6 rri-route network-mode L3 rri-ip 2001:4A2B::1f3F
ipv6 sri-route

Configures Layer 3 (L3) High Availability (HA) IPv6 routing parameters for Service Route Injection (SRI). (VPC-VSM only)

**Product**
SecGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```
ipv6 sri-route sri-ip network_address next hop nexthop_address interface interface_name [ vrf vrf_name ]
no ipv6 sri-route sri-ip network_address next hop nexthop_address interface interface_name [ vrf vrf_name ]
```

**no**

Disables the specified SRI route.

**sri-ip network_address**

Specifies the IPv6 address associated with the SRI route.

**next hop nexthop_address**

Next hop address specified in IPv6 colon-separated-hexadecimal notation. The next hop IP address is not required for point-to-point and tunnel interfaces.

**interface interface_name**

Specifies the name of an existing egress interface as an alphanumeric string of 1 through 79 characters.

**vrf vrf_name**

Specifies the name of an existing VRF as an alphanumerical string of 1 through 63 characters.

**Usage Guidelines**

Use this command to configure L3 HA IPv6 routing parameters for SRI.

**Example**

```
ipv6 sri-route sri-ip 2001:4A2B::1f3F interface sri23
```
**isakmp disable-phase1-rekey**

This command is deprecated. Use `ikev1 disable-phase1-rekey` command to configure the parameters for Phase1 SA rekeying when ISAKMP lifetime expires for IKE v1 protocol.

**isakmp keepalive**

This command is deprecated. Use `ikev1 keepalive dpd` command to configure ISAKMP IPSec Dead Peer Detection (DPD) message parameters for IKE v1 protocol.

**isakmp policy**

This command is deprecated. Use `ikev1 policy` command to create/configure an ISAKMP policy with the specified priority for IKE v1 protocol.

**iups-service**

Creates an Iu-PS service instance and enters the Iu-PS Service Configuration Mode. This mode defines the configuration and usage of Iu-PS interfaces between the SGSN and the RNCs in the UMTS radio access network (UTRAN). It defines both the control plane (GTP-C) and the data plane (GTP-U) between these nodes.

For details about the commands and parameters for this mode, check the *IuPS Service Configuration Mode Commands* chapter.

---

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```plaintext
[context_name] host_name(config-ctx)#
```

**Syntax Description**

```plaintext
[ no ] iups-service srvc_name
```

**no**

Remove the configuration for the specified Iu-PS service from the configuration for the current context.
**srvc_name**

Specifies the IuPS service name as a unique alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Use this command to create, edit, or remove an Iu-PS service. Add up to eight definitions to be used with a single SGSN service so the SGSN can support multiple PLMNs.

**Example**

The following command creates an Iu-PS service named \textit{iu-ps1}:

\texttt{iups-service iu-ps1}

The following command removes the Iu-PS service named \textit{iu-ps1}:

\texttt{no iups-service iu-ps1}

## I2tp peer-dead-time

Configures a delay when attempting to tunnel to a specific peer which is initially unreachable due to reasons such as a network issue or temporarily having reached its capacity.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

\texttt{configure > context context_name}

Entering the above command sequence results in the following prompt:

\texttt{[context_name]host_name(config-ctx)#}

**Syntax Description**

\texttt{l2tp peer-dead-time \textit{seconds}}
\texttt{default l2tp peer-dead-time \textit{seconds}}

**default**

Rests the command to its default setting of 60.

**seconds**

Specifies the interval (in seconds) to wait before attempting to tunnel to a specific peer which is initially unreachable as an integer from 5 through 64,000. Default: 60

**Usage Guidelines**

The time to wait before trying to establish a tunnel to a known peer after the initial attempt was unsuccessful.
Example
The following example configures the delay in attempting to tunnel to a temporarily unreachable peer. The delay is set to 120 seconds in this example.

```
l2tp peer-dead-time 120
```

**lac-service**

Enters the LAC Service Configuration Mode, or is used to add or remove a specified L2TP Access Concentrator (LAC) service.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] lac-service name
```

- **no**
  
  Removes the specified lac-service from the current context.

- **name**
  
  Specifies the name of a LAC service to configure, add, or remove as an alphanumeric string of 1 through 63 characters that is case-sensitive.

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Enter the LAC Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.
Example
To add a new LAC service named LAC1 and enter the LAC Service Configuration Mode, enter the following command:

`lac-service LAC1`

To configure an existing LAC service named LAC2, enter the following command:

`lac-service LAC2`

To delete an existing LAC service named LAC3, enter the following command:

`no lac-service LAC3`

lawful-intercept

Refer to the Lawful Intercept Configuration Guide for a description of this command.

lawful-intercept dictionary

Refer to the Lawful Intercept Configuration Guide for a description of this command.

limit ipsecmgr ikev1 max

Use this command to limit the parameter for this context.

<table>
<thead>
<tr>
<th>Product</th>
<th>IPSec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
| Command Modes | Exec > Global Configuration > Context Configuration  

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

Syntax Description

`limit ipsecmgr ikev1 max max_value`

`default limit ipsecmgr ikev1 max`

`default`

Sets/Restores default value assigned for specified parameter.

`limit`

Limits the parameter for this context.
ipsecmgr
To limit ipsecmgr manager settings.

ikev1
Specifies IKEv1 tasks.

`max max_value`
Specifies maximum ipsecmgr IKEv1 tasks. `max_value` must be an integer from 1 to 176.

**Example**
Use the following command to limit number of IPSec managers within a context to 23.
```
limit ipsecmgr ikev1 max 23
```

### lma-service

Creates an Local Mobility Anchor (LMA) service or specifies an existing LMA service and enters the LMA Service Configuration Mode for the current context.

<table>
<thead>
<tr>
<th>Product</th>
<th>P-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
lma-service service_name [ -noconfirm ]
no lma-service service_name
```

`no`
Removes the specified LMA service from the context.

`service_name`
Specifies the name of the LMA service. If `service_name` does not refer to an existing service, the new service is created if resources allow.

`service_name` is an alphanumeric string of 1 through 63 characters.

**Important**
Service names must be unique across all contexts within a chassis.
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Enter the LMA Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-lma-service)#
```

LMA Service Configuration Mode commands are defined in the LMA Service Configuration Mode Commands chapter.

Use this command when configuring the following eHRPD and PMIP SAE components: P-GW (SAEGW).

Example

The following command enters the existing LMA Service Configuration Mode (or creates it if it does not already exist) for the service named lma-service1:

```
lma-service lma-service1
```

The following command will remove lma-service1 from the system:

```
no lma-service lma-service1
```

Ins-service

Enters the LNS Service Configuration Mode, or is used to add or remove a specified L2TP Network Server (LNS) service.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
[ no ] lns-service name
```
no

Removes the specified lac-service from the current context.

name

Specifies the name of a LNS service to configure, add or remove as an alphanumeric string of 1 through 63 characters that is case-sensitive.

Important

Service names must be unique across all contexts within a chassis.

Usage Guidelines

Enter the LNS Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Example

To add a new LNS service named *LNS1* and enter the LNS Service Configuration Mode, enter the following commands:

```
lns-service LNS1
```

To configure an existing LNS service named *LNS2*, enter the following command:

```
lns-service LNS2
```

To delete an existing LNS service named *LNS3*, enter the following command:

```
no lns-service LNS3
```

**location-service**

Creates a location service configuration instance or configures an existing location service configuration and enters the Location Service Configuration Mode. LoCation Services (LCS) are used to determine the geographic location of a UE.

Product

| MME |
| SGSN |

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

{(context_name)host_name(config-ctx) #}

**Syntax Description**

```
location-service service_name [ -noconfirm ]
no location-service service_name
```

**no**

Removes the specified location service configuration instance from the context.

**service_name**

Specifies the name of the location service configuration instance. If `service_name` does not refer to an existing service, the new service is created if resources allow.

`service_name` is an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Enter the Location Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing Service Configuration instance.

Location Service Configuration Mode commands are defined in the *Location Service Configuration Mode Commands* chapter.

A maximum of 16 location service instances can be configured per system.

Entering this command results in the following prompt:

{(context_name)host_name(config-location-service) #}

**Example**

The following command enters the existing Location Service Configuration Mode (or creates it if it does not already exist) for the service named `location-service1`:

```
location-service location-service1
```

The following command will remove `location-service1` from the system:

```
no location-service location-service1
```

**logging**

Modifies the logging options for a specified system log server for the current context.
All

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```plaintext
[ no ] logging syslog ip_address [ event-verbosity { min | concise | full } | facility facilities | msg-format { rfc3164 | rfc5424 } | pdu-data { none | hex | hex-ascii } | pdu-verbosity pdu_level | port number rate value ] { first-console }
```

- **no**
  - Indicates that internal logging is to be disabled for the options specified.

- **syslog ip_address**
  - Specifies the IP address of a system log server on the network in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

- **event-verbosity { min | concise | full }**
  - Specifies the level of detail to use in logging of events. Detail level must be one of the following:
    - **min**: Displays minimal detail.
    - **concise**: Displays summary detail.
    - **full**: Displays full detail.

- **facility facilities**
  - Default: **local7**
  - Specifies the local facility for which the system logging server's logging options shall be applied. Local facility must be one of the following:
    - **local0** — Pertains to syslog severity level of 0, Emergency
    - **local1** — Pertains to syslog severity level of 1, Alert
    - **local2** — Pertains to syslog severity level of 2, Critical
    - **local3** — Pertains to syslog severity level of 3, Error
    - **local4** — Pertains to syslog severity level of 4, Warning
    - **local5** — Pertains to syslog severity level of 5, Notice
    - **local6** — Pertains to syslog severity level of 6, Informational
    - **local7** — Pertains to syslog severity level of 7, Debug
If local facility is not specified, then local7 is applied by default.

Multiple system log servers can share the logging options of a given local facility. This allows for the logical grouping of system log servers and the options which affect all of those associated with the same local facility.

**msg-format { rfc3164 | rfc5424 }**

Configures the message format for each system log server as per RFC3164 or RFC5424. Default: rfc3164.

**pdu-data { none | hex | hex-ascii }**

Specifies output format for packet data units when logged. Format must be one of the following:

- **none**: Displays data in raw format.
- **hex**: Displays data in hexadecimal format.
- **hex-ascii**: Displays data in hexadecimal and ASCII format (similar to a main-frame dump).

**pdu-verbosity pdu_level**

Specifies the level of verboseness to use in logging of packet data units as a value from 1 through 5, where 5 is the most detailed.

**port number**

Specifies an alternate port number for the system log server. Default: 514.

*number* must be an integer value from 1 through 65535.

**rate value**

Specifies the rate at which log entries are allowed to be sent to the system log server. No more than the number specified by *value* will be sent to a system log server within any given one-second interval.

*value* must be an integer from 0 through 100000. Default: 1000

**first-console**

Enables the first serial port as the debug console for event log collection.

Note that on a VPC-DI that has a CF and SF card, the CF card on the first serial port is configured as the debug console. The second serial port is configured as the CLI console.

---

**Note**

The CF card on the VPC-DI and VPC-SI can be configured as the VGA, which also provides the CLI console.

On the SF card, the first serial port is configured as the debug console. The second serial port cannot be configured as the CLI console because there is no support for this console on the SF card.

---

**Note**

The **logging first-console** CLI command does not enable or disable system logs such as crash logs, system printed logs, and so on, which are always enabled.
Usage Guidelines
Set the log servers to enable remote review of log data.

Example
The following sets the logging for events to the maximum for the local7 facility:

```
logging syslog 10.2.3.4 event-verbosity full
```

The following command sets the logging for packet data units to level 3 and sets the output format to the main-frame style hex-ascii for the local3 facility:

```
logging syslog 10.2.3.4 facility local3 pdu-data hex-ascii pdu-verbosity 3
```

The following sets the rate of information for the local1 facility:

```
logging syslog 10.2.3.4 facility local1 rate 100
```

The following disables internal logging to the system log server specified:

```
no logging syslog 10.2.3.4
```

The following configure the first serial port as the debug console:

```
logging first-console
```

mag-service

Creates a Mobile Access Gateway (MAG) service or specifies an existing MAG service and enters the MAG Service Configuration Mode for the current context.

Product
HSGW
S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description
```
mag-service service_name [ -noconfirm ]
no mag-service service_name
```

**no**
Removes the specified MAG service from the context.

**service_name**
Specifies the name of the MAG service. If `service_name` does not refer to an existing service, the new service is created if resources allow.
service_name is an alphanumeric string of 1 through 63 characters.

Important

Service names must be unique across all contexts within a chassis.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Enter the MAG Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your Cisco service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-mag-service)#
```

MAG Service Configuration Mode commands are defined in the MAG Service Configuration Mode Commands chapter.

Use this command when configuring the following eHRPD and PMIP SAE components: HSGW and S-GW.

Example

The following command enters the existing MAG Service Configuration Mode (or creates it if it does not already exist) for the service named mag-service1:

```
map-service mag-service1
```

The following command will remove mag-service1 from the system:

```
no map-service mag-service1
```

map-service

Creates a Mobile Application Part (MAP) Service instance and enters the MAP Service Configuration mode to define or edit the MAP service parameters.

MAP is the SS7 protocol that provides the application layer required by some of the nodes in GPRS/UMTS networks to communicate with each other in order to provide services to mobile phone users. MAP is used by the serving GPRS support node (SGSN) to access SS7 network nodes such as a home location register (HLR) or a radio access network (RAN).

Product

SGSN
Syntax Description

```plaintext
map-service srvc_name
no map-service srvc_name
```

The `map-service` command is used to configure a MAP service with the specified name. The `no` keyword is used to remove the configuration for a MAP service.

**srvc_name**

Specifies the name of the MAP service as a unique alphanumeric string of 1 through 63 characters. Service names must be unique across all contexts within a chassis.

### Usage Guidelines

Use this command to create, edit, or remove a MAP service configuration.

For details about the commands and parameters, check the *MAP Service Configuration Mode Commands* chapter.

### Example

The following command creates a MAP service named `map_1`:

```plaintext
map-service map_1
```

The following command removes the configuration for a MAP service named `map_1` from the current context:

```plaintext
no map-service map_1
```

### max-sessions

Configures the maximum simultaneous sessions allows for corresponding users.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

max-sessions number { administrator name user_name | config-administrator name user_name | inspector name user_name | operator name user_name }
no max-sessions { administrator name user_name | config-administrator name user_name | inspector name user_name | operator name user_name }

default max-sessions { administrator name user_name | config-administrator name user_name | inspector name user_name | operator name user_name }

max-sessions number

Specifies the maximum number of simultaneous CLI sessions. It must be an alphanumeric integer from 1 to 100. Default: No limit.

administrator

Configures login user with security administrator rights for specific content. A username must follow the administrator keyword.

config-administrator

Configures login user with configuration administrator rights for specific content. A username must follow the config-administrator keyword.

inspector

Configures login user with inspector rights for specific content. A username must follow the inspector keyword.

operator

Configures login user with operator rights for specific content. A username must follow the operator keyword.

name user_name

Specifies the username. user_name specifies the security username. It must be an string size from 1 to 32.

no

Removes the configured maximum number of simultaneous CLI sessions. This option returns the user to the default setting. If the user does not exist, then an error message appears stating: 'Failure: User x has not been configured. Configure it first!'.

default

Removes the configured maximum number of simultaneous CLI sessions and returns the user to the default number. Default: No limit.

Usage Guidelines

This command allows administrative users the ability configure the maximum simultaneous sessions allowed for corresponding users.
Example
The following command allows an administrator the ability to configure 4 simultaneous sessions for user 5.

```
max-sessions 4 administrator name 5
```

mipv6ha-service

Creates a Mobile IPv6 Home Agent (MIPv6-HA) service instance and enters the MIPv6 HA Service Configuration mode to define or edit the MIPv6-HA service parameters.

**Product**
PDSN

**HA**

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

**Syntax Description**

```
mipv6ha-service srvc_name
no mipv6ha-service srvc_name
```

**no**
Remove the specified MIPv6-HA service from the configuration for the current context.

**srvc_name**
Specifies the name of the MIPv6-HA service as a unique alphanumeric string of 1 through 63 characters.

---

**Important**
Service names must be unique across all contexts within a chassis.

---

**Usage Guidelines**
Use this command to create, edit, or remove a MIPv6-HA service configuration.

**Important**
For details about the commands and parameters, check the *MIPv6 HA Service Configuration Mode Commands* chapter.

**Example**
The following command creates a MIPv6-HA service named *mipv6ha_1*:
mipv6ha-service mipv6ha_1
The following command removes the configuration for a MIPv6-HA service named mipv6ha_1 from the configuration for the current context:

no mipv6ha-service mipv6ha_1

mme-embms-service

Creates an MME-eMBMS service or configures an existing MME-eMBMS service. As well, this command enters the MME-eMBMS Service configuration mode. MME-eMBMS service handles the MME's Multimedia Broadcast/Multicast Service (MBMS) functional for Evolved Packet Core (EPC) networks in the current context.

Product
MME

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name
Entering the above command sequence results in the following prompt:
 [context_name]host_name(config-ctx)#

Syntax Description
mme-embms-service service_name [ -noconfirm ]
no mme-embms-service service_name

no
Removes the specified MME-eMBMS service from the context.

service_name
Specifies the name of the MME-eMBMS service. If service_name does not refer to an existing service, the new service is created if resources allow.

service_name is an alphanumeric string of 1 through 63 characters.

Important
Service names must be unique across all contexts within a chassis.

-noconfirm
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines
Enter the MME-eMBMS Service configuration mode to access the commands needed to setup or modify either a newly defined service or an existing service. This command is also used to remove an existing MME-eMBMS service from the MME's configuration.
A maximum of 8 MME-eMBMS services can be configured on a system which is further limited to a maximum of 256 services (regardless of type) can be configured per system.

⚠️ Caution

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-mme-embms-service)#
```

MME Service Configuration Mode commands are defined in the *MME Service Configuration Mode Commands* chapter.

**Example**

The following command enters the existing MME-eMBMS Service configuration mode (or creates it if it does not already exist) for the service named *embms1*:

```
mme-embms-service embms1
```

The following command will remove *embms1* from the system:

```
no mme-embms-service embms1
```

**mme-service**

Creates an Mobility Management Entity (MME) service or configures an existing MME service and enters the MME Service Configuration Mode for Evolved Packet Core (EPC) networks in the current context.

**Product**

MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]hostname(config-ctx)#
```

**Syntax Description**

```
mme-service service_name [ -noconfirm ]
nmme-service service_name

no
```

Removes the specified MME service from the context.
**service_name**

Specifies the name of the MME service. If *service_name* does not refer to an existing service, the new service is created if resources allow.

*service_name* is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**Usage Guidelines**

Enter the MME Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 8 MME service can be configured on a system which is further limited to a maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-mme-service)#
```

MME Service Configuration Mode commands are defined in the *MME Service Configuration Mode Commands* chapter.

---

**Caution**

This is a critical configuration. The MME service cannot be configured without this configuration. Any change to this configuration would lead to restarting the MME service and removing or disabling this configuration will stop the MME service.

---

**Example**

The following command enters the existing MME Service Configuration Mode (or creates it if it does not already exist) for the service named *mme-service1*:

```
mme-service mme-service1
```

The following command will remove *mme-service1* from the system:

```
no mme-service mme-service1
```
mobile-access-gateway

Controls whether duplicate MAG sessions are allowed in HSGW. By default, duplicate sessions are rejected.

**Product**
HSGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
mobile-access-gateway newcall duplicate-session { purge | reject }
[ default | no ] mobile-access-gateway newcall duplicate-session
```

- **default | no**
  Disables the feature. New session create request is discarded.

- **newcall duplicate-session { purge | reject }**
  Determines new call related behavior on context when duplicate MAG sessions are requested in HSGW (Mobile Access Gateway).

  - **purge**: Enables the feature. Old MAG session is deleted and new session create request is rejected, but on retry the new call comes up.
  - **reject**: Disables the feature. Rejects new call with duplicate session create request; new session create request is discarded.

**Usage Guidelines**
This command controls whether duplicate MAG sessions are allowed in HSGW.

When enabled, HSGW rejects new session create request initially and creates new call on retry.
When disabled, HSGW rejects new call and new session create request is discarded.

**Example**
The following command allows duplicate MAG sessions in HSGW on this context:

```
mobile-access-gateway newcall duplicate-session purge
```

---

mobile-ip fa

Configures settings that effect all FA services in the current context.

**Product**
FA
Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

mobile-ip fa { multiple-dynamic-reg-per-nai | newcall duplicate-home-address { accept | reject } }
{ default | no } mobile-ip fa { multiple-dynamic-reg-per-nai | newcall duplicate-home-address }

default
Configures the default setting for the specified parameter.

• multiple-dynamic-reg-per-nai: All FA services in the current context can not simultaneously setup multiple dynamic home address registrations that have the same NAI.

• newcall duplicate-home-address: reject

no

• multiple-dynamic-reg-per-nai: Disables all FA services in the current context from simultaneously setting up multiple dynamic home address registrations that have the same NAI.

• newcall duplicate-home-address: Resets this option to its default of reject.

multiple-dynamic-reg-per-nai
This keyword allows all FA services in the current context to simultaneously setup multiple dynamic home address registrations that have the same NAI.

newcall duplicate-home-address { accept | reject }

• accept: The new call is accepted and the existing call is dropped.

• reject: The new call is rejected with an Admin Prohibited code.

Usage Guidelines
Use this command to set the behavior of all FA services in the current context.

Example
To configure all FA services to accept new calls and drop the existing call when the new call requests an IP address that is already in use by an existing call, enter the following command:

mobile-ip fa newcall duplicate-home-address accept

To enable all FA services in the current context to allow all FA services in the current context to simultaneously setup multiple dynamic home address registrations that have the same NAI, enter the following command:
mobile-ip ha assignment-table

Creates a Mobile IP HA assignment table and enters Mobile IP HA Assignment Table Configuration Mode.

Product
HA

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description

mobile-ip ha assignment-table atable_name [ -noconfirm ]
no mobile-ip ha assignment-table atable_name

no

This keyword deletes the specified assignment table

atable_name

Specifies the name of the MIP HA assignment table to create or edit as an alphanumeric string of 1 through 63 characters.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Use this command to create a new MIP HA assignment table or edit an existing MIP HA assignment table.

Important

A maximum of eight MIPHA assignment tables can be configured per context with a maximum of 8 MIP HA assignment tables across all contexts.

Important

A maximum of 256 non-overlapping hoa-ranges can be configured per MIP HA Assignment table with a maximum of 256 non-overlapping hoa-ranges across all MIP HA Assignment tables.

Example

The following command creates a new MIP HA assignment table name MIPHAtable1 and enters MIP HA Assignment Table Configuration Mode without asking for confirmation from the user:
mobile-ip ha newcall

Configures the behavior of all HA services when duplicate home addresses and duplicate IMSI sessions occur for new calls.

**Product**
HA

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
mobile-ip ha newcall { duplicate-home-address { accept | reject } |
   duplicate-imsi-session { allow | disallow | global-disallow } |
   wimax-session-overwrite { allow | disallow } |
   { default | no } mobile-ip ha newcall { duplicate-home-address |
   duplicate-imsi-session | wimax-session-overwrite }
```

default

Configures the default setting for the specified parameter.

- **duplicate-home-address**: reject — sets HA services to reject a new call that requests an IP address that is already assigned.

- **duplicate-imsi-session**: allow — sets HA services to accept new calls that have the same IMSI as a call that is already active.

- **wimax-session-overwrite**: disallow — disable session overwrite feature for WiMax mobile-ip calls on the HA.

no

Configures the default setting for the specified parameter.

duplicate-home-address { accept | reject }

Configures the HA to either accept or reject new calls if the new call requests a static IP home address that is already assigned to an existing call from an IP address pool in the same destination context.

- **accept**: The new call is accepted and the existing call is dropped.

- **reject**: The new call is rejected with an Admin Prohibited code.
**duplicate-imsi-session { allow | disallow | global-disallow }**

Configures the HA to either permit or not permit multiple sessions for the same IMSI.

- **allow**: Allows multiple sessions for the same IMSI.
- **disallow**: If a mobile node already has an active session and a new session is requested using the same IMSI, the currently active session is dropped and the new session is accepted.
- **global-disallow**: Enables HA services in this context to accept a new session and disconnect any other session(s) having the same IMSI being processed in this context. In addition, a request is sent to all other contexts containing HA services to do the same.

---

**Important**

In order to ensure a single session per IMSI across all contexts containing HA services, the global-disallow option must be configured in every context.

**wimax-session-overwrite { allow | disallow }**

Use this command to enable or disable the overwrite feature for WiMAX mobile ip (MIPv4) calls on the HA.

**Usage Guidelines**

Use this command to set the behavior of all HA services for new calls.

**Example**

To configure all HA services to accept new calls when the new call requests a static IP that is already assigned from an IP pool in the same destination context, enter the following command:

```
mobile-ip ha newcall duplicate-home-address accept
```

To configure all HA services to drop an active call and accept a new one that uses the same IMSI, enter the following command:

```
mobile-ip ha newcall duplicate-imsi-session disallow
```

---

**mobile-ip ha reconnect**

Sets the behavior of all HA services to reconnect dropped calls.

**Product**

HA

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
cconfigure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```
Syntax Description


static-homeaddr
Specifies that the home address as a static IP address.

dynamic-pool-allocation
Allows a dynamic pool to accept a static address allocation.

Usage Guidelines
Use this command to reset the HA behavior for new calls.

Example

mobile-ip ha reconnect
mobile-ip ha reconnect static-homeaddr
mobile-ip ha reconnect static-homeaddr dynamic-pool-allocation
no mobile-ip ha reconnect
no mobile-ip ha reconnect static-homeaddr

monitor-protocols

Enters the Monitor Protocols configuration mode.

Product
CUPS

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

monitor-protocols

Usage Guidelines
The Monitor Protocols configuration mode contains commands used to configure protocol monitoring groups (relationships) between the current device and a remote peer.

Configure monitor protocol groups on both the CP and UP and within the same context as the CUPS Sx interface.

mpls bgp forwarding

Globally enables Multi protocol Label Switching (MPLS) Border Gateway Protocol (BGP) forwarding.

Product
All
**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
[ no ] mpls bgp forwarding

no
Disables MPLS BGP forwarding.
```

**Usage Guidelines**
Use this command to globally enable the MPLS BGP forwarding. By enabling this command, the BGP VPNv4 routes need not have an underlying LSP to forward the IP packets. If this command is not enabled, then the nexthop for the BGP routes must be reachable via LDP.

⚠️ **Caution**
This command should always be enabled when nexthop is not reachable thorough LSP.

**Example**
The following command enables the MPLS BGP forwarding on the system:
```
mls bgp forwarding
```

---

**mpls exp**

Sets the default behavior as Best Effort using a zero value in the 3-bit MPLS EXP (Experimental) header. This setting overrides the value sent by the mobile subscriber.

**Product**
eHRPD
GGSN
PDSN (HA)

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
[ no ] mpls exp <value>
```
Reverts back to the default behavior, which is to copy the DSCP from the mobile subscriber packet to the EXP header of the packet, if there is no explicit configuration for DSCP to EXP.

\<value>\n
Specifies the MPLS EXP header value as an integer from 0 through 7. Higher value indicates higher priority.

**Usage Guidelines**

Set the default behavior as Best Effort using a zero value in the 3-bit MPLS EXP header. This value applies to all the VRFs in the context. The default behavior is to copy the DSCP value of mobile subscriber traffic to the EXP header, if there is no explicit configuration for DSCP to EXP (via the `mpls map-dscp-to-exp dscp <n> exp <m>` command).

This command disables the default behavior and sets the EXP value to the configured `<value>`.

**Example**

The following command sets the MPLS EXP header value to 2:

\texttt{mpls exp 2}

**mpls ip**

Globally enables the Multiprotocol Label Switching (MPLS) forwarding of IPv4 packets along normally routed paths.

**Product**

GGSN

HA

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

\texttt{configure > context context_name}

Entering the above command sequence results in the following prompt:

\texttt{[context_name]host_name(config-ctx)#}

**Syntax Description**

\[ \texttt{no } \texttt{mpls ip} \]

**no**

Disables MPLS forwarding of IPv4 packets configured on the system. \texttt{no mpls ip} stops dynamic label distribution on all the interfaces regardless of interface configuration.

**Usage Guidelines**

Globally enables the MPLS forwarding of IPv4 packets along normally routed paths for the entire context.
It does not start label distribution over an interface until MPLS has been enabled for the interface as well. Refer to the *Ethernet Interface Configuration Mode Commands* chapter for additional information.

⚠️ **Caution**

This feature is not enabled by default.

**Example**

Following command enables (but does not start) MPLS forwarding of IPv4 packets along normally routed paths:

```bash
mpls ip
```

**mseg-service**

This command is not supported in this release.

**multicast-proxy**

Creates, configures or deletes a multicast proxy host configuration.

**Syntax Description**

```
[no] multicast-proxy { igmp interface ip_address range-start start_ip_address range-end end_ip_address | listen address listen_ip_address port port_number protocol protocol_number sessmgr instance }
```

- **no**
  
  If previously configured, deletes the specified multicast proxy parameter from the current context.

- **igmp interface ip_address range-start start_ip_address range-end end_ip_address**
  
  Specifies the IP address and range of associated addresses for this Internet Group Management Protocol (IGMP) interface.

  *ip_address* is the IP address of this interface expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.
range-start start_ip_address is the start point for the multicast address range expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

range-end end_ip_address is the end point for the multicast address range expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

listen address listen_ip_address port port_number protocol protocol_number sessmgr instance

Configures this context as a multicast proxy listener.

listen_ip_address is the IP address that will be listened to, expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

port port_number is the port number which will be listened to. If this is not provided, the listener will receive all packets from the listen_ip_address. port_number is an integer from 1 through 65535.

protocol protocol_number is the IANA protocol number associated with the port number. If this is not provided, the listener will receive all packets from the listen_ip_address and port_number. protocol_number is an integer from 1 through 255.

sessmgr instance session manager instance that will do the listening. instance is an integer from 1 through 270.

Usage Guidelines

Use this command to create/configure/delete a multicast proxy host configuration.

Example

The following command creates an IGMP multicast host configuration:

multicast proxy igmp interface 192.155.1.34 range-start 255.0.0.0 range-end 255.0.0.1
This section includes the commands `nw-reachability server` through `router service`.

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `nw-reachability server`, on page 587
- `network-requested-pdp-context activate`, on page 588
- `network-requested-pdp-context gsn-map`, on page 590
- `network-requested-pdp-context hold-down-time`, on page 591
- `network-requested-pdp-context interval`, on page 592
- `network-requested-pdp-context sgsn-cache-time`, on page 592
- `operator`, on page 593
- `optimize pdsn inter-service-handoff`, on page 596
- `password`, on page 596
- `pcc-af-service`, on page 598
- `pcc-policy-service`, on page 599
- `pcc-service`, on page 601
- `pcc-sp-endpoint`, on page 602
- `pdg-service`, on page 604
- `pdif-service`, on page 604
- `pdsn-service`, on page 605
- `pdsnclosedrp-service`, on page 606
- `pgw-service`, on page 607
- `policy`, on page 609
- `policy-group`, on page 609
- `policy-map`, on page 610
- `ppp`, on page 611
• ppp magic-number, on page 616
• ppp statistics, on page 617
• proxy-dns intercept-list, on page 618
• radius accounting, on page 619
• radius accounting algorithm, on page 622
• radius accounting apn-to-be-included, on page 623
• radius accounting billing-version, on page 624
• radius accounting gtp trigger-policy, on page 625
• radius accounting ha policy, on page 626
• radius accounting interim volume, on page 627
• radius accounting ip remote-address, on page 628
• radius accounting keepalive, on page 629
• radius accounting rp, on page 630
• radius accounting server, on page 633
• radius algorithm, on page 637
• radius allow, on page 637
• radius attribute, on page 638
• radius authenticate null-username, on page 641
• radius authenticate apn-to-be-included, on page 641
• radius authenticator-validation, on page 642
• radius change-authorize-nas-ip, on page 643
• radius charging, on page 646
• radius charging accounting algorithm, on page 647
• radius charging accounting server, on page 648
• radius charging algorithm, on page 650
• radius charging server, on page 651
• radius deadtime, on page 653
• radius detect-dead-server, on page 654
• radius dictionary, on page 656
• radius group, on page 658
• radius ip vrf, on page 658
• radius keepalive, on page 659
• radius max-outstanding, on page 661
• radius max-retries, on page 662
• radius max-transmissions, on page 662
• radius mediation-device, on page 663
• radius probe-interval, on page 663
• radius probe-max-retries, on page 664
• radius probe-message, on page 665
• radius probe-timeout, on page 666
• radius server, on page 666
• radius strip-domain, on page 669
• radius timeout, on page 670
• radius trigger, on page 671
• realtime-trace-module, on page 672
• remote-server-list, on page 672
nw-reachability server

Adds or deletes a reachability-detect server and configures parameters for retrying the failure-detection process. When network reachability is enabled, an ICMP ping request is sent to this device. If there is no response after a specified number of retries, the network is deemed failed. Execute this command multiple times to configure multiple network reachability servers.

Product
P-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description
nw-reachability server server_name [ interval seconds ] [ local-addr ip_addr ]
[ num-retry num ] [ remote-addr ip_addr ] [ timeout seconds] [ vfr name]

no nw-reachability server server_name

no
Delete the reference to the specified network reachability server.

server_name
Specifies the name for the network device that is sent ping packets to test for network reachability.

interval seconds
Specifies the frequency in seconds for sending ping requests as an integer from 1 through 3600. Default: 60

local-addr ip_addr
Specifies the IP address to be used as the source address of the ping packets; If this is unspecified, an arbitrary IP address that is configured in the context is used. ip_addr must be entered using IPv4 dotted-decimal notation.

num-retry num
Specifies the number of retries before deciding that there is a network-failure as an integer from 0 through 100. Default: 5
### remote-addr ip_addr

Specifies the IP address of a network element to use as the destination to send the ping packets for detecting network failure or reachability. `ip_addr` must be entered using IPv4 dotted-decimal notation.

### timeout seconds

Specifies how long to wait (in seconds) before retransmitting a ping request to the remote address as an integer from 1 through 1. Default: 3

### vrf name

Specifies an existing VRF name as an alphanumeric string of 1 through 63 characters.

---

**Usage Guidelines**

Use this command to set up a network device on a destination network that is used ensure that Mobile IP sessions can reach the required network from the P-GW.

**Important**

Refer to the P-GW Configuration Mode command `policy nw-reachability-fail` to configure the action that should be taken when network reachability fails.

**Important**

Refer to the Subscriber Config Mode command `nw-reachability-server` to bind the network reachability to a specific subscriber.

**Important**

Refer to the `nw-reachability server server_name` keyword of the `ip pool` command in this chapter to bind the network reachability server to an IP pool.

---

**Example**

To set a network device called Internet Device with the IP address of 192.168.100.10 as the remote address that is pinged to determine network reachability and use the address 192.168.200.10 as the origination address of the ping packets sent, enter the following command:

```
nw-reachability server InternetDevice local-addr 192.168.200.10 remote-addr 192.168.100.10
```

---

**network-requested-pdp-context activate**

Configures the mobile station(s) (MSs) for which network initiated PDP contexts are supported.

**Product**

GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

```
network-requested-pdp-context activate address ip_address dst-context
context_name imsi imsi apn apn_name
```

```
no
```

no

Disables the system's ability to accept network-requested PDP contexts on the specified interface.

```
ip_address
```

Specifies the static IP address of the MS n IPv4 dotted-decimal notation.

```
dst-context context_name
```

Specifies the name of the destination context configured on the system containing the static IP address pool in which the MS's IP address is configured. `context_name` is an alphanumeric string of 1 through 79 characters that is case sensitive.

```
imsi imsi
```

Specifies the International Mobile Subscriber Identity (IMSI) of the MS as a string of 1 through 15 numeric characters

```
apn apn_name
```

Specifies the Access Point Name (APN) that is passed to the SGSN by the system. `apn_name` is an alphanumeric string of 1 through 63 characters that is case sensitive.

Usage Guidelines

Use this command to specify the MS(s) for which network initiated PDP contexts are supported.

When a packet is received for an MS that does not currently have a PDP context established, the system checks the configuration of this parameter to determine if the destination IP address specified in the packet is specified by this parameter. If the address is not specified, then the system discards the packet. If the address is specified, the system uses the configured IMSI and APN to determine the appropriate SGSN from the Home Location Register (HLR). The system communicates with the HLR through the interworking node configured using the network-requested-pdp-context gsn-map command.

Once the session is established, the destination context specified by this command is used in place of the one either configured within the specified APN template or returned by a RADIUS server during authentication.

This command can be issued multiple times supporting network initiated PDP contexts for up to 1,000 configured addresses per system context.

Example

The following command enables support for network initiated PDP contexts for an MS with a static IP address of 20.13.5.40 from a pool configured in the destination context pdn1 with an IMSI of 3319784450 that uses an APN template called `isp1`:

```
configure > context context_name
data
```
network-requested-pdp-context activate address 20.13.5.40 dst-context pdn1 imsi 3319784450 apn ispl

**network-requested-pdp-context gsn-map**

Configures the IP address of the interworking node that is used by the system to communicate with the Home Location Register (HLR), and optionally sets the GTP version to use.

**Product**

GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

*Exec > Global Configuration > Context Configuration*

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

**Syntax Description**

```plaintext
network-requested-pdp-context gsn-map ip_address [ gtp-version { 0 | 1 } ]
no network-requested-pdp-context gsn-map
```

no

Deletes a previously configured gsn-map node.

**ip_address**

Specifies the IP address of the gsn-map node in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**gtp-version { 0 | 1 }**

Specifies the gtp version used. Default: 1

**Usage Guidelines**

Communications from the system to the HLR must go through a GSN-map interworking node that performs the protocol conversion from GTPC to SS7.

The UDP port for this communication is 2123.

Support for network requested PDP contexts must be configured within source contexts on the system. Only one gsn-map node can be configured per source context.

The source context also contains the GGSN service configuration that specifies the IP address of the Gn interface. If multiple GGSN services are configured in the source context, one is selected at random for initiating the Network Requested PDP Context Activation procedure.

Communication with the gsn-map node is done over the Gn interface configured for the GGSN service. The IP address of that interface is used as the system's source address.
Example
The following command configures the system to communicate with a gsn-map node having an IP address of 192.168.2.5:

```
network-requested-pdp-context gsn-map 192.168.2.5
```

**network-requested-pdp-context hold-down-time**

Configures the time duration to that the system will wait after the SGSN rejects an attempt for a network-requested PDP context creation for the subscriber.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```
Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
network-requested-pdp-context hold-down-time time
default network-requested-pdp-context hold-down-time
```

**default**
Configures the default setting.
Default: 60 seconds

**time**
Specifies the time interval (in seconds) as an integer from 0 through 86400.

**Usage Guidelines**
Packets received during this time period would be discarded, rather than being used to cause another network-requested PDP context creation attempt for the same subscriber. After the time period has expired, any subsequent packets received would cause another network-requested PDP context creation procedure to begin.

Example
The following command configures a hold-down-time of 120 seconds:

```
network-requested-pdp-context hold-down-time 120
```
network-requested-pdp-context interval

Configures the minimum amount of time that must elapse between the deletion of a network initiated PDP context and the creation of a new one for the same MS.

**Product**
GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```
network-requested-pdp-context interval time

default network-requested-pdp-context interval
```

**default**

Returns the command to its default setting of 60.

**time**

Specifies the minimum amount of time (in seconds) that must pass before the system allows another network-requested PDP context for a specific MS after the previous context was deleted. *time* is an integer from 0 through 86400. Default: 60

**Usage Guidelines**

Once an MS deletes a PDP context that initiated from the network, the system automatically waits the amount of time configured by this parameter before allowing another network initiated PDP context for the same MS.

**Example**

The following command specifies that the system waits 120 seconds before allowing another network requested PDP context for an MS:

```
network-requested-pdp-context interval 120
```

network-requested-pdp-context sgsn-cache-time

Configures the time duration that the GGSN keeps the SGSN/subscriber pair cached in its local memory.

**Product**
GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Command Line Interface Reference, Modes C - D, StarOS Release 21.20
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```
network-requested-pdp-context sgsn-cache-time time
default network-requested-pdp-context sgsn-cache-time

default

Configures the default setting.
Default: 300 seconds
```

```
time

Specifies the time interval (in seconds) as an integer from 0 through 86400.
```

### Usage Guidelines

For an initial network-requested PDP context creation, the system contacts the HLR (via the GSN-MAP interworking node) to learn which SGSN is currently servicing the subscriber. The system keeps that information in cache memory for the configured time, so that future network-requested PDP context creations for that subscriber can be initiated without having to contact the HLR again.

### Example

The following command configures an sgsn-cache-time of 500 seconds:

```
network-requested-pdp-context sgsn-cache-time 500
```

### operator

Configures a context-level operator account within the current context.

#### Product

All

#### Privilege

Security Administrator

#### Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

#### Syntax Description

```
operator user_name [ encrypted ] [ nopassword ] password password [ ecs ] [ expiry-date date_time ] [ li-administration ] [ noconsole ] [ noecs ] [ timeout-absolute abs_seconds ] [ timeout-min-absolute abs_minutes ] [ timeout-idle timeout_duration ] [ timeout-min-idle idle_minutes ]
```

```
no operator user_name

no

Removes a previously configured context-level operator account.
### user_name

Specifies a name for the account as an alphanumeric string of 1 through 32 characters.

### [ encrypted ] password password

Specifies the password to use for the user which is being given context-level operator privileges within the current context. The encrypted keyword indicates the password specified uses encryption.

password is an alphanumeric string of 1 through 63 characters without encryption, or 1 through 127 with encryption.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the password keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

### [ nopassword ]

This option allows you to create an operator without an associated password. Enable this option when using ssh public keys (authorized key command in SSH Configuration mode) as a sole means of authentication. When enabled this option prevents someone from using an operator password to gain access to the user account.

### ecs

Permits the specific user to access ACS-specific configuration commands from Exec Mode only. Default: ACS-specific configuration commands are not allowed.

### expiry-date date_time

Specifies the date and time that this account expires. Enter the date and time in the format YYYYY:MM:DD:HH:mm or YYYYY:MM:DD:HH:mm:ss.

Where YYYY is the year, MM is the month, DD is the day of the month, HH is the hour, mm is minutes, and ss is seconds.

### li-administration

Refer to the Lawful Intercept Configuration Guide for a description of this parameter.

### noconsole

Disables user access to a Console line.

---

**Note**

The Global Configuration mode local-user allow-aaa-authentication noconsole command takes precedence in a normal (non-Trusted) StarOS build. In this case, all AAA-based users cannot access a Console line.

### noecs

Prevents the user from accessing ACS-specific configuration commands. Default: Enabled
timeout-absolute \textit{abs\_seconds}

This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum amount of time (in seconds) the context-level operator may have a session active before the session is forcibly terminated. \textit{abs\_seconds} must be a value in the range from 0 through 300000000. The value 0 disables the absolute timeout. Default: 0

timeout-min-absolute \textit{abs\_minutes}

Specifies the maximum amount of time (in minutes) the context-level operator may have a session active before the session is forcibly terminated. \textit{abs\_minutes} must be an integer from 0 through 300000000. The value 0 disables the absolute timeout. Default: 0

timeout-idle \textit{timeout\_duration}

This keyword is obsolete. It has been left in place for backward compatibility. If used a warning is issued and the value entered is rounded to the nearest whole minute.

Specifies the maximum amount of idle time (in seconds) the context-level operator may have a session active before the session is terminated. \textit{timeout\_duration} must be an integer from 0 through 300000000. The value 0 disables the idle timeout. Default: 0

timeout-min-idle \textit{idle\_minutes}

Specifies the maximum amount of idle time (in minutes) the context-level operator may have a session active before the session is terminated. \textit{idle\_minutes} must be an integer from 0 through 300000000. The value 0 disables the idle timeout. Default: 0

Usage Guidelines

Use this command to create new context-level operator or modify existing operator's options, in particular, the timeout values.

Operators have read-only privileges. They can maneuver across multiple contexts, but cannot perform configuration operations. Refer to the \textit{Command Line Interface Overview} chapter for more information.

A maximum of 128 administrative users and/or subscribers may be locally configured per context.

Example

The following command creates a context-level operator account named \textit{user1} with ACS control:

\texttt{operator user1 password secretPassword ecs}

The following command removes a previously configured context-level operator account named \textit{user1}:

\texttt{no operator user1}
optimize pdsn inter-service-handoff

Controls the optimization of the system's handling of inter-PDSN handoffs.

**Product**
PDSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
<context_name>host_name(config-ctx)#
```

**Syntax Description**

```
[ default | no ] optimize pdsn inter-service-handoff
```

- **default**
  - Resets the command to its default setting of enabled.

- **no**
  - Disables the feature.

**Usage Guidelines**

When more than one PDSN service is defined in a context, each PDSN-Service acts as an independent PDSN. When a Mobile Node (MN) moves from one PDSN service to another PDSN service, by rule, it is an inter-PDSN handoff. This command optimizes PDSN handoffs between PDSN Services that are defined in the same context in the system.

The default for this parameter is enabled. The no keyword disables this functionality.

When enabled, the system treats handoffs happening between two PDSN services in the same context as an inter-PDSN handoff. Existing PPP session states and connection information is reused. If the inter-PDSN handoff requires a PPP restart, then PPP is restarted. The optimized inter-service-handoff may not restart the PPP during handoffs allowing the MN to keep the same IP address for the Simple IP session.

**Example**

```
optimize pdsn inter-service-handoff
```

---

**password**

Configures password rules (complexity and minimum length) to be enforced for all users in this context.

**Product**
All

**Privilege**
Security Administrator, Administrator
**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:
`[(context_name)host_name(config-ctx)#`

**Syntax Description**

```
[ default ] password { [ complexity { ansi-t1.276-2003 | none } ] } [ auto-generate ]
[ default ] password min-length min_size
```

**default**
The default password complexity is `ansi-t1.276-2003`.
The default minimum length is `8`.

**complexity { ansi-t1.276-2003 | none }**
Specifies the complexity to be enforced for all context user passwords.

ansi-t1.276-2003 requires that all context user passwords comply with the following rules:
- Passwords may not contain the username or the reverse of the username
- Passwords may contain no more than three of the same characters used consecutively.
- Passwords must contain at least three of the following:
  - uppercase alpha character (A, B, C, D...Z)
  - lowercase alpha character (a, b, c, d ...z)
  - numeric character (0, 1, 2, 3...)
  - special character (see the Alphanumeric Strings section of the Command Line Interface Overview chapter)

none results in only the password length being checked.

**[ auto-generate [ none | length password-length ]**
Presents an automatically generated password to the user at login when password is found weak.
The auto-generate option is enabled by default with the password length of 8.

none : Specifies that the user must not be presented with the option to automatically generate a password.

length password-length : Specifies the length of the automatically-generated password for the user. The length of the automatically-generated password is an integer between 6 to 127.

**password min-length min_size**
Specifies the minimum length for all context user passwords. min_size is an integer from 3 to 31. Default = `8`.

**Usage Guidelines**
Use this command to specify the complexity and minimum length of all passwords assigned within this context.
Example
The following commands set the password complexity to ANSI-T1.276 requirements and minimum length to 12.

```
password complexity ansi-t1.276-2003
password min-length 12
```

The following command configures the auto-generated password with the specified length.

```
password auto-generate length 10
```

pcc-af-service

Creates or removes an IPCF Policy and Charging Control (PCC) Application Function (AF) service or configures an existing PCC-AF service. It enters the PCC-AF Service Configuration Mode to link, configure, and manage the Application Function endpoints and associated PCC services over the Rx interface for the IPCF services.

**Product**

IPCF

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- \texttt{pcc-af-service service_name \([-\textit{noconfirm}]\)}
- \texttt{no pcc-af-service service_name}

\textbf{no}

Removes the specified PCC-AF service from the context.

\textit{service_name}

Specifies the name of the PCC-AF service. If \textit{service_name} does not refer to an existing service, the new service is created if resources allow. \textit{service_name} is an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.

\textbf{-noconfirm}

Executes the command without any additional prompt and confirmation from the user.
**Usage Guidelines**

Use this command to enter the PCC-AF Service Configuration Mode for an existing service or for a newly defined PCC-AF service. This command is also used to remove an existing service.

The PCC-AF-Service consolidates the provisioning and management required for the PCC-AF services being supported by the network that fall under the PCC regime. The application service handles the **Rx** interface over which the IPCF may receive media information for the application usage from AF.

---

**Important**

In the absence of an Rx interface, the media information is available in the PCC-AF Service statically.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name] hostname(config-imsapp-service)#
```

The commands available in this mode are defined in the *PCC-AF Service Configuration Mode Commands* chapter.

---

**Caution**

This is a critical configuration. The PCC-AF service cannot be configured without this configuration. Any change to this configuration would lead to restarting the PCC-AF service and removing or disabling this configuration will stop the PCC-AF service.

---

**Example**

The following command enters the existing PCC-AF Service Configuration Mode (or creates it if it does not already exist) for the service named *af-service1*:

```
pcc-af-service af-service1
```

The following command will remove *af-service1* from the system:

```
no pcc-af-service af-service1
```

---

**pcc-policy-service**

Creates or removes an IPCF PCC-Policy service or configures an existing PCC-Policy service. It enters the PCC-Policy Service Configuration Mode to link, configure, and manage the Gx interface endpoints for policy authorization where IPCF acts as a policy server.

**Product**

IPCF

**Privilege**

Administrator
**Command Modes**

Execute > Global Configuration > Context Configuration

**configure > context context_name**

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
pcc-policy-service service_name [ -noconfirm ]
no pcc-policy-service service_name
```

- **no**
  - Removes the specified PCC-Policy service from the context.

  - **service_name**
    - Specifies the name of the PCC-Policy service. If `service_name` does not refer to an existing service, the new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

- **-noconfirm**
  - Executes the command without any additional prompt and confirmation from the user.

**Important**

- Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Use this command to enter the PCC-Policy Service Configuration Mode for an existing service or for a newly defined PCC-Policy service. This command is also used to remove an existing service.

The PCC-Policy-Service is mainly used to provide a mechanism to manage the external Gx or similar interfaces required for policy authorization purpose. It manages Gx and Gx-like interfaces such as Gxc/Gxa between IPCF/PCRF and PCEF or BBERF, which is based on the dictionary used for PCC.

Multiple instances of PCC-Policy-Service may exist in a system which could link with the same PCC-Service that controls the business logic. This service allows for management of configuration for peers as well self related to Gx like functions.

A maximum of 256 services (regardless of type) can be configured per system.

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-pccpolicy-service)#
```

The commands available in this mode are defined in the **PCC-Policy Service Configuration Mode Commands** chapter.
This is a critical configuration. The PCC-Policy service cannot be configured without this configuration. Any change to this configuration would lead to restarting the PCC-Policy service and removing or disabling this configuration will stop the PCC-Policy service.

**Example**

The following command enters the existing PCC-Policy Service Configuration Mode (or creates it if it does not already exist) for the service named `gx-service1`:

```
pcc-policy-service gx-service1
```

The following command will remove `gx-service1` from the system:

```
no pcc-policy-service gx-service1
```

**pcc-service**

Creates or removes an IPCF Policy and Charging Control (PCC) service or configures an existing PCC service. It enters the PCC Service Configuration Mode for IPCF related configurations in the current context.

**Product**

IPCF

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- `pcc-service service_name [ -noconfirm ]`
- `no pcc-service service_name`

**no**

Removes the specified PCC service from the context.

**service_name**

Specifies the name of the PCC service. If `service_name` does not refer to an existing service, the new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

**Important**

Service names must be unique across all contexts within a chassis.
pcc-sp-endpoint

Creates or removes a PCC Sp interface endpoint or configures an existing PCC Sp interface client endpoint. It enters the PCC Sp Endpoint Configuration Mode to link, configure, and manage the operational parameters related to its peer.

Product
- IPCF

Privilege
- Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

pcc-sp-endpoint sp_intfc1 [ -noconfirm ]
no pcc-sp-endpoint name sp_intfc1

no

Removes the specified PCC Sp interface endpoint from the context.

sp_intfc1

Specifies the name of the PCC Sp interface endpoint. If sp_intfc_endpoint does not refer to an existing endpoint, the new endpoint is created if resources allow.

sp_intfc_endpoint is an alphanumeric string of 1 through 63 characters.

-noconfirm

Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Use this command to enter the PCC-Sp-Endpoint Configuration Mode for an existing interface or for a newly defined PCC Sp interface endpoint. This command is also used to remove an existing endpoint.

An instance of PCC Sp endpoint represents a client end for SSC/SPR interactions. It is possible to support multiple Sp endpoints each supporting the same or different protocol(s). The PCC Sp endpoint facilitates the configuration of the treatment required of the Sp interface as well as manages the connection and operational parameters related to its peer.

Only one PCC Sp endpoint across a chassis can be configured on a system.

Entering this command results in the following prompt:

[context_name]hostname(config-spendpoint)#

The commands available in this mode are defined in the PCC-Sp-Endpoint Configuration Mode Commands chapter.

Caution

This is a critical configuration. The PCC Sp endpoint cannot be configured without this configuration. Any change to this configuration would lead to reset the PCC Sp interface and removing or disabling this configuration also disables the PCC Sp interface.

Example

The following command enters the existing PCC Sp Endpoint Configuration Mode (or creates it if it does not already exist) for the endpoint named sp_intfc1:

pcc-sp-endpoint sp_intfc1

The following command will remove sp_intfc1 from the system:
pcc-sp-endpoint name sp_intfcl

**pdg-service**

Creates a new PDG service or specifies an existing PDG service and enters the PDG Service Configuration Mode. A maximum of 16 PDG services can be created. This limit applies per ASR 5000 chassis and per context.

**Product**

PDG/TTG

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] pdg-service name
```

**name**

Specifies the name of a new or existing PDG service as an alphanumeric string 1 through 63 characters that must be unique across all FNG services within the same context and across all contexts.

**Important**

Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Use this command in Context Configuration Mode to create a new PDG service or modify an existing one. Executing this command enters the PDG Service Configuration Mode.

**Example**

The following command configures an PDG service named *pdg_service_1* and enters the PDG Service Configuration Mode:

```
pdg-service pdg_service_1
```

**pdif-service**

Creates a new, or specifies an existing, Packet Data Interworking Function (PDIF) service and enters the PDIF Service Configuration Mode.
### pdif-service

**Product**
PDIF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] pdif-service name [ -noconfirm ]
```

- **name**
  Specifies the name of a new or existing PDIF service as an alphanumeric string of 1 through 63 characters.

**Important**
Service names must be unique across all contexts within a chassis.

**Usage Guidelines**

Use this command to create a new or enter an existing PDIF service.

Entering this command results in the following prompt:

```
[context_name]host_name(config-pdif-service)#
```

PDIF Service Configuration Mode commands are defined in the *PDIF Service Configuration Mode Commands* chapter.

**Example**

The following command configures a PDIF service called *pdif2* and enters the PDIF Service Configuration Mode:

```
pdif-service pdif2
```

---

### pdsn-service

**Product**
PDSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```
Syntax Description

[ no ] pdsn-service name

no
Indicates the packet data service specified is to be removed.

name
Specifies the name of the PDSN service to configure. If name does not refer to an existing service, the new service is created if resources allow. name is an alphanumeric string of 1 through 63 characters.

Important
Service names must be unique across all contexts within a chassis.

Usage Guidelines
Enter the PDSN Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

Caution
Large numbers of services greatly increase the complexity of management and may impact overall system performance (resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your Cisco service representative for more information.

Example
The following command will enter the PDSN Service Configuration Mode creating the service sampleService, if necessary.

pdsn-service sampleService

The following command will remove sampleService as being a defined PDSN service.

no pdsn-service sampleService

pdsnclosedrp-service

Creates or deletes a Closed R-P packet data service or specifies an existing PDSN Closed R-P service for which to enter the Closed R-P Service Configuration Mode for the current context.

Product
PDSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

**Syntax Description**

```plaintext
[ no ] pdsnclosedrp-service name
```

- **no**
  - Removes the specified PDSN Closed R-P service.

- **name**
  - Specifies the name of the Closed R-P PDSN service to configure. If `name` does not refer to an existing service, the new service is created if resources allow. `name` is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**Usage Guidelines**

Enter the Closed R-P Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (i.e. resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

---

**Example**

The following command enters the Closed R-P Service Configuration Mode creating the service `sampleService`, if necessary:

```plaintext
pdsnclosedrp-service sampleService
```

The following command removes `sampleService` as being a defined Closed R-P PDSN service:

```plaintext
no pdsnclosedrp-service sampleService
```

---

**pgw-service**

Creates a PDN-Gateway (P-GW) service or specifies an existing P-GW service and enters the P-GW Service Configuration Mode for the current context.

**Product**

- P-GW
- SAEGW

**Privilege**

- Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

### Syntax Description

**pgw-service**  
`service_name`  
`[-noconfirm]`

**no pgw-service**  
`service_name`

**service_name**

Specifies the name of the P-GW service. If `service_name` does not refer to an existing service, the new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

**no pgw-service service_name**

Removes the specified P-GW service from the context.

---

### Usage Guidelines

Enter the P-GW Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-pgw-service) #
```

P-GW Service Configuration Mode commands are defined in the *P-GW Service Configuration Mode Commands* chapter.

Use this command when configuring the following eHRPD and SAE components: P-GW.

---

### Example

The following command enters the existing P-GW Service Configuration Mode (or creates it if it does not already exist) for the service named `pgw-service1`:

```
pgw-service pgw-service1
```

The following command will remove `pgw-service1` from the system:

```
no pgw-service pgw-service1
```
policy

Enters an existing accounting policy or creates a new one where accounting parameters are configured.

Product

HSGW
P-GW
S-GW
SAEGW

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] policy accounting name

no

Removes the specified accounting policy from the context.

name

Specifies the name of the existing or new accounting policy as an alphanumeric string of 1 through 63 characters.

Usage Guidelines

Use this command to enter the Accounting Policy Configuration mode to edit an existing accounting policy or configure a new policy.

Entering this command results in the following prompt:

[context_name]host_name(config-accounting-policy)#

Accounting Policy Configuration Mode commands are defined in the Accounting Policy Configuration Mode Commands chapter.

Example

The following command enters the Accounting Policy Configuration Mode for a policy named acct5:

policy accounting acct5

policy-group

Creates or deletes a policy group. It enters the Policy-Group Configuration Mode within the current destination context for flow-based traffic policing to a subscriber session flow.
### policy-map

**Product**

- PDSN
- HA
- ASN-GW
- HSGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] policy-group name policy_group
```

- **no**
  
  Deletes configured policy group within the context.

- **name policy_group**
  
  Specifies the name of Policy-Group as an alphanumeric string of 1 through 15 characters that is case sensitive.

**Usage Guidelines**

Use this command to form a policy group from a set of configured Policy-Maps. A policy group supports up to 16 policies for a subscriber session flow.

**Example**

The following command configures a policy group `policy_group1` for a subscriber session flow:

```
policy-group name policy_group1
```
Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] policy-map name policy_name

no

Deletes configured Policy-Map within the context.

cpyolicy_name

Specifies the name of Policy-Map as an alphanumeric string of 1 through 15 characters that is case sensitive.

Usage Guidelines

Use this command to enter Traffic Policy-Map Configuration Mode and to set the Class-Map and corresponding traffic flow treatment to traffic policy for a subscriber session flow.

Example

Following command configures a policy map policy1 where other flow treatments is configured.

cpyolicy-map name policy1

ppp

Configures point-to-point protocol parameters for the current context.

Product

PDSN
GGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

renegotiation retain-ip-address | retransmit-timeout milliseconds }
no ppp { auth-retry suppress-aaa-auth | chap fixed-challenge-length |
dormant send-lcp-terminate | lcp-authentication-descard retry-alternate
num_discard | lcp-authentication-reject retry-alternate | lcp-start-delay
| lcp-terminate connect-state | reject-peer-authentication | renegotiation
retain-ip-address }
default lcp-authentication-descard retry-alternate num_discard

default
Restores the system defaults for the specific command/keyword.

no
Disables, deletes, or resets the specified option.

For no ppp renegotiation retain-ip-address the initially allocated IP address will be released and a new IP address will be allocated during PPP renegotiation.

acfc { receive { allow | deny } | transmit { apply | ignore | reject} }
Configures PPP Address and Control Field Compression (ACFC) parameters.

receive { allow | deny }
This keyword specifies whether to allow Address and Control Field Compressed PPP packets received from the Peer. During LCP negotiation, the local PPP side indicates whether it can handle ACFC compressed PPP packets. Default: allow

When allow is specified, the local PPP side indicates that it can process ACFC compressed PPP packets and compressed packets are allowed. When deny is specified, the local PPP side indicates that it cannot handle ACFC compressed packets and compressed packets are not allowed.

transmit { apply | ignore | reject }
Specifies how Address and Control Field Compression should be applied for PPP packets transmitted to the Peer. During LCP negotiation, the Peer indicates whether it can handle ACFC compressed PPP packets.
Default: ignore

When apply is specified, if the peer requests ACFC, the request is accepted and ACFC is applied for transmitted PPP packets. When ignore is specified, if the peer requests ACFC, the request is accepted, but ACFC is not applied for transmitted PPP packets. When reject is specified, if the peer requests ACFC, the request is rejected and ACFC is not applied to transmitted packets.

auth-retry suppress-aaa-auth
This option does not allow PPP authentication retries to the AAA server after the AAA server has already authenticated a session. PPP locally stores the username and password, or challenge response, after a successful PPP authentication. If the Mobile Node retries the PAP request or CHAP-Response packet to the PDSN, PPP locally compares the incoming username, password or Challenge Response with the information stored from the previous successful authentication. If it matches, PAP ACK or CHAP Success is sent back to the Mobile Node, without performing AAA authentication. If the incoming information does not match with what is stored locally, then AAA authentication is attempted. The locally stored PPP authentication information is cleared once the session reaches a connected state.

Default: no auth-retry suppress-aaa-auth
This option is not supported in conjunction with the GGSN product.

**chap fixed-challenge-length length**

Normally PPP CHAP uses a random challenge length from 17 to 32 bytes. This command allows you to configure a specific fixed challenge length of from 4 through 32 bytes. *length* must be an integer from 4 through 32.

Default: Disabled. PAPCHAP uses a random challenge length.

**dormant send-lcp-terminate**

Indicates a link control protocol (LCP) terminate message is enabled for dormant sessions.

This option is not supported in conjunction with the GGSN product.

**echo-max-retransmissions num_retries**

Configures the maximum number of retransmissions of LCP ECHO_REQ before a session is terminated in an always-on session. *num_retries* must be an integer from 1 through 16. Default: 3

**echo-retransmit-timeout msec**

Configures the timeout (in milliseconds) before trying LCP ECHO_REQ for an always-on session. *msec* must be an integer from 100 through 5000. Default: 3000

**first-lcp-retransmit-timeout milliseconds**

Specifies the number of milliseconds to wait before attempting to retransmit control packets. This value configures the first retry. All subsequent retries are controlled by the value configured for the ppp retransmit-timeout keyword.

*milliseconds* must be an integer from 100 through 5000. Default: 3000

**lcp-authentication-discard retry-alternate num_discard**

Sets the number of discards up to which authentication option is discarded during LCP negotiation and retries starts to allow alternate authentication option. *num_discard* must be an integer from 0 through 5. Recommended value is 2. Default: Disabled.

**lcp-authentication-reject retry-alternate**

Specifies the action to be taken if the authentication option is rejected during LCP negotiation and retries the allowed alternate authentication option.

Default: Disabled. No alternate authentication option will be retried.
**lcp-start-delay delay**

Specifies the delay (in milliseconds) before link control protocol (LCP) is started. delay must be an integer from 0 through 5000. Default: 0

**lcp-terminate connect-state**

Enables sending an LCP terminate message to the Mobile Node when a PPP session is disconnected if the PPP session was already in a connected state.

Note that if the no keyword is used with this option, the PDSN must still send LCP Terminate in the event of an LCP/PCP negotiation failure or PPP authentication failure, which happens during connecting state.

---

**Important**

This option is not supported in conjunction with the GGSN product.

**lcp-terminate mip-lifetime-expiry**

Configures the PDSN to send an LCP Terminate Request when a MIP Session is terminated due to MIP Lifetime expiry (default).

Note that if the no keyword is used with this option, the PDSN does not send a LCP Terminate Request when a MIP session is terminated due to MIP Lifetime expiry.

**lcp-terminate mip-revocation**

Configures the PDSN to send a LCP Terminate Request when a MIP Session is terminated due to a Revocation being received from the HA (default).

Note that if the no keyword is used with this option, the PDSN does not send a LCP Terminate Request when a MIP session is terminated due to a Revocation being received from the HA.

**max-authentication-attempts num**

Configures the maximum number of time the PPP authentication attempt is allowed. num must be an integer from 1 through 10. Default: 1

**max-configuration-nak num**

This command configures the maximum number of consecutive configuration REJ/NAKs that can be sent during CP negotiations, before the CP is terminated. num must be an integer from 1 through 20. Default: 10

**max-retransmission number**

Specifies the maximum number of times control packets will be retransmitted. number must be an integer from 1 through 16. Default: 5

**max-terminate number**

Sets the maximum number of PPP LCP Terminate Requests transmitted to the Mobile Node. number must be an integer from 0 through 16. Default: 2
This option is not supported in conjunction with the GGSN product.

**mru packet_size**

Specifies the maximum packet size that can be received in bytes. `packet_size` must be an integer from 128 through 1500. Default: 1500

**negotiate default-value-options**

Enables the inclusion of configuration options with default values in PPP configuration requests. Default: Disabled

The PPP standard states that configuration options with default values should not be included in Configuration Request (LCP, IPCP, etc.) packets. If the option is missing in the Configuration Request, the peer PPP assumes the default value for that configuration option.

When `negotiate default-value-options` is enabled, configuration options with default values are included in the PPP configuration Requests.

**peer-authenticate user_name [ [ encrypted ] password password ]**

Specifies the username and an optional password required for point-to-point protocol peer connection authentications. `user_name` is an alphanumeric string of 1 through 63 characters. The keyword `password` is optional and if specified `password` is an alphanumeric string of 1 through 63 characters. The password specified must be in an encrypted format if the optional keyword `encrypted` was specified.

The `encrypted` keyword is intended only for use by the system while saving configuration scripts. The system displays the `encrypted` keyword in the configuration file as a flag that the variable following the `password` keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

**pfc { receive { allow | deny } | transmit { apply | ignore | reject } }**

Configures Protocol Field Compression (PFC) parameters.

**receive { allow | deny }** Default: `allow`

This keyword specifies whether to allow Protocol Field Compression (PFC) for PPP packets received from the peer. During LCP negotiation, the local PPP side indicates whether it can handle Protocol Field Compressed PPP packets.

When `allow` is specified, the peer is allowed to request PFC during LCP negotiation. When `deny` is specified, the Peer is not allowed to request PFC during LCP negotiation.

**transmit { apply | ignore | reject }** Default: `ignore`

This keyword specifies how Protocol field Compression should be applied for PPP packets transmitted to the Peer. During LCP negotiation, the Peer indicates whether it can handle PFC compressed PPP packets.

When `apply` is specified, if the peer requests PFC, it is accepted and PFC is applied for transmitted PPP packets. When `ignore` is specified, If the peer requests PFC, it is accepted but PFC is not applied for transmitted packets. When `reject` is specified, all requests for PFC from the peer are rejected.
reject-peer-authentication

If disabled, re-enables the system to reject peer requests for authentication. Default: Enabled

renegotiation retain-ip-address

If enabled, retain the currently allocated IP address for the session during PPP renegotiation (SimpleIP) between FA and Mobile node. Default: Enabled

If disabled, the initially allocated IP address will be released and a new IP address will be allocated during PPP renegotiation.

retransmit-timeout milliseconds

Specifies the number of milliseconds to wait before attempting to retransmit control packets. milliseconds must be an integer from 100 through 5000. Default: 3000

Usage Guidelines

Modify the context PPP options to ensure authentication and communication for PPP sessions have fewer dropped sessions.

Example

The following commands set various PPP options:

```
ppp dormant send-lcp-terminate
ppp max-retransmission 3
ppp peer-authenticate user1 password secretPwd
ppp peer-authenticate user1
ppp retransmit-timeout 1000
```

The following command disables the sending of LCP terminate messages for dormant sessions.

```
no ppp dormant send-lcp-terminate
```

ppp magic-number

Manages magic number checking during LCP Echo message handling. The magic number is a random number chosen to distinguish a peer and detect looped back lines.

Product

PDSN
GGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx) #
```

Syntax Description

[ no | default ] ppp magic-number receive ignore
no
Disables the specified behavior.

default
Restores the system defaults for the specific command/keyword.

receive ignore
Ignores the checking of magic number at the PDSN during LCP Echo message handling. Default: Disabled.
If a valid magic numbers were negotiated for the PPP endpoints during LCP negotiation and LCP Echo Request/Response have invalid magic numbers, enabling this command will cause the system to ignore the checking of magic number during LCP Echo message handling.

Usage Guidelines
Use this command to allow the system to ignore invalid magic number during LCP Echo Request/Response handling.

Example
The following command allows the invalid magic number during LCP Echo Request/Response negotiation:

```
ppp magic-number receive ignore
```
success-sessions misc-reasons
Alters statistical calculations so that: ppp successful session = successful sessions + misc-reasons.

success-sessions remote-terminated
Alters statistical calculations so that: ppp successful session = successful sessions + remote-terminated.

Usage Guidelines
Use this command to alter how certain PPP statistics are calculated.

Caution
This command alters the way that some PPP statistics are calculated. Please consult your designated service representative before using this command

Example
The following command alters the statistic "ppp successful session" so that it displays the sum of successful sessions and lcp-max-retry:

```
ppp statistics success-sessions lcp-max-retry
```

The following command disables the alteration of the statistic ppp successful session:

```
no ppp statistics success-sessions lcp-max-retry
```

proxy-dns intercept-list

Enters the HA Proxy DNS Configuration Mode and defines a name of a redirect rules list for the domain name servers associated with a particular FA (Foreign Agent) or group of FAs.

Important
HA Proxy DNS Intercept is a license-enabled feature.

Product
HA

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
```configure > context context_name```
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```
name

Defines the rules list and enters the Proxy DNS Configuration Mode. *name* must be an alphanumeric string of 1 through 63 characters.

Usage Guidelines

Use this command to define a name for a list of rules pertaining to the IP addresses associated with the foreign network's DNS. Up to 128 rules of any type can be configured per rules list.

Upon entering the command, the system switchesto the HA Proxy DNS Configuration Mode where the lists can be defines. Up to 64 separate rules lists can be configured in a single AAA context.

This command and the commands in the HA Proxy DNS Configuration Mode provide a solution to the Mobile IP problem that occurs when a MIP subscriber, with a legacy MN or MN that does not support IS-835D, receives a DNS server address from a foreign network that is unreachable from the home network. The following flow shows the steps that occur when this feature is enabled:

By configuring the Proxy DNS feature on the Home Agent, the foreign DNS address is intercepted and replaced with a home DNS address while the call is being handled by the home network.

Example

The following command creates a proxy DNS rules list named *list1* and places the CLI in the HA Proxy DNS Configuration Mode:

```
proxy-dns intercept-list list1
```

radius accounting

This command configures RADIUS accounting parameters for the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius accounting { archive [ stop-only ] | deadline deadline | detect-dead-server { consecutive-failures consecutive_failures | keepalive | response-timeout timeout_duration } | interim interval seconds | max-outstanding max_messages | max-pdu-size octets | max-retries max_retries | max-transmissions max_transmissions | timeout timeout_duration | unestablished-sessions }

default radius accounting { deadline | detect-dead-server | interim interval seconds | max-outstanding | max-pdu-size | max-retries | max-transmissions | timeout }

no radius accounting { archive | detect-dead-server | interim interval | max-transmissions | unestablished-sessions }
```
**default**

Configures the default settings.

**no**

Removes earlier configuration for the specified keyword.

**archive [ stop-only ]**

Enables archiving of RADIUS Accounting messages in the system after the accounting message has exhausted retries to all available RADIUS Accounting servers. All RADIUS Accounting messages generated by a session are delivered to the RADIUS Accounting server in serial. That is, previous RADIUS Accounting messages from the same call must be delivered and acknowledged by the RADIUS Accounting server before the next RADIUS Accounting message is sent to the RADIUS Accounting server.

*stop-only* specifies archiving of STOP accounting messages only.

Default: Enabled

**deadtime dead_minutes**

Specifies the number of minutes to wait before attempting to communicate with a server which has been marked as unreachable.

*dead_minutes* must be an integer from 0 through 65535.

Default: 10

**detect-dead-server { consecutive-failures consecutive_failures | keepalive | response-timeout timeout_duration }**

- **consecutive-failures consecutive_failures**: Specifies the number of consecutive failures, for each AAA manager, before a server is marked as unreachable.

  *consecutive_failures* must be an integer from 0 through 1000.

  Default: 4

- **keepalive**: Enables the AAA server alive-dead detect mechanism based on sending keep alive authentication messages to all authentication servers.

  Default: Disabled

- **response-timeout timeout_duration**: Specifies the number of seconds for each AAA manager to wait for a response to any message before a server is detected as failed, or in a down state.

  *timeout_duration* must be an integer from 1 through 65535.

**Important**

If both *consecutive-failures* and *response-timeout* are configured, then both parameters have to be met before a server is considered unreachable, or dead.
**interim interval seconds**

Specifies the time interval (in seconds) for sending accounting INTERIM-UPDATE records. *seconds* must be an integer from 50 through 4000000.

---

**Important**

If RADIUS is used as the accounting protocol for the GGSN product, other commands are used to trigger periodic accounting updates. However, these commands would cause RADIUS STOP/START packets to be sent as opposed to INTERIM-UPDATE packets. Also note that accounting interim interval settings received from a RADIUS server take precedence over those configured on the system.

Default: Disabled

**max-outstanding max_messages**

Specifies the maximum number of outstanding messages a single AAA manager instance will queue. *max_messages* must be an integer from 1 through 4000. Default: 256

**max-pdu-size octets**

Specifies the maximum sized packet data unit which can be accepted/generated in bytes (octets). *octets* must be an integer from 512 through 4096. Default: 4096

**max-retries max_retries**

Specifies the maximum number of times communication with a AAA server will be attempted before it is marked as unreachable and the detect dead servers consecutive failures count is incremented. *max_retries* must be an integer from 0 through 65535. Default: 5

Once the maximum number of retries is reached this is considered a single failure for the consecutive failures count for detecting dead servers.

**max-transmissions max_transmissions**

Sets the maximum number of transmissions for a RADIUS accounting message before the message is declared as failed. *max_transmissions* must be an integer from 1 through 65535. Default: Disabled

**timeout seconds**

Specifies the amount of time to wait for a response from a RADIUS server before retransmitting a request. *seconds* must be an integer from 1 through 65535. Default: 3

**unestablished-sessions**

Indicates RADIUS STOP events are to be generated for sessions that were initiated but never fully established.

---

**Usage Guidelines**

Manage the RADIUS accounting options according to the RADIUS server used for the context.

**Example**

The following commands configure accounting options.
radius accounting detection consecutive-failures 5
radius accounting max-pdu-size 1024
radius accounting timeout 16

**radius accounting algorithm**

This command specifies the fail-over/load-balancing algorithm to select the RADIUS accounting server(s) to which accounting data must be sent.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius accounting algorithm { first-n n | first-server [ fallback ] | round-robin }
default radius accounting algorithm
```

**default**

Configures the default setting.

Default: `first-server`

**first-n n**

Specifies that the AGW must send accounting data to \( n \) (more than one) AAA accounting servers based on their priority. The full set of accounting data is sent to each of the \( n \) AAA servers. Response from any one of the servers would suffice to proceed with the call. On receiving an ACK from any one of the accounting servers, all retries are stopped.

\( n \) is the number of AAA accounting servers to which accounting data will be sent, and must be an integer from 2 through 128. Default: 1 (Disabled)

**first-server[ fallback ]**

Specifies that the context must send accounting data to the RADIUS accounting server with the highest configured priority. In the event that this server becomes unreachable, accounting data is sent to the accounting server with the next-highest configured priority. This is the default algorithm.

**fallback**: This algorithm is an extension of the existing "first-server" algorithm. This algorithm specifies that the context must send accounting data to the RADIUS server with the highest configured priority. When the server is unreachable, accounting data is sent to the server with the next highest configured priority. If a higher priority server recovers back, the accounting requests of existing sessions and new sessions are sent to the newly recovered server.
This new algorithm behaves similar to "first-server" algorithm, i.e. the accounting data is sent to the highest priority RADIUS/mediation server at any point of time.

If the highest priority server is not reachable, accounting data is sent to the next highest priority server. The difference between "first-server" and "first-server fallback" is that, with the new algorithm, if a higher priority server recovers, all new RADIUS requests of existing sessions and new accounting sessions are sent to the newly available higher priority server. In the case of "first-server" algorithm, the accounting requests of existing sessions continued to be sent to the same server to which the previous accounting requests of those sessions were sent.

The following are the two scenarios during which the requests might be sent to lower priority servers even though a higher priority server is available:

- When `radius max-outstanding` command or `max-rate` is configured, there are chances that the generated requests might be queued and waiting to be sent when bandwidth is available. If a higher priority server recovers, the queued requests will not be switched to the newly available higher priority server.
- When a higher priority server becomes reachable, all existing requests, which are being retried to a lower priority server, will not be switched to the newly available higher priority RADIUS server.

**round-robin**

Specifies that the context must load balance sending accounting data among all of the defined RADIUS accounting servers. Accounting data is sent in a circular queue fashion on a per Session Manager task basis, where data is sent to the next available accounting server and restarts at the beginning of the list of configured servers. The order of the list is based upon the configured relative priority of the servers.

**Usage Guidelines**

Use this command to specify the algorithm to select the RADIUS accounting server(s) to which accounting data must be sent.

**Example**

The following command specifies to use the round-robin algorithm to select the RADIUS accounting server:

```bash
radius accounting algorithm round-robin
```

---

**radius accounting apn-to-be-included**

This command configures the Access Point Name (APN) to be included for RADIUS accounting.

**Product**

GGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```bash
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```
Syntax Description

radius accounting apn-to-be-included { gi | gn }
default radius accounting apn-to-be-included

default
Configures the default setting.

gi
Specifies the usage of the Gi APN name in the RADIUS accounting request. The Gi APN represents the APN received in the Create PDP context request message from the SGSN.

gn
Specifies the usage of the Gn APN name in the RADIUS accounting request. The Gn APN represents the APN selected by the GGSN.

Usage Guidelines

Use this command to configure the APN name for RADIUS Accounting. This can be set to either gi or gn.

Example

The following command specifies the usage of Gn APN name in the RADIUS accounting request:
radius accounting apn-to-be-included gn

radius accounting billing-version

This command configures the billing-system version of RADIUS accounting servers.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
\[(context_name)host_name(config-ctx)\]

Syntax Description

radius accounting billing-version version
default radius accounting billing-version

default
Configures the default setting. Default: 0

version
Specifies the billing-system version of RADIUS accounting servers as an integer from 0 through 4294967295. Default: 0
Usage Guidelines

Use this command to configure the billing-system version of RADIUS accounting servers.

Example

The following command configures the billing-system version of RADIUS accounting servers as 10:

```
radius accounting billing-version 10
```

**radius accounting gtp trigger-policy**

This command configures the RADIUS accounting trigger policy for GTP messages.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
Exec > Global Configuration > Context Configuration
```

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius accounting gtp trigger-policy [ standard | ggsn-preservation-mode ]
default radius accounting gtp trigger-policy
```

<table>
<thead>
<tr>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>Resets the RADIUS accounting trigger policy to standard behavior for GTP session.</td>
</tr>
<tr>
<td>standard</td>
<td>Sets the RADIUS accounting trigger policy to standard behavior which is configured for GTP session for GGSN service.</td>
</tr>
<tr>
<td>ggsn-preservation-mode</td>
<td>Sends RADIUS Accounting Start when the GTP message with private extension of preservation mode is received from SGSN.</td>
</tr>
</tbody>
</table>

**Important**

This is a customer-specific keyword and needs customer-specific license to use this feature. For more information on GGSN preservation mode, refer to *GGSN Service Configuration Mode Commands* chapter.

**Usage Guidelines**

Use this command to set the trigger policy for the AAA accounting for a GTP session.
Example
The following command sets the RADIUS accounting trigger policy for GTP session to standard:

```
default radius accounting gtp trigger-policy
```

radius accounting ha policy

This command configures the RADIUS accounting policy for HA sessions.

**Product**
HA

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius accounting ha policy { session-start-stop | custom1-aaa-res-mgmt }
```

```
default radius accounting ha policy
```

**session-start-stop**
Specifies to send Accounting Start when the session is connected, and send Accounting Stop when the session is disconnected. This is the default behavior.

**custom1-aaa-res-mgmt**
Accounting Start/Stop messages are generated to assist special resource management done by AAA servers. It is similar to the session-start-stop accounting policy, except for the following differences:

- Accounting Start is generated when a new call overwrites an existing session. Accounting Start is also generated during MIP session handoffs.
- No Accounting stop is generated when an existing session is overwritten and the new session continues to use the IP address assigned for the old session.

**Usage Guidelines**
Use this command to set the behavior of the AAA accounting for an HA session.

Example
The following command sets the HA accounting policy to `custom1-aaa-res-mgmt`:
```
radius accounting ha policy custom1-aaa-res-mgmt
```
radius accounting interim volume

This command configures the volume of uplink and downlink volume octet counts that triggers RADIUS interim accounting.

**Product**

GGSN  
PDSN  
HA

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration  
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius accounting interim volume { downlink bytes uplink bytes | total bytes  
| uplink bytes downlink bytes }
no radius accounting interim volume
```

**no**

Disables volume based RADIUS accounting.

**downlink bytes uplink bytes**

Specifies the downlink to uplink volume limit for RADIUS Interim accounting, in bytes. bytes must be an integer to 100000 through 4000000000.

**total bytes**

Specifies the total volume limit for RADIUS interim accounting in bytes. bytes must be an integer from 100000 through 4000000000.

**uplink bytes**

Specifies the uplink volume limit for RADIUS interim accounting in bytes. bytes must be an integer from 100000 through 4000000000.

**downlink bytes**

Specifies the downlink volume limit for RADIUS interim accounting in bytes. bytes must be an integer from 100000 through 4000000000.

**Usage Guidelines**

Use this command to trigger RADIUS interim accounting based on the volume of uplink and downlink bytes.
Example

The following command triggers RADIUS interim accounting when the total volume of uplink and
downlink bytes reaches 110000:

```
radius accounting interim volume total 110000
```

radius accounting ip remote-address

This command configures IP remote address-based RADIUS accounting parameters.

Product

PDSN

HA

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
[ no ] radius accounting ip remote-address { collection | list list_id }
```

no

Removes earlier configuration for the specified keyword.

collection

Enables collecting and reporting Remote-Address-Based accounting in RADIUS Accounting. This should be
enabled in the AAA Context. It is disabled by default.

list list_id

Enters the Remote Address List Configuration Mode. This mode configures a list of remote addresses that
can be referenced by the subscriber's profile. `list_id` must be an integer from 1 through 65535.

Usage Guidelines

This command is used as part of the Remote Address-based Accounting feature to both configure remote IP
address lists and enable the collection of accounting data for the addresses in those lists on a per-subscriber
basis.

Individual subscriber can be associated to remote IP address lists through the configuration/specification of
an attribute in their local or RADIUS profile. (Refer to the `radius accounting` command in the Subscriber
Configuration mode.) When configured/specified, accounting data is collected pertaining to the subscriber's
communication with any of the remote addresses specified in the list.

Once this functionality is configured on the system and in the subscriber profiles, it must be enabled by
executing this command with the collection keyword.
Example
The following command enables collecting and reporting Remote-Address-Based accounting in RADIUS Accounting:

```
radius accounting ip remote-address collection
```

```
Example
The following command enables collecting and reporting Remote-Address-Based accounting in RADIUS Accounting:

 radius accounting ip remote-address collection
```

**radius accounting keepalive**

This command configures the keepalive authentication parameters for the RADIUS accounting server.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
| Command Modes | Exec > Global Configuration > Context Configuration  
configure > context context_name |

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

- `radius accounting keepalive { calling-station-id id | consecutive-response responses_no_of | framed-ip-address ip_address | interval interval_duration | retries retries_no_of | timeout timeout_duration | username user_name }`
- `no radius accounting keepalive framed-ip-address`
- `default radius accounting keepalive { calling-station-id | consecutive-response | interval | retries | timeout | username }`
- `no`

`no`

Removes configuration for the specified keyword.

`default`

Configures the default settings.

`calling-station-id id`

Configures the Calling-Station ID to be used for the keepalive authentication as an alphanumeric string of size 1 to 15 characters. Default: 000000000000000

`consecutive-response responses_no_of`

Configures the number of consecutive authentication response after which the server is marked as reachable. `responses_no_of` must be an integer from 1 through 5. Default: 1

**Important**

The keepalive request is tried every 0.5 seconds (non-configurable) to mark the server as up.
In this case (for keepalive approach) "radius accounting deadtime" parameter is not applicable.

**framed-ip-address ip_address**

Specifies the framed ip-address to be used for the keepalive accounting in IPv4 dotted-decimal notation.

**interval interval_duration**

Configures the time interval (in seconds) between the two keepalive access requests. Default: 30

**retries retries_no_of**

Configures the number of times the keepalive access request to be sent before marking the server as unreachable. *retries_no_of* must be an integer from 3 through 10. Default: 3

**timeout timeout_duration**

Configures the time interval between each keepalive access request retries. *timeout_duration* must be an integer from 1 through 30. Default: 3

**username user_name**

Configures the username to be used for the authentication as an alphanumeric string of 1 through 127 characters. Default: Test-Username

**Usage Guidelines**

Configures the keepalive authentication parameters for the RADIUS accounting server.

**Example**

The following command sets the user name for the RADIUS keepalive access requests to *Test-Username2*:

```
radius accounting keepalive username Test-Username2
```

The following command sets the number of retries to 4:

```
radius accounting keepalive retries 4
```

**radius accounting rp**

This command configures the current context's RADIUS accounting R-P originated call options.

**Product**

PDSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration  
configure > context *context_name*
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

**radius accounting rp** { handoff-stop { immediate | wait-active-stop } | tod minute hour | trigger-event { active-handoff | active-start-param-change | active-stop } | trigger-policy { airlink-usage [ counter-rollover ] | custom [ active-handoff | active-start-param-change | active-stop ] | standard } | trigger-stop-start }

**no radius accounting rp** { tod minute hour | trigger-event { active-handoff | active-start-param-change | active-stop } | trigger-stop-start }

default radius accounting rp { handoff-stop | trigger-policy }

**no**

Removes earlier configuration for the specified keyword.

**default**

Configures this command with the default settings.

**handoff-stop { immediate | wait-active-stop }**

Specifies the behavior of generating accounting STOP when handoff occurs.

- **immediate**: Indicates that accounting STOP should be generated immediately on handoff, i.e. not to wait active-stop from the old PCF.
- **wait-active-stop**: Indicates that accounting STOP is generated only when active-stop received from the old PCF when handoff occurs.

Default: **wait-active-stop**

**tod minute hour**

Specifies the time of day a RADIUS event is to be generated for accounting. Up to four different times of the day may be specified through separate commands.

- **minute** must be an integer from 0 through 59.
- **hour** must be an integer from 0 through 23.

**trigger-event { active-handoff | active-start-param-change | active-stop }**

Configures the events for which a RADIUS event is generated for accounting as one of the following:

- **active-handoff**: Disables a single R-P event (and therefore a RADIUS accounting event) when an Active PCF-to-PFC Handoff occurs. Instead, two R-P events occur (one for the Connection Setup, and the second for the Active-Start). Default: Disabled

- **active-start-param-change**: Disables an R-P event (and therefore a RADIUS accounting event) when an Active-Start is received from the PCF and there has been a parameter change. Default: Enabled

- **active-stop**: Disables an R-P event (and therefore a RADIUS accounting event) when an Active-Stop is received from the PCF. Default: Disabled
This keyword has been obsoleted by the `trigger-policy` keyword. Note that if this command is used, if the context configuration is displayed, RADIUS accounting RP configuration is represented in terms of the trigger-policy.

```
trigger-policy { airlink-usage [ counter-rollover ] | custom [ active-handoff | active-start-param-change | active-stop ] | standard }
```

Default: `airlink-usage`: Disabled

**custom:**
- `active-handoff`: Disabled
- `active-start-param-change`: Disabled
- `active-stop`: Disabled
- `standard`: Enabled

Configures the overall accounting policy for R-P sessions as one of the following:

- `airlink-usage [ counter-rollover ]`: Designates the use of Airlink-Usage RADIUS accounting policy for R-P, which generates a start on Active-Starts, and a stop on Active-Stops.

If the `counter-rollover` option is enabled, the system generates a STOP/START pair before input/output data octet counts (or input/output data packet counts) become larger than \((2^{32} - 1)\) in value. This setting is used to guarantee that a 32-bit octet count in any STOP message has not wrapped to larger than \(2^{32}\) thus ensuring the accuracy of the count. The system, may send the STOP/START pair at any time, so long as it does so before the 32-bit counter has wrapped. Note that a STOP/START pair is never generated unless the subscriber RP session is in the Active state, since octet/packet counts are not accumulated in the Dormant state.

- `custom`: specifies the use of custom RADIUS accounting policy for R-P. The custom policy can consist of the following:

  - `active-handoff`: Enables a single R-P event (and therefore a RADIUS accounting event) when an Active PCF-to-PFC Handoff occurs. Normally two R-P events will occur (one for the Connection Setup, and the second for the Active-Start).

  - `active-start-param-change`: Enables an R-P event (and therefore a RADIUS accounting event) when an Active-Start is received from the PCF and there has been a parameter change.

**Important**

Note that a custom trigger policy with only `active-start-param-change` enabled is identical to the `standard` trigger-policy.

- `active-stop`: Enables an R-P event (and therefore a RADIUS accounting event) when an Active-Stop is received from the PCF.
If the `radius accounting rp trigger-policy custom` command is executed without any of the optional keywords, all custom options are disabled.

- **standard**: Specifies the use of Standard RADIUS accounting policy for R-P in accordance with IS-835B.

**trigger-stop-start**

Specifies that a stop/start RADIUS accounting pair should be sent to the RADIUS server when an applicable R-P event occurs.

**Usage Guidelines**

Use this command to configure the events for which a RADIUS event is sent to the server when the accounting procedures vary between servers.

**Example**

The following command enables an R-P event (and therefore a RADIUS accounting event) when an Active-Stop is received from the PCF:

```
radius accounting rp trigger-event active-stop
```

The following command generates the STOP only when active-stop received from the old PCF when handoff occurs:

```
default radius accounting rp handoff-stop
```

**radius accounting server**

This command configures RADIUS accounting server(s) in the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius [ mediation-device ] accounting server ip_address [ encrypted ] key
  value [ acct-on { enable | disable } ] [ acct-off { enable | disable } ]
  [ max max_messages ] [ oldports ] [ port port_number ] [ priority priority ] [ type
  { mediation-device | standard } ] [ admin-status { enable | disable } ] [ -noconfirm ]
no radius [ mediation-device ] accounting server ip_address [ oldports |
  port port_number ]
```
no

Removes the server or server port(s) specified from the list of configured servers.

mediation-device

Enables mediation-device specific AAA transactions used to communicate with this RADIUS server.

**Important**

If this option is not used, the system by default enables standard AAA transactions.

`ip_address`

Specifies the IP address of the accounting server.

*ip_address* must be specified in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. A maximum of 128 RADIUS servers can be configured per context. This limit includes accounting and authentication servers.

`[ encrypted ] key value`

Specifies the shared secret key used to authenticate the client to the servers. The *encrypted* keyword indicates the key specified is encrypted.

In 12.1 and earlier releases, the *key value* must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 256 characters with encryption.

In 12.2 and later releases, the *key value* must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 236 characters with encryption enabled.

The *encrypted* keyword is intended only for use by the system while saving configuration scripts. The system displays the *encrypted* keyword in the configuration file as a flag that the variable following the *key* keyword is the encrypted version of the plaintext key. Only the encrypted key is saved as part of the configuration file.

`acct-on { enable | disable }

This keyword enables/disables sending of the Accounting-On message when a new RADIUS server is added to the configuration. By default, this keyword will be disabled.

When enabled, the Accounting-On message is sent when a new RADIUS server is added in the configuration. However, if for some reason the Accounting-On message cannot be sent at the time of server configuration (for example, if the interface is down), then the message is sent as soon as possible. Once the Accounting-On message is sent, if it is not responded to after the configured RADIUS accounting timeout, the message is retried the configured number of RADIUS accounting retries. Once all retries have been exhausted, the system no longer attempts to send the Accounting-On message for this server.

In releases prior to 18.0, whenever a chassis boots up or when a new RADIUS accounting server or RADIUS mediation-device accounting server is configured with Acct-On configuration enabled, the state of the RADIUS server in all the AAA manager instances was initialized to "Waiting-for-response-to-Accounting-On". The Acct-On transmission and retries are processed by the Admin-AAAmgr.

When the Acct-On transaction is complete (i.e., when a response for Accounting-On message is received or when Accounting-On message is retried and timed-out), Admin-AAAmgr changes the state of the RADIUS accounting server to Active in all the AAA manager instances. During the period when the state of the server...
is in "Waiting-for-response-to-Accounting-On", any new RADIUS accounting messages which are generated as part of a new call will not be transmitted towards the RADIUS accounting server but it will be queued. Only when the state changes to Active, these queued up messages will be transmitted to the server.

During ICSR, if the interface of the radius nas-ip address is srp-activated, then in the standby chassis, the sockets for the nas-ip will not be created. The current behavior is that if the interface is srp-activated Accounting-On transaction will not happen at ICSR standby node and the state of the RADIUS server in all the AAAmgr instances will be shown as "Waiting-for-response-to-Accounting-On" till the standby node becomes Active.

In 18.0 and later releases, whenever the chassis boots up or when a new RADIUS accounting server or RADIUS mediation-device accounting server is configured with Acct-On configuration enabled, the state of the RADIUS server will be set to Active for all the non-Admin-AAAmgr instances and will be set to "Waiting-for-response-to-Accounting-On" for only Admin-AAAmgr instance. The Accounting-On transaction logic still holds good from Admin-AAAmgr perspective. However, when any new RADIUS accounting messages are generated even before the state changes to Active in Admin-AAAmgr, these newly generated RADIUS accounting messages will not be queued at the server level and will be transmitted to the RADIUS server immediately.

During ICSR, even if the interface of radius nas-ip address is srp-activated, the state of the RADIUS accounting server will be set to Active in all non-Admin-AAAmgr instances and will be set to "Waiting-for-response-to-Accounting-On" in Admin-AAAmgr instance.

\[ \text{acct-off} \{ \text{enable} | \text{disable} \} \]

Default: enable

Disables and enables the sending of the Accounting-Off message when a RADIUS server is removed from the configuration.

The Accounting-Off message is sent when a RADIUS server is removed from the configuration, or when there is an orderly shutdown. However, if for some reason the Accounting-On message cannot be sent at this time, it is never sent. The Accounting-Off message is sent only once, regardless of how many accounting retries are enabled.

\[ \text{max max_messages} \]

Specifies the maximum number of outstanding messages that may be allowed to the server. \( \text{max_messages} \) must be an integer from 0 through 4000. Default: 0

\[ \text{oldports} \]

Sets the UDP communication port to the out of date standardized default for RADIUS communications to 1646.

\[ \text{port port_number} \]

Specifies the port number to use for communications as an integer from 1 through 65535. Default: 1813

\[ \text{priority priority} \]

Specifies the relative priority of this accounting server. The priority is used in server selection for determining which server to send accounting data to.

\( \text{priority} \) must be an integer from 1 through 1000, where 1 is the highest priority. When configuring two or more servers with the same priority you will be asked to confirm that you want to do this. If you use the
-noconfirm option, you are not asked for confirmation and multiple servers could be assigned the same priority.
Default: 1000

type { mediation-device | standard }
Specifies the type of AAA transactions to use to communicate with this RADIUS server.
  • standard: Use standard AAA transactions.
  • mediation-device: This keyword is obsolete.
Default: standard

type standard
Specifies the use of standard AAA transactions to use to communicate with this RADIUS server. Default: standard

admin-status { enable | disable }
Enables or disables the RADIUS authentication/accounting/charging server functionality, and saves the status setting in the configuration file to re-establish the set status at reboot.

-noconfirm
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines
This command is used to configure the RADIUS accounting servers with which the system is to communicate for accounting.

Up to 128 RADIUS servers can be configured per context. The servers can be configured as Accounting, Authentication, charging servers, or any combination thereof.

Example
The following commands configure the RADIUS accounting server with the IP address set to 10.2.3.4, port to 1024, and priority to 10:

radius accounting server 10.2.3.4 key sharedKey port 1024 max 127
radius accounting server 10.2.3.4 encrypted key scrambledKey oldports priority 10
no radius accounting server 10.2.5.6

The following command sets the accounting server with mediation device transaction for AAA server 10.2.3.4:

radius mediation-device accounting server 10.2.3.4 key sharedKey port 1024 max 127
radius algorithm

This command configures the RADIUS authentication server selection algorithm for the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

**Syntax Description**

radius algorithm { first-server | round-robin }

default radius algorithm

default

Configures this command with the default setting. Default: first-server

first-server

Sends authentication data to the first available RADIUS authentication server based upon the relative priority of each configured server.

round-robin

Sends authentication data in a circular queue fashion on a per Session Manager task basis where data is sent to the next available RADIUS authentication server and restarts at the beginning of the list of configured servers. The order of the list is based upon the configured relative priority of the servers.

**Usage Guidelines**

Use this command to configure the context's RADIUS server selection algorithm to ensure proper load distribution through the available RADIUS authentication servers.

**Example**

The following command configures to use the round-robin algorithm for RADIUS authentication server selection:

radius algorithm round-robin

radius allow

This command configures the system behavior to allow subscriber sessions when RADIUS accounting and/or authentication is unavailable.

**Product**
PDSN
HA
FA

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description
[ no ] radius allow { accounting-down | authentication-down }

no
Removes earlier configuration for the specified keyword.

accounting-down
Allows sessions while accounting is unavailable (down). Default: Enabled

authentication-down
Allows sessions while authentication is not available (down). Default: Disabled

Usage Guidelines
Allow sessions during system troubles when the risk of IP address and/or subscriber spoofing is minimal. The denial of sessions may cause dissatisfaction with subscribers at the cost/expense of verification and/or accounting data.

Important
Please note that this command is applicable ONLY to CDMA products. To configure this functionality in UMTS/LTE products (GGSN/P-GW/SAEGW), use the command mediation-device delay-GTP-response in APN Configuration mode.

Example
The following command configures the RADIUS server to allow the sessions while accounting is unavailable:

radius allow accounting-down

radius attribute

This command configures the system's RADIUS identification parameters.

Product
All

Privilege
Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

radius attribute { nas-identifier id | nas-ip-address address primary_address
[ backup secondary_address ] [ nexthop-forwarding-address nexthop_ip_address ]
[ vlan vlan_id ] [ mpls-label input in_label_value output out_label_value1
out_label_value2 ] }

no radius attribute { nas-identifier | nas-ip-address }
default radius attribute nas-identifier

no

Removes earlier configuration for the specified keyword.

default

Configures the default setting.

nas-identifier id

Specifies the attribute name by which the system will be identified in Access-Request messages. id must be an alphanumeric string of 1 through 32 characters that is case sensitive.

nas-ip-address address primary_address

Specifies the AAA interface IP address(es) used to identify the system. Up to two addresses can be configured. primary_address is the IP address of the primary interface to use in the current context in IPV4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

backup secondary_address

Specifies the IP address of the secondary interface to use in the current context in IPV4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

mpls-label input in_label_value | output out_label_value1 [ out_label_value2 ]

This command configures the traffic from the specified AAA client NAS IP address to use the specified MPLS labels.

• in_label_value is the MPLS label that identifies inbound traffic destined for the configured NAS IP address.

• out_label_value1 and out_label_value2 identify the MPLS labels to be added to the packets sent from the specified NAS IP address.

• out_label_value1 is the inner output label.

• out_label_value2 is the outer output label.

MPLS label values must be an integer from 16 through 1048575.
This option is available only when nexthop-forwarding gateway is also configured with the nexthop-forwarding-address keyword.

**nexthop-forwarding-address nexthop_ip_address**

Configures the next hop IP address for this NAS IP address in IPV4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**vlan vlan_id**

Specifies the VLANID to be associated with the next-hop IP address as an integer from 1 through 4094.

**Usage Guidelines**

This is necessary for NetWare Access Server usage such as the system must be identified to the NAS.

The system supports the concept of the active nas-ip-address. The active nas-ip-address is defined as the current source ip address for RADIUS messages being used by the system. This is the content of the nas-ip-address attribute in each RADIUS message.

The system will always have exactly one active nas-ip-address. The active nas-ip-address will start as the primary nas-ip-address. However, the active nas-ip-address may switch from the primary to the backup, or the backup to the primary. The following events will occur when the active nas-ip-address is switched:

- All current in-process RADIUS accounting messages from the entire system are cancelled. The accounting message is re-sent, with retries preserved, using the new active nas-ip-address. Acct-Delay-Time, however, is updated to reflect the time that has occurred since the accounting event. The value of Event-Timestamp is preserved.

- All current in-process RADIUS authentication messages from the entire system are cancelled. The authentication message is re-sent, with retries preserved, using the new active nas-ip-address. The value of Event-Timestamp is preserved.

- All subsequent in-process RADIUS requests uses the new active nas-ip-address.

The system uses a revertive algorithm when transitioning active NAS IP addresses as described below:

- If the configured primary nas-ip-address transitions from UP to DOWN, and the backup nas-ip-address is UP, then the active nas-ip-address switches from the primary to the backup nas-ip-address.

- If the backup nas-ip-address is active, and the primary nas-ip-address transitions from DOWN to UP, then the active nas-ip-address switches from the backup to the primary nas-ip-address.

**Example**

The following command configures the RADIUS attribute nas-ip-address as 10.2.3.4:

```
radius attribute nas-ip-address 10.2.3.4
```
radius authenticate null-username

This command enables (allows) or disables (prevents) the authentication of user names that are blank or empty. This is enabled by default.

**Product**
- PDSN

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
- configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no | default ] radius authenticate null-username
```

**default**

Configures the default setting.

Default: Authenticate, send Access-Request messages to the AAA server, all user names, including NULL user names.

**no**

Disables sending an Access-Request message to the AAA server for user names (NAI) that are blank.

**null-username**

Enables sending an Access-Request message to the AAA server for user names (NAI) that are blank.

**Usage Guidelines**

Use this command to disable, or re-enable, sending Access-Request messages to the AAA server for user names (NAI) that are blank (NULL).

**Example**

The following command disables sending of Access-Request messages for user names (NAI) that are blank:

```
no radius authenticate null-username
```

The following command re-enables sending of Access-Request messages for user names (NAI) that are blank:

```
radius authenticate null-username
```

radius authenticate apn-to-be-included

This command configures the Access Point Name (APN) to be included for RADIUS authentication.
radius authenticator-validation

This command enables (allows) or disables (prevents) the MD5 authentication of RADIUS users. By default this feature is enabled.

Product
PDSN
GGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:
)[context_name]host_name(config-ctx) #
Syntax Description

[ default | no ] radius authenticator-validation

default
Enables MD5 authentication validation for an Access-Request message to the AAA server.

no
Disables MD5 authentication validation for an Access-Request message to the AAA server.

Usage Guidelines

Use this command to disable, or re-enable, sending Access-Request messages to the AAA server for MD5 validation.

Example

The following command disables MD5 authentication validation for Access-Request messages for user names (NAI):

no radius authenticator-validation

The following command enables MD5 authentication validation for Access-Request messages for user names (NAI):

radius radius authenticator-validation

radius change-authorize-nas-ip

This command configures the NAS IP address and UDP port on which the current context will listen for Change of Authorization (COA) messages and Disconnect Messages (DM). If the NAS IP address is not defined with this command, any COA or DM messages from the RADIUS server are returned with a Destination Unreachable error.

Product

FA
GGSN
HA
LNS
PDSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

radius change-authorize-nas-ip ip_address [ encrypted ] key value [ port port ] [ event-timestamp-window window ] [ no-nas-identification-check ] [ no-reverse-path-forward-check ] [ mpls-label input in_label_value | output ]
no radius change-authorize-nas-ip

no

Deletes the NAS IP address information which disables the system from receiving and responding to COA and DM messages from the RADIUS server.

ip_address

Specifies the NAS IP address of the current context's AAA interface that was defined with the radius attribute command.

ip_address can be expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

[ encrypted ] key value

Specifies the shared secret key used to authenticate the client to the servers. The encrypted keyword indicates the key specified is encrypted.

In 12.1 and earlier releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 256 characters with encryption.

In 12.2 and later releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 236 characters with encryption enabled.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the key keyword is the encrypted version of the plain text key. Only the encrypted key is saved as part of the configuration file.

port port

The UDP port on which to listen for CoA and DM messages. Default: 3799

event-timestamp-window window

When a COA or DM request is received with an event-time-stamp, if the current-time is greater than the received-pkt-event-time-stamp plus the event-time-stamp-window, the packet is silently discarded.

When a COA or DM request is received without the event-time stamp attribute, the packet is silently discarded.

window must be an integer from 0 through 4294967295. If window is specified as 0 (zero), this feature is disabled; the event-time-stamp attribute in COA or DM messages is ignored and the event-time-stamp attribute is not included in NAK or ACK messages. Default: 300

no-nas-identification-check

Disables the context from checking the NAS Identifier/NAS IPAddress while receiving the CoA/DM requests. By default this check is enabled.

no-reverse-path-forward-check

Disables the context from checking whether received CoA or DM packets are from one of the AAA servers configured under the default AAA group in the current context. Only the src-ip address in the received CoA or DM request is validated and the port and key are ignored. The reverse-path-forward-check is enabled by default.
If `reverse-path-forward-check` is disabled, the CoA and DM messages will be accepted from AAA servers from any groups. If the check is enabled, then the CoA and DM messages will be accepted only from servers under default AAA group.

```plaintext
mpls-label input in_label_value | output out_label_value1 [ out_label_value2 ]
```

This command configures COA traffic to use the specified MPLS labels.

- `in_label_value` is the MPLS label that identifies inbound COA traffic.
- `out_label_value1` and `out_label_value2` identify the MPLS labels to be added to COA response.
  - `out_label_value1` is the inner output label.
  - `out_label_value2` is the outer output label.

MPLS label values must be an integer from 16 through 1048575.

**Usage Guidelines**

Use this command to enable the current context to listen for COA and DM messages.

Any one of the following RADIUS attributes may be used to identify the subscriber:

- **3GPP-IMSI**: The subscriber's IMSI. It may include the 3GPP-NSAPI attribute to delete a single PDP context rather than all of the PDP contexts of the subscriber when used with the GGSN product.
- **Framed-IP-address**: The subscriber's IP address.
- **Acct-Session-Id**: Identifies a subscriber session or PDP context.

**Important**

For the GGSN product, the value for Acct-Session-Id that is mandated by 3GPP is used instead of the special value for Acct-Session-Id that we use in the RADIUS messages we exchange with a RADIUS accounting server.

**Important**

When this command is used in conjunction with the GGSN, CoA functionality is not supported.

**Example**

The following command specifies the IP address `192.168.100.10` as the NAS IP address, a key value of `123456` and uses the default port of `3799`:

`radius change-authorize-nas-ip 192.168.100.10 key 123456`

The following command disables the nas-identification-check for the above parameters:

`radius change-authorize-nas-ip 192.168.100.10 key 123456 no-nas-identification-check`
radius charging

This command configures basic RADIUS options for Active Charging Services.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius charging { deadtime dead_minutes | detect-dead-server { consecutive-failures consecutive_failures | response-timeout timeout_duration } | max-outstanding max_messages | max-retries max_retries | max-transmissions transmissions | timeout timeout_duration }
```

- **default radius charging { deadtime | detect-dead-server | max-outstanding | max-retries | max-transmissions | timeout }
- **no**
- **default**

Removes configuration for the specified keyword.

**default**
Configures the default settings.

**deadtime dead_minutes**

Specifies the number of minutes to wait before attempting to communicate with a server which has been marked as unreachable.

- **dead_minutes** must be an integer from 0 through 65535.

Default: 10

**detect-dead-server { consecutive-failures consecutive_failures | response-timeout timeout_duration }
**

- **consecutive-failures consecutive_failures**: Default: 4. Specifies the number of consecutive failures, for each AAA manager, before a server is marked as unreachable. **consecutive_failures** must be an integer from 0 through 1000.

- **response-timeout timeout_duration**: Specifies the number of seconds for each AAA manager to wait for a response to any message before a server is detected as failed, or in a down state. **timeout_duration** must be an integer from 1 through 65535.
max-outstanding max_messages

Specifies the maximum number of outstanding messages a single AAA manager instance will queue. max_messages must be an integer from 1 through 4000. Default: 256

max-retries max_retries

Specifies the maximum number of times communication with a AAA server will be attempted before it is marked as unreachable and the detect dead servers consecutive failures count is incremented. max_retries must be an integer from 0 through 65535. Default: 5

max-transmissions transmissions

Sets the maximum number of re-transmissions for RADIUS authentication requests. This limit is used in conjunction with the max-retries for each server. transmissions must be an integer from 1 through 65535. Default: Disabled

When failing to communicate with a RADIUS server, the subscriber is failed once all of the configured RADIUS servers have been exhausted or once the configured number of maximum transmissions is reached.

For example, if 3 servers are configured and if the configured max-retries is 3 and max-transmissions is 12, then the primary server is tried 4 times (once plus 3 retries), the secondary server is tried 4 times, and then a third server is tried 4 times. If there is a fourth server, it is not tried because the maximum number of transmissions (12) has been reached.

timeout timeout_duration

Specifies the number of seconds to wait for a response from the RADIUS server before re-sending the messages. timeout_duration must be an integer from 1 through 65535. Default: 3

Usage Guidelines

Manage the basic Charging Service RADIUS options according to the RADIUS server used for the context.

Example

The following command configures the AAA server to be marked as unreachable when the consecutive failure count exceeds 6:

radius charging detect-dead-server consecutive-failures 6

The following command sets the timeout value to 300 seconds to wait for a response from RADIUS server before resending the messages:

radius charging timeout 300

radius charging accounting algorithm

This command specifies the fail-over/load-balancing algorithm to be used for selecting RADIUS servers for charging services.

Product

PDSN

GGSN
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[(context_name)host_name(config-ctx)#

Syntax Description

radius charging accounting algorithm { first-n n | first-server | round-robin }

first-n n
Specifies that the AGW must send accounting data to n (more than one) AAA servers based on their priority. Response from any one of the n AAA servers would suffice to proceed with the call. The full set of accounting data is sent to each of the n AAA servers.

n is the number of AAA servers to which accounting data will be sent, and must be an integer from 2 through 128. Default: 1 (Disabled)

first-server
Specifies that the context must send accounting data to the RADIUS server with the highest configured priority. In the event that this server becomes unreachable, accounting data is sent to the server with the next-highest configured priority. This is the default algorithm.

round-robin
Specifies that the context must load balance sending accounting data among all of the defined RADIUS servers. Accounting data is sent in a circular queue fashion on a per Session Manager task basis, where data is sent to the next available server and restarts at the beginning of the list of configured servers. The order of the list is based upon the configured relative priority of the servers.

Usage Guidelines

Use this command to specify the accounting algorithm to use to select RADIUS servers for charging services configured in the current context.

Example

The following command specifies to use the round-robin algorithm to select the RADIUS server:

radius charging accounting algorithm round-robin

radius charging accounting server

This command configures RADIUS charging accounting servers in the current context for Active Charging Services prepaid accounting.

Product

All

Privilege

Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

radius charging accounting server ip_address [ encrypted ] key key [ max max_messages ] [ max-rate max_rate ] [ oldports ] [ port port_number ] [ priority priority ] [ admin-status { enable | disable } ] [ -noconfirm ]

no radius charging accounting server ip_address [ oldports | port port_number ]

no

Removes the server or server port(s) specified from the list of configured servers.

ip_address

Specifies IP address of the accounting server in IPv4 dotted-decimal notation. A maximum of 128 RADIUS servers can be configured per context. This limit includes accounting and authentication servers.

[ encrypted ] key key

Specifies the shared secret key used to authenticate the client to the servers. The encrypted keyword indicates the key specified is encrypted.

In 12.1 and earlier releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 256 characters with encryption.

In 12.2 and later releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 236 characters with encryption enabled.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the key keyword is the encrypted version of the plain text key. Only the encrypted key is saved as part of the configuration file.

max max_messages

Specifies the maximum number of outstanding messages that may be allowed to the server. max_messages must be integer from 0 through 4000. Default: 0

max-rate max_rate

Specifies the rate (number of messages per second) at which the authentication messages should be sent to the RADIUS server. max_rate must be an integer from 0 through 1000. Default: 0 (Disabled)

oldports

Sets the UDP communication port to the out of date standardized default for RADIUS communications to 1646.
**port port_number**

Specifies the port number to use for communications as an integer from 1 through 65535. Default: 1813

**priority priority**

Specifies the relative priority of this accounting server. The priority is used in server selection for determining to which server to send accounting data. *priority* must be an integer 1 through 1000 where 1 is the highest priority. Default: 1000

**admin-status { enable | disable }**

Enables or disables the RADIUS authentication/accounting/charging server functionality, and saves the status setting in the configuration file to re-establish the set status at reboot.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

---

**Usage Guidelines**

This command is used to configure the RADIUS charging accounting server(s) with which the system is to communicate for Active Charging Services prepaid accounting requests.

Up to 128 AAA servers can be configured per context when the system is functioning as a PDSN and/or HA. Up to 16 servers are supported per context when the system is functioning as a GGSN.

**Example**

The following commands configure RADIUS charging accounting server with the IP address set to 10.2.3.4, port to 1024, and priority to 10:

```
radius charging accounting server 10.2.3.4 key sharedKey port 1024 max 127
radius charging accounting server 10.2.3.4 encrypted key scrambledKey oldports priority 10
```

---

**radius charging algorithm**

This command configures the RADIUS authentication server selection algorithm for Active Charging Services for the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```
Syntax Description

radius charging algorithm { first-server | round-robin }
default radius charging algorithm

default
Configures the default setting. Default: first-server

first-server
Sends accounting data to the first available server based upon the relative priority of each configured server.

round-robin
Sends accounting data in a circular queue fashion on a per Session Manager task basis where data is sent to the next available server and restarts at the beginning of the list of configured servers. The order of the list is based upon the configured relative priority of the servers.

Usage Guidelines
Set the context's RADIUS server selection algorithm for Active Charging Services to ensure proper load distribution through the servers available.

Example
The following command configures to use the round-robin algorithm for RADIUS server selection:
radius charging algorithm round-robin

radius charging server
This command configures the RADIUS charging server(s) in the current context for Active Charging Services prepaid authentication.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description
radius charging server ip_address [ encrypted ] key key [ max max-messages ] [ max-rate max_rate ] [ oldports ] [ port port_number ] [ priority priority ] [ admin-status { enable | disable } ] [ -noconfirm ]

no radius charging server ip_address [ oldports | port port_number ]

no
Removes the server or server port(s) specified from the list of configured servers.
ip_address
Specifies the IP address of the server in IPv4 dotted-decimal notation. A maximum of 128 RADIUS servers can be configured per context. This limit includes accounting and authentication servers.

[ encrypted ] key key
Specifies the shared secret key used to authenticate the client to the servers. The encrypted keyword indicates the key specified is encrypted.

In 12.1 and earlier releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 256 characters with encryption.

In 12.2 and later releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 236 characters with encryption enabled.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the key keyword is the encrypted version of the plain text key. Only the encrypted key is saved as part of the configuration file.

max max_messages
Specifies the maximum number of outstanding messages that may be allowed to the server. max_messages must be an integer from 0 through 4000. Default: 256

max-rate max_rate
Specifies the rate (number of messages per second), at which the authentication messages should be sent to the RADIUS server. max_rate must be an integer from 0 through 1000. Default: 0 (Disabled)

oldports
Sets the UDP communication port to the old default for RADIUS communications to 1645.

port port_number
Specifies the port number to use for communications as an integer from 1 through 65535. Default: 1812

priority priority
Specifies the relative priority of this accounting server. The priority is used in server selection for determining to which server to send accounting data. priority must be an integer from 1 through 1000 where 1 is the highest priority. Default: 1000

admin-status { enable | disable }
Enables or disables the RADIUS authentication/accounting/charging server functionality and saves the status setting in the configuration file to re-establish the set status at reboot.

-noconfirm
Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines
This command is used to configure the RADIUS charging server(s) with which the system is to communicate for Active Charging Services prepaid authentication requests.
Up to 128 AAA servers can be configured per context when the system is functioning as a PDSN and/or HA. Up to 16 servers are supported per context when the system is functioning as a GGSN.

**Example**

The following commands configure RADIUS charging server with the IP address set to 10.2.3.4, port to 1024, and priority to 10:

```
radius charging server 10.2.3.4 key sharedKey port 1024 max 127
radius charging server 10.2.3.4 encrypted key scrambledKey oldports priority 10
```

**radius deadtime**

This command configures the maximum period of time (in minutes) that must elapse between when a context marks a RADIUS server as unreachable and when it can re-attempt to communicate with the server.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius deadtime minutes
default radius deadtime
```

**default**

Configures the default setting.

Default: 10 minutes

**minutes**

Specifies the number of minutes to wait before changing the state of a RADIUS server from "Down" to "Active". minutes must be an integer from 0 through 65535.

**Important**

Configuring deadtime as 0 disables the feature and the server is never marked as DOWN.

**Usage Guidelines**

Use this command to configure the basic RADIUS parameters according to the RADIUS server used for the context.
This parameter is not applicable when **radius detect-dead-server keepalive** is configured. For keepalive approach, **radius keepalive consecutive-response** is used instead of **radius deadtime** to determine when the server is marked as reachable. For further explanation refer to **radius keepalive consecutive-response** command's description.

**Important**
This parameter should be set to allow enough time to remedy the issue that originally caused the server's state to be changed to "Down". After the dead time timer expires, the system returns the server's state to "Active" regardless of whether or not the issue has been fixed.

**Important**
For a complete explanation of RADIUS server states, if you are using StarOS 12.3 or an earlier release, refer to the **RADIUS Server State Behavior** appendix in the AAA and GTPP Interface Administration and Reference. If you are using StarOS14.0 or a later release, refer to the **AAA Interface Administration and Reference**.

**Example**
The following command configures the RADIUS deadtime to 100 minutes:

```
radius deadtime 100
```

**radius detect-dead-server**

This command configures how the system detects a dead RADIUS server.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**
```
radius detect-dead-server { consecutive-failures consecutive_failures_count | keepalive | response-timeout timeout_duration }
{ default | no } radius detect-dead-server
```

```
no
```

Removes the configuration.
default
Configures the default setting.

- **consecutive-failures**: Enabled; 4 consecutive failures
- **keepalive**: Disabled
- **response-timeout**: Disabled

**consecutive-failures consecutive_failures_count**
Specifies the consecutive number of times that the system must find the AAA server unreachable for the server to be marked unreachable, that is the server's state is changed from "Active" to "Down".

*consecutive_failures_count* must be an integer from 1 through 1000. Default: Enabled; 4 consecutive failures

**keepalive**
Enables the AAA server alive-dead detect mechanism based on sending keepalive authentication messages to all authentication servers. Default: Disabled

**response-timeout timeout_duration**
Specifies the time duration, in seconds, that the system must wait for a response from the AAA server to any message before the server is marked unreachable, that is the server's state is changed from "Active" to "Down".

*timeout_duration* must be an integer from 1 through 65535. Default: Disabled

**Usage Guidelines**
Use this command to configure how the system detects a dead RADIUS server.

---

**Important**
If both **consecutive-failures** and **response-timeout** are configured, then both parameters must be met before a server's state is changed to "Down".

---

**Important**
The "Active" or "Down" state of a RADIUS server as defined by the system, is based on accessibility and connectivity. For example, if the server is functional but the system has placed it into a "Down" state, it could be the result of a connectivity problem. When a RADIUS server's state is changed to "Down", a trap is sent to the management station and the **deadtime** timer is started.

---

**Example**
The following command enables the detect-dead-server consecutive-failures mechanism and configures the consecutive number of failures to 10:

```
radius detect-dead-server consecutive-failures 10
```
radius dictionary

Configures the RADIUS dictionary.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```
radius dictionary
```

**dictionary**

Specifies which dictionary to use.

**default**

Configures the default setting.

**dictionary**

Specifies which dictionary to use.

**Default**

Must be one of the following values:

**Table 2: RADIUS Dictionary Types**

<table>
<thead>
<tr>
<th>Dictionary</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3gpp</td>
<td>This dictionary consists of all the attributes in the standard dictionary, and all of the attributes specified in 3GPP 32.015.</td>
</tr>
<tr>
<td>3gpp2</td>
<td>This dictionary consists of all the attributes in the standard dictionary, and all of the attributes specified in IS-835-A.</td>
</tr>
<tr>
<td>3gpp2-835</td>
<td>This dictionary consists of all the attributes in the standard dictionary, and all of the attributes specified in IS-835.</td>
</tr>
<tr>
<td>customXX</td>
<td>These are customized dictionaries. For information on custom dictionaries, contact your local service representative. XX is the integer of the custom dictionary.</td>
</tr>
</tbody>
</table>

NOTE: RADIUS dictionary custom23 should be used in conjunction with Active Charging Service (ACS).
<table>
<thead>
<tr>
<th>Dictionary</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>standard</td>
<td>This dictionary consists only of the attributes specified in RFC 2865, RFC 2866, and RFC 2869.</td>
</tr>
<tr>
<td>starent</td>
<td>This dictionary consists of all the attributes in the starent-vsa1 dictionary and incorporates additional VSAs by using a two-byte VSA Type field. This dictionary is the master-set of all of the attributes in all of the dictionaries supported by the system.</td>
</tr>
<tr>
<td>starent-835</td>
<td>This dictionary consists of all of the attributes in the starent-vsa1-835 dictionary and incorporates additional VSAs by using a two-byte VSA Type field. This dictionary is the master-set of all of the attributes in all of the -835 dictionaries supported by the system.</td>
</tr>
</tbody>
</table>
| starent-vsa1       | This dictionary consists not only of the 3gpp2 dictionary, but also includes vendor-specific attributes (VSAs) as well. The VSAs in this dictionary support a one-byte wide VSA Type field in order to support certain RADIUS applications. The one-byte limit allows support for only 256 VSAs (0–255). This is the default dictionary. 

**Important** In 12.0 and later releases, no new attributes can be added to the **starent-vsa1** dictionary. If there are any new attributes to be added, these can only be added to the **starent** dictionary. For more information, please contact your Cisco account representative. |
| starent-vsa1-835   | This dictionary consists not only of the 3gpp2-835 dictionary, but also includes vendor-specific attributes (VSAs) as well. The VSAs in this dictionary support a one-byte wide VSA Type field in order to support certain RADIUS applications. The one-byte limit allows support for only 256 VSAs (0–255). This is the default dictionary. |

**Usage Guidelines**

Use this command to configure the RADIUS dictionary.

**Example**

The following command configures the RADIUS dictionary standard.

```
radius dictionary standard
```
radius group

This command has been deprecated and is replaced by AAA Server Group configurations. See the AAA Server Group Configuration Mode Commands chapter.

radius ip vrf

This command associates the specific AAA group (NAS-IP) with a Virtual Routing and Forwarding (VRF) Context instance for BGP/MPLS, GRE, and IPSec tunnel functionality which needs VRF support for RADIUS communication. By default the VRF is NULL, which means that AAA group is associated with global routing table.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

radius ip vrf vrf_name

no radius ip vrf

no

Disables the configured IP Virtual Routing and Forwarding (VRF) context instance and removes the association between the VRF context instance and the AAA group instance (NAS-IP).

By default this command is disabled, which means the NAS-IP being used is assumed a non-VRF IP and specific AAA group does not have any VRF association.

vrf_name

Specifies the name of a pre-configured VRF context instance. vrf_name is the alphanumeric string of a pre-configured VRF context configured in Context Configuration Mode via the ip vrf command.

Caution

Any incorrect configuration, such as associating AAA group with wrong VRF instance or removing a VRF instance, will fail the RADIUS communication.

Usage Guidelines

Use this command to associate/disassociate a pre-configured VRF context for a feature such as BGP/MPLS VPN or GRE, and IPSec tunneling which needs VRF support for RADIUS communication.

By default the VRF is NULL, which means that AAA group (NAS-IP) is associated with global routing table and NAS-IP being used is assumed a non-VRF IP.
This IP VRF feature can be applied to RADIUS communication, which associates the VRF with the AAA group. This command must be configured whenever a VRF IP is used as a NAS-IP in the AAA group or at the Context level for 'default' AAA group.

This is a required configuration as VRF IPs may be overlapping hence AAA needs to know which VRF the configured NAS-IP belongs to. By this support different VRF-based subscribers can communicate with different RADIUS servers using the same, overlapping NAS-IP address, if required across different AAA groups.

**Example**

The following command associates VRF context instance `ip_vrf1` with specific AAA group (NAS-IP):

```
radius ip vrf ip_vrf1
```

### radius keepalive

This command configures the keepalive authentication parameters for the RADIUS server.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius keepalive [ calling-station-id id | consecutive-response responses_no_of | encrypted | interval interval_duration | password | retries retries_no_of | timeout timeout_duration | username user_name | valid-response access-accept [ access-reject ] ]
default radius keepalive { calling-station-id | consecutive-response | interval | password | retries | timeout | username | valid-response }
```

**default**

Configures the default setting for the specified parameter.

**calling-station-id id**

Configures the Calling-Station ID to be used for the keepalive authentication. `id` must be an alphanumeric string of size 1 to 15 characters. Default: 000000000000000

**consecutive-response responses_no_of**

Configures the number of consecutive authentication responses after which the server is marked as reachable. `responses_no_of` must be an integer from 1 through 10. Default: 1
The keepalive request is tried every 0.5 seconds (non-configurable) to mark the server as up.

In this case (for keepalive approach) "radius deadtime" parameter is not applicable.

**encrypted password**

Designates use of encryption for the password.

In 12.1 and earlier releases, *password* must be an alphanumeric string of 1 through 63 characters.

In 12.2 and later releases, *password* must be an alphanumeric string of 1 through 132 characters.

Default: Test-Password

**interval interval_duration**

Configures the time interval (in seconds) between two keepalive access requests. *interval_duration* must be an integer from 30 through 65535. Default: 30

**password**

Configures the password to be used for the authentication as an alphanumeric string of 1 through 63 characters.

Default: Test-Password

**retries retries_no_of**

Configures the number of times the keepalive access request are sent before marking the server as unreachable. *retries_no_of* must be an integer from 3 through 10. Default: 3

**timeout timeout_duration**

Configures the time interval (in seconds) between keepalive access request retries. *timeout_duration* must be an integer from 1 through 30. Default: 3

**username user_name**

Configures the username to be used for authentication as an alphanumeric string of 1 through 127 characters.

Default: Test-Username

**valid-response access-accept [ access-reject]**

Configures the valid response for the authentication request.

If *access-reject* is configured, then both access-accept and access-reject are considered as success for the keepalive authentication request.

If *access-reject* is not configured, then only access-accept is considered as success for the keepalive access request.

Default: keepalive valid-response access-accept
Usage Guidelines

Use this command to configure the Keepalive Authentication parameters for the RADIUS server.

Example

The following command sets the user name for the RADIUS keepalive access requests to Test-Username2:

```
radius keepalive username Test-Username2
```

The following command sets the number of retries to 4:

```
radius keepalive retries 4
```

radius max-outstanding

This command configures the maximum number of outstanding messages a single AAA Manager instance will queue.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
radius max-outstanding max_messages
default radius max-outstanding
```

**default**

Configures the default setting.

Default: 256

**max_messages**

Specifies the maximum number of outstanding messages a single AAA Manager instance will queue.

Default: 256

Usage Guidelines

Use this command to configure the maximum number of outstanding messages a single AAA Manager instance will queue.

Example

The following command configures the maximum number of outstanding messages a single AAA Manager instance will queue to 100:

```
radius max-outstanding 100
```
radius max-retries

This command configures the maximum number of times communication with a AAA server will be attempted before it is marked as "Not Responding".

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-ctx)#

**Syntax Description**

radius max-retries  max_retries

default radius max-retries

default

Configures the default setting.

**max_retries**

Specifies the maximum number of times communication with a AAA server will be attempted before it is marked as "Not Responding", and the detect dead server's consecutive failures count is incremented. max_retries must be an integer from 0 through 65535. Default: 5

**Usage Guidelines**

Use this command to configure the maximum number of times communication with a AAA server will be attempted before it is marked as "Not Responding".

**Example**

The following command configures the maximum number of times communication with a AAA server will be attempted before it is marked as "Not Responding" to 10:

radius max-retries 10

radius max-transmissions

This command configures the maximum number of re-transmissions for RADIUS authentication requests.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

configure > context context_name
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```
radius max-transmissions max_transmissions
{ default | no } radius max-transmissions
```

**no**

Deletes the RADIUS max-transmissions configuration.

**default**

Configures the default setting.

Default: Disabled

**max_transmissions**

Specifies the maximum number of re-transmissions for RADIUS authentication requests. This limit is used in conjunction with `radius max-retries` configuration for each server. `max_transmissions` must be an integer from 1 through 65535. Default: Disabled

When failing to communicate with a RADIUS server, the subscriber is failed once all of the configured RADIUS servers have been exhausted, or once the configured number of maximum transmissions is reached.

For example, if three servers are configured and if the configured max-retries is 3 and max-transmissions is 12, then the primary server is tried four times (once plus three retries), the secondary server is tried four times, and then a third server is tried four times. If there is a fourth server, it is not tried because the maximum number of transmissions (12) has been reached.

### Usage Guidelines

Use this command to configure the maximum number of re-transmissions for RADIUS authentication requests.

### Example

The following command configures the maximum number of re-transmissions for RADIUS authentication requests to 10:

```
radius max-transmissions 10
```

---

**radius mediation-device**

See the `radius accounting server` command.

**radius probe-interval**

This command configures the interval between two RADIUS authentication probes.

<table>
<thead>
<tr>
<th>Product</th>
<th>All products supporting Interchassis Session Recovery (ICSR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

radius probe-interval seconds

default radius probe-interval

default

Configures the default setting of 3.

seconds

Specifies the time duration (in seconds) to wait before sending another probe authentication request to a RADIUS server. The value must be an integer from 1 through 65535. Default: 3

Usage Guidelines

Use this command for ICSR support to set the duration between two authentication probes to the RADIUS server.

Example

The following command sets the authentication probe interval to 30 seconds.

radius probe-interval 30

radius probe-max-retries

This command configures the number of retries for RADIUS authentication probe response.

Product

All products supporting Inter chassis Session Recovery (ICSR)

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

radius probe-max-retries retries

default radius probe-max-retries

default

Configures the default setting.

Default: 5
retries

Specifies the number of retries for RADIUS authentication probe response before the authentication is declared as failed. retries must be an integer from 1 through 65535. Default: 5

Usage Guidelines

Use this command for ICSR support to set the number of attempts to send RADIUS authentication probe without a response before the authentication is declared as failed.

Example

The following command sets the maximum number of retries to 6:

radius probe-max-retries 6

radius probe-message

This command configures the service ip-address to be sent as an AVP in RADIUS authentication probe messages.

Product

All products supporting Inter chassis Session Recovery (ICSR)

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

radius probe-message local-service-address ipv4/ipv6_address
	no radius probe-message local-service-address

no

Disables sending of AVPs configured under probe-message cli in RADIUS authentication probe messages.

radius probe-message local-service-address

radius probe-message

Configures AVPs to be sent in RADIUS authentication probe messages.

local-service-address

Configures the service ip-address to be sent as an AVP in RADIUS authentication probe messages.

ipv4/ipv6_address

Specifies the IPv4/IPv6 address of the server in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. A maximum of 128 RADIUS servers can be configured per context. This limit includes accounting and authentication servers.
Example
The following command configures the service ip-address 21.32.36.25 to be sent as an AVP in RADIUS authentication probe messages:

```
radius probe-message local-service-address 21.32.36.25
```

radius probe-timeout

This command configures the timeout duration to wait for a response for RADIUS authentication probes.

**Product**
All products supporting Interchassis Session Recovery (ICSR)

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctxt)#
```

**Syntax Description**

```
radius probe-timeout timeout_duration
default radius probe-timeout
```

**default**
Configures the default setting.

Default: 3

**timeout_duration**
Specifies the time duration (in seconds) to wait for a response from the RADIUS server before resending the authentication probe. `timeout_duration` must be an integer from 1 through 65535. Default: 3

**Usage Guidelines**
Use this command for ICSR support to set the duration to wait for a response before re-sending the RADIUS authentication probe to the RADIUS server.

**Example**
The following command sets the authentication probe timeout to 120 seconds:

```
radius probe-timeout 120
```

radius server

This command configures RADIUS authentication server(s) in the current context.
Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
radius server ip_address [ encrypted ] key value [ max max_messages ] [ max-rate max_rate ] [ oldports ] [ port port_number ] [ priority priority ] [ probe | no-probe ] [ probe-username user_name ] [ probe-password [ encrypted ] password password ] [ type { mediation-device | standard } ] [ admin-status { enable | disable } ] [ -noconfirm ]
```

no

Removes the server or server port(s) specified from the list of configured servers.

```
   ip_address
```

Specifies the IP address of the server in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. A maximum of 128 RADIUS servers can be configured per context. This limit includes accounting and authentication servers.

```
   [ encrypted ] key value
```

Specifies the shared secret key used to authenticate the client to the servers. The `encrypted` keyword indicates the key specified is encrypted.

In 12.1 and earlier releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 256 characters with encryption.

In 12.2 and later releases, the key value must be an alphanumeric string of 1 through 127 characters without encryption, and 1 through 236 characters with encryption enabled.

The `encrypted` keyword is intended only for use by the system while saving configuration scripts. The system displays the `encrypted` keyword in the configuration file as a flag that the variable following the `key` keyword is the encrypted version of the plain text key. Only the encrypted key is saved as part of the configuration file.

```
   max max_messages
```

Specifies the maximum number of outstanding messages that may be allowed to the server. `max_messages` must be an integer from 0 through 4000. Default: 256

```
   max-rate max_rate
```

Specifies the rate (number of messages per second), at which the authentication messages should be sent to the RADIUS server. `max_rate` must be an integer from 0 through 1000. Default: 0 (Disabled)
oldports
Sets the UDP communication port to the old default for RADIUS communications to 1645.

port port_number
Specifies the port number to use for communications as an integer from 1 through 65535. Default: 1812

priority priority
Specifies the relative priority of this accounting server. The priority is used in server selection for determining to which server is to send accounting data.

priority must be an integer from 1 through 1000 where 1 is the highest priority. When configuring two or more servers with the same priority you will be asked to confirm that you want to do this. If you use the -noconfirm option, you are not asked for confirmation and multiple servers could be assigned the same priority.
Default: 1000

probe
Enables probe messages to be sent to the specified RADIUS server.

no-probe
Disables probe messages from being sent to the specified RADIUS server. This is the default behavior.

probe-username username
Specifies the username sent to the RADIUS server to authenticate probe messages. username must be an alphanumeric string of 1 through 127 characters.

probe-password [ encrypted ] password password
The password sent to the RADIUS server to authenticate probe messages.

encrypted: This keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the password keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file.

password password: Specifies the probe-user password for authentication. password must be an alphanumeric string of 1 through 63 characters.

type { mediation-device | standard }
Specifies the type of transactions the RADIUS server accepts.

mediation-device: Specifies mediation-device specific AAA transactions. This device is available if you purchased a transaction control services license. Contact your local sales representative for licensing information.

standard: Specifies standard AAA transactions. (Default)
**admin-status { enable | disable }**

Enables or disables the RADIUS authentication/accounting/charging server functionality, and saves the status setting in the configuration file to re-establish the set status at reboot.

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

This command is used to configure the RADIUS authentication server(s) with which the system is to communicate for authentication.

Up to 128 RADIUS servers can be configured per context. The servers can be configured as Accounting, Authentication, charging servers, or any combination thereof.

**Example**

The following commands configure RADIUS server with the IP address set to 10.2.3.4, port to 1024, and priority to 10:

```
radius server 10.2.3.4 key sharedKey port 1024 max 127
radius server 10.2.3.4 encrypted key scrambledKey oldports priority 10
```

**radius strip-domain**

This command configures the stripping of the domain from the user name prior to authentication or accounting.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
radius strip-domain { authentication-only | accounting-only }
no radius strip-domain
```

`no`

Removes the RADIUS strip-domain configuration.

**authentication-only**

Specifies that the domain must be stripped from the user name prior to authentication.

**accounting-only**

Specifies that the domain must be stripped from the user name prior to accounting.
Usage Guidelines
Use this command to configure the stripping of domain from the user name prior to authentication or accounting.

By default, strip-domain configuration will be applied to both authentication and accounting messages, if configured. When the argument authentication-only or accounting-only is present, strip-domain is applied only to the specified RADIUS message types.

Example
The following command configures the stripping of domain from the user name prior to authentication:

```
radius strip-domain authentication-only
```

---

radius timeout

This command configures the time duration to wait for a response from the RADIUS server before resending the messages.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
radius timeout timeout_duration

default radius timeout
default
```

**default**

Configures the default setting.

**timeout_duration**

Specifies the time duration (in seconds) to wait for a response from the RADIUS server before resending the messages. `timeout_duration` must be an integer from 1 through 65535. Default: 3

Usage Guidelines
Use this command to configure the time duration to wait for a response from the RADIUS server before resending the messages.

Example
The following command configures the RADIUS timeout parameter to 300 seconds:

```
radius timeout 300
```
radius trigger

This command enables specific RADIUS triggers. The RADIUS Trigger configuration in the Context Configuration Mode is to enable backward compatibility. To configure RADIUS triggers for the default AAA group, you must configure them in the Context Configuration Mode.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
  - configure > context context_name
  
  Entering the above command sequence results in the following prompt:
  
  ```
  [context_name]host_name(config-ctx)#
  ```

**Syntax Description**

```
[ no ] radius trigger { ms-timezone-change | qos-change | rai-change | rat-change | serving-node-change | uli-change }

default radius trigger
```

- **no**
  
  Disables the specified RADIUS trigger.

- **default**
  
  Configures the default setting.
  
  Default: All RADIUS triggers are enabled.

- **ms-timezone-change**
  
  Specifies to enable RADIUS trigger for MS time zone change.

- **qos-change**
  
  Specifies to enable RADIUS trigger for Quality of Service change.

- **rai-change**
  
  Specifies to enable RADIUS trigger for Routing Area Information change.

- **rat-change**
  
  Specifies to enable RADIUS trigger for Radio Access Technology change.

- **serving-node-change**
  
  Specifies to enable RADIUS trigger for Serving Node change.
uli-change
Specifies to enable RADIUS trigger for User Location Information change.

Usage Guidelines
Use this command to enable RADIUS triggers.

Example
The following command enables RADIUS trigger for RAT change:

```
radius trigger rat-change
```

realtime-trace-module
This command is used to create, configure, or delete the module for Real Time Cell Traffic Tracing in a context.

Product
MME

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration
```
configure > context context_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

Syntax Description
```
[ no ] realtime-trace-module
```

no
Removes the real time trace module configuration for the current context.

```
realtime-trace-module
```

Creates the module for real time cell traffic tracing.

Once the realtime trace module is configured, the real time trace file transfer parameters can be configured.

Usage Guidelines
Use this command to configure the module for Real Time Cell Traffic Tracing in a context. The user must be in a non-local context when specifying the `realtime-trace-module` command.

On entering this command, the CLI prompt changes to:
```
[context_name]host_name(config-realtime-trace)#
```

remote-server-list

Creates or specifies the name of an existing remote server list for this context and enters the Remote Access List Configuration Mode.
Product: All
Privilege: Administrator
Command Modes: Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description:

remote-server-list name list_name
no remote-server-list name list_name

no

Removes the specified remote server list from the context.

list_name

Specifies the name of the remote server list. If list_name does not refer to an existing list, the new list is created if resources allow. list_name is an alphanumeric string of 1 through 31 characters.

Usage Guidelines:

Enter the Remote Server List Configuration Mode for an existing list or for a newly defined list. This command is also used to remove an existing remote access list.

A maximum of 256 services (regardless of type) can be configured per system.

Entering this command results in the following prompt:
[context_name]host_name(config-remote-server-list)#

Remote Server List Configuration Mode commands are defined in the remote Server List Configuration Mode Commands chapter.

Example:

The following command enters the Remote Server List Configuration Mode for the list named remote_list_1:

remote-server-list remote_list_1

The following command will remove remote_list_1 from the system:

no remote-server-list remote_list_1

route-access-list extended

Configures an access list for filtering routes based on a specified range of IP addresses.

Product:

PDSN
HA
GGSN
route-access-list extended

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration

\texttt{configure > context context\_name}

Entering the above command sequence results in the following prompt:

\texttt{[context\_name]host\_name(config-ctx) #}

Syntax Description
\begin{verbatim}
[ no ] route-access-list extended \texttt{identifier} \{ deny \ | \ permit \} \texttt{ip} \{ network\_parameter \} \{ mask\_parameter
\end{verbatim}

\texttt{no}
Deletes the specified route access list.

\texttt{identifier}
Specifies a value to identify the route access list as an integer from 100 through 999.

\texttt{deny}
Deny routes that match the specified criteria.

\texttt{permit}
Permit routes that match the specified criteria.

\texttt{ip network\_parameter ip\_address wildcard\_mask}
Specifies the network portion of the route to match. The network portion of the route is mandatory and must be expressed in one of the following ways:

- \texttt{ip\_address wildcard\_mask}: Matches a network address and wildcard mask expressed in IPv4 dotted-decimal notation.
- \texttt{any}: Matches any network address.
- \texttt{host network\_address}: Match the specified network address exactly. \texttt{network\_address} must be an IPv4 address specified in dotted-decimal notation.

\texttt{mask\_parameter}
This specifies the mask portion of the route to match. The mask portion of the route is mandatory and must be expressed in one of the following ways:

- \texttt{mask\_address wildcard\_mask}: A mask address and wildcard mask expressed in IPv4 dotted-decimal notation.
- \texttt{any}: Match any network mask.
- \texttt{host mask\_address}: Match the specified mask address exactly. \texttt{mask\_address} must be an IPv4 address specified in dotted-decimal notation.
Usage Guidelines

Use this command to create an extended route-access-list that matches routes based on network addresses and masks.

Example

Use the following command to create an extended route-access-list:

```
route-access-list extended 100 permit ip 192.168.100.0 0.0.0.255
```

route-access-list named

Configures an access list for filtering routes based on a network address and net mask.

Product

- PDSN
- HA
- GGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
[ no ] route-access-list named list_name { deny | permit } { ip_address/mask | any } [ exact-match ]
```

no

Deletes the specified route access list.

`list_name`

Specifies name that identifies the route access list as an alphanumeric string of 1 through 79 characters.

`deny`

Denies routes that match the specified criteria.

`permit`

Permits routes that match the specified criteria.

`ip_address/mask`

Specifies the IP address (in IPv4 dotted-decimal notation) and the number of subnet bits, representing the subnet mask in CIDR notation (for example 10.1.1.1/24).
**any**
Matches any route.

**exact-match**
Matches the IP address prefix exactly.

### Usage Guidelines
Use this command to create route-access lists that specify routes that are accepted.
Up to 16 routes can be added to each route-access-list.

### Example
Use the following command to create a route access list named `list27` that permits routes that match `192.168.1.0/24` exactly:

```
route-access-list named list 27 permit 192.168.1.0/24 exact-match
```
To delete the list, use the following command:

```
no route-access-list named list 27 permit 192.168.1.0/24 exact-match
```

## route-access-list standard

Configures an access-list for filtering routes based on network addresses.

### Product
PDSN
HA
GGSN

### Privilege
Security Administrator, Administrator

### Command Modes
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

### Syntax Description

```
[ no ] route-access-list standard identifier { permit | deny } { ip_address wildcard_mask | any | host network_address }
```

**no**
Deletes the specified route access list.

**identifier**
Specifies a value that identifies the route-access-list as an integer from 1 through 99.
deny
Denies routes that match the specified criteria.

permit
Permits routes that match the specified criteria.

**ip_address wildcard_mask**
Specifies the IP address and subnet mask to match for routes. Both ip_address and wildcard_mask must be entered in IPv4 dotted-decimal notation. (For example, 192.168.100.0 255.255.255.0)

any
Matches any route.

**host network_address**
Matches only route having the specified network address as if it had a 32-bit network mask. network_address must be an IPv4 address specified in dotted-decimal notation.

**Usage Guidelines**
Use this command to create route-access-lists that specify routes that are accepted.

**Example**
Use the following command to create a route access list with an identifier of 10 that permits routes:
```
route-access-list standard 10 permit 192.168.1.0 255.255.255.0
```
To delete the list, use the following command:
```
no route-access-list standard 10 permit 192.168.1.0 255.255.255.0
```

**route-map**
Creates a route-map that is used by the routing features and enters Route-map Configuration mode. A route-map allows redistribution of routes and includes a list of match and set commands associated with it. The match commands specify the conditions under which redistribution is allowed; the set commands specify the particular redistribution actions to be performed if the criteria specified by match commands are met. Route-maps are used for detailed control over route distribution between routing processes. Up to eight route-maps can be created in each context. Refer to the *Route-map Configuration Mode Commands* chapter for more information.

**Product**
PDSN
HA
GGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx) #

Syntax Description

route-map map_name { deny | permit } seq_number

no route-map map_name

no

Deletes the specified route map.

map_name

Specifies the name of the route map to create or edit as an alphanumeric string of 1 through 69 characters.

deny

If the deny parameter is specified and the match command criteria are met, the route is not redistributed and any other route maps with the same map name are not examined. Set commands have no affect on deny route-maps.

permit

If the permit parameter is specified, and the match criteria are met, the route is redistributed as specified by set actions. If the match criteria are not met, the next route map with the same name is tested.

seq_number

Specifies the sequence number that indicates the position a new route map is to have in the list of route maps already configured with the same name. Route maps with the same name are tested in ascending order of their sequence numbers. This must be an integer from 1 through 65535.

Usage Guidelines

Use this command to create route maps that allow redistribution of routes based on specified criteria and set parameters for the routes that get redistributed. The chassis supports a maximum of 64 route maps per context.

Example

To create a route map named map1 that permits routes that match the specified criteria, use the following command:

route-map map1 permit 10

To delete the route-map, enter the following command:

no route-map map1 permit 10

router

Enables BGP, Open Shortest Path First (OSPF) or OSPF version 3 (OSPFv3) routing functionality and enters the corresponding Configuration Mode. Refer to the BGP Configuration Mode Commands, OSPF Configuration...
Mode Commands or OSPFv3 Configuration Mode Commands chapter for details on associated Configuration mode commands.

**Product**
- PDSN
- HA
- GGSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] router { bgp as_number | ospf | ospfv3 | rip }
```

- **no**
  Disables the specified routing support in the current context.

- **bgp as_number**
  Enables a BGP routing service for this context and assigns it the specified Autonomous System (AS) number before entering the BGP Configuration mode. `as_number` must be an integer from 1 through 4294967295.

  **Important**
  BGP routing is supported only for use with the HA.

- **ospf**
  Enables OSPF routing in this context and enters OSPF Configuration mode.

- **ospfv3**
  Enables OSPFv3 routing in this context and enter OSPFv3 Configuration mode.

**Usage Guidelines**

Use this command to enable and configure OSPF and BGP routing in the current context.

**Important**
You must obtain and install a valid license key to use these features. Refer to the *System Administration Guide* for details on obtaining and installing feature use license keys.
Example

The following command enables the OSPF routing functionality and enters the OSPF Configuration Mode:

`router ospf`

The following command enables the OSPFv3 routing functionality and enters the OSPFv3 Configuration Mode:

`router ospfv3`

The following command enables a BGP routing service with an AS number of 100, and enters the BGP Configuration Mode:

`router bgp 100`
Context Configuration Mode Commands S-Z

This section includes the commands `s102-service` through `wsg-service` service.

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-ctx)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `s102-service`, on page 682
- `saegw-service`, on page 683
- `sbc-service`, on page 684
- `server`, on page 685
- `service-redundancy-protocol`, on page 687
- `session-event-module`, on page 687
- `sgsn-service`, on page 688
- `sgs-service`, on page 689
- `sgtp-service`, on page 690
- `sgw-service`, on page 691
- `sls-service`, on page 692
- `smcs-service`, on page 693
- `ssh`, on page 695
- `ssl`, on page 696
- `subscriber`, on page 697
- `sx-service`, on page 698
- `threshold available-ip-pool-group`, on page 699
- `threshold ha-service init-rrq-rcvd-rate`, on page 700
- `threshold ip-pool-free`, on page 701
- `threshold ip-pool-hold`, on page 702
- `threshold ip-pool-release`, on page 704
- `threshold ip-pool-used`, on page 705
s102-service

Creates and configures an S102 service instance to manage an S102 interface. The S102 interface is used in support of the CSFB for CDMA 1xRTT feature and the SRVCC for CDMA 1xRTT feature.

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] s102-service service_name
```

- **no**
  Remove the configuration for the specified S102 service from the configuration of the current context.

- **service_name**
  Specifies the name of the S102 service as a unique alphanumeric string from 1 through 63 characters in length.

**Important**
Service names must be unique across all contexts within a chassis.

**Usage Guidelines**
Use this command to create, edit, or remove an S102 service. The S102 service configuration is used to configure and manage the S102 interface.

An unlimited number of S102 service configurations can be created. However, for the S102 interface associated with the S102 service configuration to function, the S102 service/interface must be associated with an MME service, using the `associate` command in the MME service configuration mode. This requirement effectively limits the MME to supporting a maximum of 8 'associated' S102 service configurations at one time.

For details on the configuration and use of an S102 service/interface, refer to either the CSFB for 1xRTT or SRVCC for 1xRTT feature chapter in the *MME Administration Guide*. 
Example
The following command creates an S102 service named S102intf-1 in the current context:

```
s102-service s102intf-1
```

saegw-service

Creates a System Architecture Evolution Gateway (SAEGW) service or specifies an existing SAEGW service and enters the SAEGW Service Configuration Mode for the current context.

**Product**
SAEGW

**Privilege**
Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
saegw-service service_name [ -noconfirm ]
no saegw-service service_name
```

- **no**
  Removes the specified SAEGW service from the context.

- **service_name**
  Specifies the name of the SAEGW service. If `service_name` does not refer to an existing service, the new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

- **-noconfirm**
  Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Enter the SAEGW Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

**Important**

An S-GW and/or P-GW created in the same context must be associated with this SAEGW service.

A maximum of 256 services (regardless of type) can be configured per system.
Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following prompt:

```
[context_name]hostname(config-saegw-service)#
```

SAEGW Service Configuration Mode commands are defined in the SAEGW Service Configuration Mode Commands chapter.

Use this command when configuring the following SAE components: SAEGW.

### Example

The following command enters the existing SAEGW Service Configuration Mode (or creates it if it does not already exist) for the service named `saegw-service1`:

```
saegw-service saegw-service1
```

The following command will remove `pgw-service1` from the system:

```
no saegw-service saegw-service1
```

## sbc-service

Creates or removes an SBC service and enters the SBC Service Configuration mode. This mode configures or edits the configuration for an SBC service which controls the interface between the MME and E-SMLC.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
Exec > Global Configuration > Context Configuration
```

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
[ no ] sbc-service sbc_svc_name
```

- **no**
  - Remove the configuration for the specified SBC service from the configuration of the current context.

- **sbc_svc_name**
  - Specifies the name of the SBC service as a unique alphanumeric string from 1 to 63 characters.
  - The SBC service name must be unique across all contexts.
Service names must be unique across all contexts within a chassis.

Usage Guidelines
Use this command to create, edit, or remove an SBc service.
Up to 8 SGs + MME + SBc + SLs Services can be configured on the system.

Example
The following command creates an SBc service named sbc1 in the current context:
```
sbc-service sbc1
```

server

Configures remote server access protocols for the current context. This command is used to enter the specified protocols configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
 Exec > Global Configuration > Context Configuration
 configure > context context_name

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

Syntax Description
```
server { confd | ftpd | named | sshd | telnetd | tftp }
no server { confd | ftpd | named | sshd | telnetd | tftp } [ kill ]
```

no
Disables the specified service.

confd
Enables ConfD-NETCONF protocol that supports a YANG model for transferring configuration and operations data with the Cisco Network Service Orchestrator (NSO). This command is restricted to the local context only. Enabling this command moves you to the NETCONF Protocol Configuration mode.

Important
ConfD-NETCONF support requires that a V2-RSA SSH key be configured on the local context. If an SSH key is not available, StarOS generates an error message.

ftpd
Enters the FTP Server Configuration Mode.
The FTPD server can only be configured in the local context. FTP is not available in Trusted builds.

For maximum system security, you should not enable FTP functionality. SFTP is the recommended file transfer protocol.

**named**

Starts the named server.

**sshd**

Enters the SSH Server Configuration Mode. SSH is the recommended remote access protocol. SSH must be configured to support SFTP.

The SSHD server allows only three unsuccessful login attempts before closing a login session attempt.

**telnetd**

Enters the Telnet Server Configuration Mode. Telnet is not available in Trusted builds.

The TELNET server allows only three unsuccessful login attempts before closing a login session attempt.

For maximum system security, you should not enable telnet functionality. SSH is the recommended remote access protocol.

**tftpd**

Enters the TFTP Server Configuration Mode.

The TFTP server can only be configured in the local context.

**kill**

Indicates all instances of the server are to be stopped.

This option only works with the `ftpd`, `sshd`, `telnetd`, and `tftpd` commands.

Enter the Context Configuration Mode for the appropriate, previously defined context, to set the server option(s). Repeat the command as needed to enable/disable more than one option server daemon.
Example
The following command sequence enables SSH login:

`server sshd`

**service-redundancy-protocol**

Configures Interchassis Session Recovery (ICSR) services for the current context. This command is used to enter the Service Redundancy Protocol Configuration Mode.

**Product**
All products supporting ICSR

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-ctx)#`

**Syntax Description**
`service-redundancy-protocol`

**Usage Guidelines**
Enter the Configuration Mode to set the service redundancy protocol options.

Example
The following command enters Service Redundancy Protocol Configuration Mode.

`service-redundancy-protocol`

**session-event-module**

Enables the event module, enters the Session Event Module Configuration Mode where the sending of P-GW or S-GW subscriber-specific event files to an external server can be configured. From release 15.0 onwards, the session-event module is used by SGSN for event logging. By default, EDR files are generated at the location: /hd-raid/records/edr. After upgrading to release R15.0, if this CLI is configured, the path for EDR files changes to: /hd-raid/records/event.

**Product**
P-GW
SAEGW
S-GW
SGSN

**Privilege**
Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] session-event-module

no

Disables the event module configuration.

Usage Guidelines

Enter the Session Event Module Configuration Mode where the sending of P-GW or S-GW subscriber-specific event files to an external server can be configured.

Entering this command results in the following prompt:

[context_name]host_name(config-event)#

Session Event Module Configuration Mode commands are defined in the Session Event Module Configuration Mode Commands chapter.

sgsn-service

Creates an SGSN service instance and enters the SGSN Service Configuration mode. This mode configures or edits the configuration for an SGSN service which controls the SGSN functionality.

An SGSN mediates access to GPRS/UMTS network resources on behalf of user equipment (UE) and implements the packet scheduling policy between different QoS classes. It is responsible for establishing the packet data protocol (PDP) context with the GGSN.

Important

For details about the commands and parameters, check the SGSN Service Configuration Mode chapter.

Product

SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

[ no ] sgsn-service srvc_name

no

Remove the configuration for the specified SGSN service from the configuration of the current context.
**srvc_name**

Specifies the name of the SGSN service as a unique alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**Usage Guidelines**

Use this command to create, edit, or remove an SGSN service.

---

**Example**

The following command creates an SGSN service named `sgsn1` in the current context:

```
sgsn-service sgsn1
```

The following command removes the sgsn service named `sgsn1` from the configuration for the current context:

```
no sgsn-service sgsn1
```

---

**sgs-service**

Creates an SGs service instance and enters the SGS Service Configuration mode.

---

**Product**

MME

---

**Privilege**

Administrator

---

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

---

**Syntax Description**

```
[ no ] sgs-service name
```

- **no**
  
  Remove the configuration for the specified SGs service from the configuration of the current context.

- **name**
  
  Specifies a name for an SGs service as a unique alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.
Executes the command without any additional prompt and confirmation from the user.

**Usage Guidelines**

Enter the SGS Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

Entering this command results in the following CLI prompt:

```
[context_name]hostname(config-sgs-service)#
```

SGS Service Configuration Mode commands are defined in the *MME SGS Service Configuration Mode Commands* chapter.

**Example**

The following command creates an SGS service named `sgsl` in the current context:

```
sgs-service sgsl
```

The following command removes the SGS service named `sgsl` from the configuration for the current context:

```
no sgs-service sgsl
```

---

### sgtp-service

Creates an SGTP service instance and enters the SGTP Service Configuration mode. This mode configures the GPRS Tunneling Protocol (GTP) related settings required by the SGSN and eWAG to support GTP-C (control plane) messaging and GTP-U (user data plane) messaging.

**Product**

- eWAG
- SGSN

**Privilege**

- Security Administrator
- Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration
- `configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]hostname(config-ctx)#
```

**Syntax Description**

```
[ no ] sgtp-service sgtp_service_name
```
no
If previously configured, removes the specified SGTP service configuration in the current context.

sgtp_service_name
Specifies name of the SGTP service.
sgtp_service_name must be an alphanumeric string of 1 through 63 characters.

Important
Service names must be unique across all contexts within a chassis.

Usage Guidelines
Use this command to create, edit, or remove an SGTP service.
On entering this command, the CLI prompt changes to:
[context_name]hostname(config-sgtp-service)#

Example
The following command creates an SGTP service named sgtp1 in the current context:
sgtp-service sgtp1
The following command removes, if previously configured, the SGTP service named sgtp1 from the current context:
no sgtp-service sgtp1

sgw-service
Creates an S-GW service or specifies an existing S-GW service and enters the S-GW Service Configuration Mode for the current context.

Product
S-GW
SAEGW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration
configure > context context_name
Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx)#

Syntax Description
sgw-service service_name [ -noconfirm ]
no sgw-service service_name
**service_name**

Specifies the name of the S-GW service. If `service_name` does not refer to an existing service, the new service is created if resources allow. `service_name` is an alphanumeric string of 1 through 63 characters.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

- **noconfirm**

  Executes the command without any additional prompt and confirmation from the user.

---

**no sgw-service service_name**

Removes the specified S-GW service from the context.

---

**Usage Guidelines**

Enter the S-GW Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

A maximum of 256 services (regardless of type) can be configured per system.

---

**Caution**

Large numbers of services greatly increase the complexity of management and may impact overall system performance (for example, resulting from such things as system handoffs). Therefore, it is recommended that a large number of services only be configured if your application absolutely requires it. Please contact your local service representative for more information.

---

Entering this command results in the following prompt:

```bash
[context_name]hostname(config-sgw-service)#
```

S-GW Service Configuration Mode commands are defined in the *S-GW Service Configuration Mode Commands* chapter.

Use this command when configuring the following SAE components: S-GW.

---

**Example**

The following command enters the existing S-GW Service Configuration Mode (or creates it if it does not already exist) for the service named `sgw-service1`:

```bash
sgw-service sgw-service1
```

The following command will remove `sgw-service1` from the system:

```bash
no sgw-service sgw-service1
```

---

**sls-service**

Creates an SLs service or configures an existing SLs service and enters the SLs Service Configuration Mode in the current context.
**Product**
MME

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > SLs Service Configuration

```
configure > context context_name > sls-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-sls-service)#
```

**Syntax Description**

```
sls-service service_name [ -noconfirm ]
[ no ] sls-service service_name
```

**no**
Removes the specified SLs service from the context.

**service_name**
Specifies the name of the SLs service. If `service_name` does not refer to an existing service, the new service is created if resources allow.

*service_name* is an alphanumeric string of 1 through 64 characters.

---

**Important**
Service names must be unique across all contexts within a chassis.

**Usage Guidelines**
Enter the SLs Service Configuration Mode for an existing service or for a newly defined service. This command is also used to remove an existing service.

Up to 4 SLs services can be configured on the system.

The SLs service name must be unique across all contexts.

Entering this command results in the following prompt:

```
[context_name]host_name(config-sls-service)#
```

SLs Service Configuration Mode commands are defined in the SLs Service Configuration Mode Commands chapter.

**Example**
The following command enters the existing SLs Service Configuration Mode (or creates it if it does not already exist) for the service named `sls1`.

```
sls-service sls1
```

**smsc-service**

Creates and configures an SMSC peer service to allow communication with SMSC peer.
Product

MME

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
[ no ] smsc-service smsc_svc_name [ -noconfirm ]
```

**no**

Removes the specified SMSC service from the current context.

**smsc_svc_name**

Specifies the name of the SMSC service. `smsc_svc_name` is an alphanumeric string of 1 through 63 characters. If `smsc_svc_name` does not refer to an existing service, the new service is created if resources allow.

---

**Important**

Service names must be unique across all contexts within a chassis.

---

**-noconfirm**

Executes the command without any additional prompt and confirmation from the user.

Usage Guidelines

Use this command to create and configure an SMSC peer service to allow communication with SMSC peer. Entering this command results in the following prompt:

```
[context_name]host_name(config-smsc-service)#
```

SMSC Service Configuration Mode commands are defined in the **MME SMSC Service Configuration Mode Commands** chapter.

Example

The following command creates an SMSC service named `sm1` in the current context (or enters the existing SMSC Service Configuration Mode if it already exists):

```
smsc-service sm1
```

The following command will remove the configured SMSC service named `sm1` from the current context:

```
no smsc-service sm1
```
ssh

Generates public/private key pairs for use with the configured Secure Shell (SSH) server and sets the public/private key pair to specified values.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
ssh { generate key | key data length octets } [ type { v1-rsa | v2-rsa | v2-dsa } ]
no ssh key [ type { v1-rsa | v2-rsa | v2-dsa } ]
```

This command clears configured SSH keys. If type is not specified, all SSH keys are cleared.

**generate key**
Generates a public/private key pair which is to be used by the SSH server. The generated key pair is in use until the command is issued again.

**Important**
In Release 19.2 and higher, the `v2-dsa` keyword is removed in the `ssh generate key type` syntax.

```
key data length octets
```

Sets the public/private key pair to be used by the system where `data` is the encrypted key and `length` is the length of the encrypted key in octets. `data` must be an alphanumeric string of 1 through 1023 characters and `octets` must be a value in the range of 0 through 65535.

**Important**
In Release 19.2 and higher, the `v2-dsa` keyword is concealed in the `ssh key name length key_length type v2-rsa` syntax.

```
[ type { v1-rsa | v2-rsa | v2-dsa } ]
```

Specifies the type of SSH key to generate. If type is not specified, all three key types are generated.

- **v1-rsa**: SSHv1 RSA host key only (obsolete)
- **v2-dsa**: SSHv2 DSA host key only (deprecated)
For maximum security, it is recommended that only SSH v2 be used. **v2-rsa** is the recommended key type.

**Usage Guidelines**

Generate secure shell keys for use in public key authentication.

**Example**

The following command generates SSH key pairs for all supported types:

```sh
generate key
```

The following command generates an SSH key pair of a specified length using an encrypted key:

```sh
key g6j93fw59cx length 128
```

**ssl**

Creates a new Secure Sockets Layer (SSL) template or specifies an existing one and enters the SSL Template Configuration Mode.

**Product**

SCM

**Privilege**

Administrator

**Command Modes**

```sh
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```sh
(context_name)host_name(config-ctx)#
```

**Syntax Description**

```sh
[ no ] ssl template name { ssl-subscriber }
```

**no**

Removes the specified SSL template from the context.

**template name**

Specifies the name of a new or existing SSL template as an alphanumeric string of 1 through 127 alphanumeric characters.

**ssl-subscriber**

Specifies that the SSL template is an SSL subscriber template.

**Usage Guidelines**

Use this command to create a new SSL template or modify an existing one.

Entering this command results in the following prompt:
SSL Template Configuration Mode commands are defined in the *SSL Template Configuration Mode Commands* chapter.

**Example**

The following command specifies the SSL template *ssl_template_1* and enters the SSL Template Configuration Mode:

```plaintext
ssl template ssl_template_1 ssl-subscriber
```

### subscriber

Configures the specified subscriber for the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]hostname(config-ctx)#
```

**Syntax Description**

```plaintext
subscriber { default | name user_name } asn-service-info mobility [ ipv4 | ipv6 | ipv6-ipv4 ]
no subscriber { default | name user_name }
```

**no**

Indicates the subscriber specified is to be removed from the list of allowed users for the current context.

**default | name user_name**

**default**: Enters the Subscriber Configuration Mode for the context's default subscriber settings.

**name user_name**: Specifies the user which is to be allowed to use the services of the current context. *user_name* must be an alphanumeric string of 1 through 127 characters.

**asn-service-info mobility**: Indicates the type of mobility supported and enabled in the Autonomous System Number (ASN).

**Usage Guidelines**

Enter the Subscriber Configuration Mode for actual users as well as for a default subscriber for the current context.

Entering this command results in the following prompt:

```
[context_name]hostname(config-subscriber)#
```

Subscriber Configuration Mode commands are defined in the *Subscriber Configuration Mode Commands* chapter.
NAS uses the specified parameter for asn-service-info mobility to indicate and pack the mobility support field for IPv4, IPv6, or both, in the Service-Info attribute in the Access-request. RADIUS sends back this attribute in the Access-accept message by indicating respective bits to authorize the service indicated by NAS.

---

**Important**

A maximum of 128 subscribers and/or administrative users may be locally configured per context.

---

**Example**

Following command configures the default subscriber in a context:

```
subscriber default
```

Following command removes the default subscriber from a context:

```
no subscriber default
```

Following command configures a subscriber named `user1` in a context:

```
subscriber name user1
```

Following command removes a subscriber named `user1` from a context:

```
no subscriber name user1
```

---

**sx-service**

Configures Sx service for the current context. This command is used to enter the Sx Service Configuration Mode.

**Product**

CUPS

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-cxt) #
```

**Syntax Description**

`sx-service`

Enter the Configuration Mode to set the Sx service options.

**Usage Guidelines**

**Example**

The following command enters Sx Service Configuration Mode.

```
sx-service
```
threshold available-ip-pool-group

Configures context-level thresholds for IP pool utilization for the system.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

`configure > context context_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

`threshold available-ip-pool-group low_thresh [ clear high_thresh ]`

`default threshold available-ip-pool-group`

`default`

Configures the default setting.

`low_thresh`

The low threshold IP pool utilization percentage that must be met or exceeded within the polling interval to generate an alert or alarm. `low_thresh` can be configured as an integer from 0 through 100. Default: 10

`clear high_thresh`

Specifies the high threshold IP pool utilization percentage that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm will be generated. `high_thresh` can be configured as an integer from 0 through 100. Default: 10

---

**Important**

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.

**Usage Guidelines**

When IP address pools are configured on the system, they can be assigned to a group. IP address pool utilization thresholds generate alerts or alarms based on the utilization percentage of all IP address contained in the pool group during the specified polling interval.

All configured public IP address pools that were not assigned to a group are treated as belonging to the same group. Individual configured static or private pools are each treated as their own group.

Alerts or alarms are triggered for IP address pool utilization based on the following rules:

- **Enter Condition**: Actual IP address utilization percentage per pool group $\leq$ Low Threshold

- **Clear Condition**: Actual IP address utilization percentage per pool group $> High Threshold$

If a trigger condition occurs within the polling interval, the alert or alarm will not be generated until the end of the polling interval.
The following table describes the possible methods for configuring IP pool utilization thresholds:

**Table 3: IP Pool Utilization Thresholds - Configuration Methods**

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context-level</td>
<td>A single IP pool utilization threshold can be configured for all IP pool groups within a given system context. If a single threshold is configured for all pool groups, separate alerts or alarms can be generated for each group. This command configures that threshold.</td>
</tr>
<tr>
<td>IP address pool-level</td>
<td>Each individual IP address pool can be configured with its own threshold. Thresholds configured for individual pools take precedence over the context-level threshold that would otherwise be applied (if configured). In the event that two IP address pools belonging to the same pool group are configured with different thresholds, the system uses the pool configuration that has the greatest low threshold for that group.</td>
</tr>
</tbody>
</table>

**Example**

The following command configures a context-level IP pool utilization low threshold percentage of 10 and a high threshold of 35 for an system using the Alarm thresholding model:

```
threshold available-ip-pool-group 10 clear 35
```

**threshold ha-service init-rrq-rcvd-rate**

Sets an alarm or alert based on the average number of calls setup per second for an HA service.

**Product**

HA

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

**Syntax Description**

```
threshold ha-service init-rrq-rcvd-rate high_thresh [ clear low_thresh ]
no threshold ha-service init-rrq-rcvd-rate
```
no

Deletes the alert or alarm.

**high_thresh**

Sets the high threshold average number of calls setup per second that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer from 0 through 1000000. Default: 0

**clear low_thresh**

Sets the low threshold average number of calls setup per second that must be met or exceeded within the polling interval to clear an alert or alarm. It can be configured as an integer from 0 through 1000000. Default: 0

---

**Important**

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the high threshold.

---

**Usage Guidelines**

Use this command to set an alert or an alarm when the average number of calls set upper second is equal to or less than a specified number of calls per second.

Alerts or alarms are triggered for the number of calls setup per second based on the following rules:

- **Enter Condition**: Actual number of calls setup per second > High Threshold
- **Clear Condition**: Actual number of calls setup per second ≤ Low Threshold

**Example**

The following command configures a number of calls setup per second threshold of 1000 and a low threshold of 500 for a system using the Alarm thresholding model:

```shell
treshold ha-service init-rrq-rcvd-rate 1000 clear 500
```

**threshold ip-pool-free**

Sets an alarm or alert based on the percentage of IP addresses that are unassigned in an IP pool. This command affects all IP pools in the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```
Syntax Description

```
threshold ip-pool-free low_thresh [ clear high_thresh ]
default threshold ip-pool-free
```

default
Configures the default setting.

```
low_thresh
```
Sets the low threshold percentage of addresses available in an IP pool that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer between 0 and 100. Default: 0

```
clear high_thresh
```
Sets the high threshold percentage of addresses available in an IP pool that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm will be generated. It may be configured as an integer between 0 and 100. Default: 0

___Important___
This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.

Usage Guidelines

Use this command to set an alert or an alarm when the number of unassigned IP addresses in any pool is equal to or less than a specified percentage of the total number of addresses in the pool.

Alerts or alarms are triggered for percentage of IP address pool free based on the following rules:

- **Enter Condition**: Actual percentage of IP addresses free per pool ≤ Low Threshold
- **Clear Condition**: Actual percentage of IP addresses free per pool > High Threshold

___Important___
This command is overridden by the settings of the alert-threshold keyword of the ip pool command.

Example

The following command configures a context-level IP pool percentage of IP addresses that are unused low threshold percentage of 10 and a high threshold of 35 for an system using the Alarm thresholding model:

```
threshold ip-pool-free 10 clear 35
```

threshold ip-pool-hold

Sets an alert based on the percentage of IP addresses from an IP pool that are on hold. This command affects all IP pools in the current context.

Product

All
Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration
configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]@host_name (config-ctx) #

Syntax Description

**threshold ip-pool-hold**  
* high_thresh  
 * clear low_thresh  

**default threshold ip-pool-hold**

default

Configures the default setting.

**high_thresh**

Sets the high threshold percentage of addresses on hold in an IP pool that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer from 0 through 100. Default: 0

**clear low_thresh**

Sets the low threshold percentage of addresses on hold in an IP pool that maintains a previously generated alarm condition. If the utilization percentage rises below the low threshold within the polling interval, a clear alarm will be generated. It may be configured as an integer from 0 through 100. Default: 0

---

**Important**

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the high threshold.

Usage Guidelines

Use this command to set an alert or an alarm when the percentage of IP addresses on hold in any pool is equal to or greater than a specified percentage of the total number of addresses in the pool.

Alerts or alarms are triggered for percentage of IP address pool addresses on hold based on the following rules:

- **Enter Condition:** Actual percentage of IP addresses on hold per pool > High Threshold
- **Clear Condition:** Actual percentage of IP addresses on hold per pool ≤ Low Threshold

---

**Important**

This command is overridden by the settings of the **alert-threshold** keyword of the **ip pool** command.

Example

The following command configures a context-level IP pool percentage of IP addresses that are on high threshold percentage of 35 and a low threshold of 10 for an system using the Alarm thresholding model:
threshold ip-pool-release

Sets an alert based on the percentage of IP addresses from an IP pool that are in the release state. This command affects all IP pools in the current context.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```plaintext
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx) #
```

**Syntax Description**
```
threshold ip-pool-release high_thresh [ clear low_thresh ]
default threshold ip-pool-release
```

default
Configures the default setting.

**high_thresh**
Sets the high threshold percentage of addresses in the release state in an IP pool that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer from 0 through 100. Default: 0

**clear low_thresh**
Sets the low threshold percentage of addresses in the release state in an IP pool that maintains a previously generated alarm condition. If the utilization percentage rises below the low threshold within the polling interval, a clear alarm will be generated. It may be configured as an integer from 0 through 100. Default: 0

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.

**Usage Guidelines**
Use this command to set an alert or an alarm when the number of IP addresses the release state in any pool is equal to or greater than a specified percentage of the total number of addresses in the pool.

Alerts or alarms are triggered for percentage of IP address pool addresses in the release state based on the following rules:

- **Enter Condition**: Actual percentage of IP addresses in the release state per pool > High Threshold
- **Clear Condition**: Actual percentage of IP addresses in the release state per pool ≤ Low Threshold
This command is overridden by the settings of the alert-threshold keyword of the ip pool command.

Example

The following command configures a context-level IP pool percentage of IP addresses that are in the release state high threshold percentage of 35 and a low threshold of 10 for an system using the Alarm thresholding model:

```
threshold ip-pool-release 35 clear 10
```

**threshold ip-pool-used**

Sets an alert based on the percentage of IP addresses that have been assigned from an IP pool. This command affects all IP pools in the current context.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
threshold ip-pool-used high_thresh [ clear low_thresh ]
default threshold ip-pool-used
```

**default**

Configures the default setting.

**high_thresh**

Sets the high threshold percentage of addresses assigned from an IP pool that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer from 0 through 100. Default: 0

**clear low_thresh**

Sets the low threshold percentage of addresses assigned from an IP pool that maintains a previously generated alarm condition. If the utilization percentage rises above the high threshold within the polling interval, a clear alarm will be generated. It may be configured to any integer between 0 and 100. Default: 0

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the low threshold.
Usage Guidelines

Use this command to set an alert or an alarm when the number of IP addresses assigned from any pool is equal to or greater than a specified percentage of the total number of addresses in the pool.

Alerts or alarms are triggered for percentage of IP address pool addresses used based on the following rules:

- **Enter Condition**: Actual percentage of IP addresses used per pool > High Threshold
- **Clear Condition**: Actual percentage of IP addresses used per pool ≤ Low Threshold

---

Important

This command is overridden by the settings of the `alert-threshold` keyword of the `ip pool` command.

---

Example

The following command configures a context-level IP pool percentage of IP addresses that are used high threshold percentage of 35 and a low threshold of 10 for an system using the Alarm thresholding model:

```
threshold ip-pool-used 35 clear 10
```

---

threshold monitoring

Enables or disables thresholds alerting for a group of thresholds.

---

Product

All

Privilege

Security Administrator, Administrator

Command Modes

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

Syntax Description

```
[ default | no ] threshold monitoring available-ip-pool-group
```

- **default**
  
  Configures the default setting.

- **no**
  
  Disables threshold monitoring for the specified value.

  - **available-ip-pool-group**
    
    Enables threshold monitoring for IP pool thresholds at the context level and the IP address pool-level.
    
    Refer to the `threshold available-ip-pool-group` command, the `threshold ip-pool-x` commands and the `alert-threshold` keyword of the `ip pool` command for additional information on these values.
Thresholding on the system is used to monitor the system for conditions that could potentially cause errors or outage. Typically, these conditions are temporary (i.e., high CPU utilization, or packet collisions on a network) and are quickly resolved. However, continuous or large numbers of these error conditions within a specific time interval may be indicative of larger, more severe issues. The purpose of thresholding is to help identify potentially severe conditions so that immediate action can be taken to minimize and/or avoid system downtime.

Thresholding reports conditions using one of the following mechanisms:

- **SNMP traps**: SNMP traps have been created that indicate the condition (high threshold crossing and/or clear) of each of the monitored values. Complete descriptions and other information pertaining to these traps is located in the starentMIB(8164).starentTraps(2) section of the SNMPMIB Reference.

The generation of specific traps can be enabled or disabled on the system allowing you to view only those traps that are most important to you.

- **Logs**: The system provides a facility called threshold for which active and event logs can be generated. As with other system facilities, logs are generated Log messages pertaining to the condition of a monitored value are generated with a severity level of WARNING.

- **Alarm System**: High threshold alarms generated within the specified polling interval are considered "outstanding" until a condition no longer exists and/or a condition clear alarm is generated.

"Outstanding" alarms are reported to through the system's alarm subsystem and are viewable through the CLI.

The following table indicates the reporting mechanisms supported by each of the above models.

*Table 4: Thresholding Reporting Mechanisms by Model*

<table>
<thead>
<tr>
<th>Model</th>
<th>SNMP Traps</th>
<th>Logs</th>
<th>Alarm System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Alarm</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Refer to the `threshold poll` command in Global Configuration Mode Commands for information on configuring the polling interval over which IP address pool utilization is monitored.

**Example**

The following command enables threshold monitoring for IP pool thresholds at the context level and the IP address pool-level:

```
threshold monitoring available-ip-pool-group
```

**threshold pdsn-service init-rrq-rcvd-rate**

Sets an alarm or alert based on the average number of calls setup per second for a PDSN service.

**Product**  
PDSN

**Privilege**  
Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

threshold pdsn-service init-rrq-rcvd-rate high_thres [ clear low_thres ]
no threshold pdsn-service init-rrq-rcvd-rate

no

Deletes the alert or alarm.

high_thres

Sets the high threshold average number of calls setup per second that must be met or exceeded within the polling interval to generate an alert or alarm. It can be configured as an integer between 0 and 1000000. Default: 0

clear low_thres

Sets the low threshold average number of calls setup per second that must be met or exceeded within the polling interval to clear an alert or alarm. It can be configured as an integer between 0 and 1000000. Default: 0

Important

This value is ignored for the Alert model. In addition, if this value is not configured for the Alarm model, the system assumes it is identical to the high threshold.

Usage Guidelines

Use this command to set an alert or an alarm when the average number of calls set upper second is equal to or less than a specified number of calls per second.

Alerts or alarms are triggered for the number of calls setup per second based on the following rules:

- **Enter Condition**: Actual number of calls setup per second > High Threshold
- **Clear Condition**: Actual number of calls setup per second ≤ Low Threshold

Example

The following command configures a number of calls setup per second threshold of 1000 and a low threshold of 500 for a system using the Alarm thresholding model:

threshold pdsn-service init-rrq-rcvd-rate 1000 clear 500

twan-profile

Creates a Trusted Wireless Access Network (TWAN) profile and enters the TWAN Profile Configuration Mode for the current context. The TWAN profile contains information on the RADIUS client addresses (WLC) and access-type corresponding to the RADIUS clients.
**Product**
SaMOG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

**Syntax Description**

[ no ] twan-profile twan_profile_name

*no*

Deletes the TWAN profile configuration for the current context.

*twan_profile_name*

Specifies the name of the TWAN profile. If a *twan_profile_name* does not already exist, a new profile is created.

In Release 17 and earlier, *twan_profile_name* must be an alphanumeric string of 1 through 64 characters.

In Release 18 and later, *twan_profile_name* must be an alphanumeric string of 1 through 48 characters.

**Usage Guidelines**

Use this command to create a Trusted Wireless Access Network (TWAN) profile and enter the TWAN Profile Configuration Mode for the current context.

On entering this command, the CLI prompt changes to:

[context_name]hostname(config-twan-profile)#

TWAN Profile Configuration Mode commands are defined in the *TWAN Profile Configuration Mode Commands* chapter.

### udr-module active-charging-service

Enables creation, configuration and deletion of the User Data Record (UDR) module for the context.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

**Syntax Description**

[ no ] udr-module active-charging-service
no

Deletes the UDR module configuration for the current context.

Usage Guidelines

Use this command to create the UDR module for the context, and configure the UDR module for active charging service records. You must be in a non-local context when specifying this command, and you must use the same context when specifying the EDR module command.

On entering this command, the CLI prompt changes to:

```
[context_name]hostname(config-udr)#
```

Example

The following command creates the UDR module for the context, and enters the UDR Module Configuration Mode:

```
udr-module active-charging-service
```

**uidh-server**

Use this command to enter the UIDH Server Configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration</td>
</tr>
</tbody>
</table>

```
configure > context context_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```
uidh-server uidh_server_name
```

*uidh_server_name*

Is a string of size ranging from 1 to 63 characters.

**user-plane-service**

Creates User Plane Service. Minimum or critical parameters to start a user-plane service is to have one Sx interface and three GTPU services of the interface type PGW-ingress, SGW-ingress, and SGW-egress. The associated services must also be in the running mode. Stopping of associated services result in stopping of user-plane service. If any of the critical parameters are removed or changed from the user-plane service, it results in user-plane service being stopped. By default, this CLI command is disabled.
This command is available in this release only for testing purposes. For more information, contact your Cisco Account representative.

**Product**
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration

```configure > context context_name```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx)#
```

**Syntax Description**

```[ no ] user-plane-service <userplane_service_name>```

- **no**
  Removing the user-plane service from the particular context.

- **user-plane-service**
  Creates specified User Plane service name to allow configuration of User Plane service.
  ```userplane_service_name```
  Assigns a service name to the user-plane service.

**Usage Guidelines**

Use this command to create the user plane service for the context and configure it.

On entering this command, the CLI prompt changes to:
```
[context_name]host_name(config-user-plane-service)#
```

**Example**

The following command creates the user plane service "UPLte" for the context, and enters the User Plane Service Configuration Mode:

```user-plane-service UPLte```

**wsg-service**

Enables or disables Wireless Security Gateway (WSG) service. When enabled you are in WSG Service Configuration mode. (VPC only)

**Product**
SecGW (WSG)

**Privilege**
Security Administrator
Command Modes

Exec > Global Configuration > Context Configuration

configure > context context_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx)#

Syntax Description

wsg-service service_name
no wsg-service service_name

no

Disables the specified WSG service.

service_name

Specifies the name of the WSG service as an alphanumeric string of 1 through 63 characters.

Important

Service names must be unique across all contexts within a chassis.

Usage Guidelines

Use this command to enter the WSG Service Configuration Mode. For additional information, see the WSG Service Configuration Mode Commands chapter.

Example

The following command enters the WSG Service Configuration Mode:

wsg-service wsg01
Credit Control Configuration Mode Commands

The Credit Control configuration Mode is used to configure prepaid services for Diameter/RADIUS applications.

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- apn-name-to-be-included, on page 714
- app-level-retransmission, on page 715
- associate, on page 716
- charging-rulebase-name, on page 717
- diameter dictionary, on page 718
- diameter disable-final-reporting-in-ccru, on page 719
- diameter dynamic-rules request-quota, on page 720
- diameter enable-quota-retry, on page 721
- diameter exclude-mscc-in-ccr-terminate, on page 722
- diameter fui-redirected-flow, on page 723
- diameter gsu-with-only-infinite-quota, on page 723
- diameter hdd, on page 724
- diameter ignore-returned-rulebase-id, on page 726
- diameter ignore-service-id, on page 726
- diameter mscc-final-unit-action terminate, on page 727
- diameter mscc-per-ccr-update, on page 728
- diameter msg-type, on page 729
- diameter origin host, on page 731
- diameter origin endpoint, on page 731
- diameter peer-select, on page 732
- diameter pending-timeout, on page 735
- diameter reauth-blacklisted-content, on page 736
This command configures whether the virtual or real Access Point Name (APN) is sent in Credit Control Application (CCA) messaging.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#
Syntax Description

apn-name-to-be-included { gn | virtual }
default apn-name-to-be-included
default

Configures this command with the default setting.
Default: gn

gn
Sends the Gn APN name in the CCA messages.

virtual
Sends the virtual APN name, if configured in the APN Configuration Mode, in the CCA messages.

Usage Guidelines

Use this command to configure the APN information in CCA messages. Virtual APN name can be set to be sent in CCA messages if it is configured in the APN Configuration Mode.

Example

The following command sets the virtual APN name to be sent in CCA message:

apn-name-to-be-included virtual

app-level-retransmission

This command enables/disables application-level retransmissions with the "T" bit set.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration

credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)\

Syntax Description

app-level-retransmission { set-retransmission-bit | unset-retransmission-bit }
default app-level-retransmission
default

Configures this command with the default setting.
Default: unset-retransmission-bit
**set-retransmission-bit**
Sets the retransmission bit.

**unset-retransmission-bit**
Unsets the retransmission bit.

**Usage Guidelines**
Use this command to enable application-level transmission with "T" bit set.
'T' bit setting is done only for DIABASE protocol-based rerouting and not for application-based retransmissions. In order to identify such retransmissions, the server expects the T bit to be set at all levels (both DIABASE and application) of retransmission, which can be achieved with this CLI command.

**Example**
The following command specifies to set retransmission bit:
```
app-level-retransmission set-retransmission-bit
```

**associate**
This command associates/disassociates a failure handling template with the Diameter Credit Control Application (DCCA) service.

**Product**
- GGSN
- HA
- HSGW
- IPSG
- PDSN
- P-GW
- S-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > ACS Configuration > Credit Control Configuration
```
active-charging service service_name > credit-control
```
Entering the above command sequence results in the following prompt:
```
[local]host_name(config-dcca)#
```

**Syntax Description**
```
associate failure-handling-template template_name
no associate failure-handling-template
```
Disassociates a failure handling template with the DCCA service.

**failure-handling-template** *template_name*

Associates a previously created failure handling template with the DCCA service. *template_name* specifies the name for a pre-configured failure handling template. *template_name* must be an alphanumeric string of 1 through 63 characters.

For more information on failure handling templates, refer to the **failure-handling-template** command in the *Global Configuration Mode Commands* chapter.

**Usage Guidelines**

Use this command to associate a configured failure handling template with the DCCA service.

The failure handling template defines the action to be taken when the Diameter application encounters a failure supposing a result-code failure, Tx-expiry or response-timeout. The application will take the action given by the template. For more information on failure handling template configurations, refer to the *Diameter Failure Handling Template Configuration Mode Commands* chapter.

**Important**

Only one failure handling template can be associated with the DCCA service. The failure handling template should be configured prior to issuing this command.

If the association is not made to the template then failure handling behavior configured in the application with the **failure-handling** command will take its effect.

**Example**

The following command associates a pre-configured failure handling template called *fht1* to the DCCA service:

```
associate failure-handling-template fht1
```

**charging-rulebase-name**

This command allows static configuration of charging rulebase name to be sent to OCS through the CCR message.

**Product**

eHRPD

GGSN

P-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```active-charging service service_name > credit-control```

Entering the above command sequence results in the following prompt:
diameter dictionary

This command configures the Diameter Credit Control dictionary for the Active Charging Service (ACS).

Syntax Description

diameter dictionary { dcca-custom1 | dcca-custom10 | dcca-custom11 | dcca-custom12 | dcca-custom13 | dca

custom14 | dcca-custom15 | dcca-custom16 | dcca-custom17 | dcca-c

custom18 | dcca-custom19 | dcca-custom2 | dcca-custom20 | dcca-custom21 | dcca-

custom22 |

Usage Guidelines

Use this command to override/change the charging rulebase name in the Gy CCRs for eHRPD, GGSN and P-GW service types.

With this feature in 18.0 release, an APN/subscriber can have a single rulebase applied to it, but allowing a static configuration to always pass a different or same rulebase to the OCS through CCR messages.

The rulebase value configured in Credit Control (CC) group will be sent to OCS via CCR. If this CLI command is not configured, then the rulebase obtained from APN/subscriber template will be sent to OCS.

The configured value of rulebase under CC group is sent in all CCR (I/U/T) messages. This implies that any change in rulebase value in CC group during mid-session gets reflected in the next CCR message.

Example

The following command defines a charging rulebase name called rb1 in the credit control group:

charging-rulebase-name rb1
default

Configures this command with the default setting.
Default: standard dictionary

**dcca-custom1 ... dcca-custom30**

Configures a custom Diameter dictionary.

**dynamic-load**

Configures the dynamically loaded Diameter dictionary. The dictionary name must be an alphanumeric string of 1 through 15 characters.

For more information on dynamic loading of Diameter dictionaries, see the `diameter dynamic-dictionary` in the Global Configuration Mode Commands chapter of this guide.

**standard**

Configures the standard Diameter dictionary.
Default: Enabled

**Usage Guidelines**

Use this command to select the Diameter dictionary for ACS.

**Example**

The following command selects the standard Diameter dictionary:

```
diameter dictionary standard
```

diameter disable-final-reporting-in-ccru

This command controls sending of CCR-U with reporting reason as FINAL immediately on receiving a 4012 or 4010 result-code at MSCC level.

**Product**

**Important**

In StarOS release 16.0 and later, this command is obsolete and is only supported for backward compatibility reasons. Release 16.0 and beyond, use the `diameter msg-type { ccru|ccrt } suppress-final-reporting` command for this functionality.

GGSN
HA
IPSG
PDSN
P-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:
[local]host_name(config-dcca)#

Syntax Description
diameter disable-final-reporting-in-ccru
{ default | no } diameter disable-final-reporting-in-ccru

default | no

Configures this command with the default setting. Default behavior is to send CCR-U with reporting reason as FINAL immediately on receiving 4010/4012 result-code.

Usage Guidelines
As per the current implementation, CCR-U is sent immediately on receiving 4010 or 4012 Result-Code at MSCC level. This new CLI command controls sending of immediate CCR-U with FINAL as Reporting-Reason. All other behaviors remain almost same like a Rating-group being blacklisted.

If this CLI command is configured, on receiving the result-code 4010/4012 at MSCC-level, immediate CCR-U with FINAL as Reporting-Reason will not be sent. All USU corresponding to that rating group is reported in CCR-T message.

Example
The following command specifies not to send immediate CCR-U with FINAL as Reporting-Reason:
diameter disable-final-reporting-in-ccru

diameter dynamic-rules request-quota

This command specifies to request quota immediately in the CCR sent to the Gy interface when the traffic matches the dynamic rules with Online AVP enabled and received over Gx interface.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:
Syntax Description

```
diameter dynamic-rules request-quota { on-traffic-match | on-receiving-rule }
default diameter dynamic-rules request-quota
```

default

Configures this command with the default setting.

Default: on-receiving-rule

on-traffic-match

Requests quota only when there is traffic matching the dynamic rules with Online AVP enabled.

on-receiving-rule

Requests quota on receiving a dynamic rule with Online AVP enabled.

Usage Guidelines

Use this command to request quota when the traffic matches the dynamic rules with Online AVP enabled.

Example

The following command specifies to request quota on receiving a dynamic rule with Online AVP enabled:

```
diameter dynamic-rules request-quota on-receiving-rule
```

diameter enable-quota-retry

This command enables/disables Quota Retry Timer for blacklisted content.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

Syntax Description

```
[ no ] diameter enable-quota-retry end-user-service-denied
```

no

Configures this command with the default setting.

Usage Guidelines

Quota-Retry-Time is currently not applicable to a Rating-Group which is blacklisted with 4010 (END_USER_SERVICE_DENIED).
If this CLI command is configured, after the quota-retry timeout, CCR-U including the RSU is sent for blacklisted content also. That is, quota will be requested for 4010 blacklisted content also.

Without the configuration of this CLI command, the old behavior persists that is, after quota retry-timer expiry, CCR-U is not sent for 4010 blacklisted category.

**Example**

The following command allows sending CCR-U requesting quota for blacklisted content:

```
diameter enable-quota-retry end-user-service-denied
```

### **diameter exclude-mscc-in-ccr-terminate**

This command enables to exclude Multiple-Services-Credit-Control (MSCC) AVP in CCR-T message.

**Product**
- GGSN
- IPSG

**Privilege**
- Security Administrator, Administrator

**Command Modes**

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
[ default | no ] diameter exclude-mscc-in-ccr-terminate
```

- **default**
  - Includes MSCC AVP in CCR-T.

- **no**
  - Includes MSCC AVP in CCR-T.

**Usage Guidelines**

Use this command to exclude MSCC AVP in CCR-T, which is included by default. Also, see the **diameter mscc-per-ccr-update** command.

**Example**

The following command specifies to exclude MSCC AVP in CCR-T:

```
diameter exclude-mscc-in-ccr-terminate
```
**diameter fui-redirected-flow**

This command enables to control the behavior of marking redirected HTTP flow as free-of-charge.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; ACS Configuration &gt; Credit Control Configuration</td>
</tr>
</tbody>
</table>

```plaintext
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcsa)#
```

**Syntax Description**

```
[ no ] diameter fui-redirected-flow allow
```

**no**

Disables the behavior of marking redirected HTTP flow as free-of-charge.

Default: `diameter fui-redirected-flow allow`

**Usage Guidelines**

Use this command to control the behavior of marking redirected HTTP flow as free-of-charge when the Final-Unit-Indication (FUI) Diameter AVP comes without Filter IDs.

---

**Important**

Note that the default value, when configured, does not appear in the output of the `show configuration` command output; instead appear only in the output of the `show configuration verbose` command. When the HTTP redirection feature is disabled using the `no diameter fui-redirected-flow allow` command, it will be appear in the output of the `show configuration` command.

---

**Example**

The following command specifies to allow the packets free of charge, when matching the redirected-flow:

```
diameter fui-redirected-flow allow
```

---

**diameter gsu-with-only-infinite-quota**

This command configures whether to accept/reject CCA messages that contain Granted-Service-Unit AVP with only infinite quota grants from the server.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>
Command Modes

Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

diameter gsu-with-only-infinite-quota { accept-credit-control-answer | reject-credit-control-answer }
default diameter gsu-with-only-infinite-quota

default

Configures this command with the default setting.

Default: reject-credit-control-answer

accept-credit-control-answer

Accepts the Credit-Control-Answer message.

reject-credit-control-answer

Rejects the Credit-Control-Answer message.

Usage Guidelines

Use this command to accept/reject CCA messages that contain the Granted-Service-Unit AVP with only infinite quota grants from the server.

Example

The following command specifies to accept CCA with the Granted-Service-Unit AVP containing only Infinite quota:

diameter gsu-with-only-infinite-quota accept-credit-control-answer

diameter hdd

This command enables/disables the Hard Disk Drive (HDD) to store the failed CCR-T messages for the corresponding credit control group.

Important

This command is license dependent. For more information, contact your Cisco account representative.

Product

HA

P-GW

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration
active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

[ no ] diameter hdd

no

Disables the HDD from storing the failed CCR-T messages for the corresponding credit control group.

Usage Guidelines

Use this command to enable the HDD to store the failed CCR-T messages. The Gy application sends the failed CCR-T messages to the CDR module for storing in the HDD. By default, this feature is disabled.

In the existing implementation with Assume Positive feature, there are high chances of losing the usage data reported through the CCR-T when the session is being terminated while in Assume Positive mode. This problem is addressed by allowing the DCCA module to write the CCR-T messages in the HDD of the chassis.

In cases where the Assume-Positive interim-quotas is allocated, and CCR-T is not reported/answered, the CCR-T message is written to a local file, and saved in the HDD. This local file and directory information can be fetched and parsed to account for the lost bytes/usage. The retrieval of the file can be done with the PULL mechanism.

Important

This feature requires a valid license to be installed prior to configuring this feature. Contact your Cisco account representative for more information on the licensing requirements.

Important

This feature is applicable only when Assume Positive feature is enabled.

For more information on this feature, see the AAA Interface Administration and Reference document.

Limitations:

• When an ICSR event occurs unexpectedly before the CCR-T is written, the CCR-T will not written to the HDD and hence the usage will be lost.

• It is expected that the customers requiring this feature should monitor the HDD and periodically pull and delete the files so that the subsequent records can be buffered.

The diameter-hdd-module CLI command is used to configure the file characteristics for storing the Diameter records (CCR-Ts) in the HDD. For more information on this command, see the Diameter HDD Module Configuration Mode Commands chapter in this guide.

Example

The following command enables the HDD to store the failed CCR-T messages:

diameter hdd
diameter ignore-returned-rulebase-id

This command configures to accept/ignore the rulebase ID in the Rulebase-Id AVP returned by the Diameter server in CCA messages.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

[ default | no ] diameter ignore-returned-rulebase-id

- **default**
  
  Configures this command with the default setting.

  Default: Accept

- **no**
  
  Accepts the rulebase ID received from Diameter server in CCA.

**Usage Guidelines**

Use this command to ignore/accept rulebase ID returned from the Diameter server in CCA.

**Example**

The following command ignores the rulebase ID returned from the Diameter server in CCA:

```
diameter ignore-returned-rulebase-id
```

---

diameter ignore-service-id

This command enables to accept/ignore service ID in the Service-Identifier AVP defined in the Diameter dictionaries. This command is applicable to all products that use the Gy interface.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:
Syntax Description

[diameter ignore-service-id]

[default | no]

default
Configures this command with the default setting.
Default: Accept

no
Specifies to accept the service ID.

Usage Guidelines

Use this command to ignore/accept service ID value in the Service-Identifier AVP in the Diameter dictionaries for Gy interface implementations.

This command can be used to disable the usage of the Service-Identifier AVP for Gy interface implementations even if any of the Diameter dictionaries support the Service-Identifier AVP, and if this AVP should not be used for Gy interactions but must be present in GCDRs/eGCDRs.

Example

The following command specifies to ignore service ID in the Diameter dictionaries:

diameter ignore-service-id

diameter mscc-final-unit-action terminate

This command enables either to terminate a PDP session immediately when the Final-Unit-Action (FUA) in a particular Multiple Service Credit Control (MSCC) is set as TERMINATE and the quota is exhausted for that service, or to terminate the session after all other MSCCs (categories) have used up their available quota.

Important

This command is available only in StarOS 10.2 and later releases.

Product

GGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

diameter mscc-final-unit-action terminate { category | session { on-per-mscc-exhaustion | on-all-mscc-exhaustion } }

default diameter mscc-final-unit-action terminate
**diameter mscc-final-unit-action terminate category**

**default**

Configures this command with the default setting.

Default: Same as `diameter mscc-final-unit-action terminate category`

**category**

This is the standard behavior wherein the category is terminated if the Final-Unit-Indication AVP comes with TERMINATE for a given MSCC.

**session**

Terminates the session depending on the quota usage of one MSCC or all the MSCCs.

- **on-per-mscc-exhaustion**: When the FUA in a particular MSCC is set as TERMINATE and the quota is exhausted for that service, the session will be terminated immediately regardless of the state of the other MSCCs.
- **on-all-mscc-exhaustion**: When the FUA in a particular MSCC is set as TERMINATE and the quota is exhausted for that service, the session termination will be initiated after all the other MSCCs (categories) have used up their available quota. There will no more CCR(U) messages sent requesting quota after receiving the FUA as TERMINATE in the MSCC level.

**Usage Guidelines**

Use this command to terminate a PDP session immediately when the FUA in a particular MSCC is set as TERMINATE and the quota is exhausted for that service, or to terminate the session after all other MSCCs (categories) have used up their available quota.

**Example**

The following command terminates the PDP session after quota exhausts for all MSCCs when MSCC FUA is set to TERMINATE:

```
diameter mscc-final-unit-action terminate session on-all-mscc-exhaustion
```

**diameter mscc-per-ccr-update**

This command configures sending single/multiple Multiple-Services-Credit-Control (MSCC) AVP in CCR-U messages.

---

**Important**

This command is available only in StarOS 8.3 and later releases.

---

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > ACS Configuration > Credit Control Configuration`

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:
**Syntax Description**

```
diameter mscc-per-ccr-update { multiple | single }
default diameter mscc-per-ccr-update
```

- **default**
  
  Configures this command with the default setting.

  Default: **multiple**

- **multiple**
  
  Sends multiple Multiple-Services-Credit-Control AVP in a single CCR-U message.

- **single**
  
  Sends only one Multiple-Services-Credit-Control AVP in a CCR-U message.

**Usage Guidelines**

Use this command to configure sending single/multiple Multiple-Services-Credit-Control AVP in CCR-U messages.

**Example**

The following command configures sending a single Multiple-Services-Credit-Control AVP in CCR-U messages:

```
diameter mscc-per-ccr-update single
```

---

**diameter msg-type**

This command controls sending of CCR-U/CCR-T with reporting reason as FINAL immediately on receiving a 4012 or 4010 result-code at MSCC level or when the MSCC is in FUI Redirect/Restrict-access state.

**Product**

- GGSN
- HA
- IPSG
- PDSN
- P-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > ACS Configuration > Credit Control Configuration
- **active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```
Syntax Description

In 18 and later releases:

\[
\text{[ no ] diameter msg-type \{ ccru \{ suppress-final-reporting \} | ccrt \{ suppress-final-reporting | suppress-blacklist-reporting \} \}}
\]

In 17 and earlier releases:

\[
diameter msg-type \{ ccru | ccrt \} suppress-final-reporting
[ no ] diameter msg-type ccru suppress-final-reporting
\]

**no**

Depending on the configuration, this keyword will selectively send FINAL either in CCR-U or CCR-T even if MSCC is in FUI Redirect/Restrict-access state and USU is zero.

The default behavior is to not send CCR-T with reporting reason as FINAL even when MSCC is in FUI Redirect/Restrict-access state and USU is zero.

**Important**

This default behavior is applicable to all dictionaries except for dcca-custom12 and dcca-custom13 dictionaries. In the case of dcca-custom12 and dcca-custom13, the FINAL reporting will always be sent in CCR-T even if MSCC is in FUI Redirect/Restrict-access and USU is zero.

**ccru**

This keyword disables Immediate FINAL reporting for result code 4010/4012 in CCR-U message.

**ccrt**

This keyword disables FINAL reporting for MSCC which are in no-quota and FUI Redirect/Restrict-access state.

**suppress-final-reporting**

**Important**

This keyword is available only in 18.3, 19.2 and later releases.

When used with the **diameter msg-type ccru** command, this keyword disables immediate FINAL reporting for result code 4010/4012. When used with the **diameter msg-type ccrt** command, this keyword disables FINAL reporting for no-quota FUA Redirect/Restrict-access.

**suppress-blacklist-reporting**

**Important**

This keyword is available only in 18.3, 19.2 and later releases.

Disables FINAL reporting for blacklisted (4010/4012) content in CCR-T.

**Usage Guidelines**

With this CLI command "diameter msg-type ccrt suppress-final-reporting" configured:
Before MSC enters into FUI Redirect or Restrict-Access state, all the used quota is reported using the Reporting-Reason as "OTHER_QUOTA_TYPE". Since all the quota is reported, there is no need to send any other FINAL reporting to OCS.

Releases prior to 16.0, even if there is no quota utilization, the gateway sends FINAL with USU as '0' octets in CCR-T. In this release, the FINAL reporting in CCR message is controlled when there is no quota usage to report to the OCS server during the FUI Redirect/Restrict-access scenario.

**With this CLI command "diameter msg-type ccru suppress-final-reporting" configured:**

In releases prior to 15.0, CCR-U is sent immediately on receiving 4010 or 4012 Result-Code at MSCC level. This new CLI command controls sending of immediate CCR-U with FINAL as Reporting-Reason. All other behaviors remain almost same like a Rating-group being blacklisted.

If this CLI command is configured, on receiving the result-code 4010/4012 at MSCC-level, immediate CCR-U with FINAL as Reporting-Reason will not be sent. All USU corresponding to that rating group is reported in CCR-T message.

In releases prior to 18, configuration control was available for filtering FINAL USU reporting in CCR-U for blacklisted content and in CCR-T for Final-Unit-Indication (REDIRECT/RESTRICT-ACCESS) activated content. In the case of CCR-T message, there is no way to ignore the FINAL reporting for blacklisted (4010/4012) content if the FINAL was previously disabled in CCR-U.

In 18 and later releases, the current CLI configuration is enhanced to disable FINAL reporting in CCR-T message for blacklisted (4010/4012) content. The **diameter msg-type ccrt** CLI command includes an additional keyword suppress-blacklist-reporting to support this enhancement. The default behavior of CCR-T is to send the FINAL reporting to be sent for blacklisted (4010/4012) content, if not reported already in CCR-U.

---

**Important**

This feature is available only in 18.3, 19.2 and later releases.

This feature is used to selectively control the reporting of FINAL Used-Service-Unit (USU) in CCR-T for a Rating-Group (RG) which is blacklisted using 4010 and 4012 transient result-codes. This customization is required for a seamless integration with the operator network.

**Example**

The following command specifies not to send FINAL reporting for FUA Redirect/Restrict-access:

```bash
diameter msg-type ccrt suppress-final-reporting
```

---

**diameter origin host**

This command is obsolete. See the **diameter origin endpoint**, on page 731 command.

**diameter origin endpoint**

This command configures the Diameter Credit Control Origin Endpoint.

**Product**

All
diameter peer-select

This command configures the Diameter credit control primary and secondary hosts for DCCA.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:
[local]host_name(config-dcca)#

Syntax Description
In 8.x and earlier releases:
**diameter peer-select peer** peer_name [ realm realm_name ] [ secondary-peer secondary_peer_name [ realm realm_name ] ] [ imsi-based start-value imsi_start_value end-value imsi_end_value ]

**no diameter peer-select** [ imsi-based start-value imsi_start_value end-value imsi_end_value ]

In 9.0 and later releases, for UMTS deployments:

**diameter peer-select peer** peer_name [ realm realm_name ] [ secondary-peer secondary_peer_name [ realm realm_name ] ] [ imsi-based { { prefix | suffix } imsi/prefix/suffix_start_value } [ to imsi/prefix/suffix_end_value ] ] [ msisdn-based { { prefix | suffix } msisdn-based/prefix/suffix_start_value } [ to msisdn-based/prefix/suffix_end_value ] ]

**no diameter peer-select** [ imsi-based { { prefix | suffix } imsi/prefix/suffix_start_value } [ to imsi/prefix/suffix_end_value ] ] [ msisdn-based { { prefix | suffix } msisdn-based/prefix/suffix_start_value } [ to msisdn-based/prefix/suffix_end_value ] ]

**no**

Removes previously configured Diameter credit control peer selection setting.

**peer peer_name**

Specifies the primary host name. as an alphanumeric string of 1 through 63 characters that can contain punctuation characters.

**imsi-based start-value imsi_start_value end-value imsi_end_value**

---

**Important**

This section applies only to 8.3 and earlier releases.

Specifies peer selection based on International Mobile Subscriber Identification (IMSI) range.

**start-value imsi_start_value** specifies the start of range in integer value of IMSI, and **end-value imsi_end_value** specifies the end of range in integer value of IMSI.

**imsi-based { { prefix | suffix } imsi/prefix/suffix_start_value } [ to imsi/prefix/suffix_end_value ]**

---

**Important**

This section applies only to 9.0 and later releases for UMTS deployments.

Selects peer based on IMSI prefix or suffix or IMSI range.

**prefix**: Specifies the prefix range

**suffix**: Specifies the suffix range

**imsi/prefix/suffix_start_value**: Specifies the IMSI/prefix/suffix start value. prefix/suffix must be an IMSI prefix/suffix, and must be an integer from 1 through 15 characters.

**imsi/prefix/suffix_end_value**: Specifies the IMSI/prefix/suffix end value. prefix/suffix must be an IMSI prefix/suffix, and must be an integer from 1 through 15 characters that must be greater than the start value.
If prefix/suffix is used, the lengths of both start and end prefix/suffix must be equal. If the prefix or suffix keyword is not specified, it will be considered as suffix.

```plaintext
msisdn-based { { prefix | suffix } msisdn/prefix/suffix_start_value } [ to msisdn/prefix/suffix_end_value ]
```

Specifies peer selection based on MSISDN prefix or suffix or MSISDN range.

- **prefix**: Specifies the prefix range
- **suffix**: Specifies the suffix range
- **msisdn/prefix/suffix_start_value**: Specifies the MSISDN/prefix/suffix start value. prefix/suffix must be an MSISDN prefix/suffix, and must be an integer from 1 through 15 characters.
- **msisdn/prefix/suffix_end_value**: Specifies the MSISDN/prefix/suffix end value. prefix/suffix must be an MSISDN prefix/suffix, and must be an integer from 1 through 15 characters that must be greater than the start value.

**realm realm_name**

The `realm_name` must be an alphanumeric string of 1 through 127 characters, and can contain punctuation characters. The realm may typically be a company or service name.

**secondary-peer secondary_peer_name**

Specifies a name for the secondary host to be used for failover processing. When the route-table does not find an AVAILABLE route, the secondary host performs a failover processing if the `diameter session failover` command is set.

The `secondary_peer_name` must be an alphanumeric string of 1 through 63 characters, and can contain punctuation characters.

---

**Usage Guidelines**

Use this command to configure Diameter credit control host selection.

If the `diameter peer-select` command is not configured, and if multiple peers are configured in the endpoint, the available peers configured in the endpoint are automatically chosen in a load-balanced round-robin manner.

9.0 and later releases support peer selection using prefix or suffix of IMSI or IMSI range. Subscribers are now assigned to a primary OCS instance based on the value of the IMSI prefix or suffix of a length of 1 to 15 digits. If the prefix or suffix keyword is not specified, it will be considered as suffix. Up to 64 peer selects can be configured. At a time either prefix or suffix mode can be used in one DCCA config. If prefix or suffix mode is used, the lengths of all prefix/suffix must be equal.

In 12.2 and later releases, Diameter peer selection can also be performed based on the configurable prefix or suffix of MSISDN or MSISDN range.

Each primary OCS may have a designated secondary OCS in case of failure of the primary. It will be the responsibility of the GGSN to use the appropriate secondary OCS in case of primary failure. The secondary OCS for each primary OCS will be one of the existing set of OCSs.

**Example**

The following command configures a Diameter credit control peer named `test` and the realm `companyx`:
diameter peer-select peer test realm companyx

The following command configures IMSI-based Diameter credit control peer selection in the IMSI range of 1234567890 to 1234567899:

diameter peer-select peer star imsi-based start-value 1234567890 end-value 1234567899

The following command configures IMSI-based DCCA peer selection with IMSI suffix of 100 through 200:

diameter peer-select peer test_peer realm test_realm secondary-peer test_sec_realm realm test_realm2 imsi-based suffix 100 to 200

**diameter pending-timeout**

This command configures the maximum time period to wait for response from a Diameter peer.

**Product**  
All

**Privilege**  
Security Administrator, Administrator

**Command Modes**  
Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-dcca) #
```

**Syntax Description**

```
diameter pending-timeout duration deciseconds msg-type { any | ccr-event | ccr-initial | ccr-terminate | ccr-update }
default diameter pending-timeout

default
```

Disables DCCA resending message at pending-timeout.

**duration**

Specifies the timeout duration (in deciseconds). The value must be an integer from 1 through 3000.

**deciseconds msg-type { any | ccr-event | ccr-initial | ccr-terminate | ccr-update }**

Specifies independent timers (in deciseconds) for all message types like CCR-I, CCR-U, CCR-T and CCR-E. The default time will be 100 deciseconds (10 seconds).

This keyword option provides additional flexibility for operator to configure independent timers with reduced granularity.

This feature implementation ensures that the timer configuration is backward compatible. If the CLI command is configured without "deciseconds" and "msg-type", the configured time will be taken as seconds and while displaying the CLI it will be converted to deciseconds and msg-type will be "any".
after-expiry-try-secondary-host

This keyword is deprecated. This can now be managed using the retry-after-tx-expiry and go-offline-after-tx-expiry keywords in the failure-handling command.

Usage Guidelines

Use this command to set the maximum time for Diameter credit control to receive a response from its peer.

DCCA refers to this as the Tx Timer. Typically, this should be configured to a value smaller than the response-timeout value of Diameter Endpoint Configuration Mode. That value is typically too large for DCCA's purposes.

If DCCA gets a "no available routes" error before pending-timeout expires, then DCCA tries to send to the secondary host (if one has been configured). If DCCA gets no response and pending-timeout expires, then DCCA either tries the secondary host or gives up. This can now be managed using the failure-handling command.

If routing has failed, i.e., the attempt to the primary host, as well as, the attempt to the secondary host (if that has been configured), then the processing configured by the failure-handling command is performed.

The routing (i.e., returning a good response, no response or an error response such as "no available routes") is controlled by Diameter Endpoint Configuration Mode. That uses a watchdog timer (called Tw Timer) to attempt a different route to a host. Multiple routes could be attempted. If there's no response before the endpoint's configured response-timeout expires, then "no available routes" is the routing result. The routing logic remembers the status of routes, so it can return "no available routes" immediately, without using any timers.

The default case will disable DCCA resending message at Tx (pending-timeout). So messages are retried only at Tw (device watchdog timeout) by diabase or at response-timeout by DCCA.

Example

The following command configures a Diameter Credit Control Pending Timeout setting of 20 seconds:

diameter pending-timeout 20

diameter reauth-blacklisted-content

This command allows reauthorization of blacklisted content (blacklisted with Result-Code like 4012, 4010, etc) when a Rating Group (RG) based Re-Authorization Request (RAR) or generic RAR is received.

Product

GGSN
HA
IPSG
PDSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration
**Syntax Description**

`diameter reauth-blacklisted-content [ content-based-rar ]`

`no diameter reauth-blacklisted-content`

`no`

Configures this command with the default setting. That means, the reauthorization of blacklisted RG will not happen.

**Usage Guidelines**

The current Gy implementation does not allow reauthorization of Blacklisted content (blacklisted with Result-Code like 4012, 4010, etc) when Gy receives an RAR (either a RG based RAR or generic RAR).

With this CLI based enhancement, it is possible to perform one of the following actions:

- to reauthorize blacklisted RG only when RG specific RAR is received.
- to reauthorize blacklisted RG on any kind of RAR (both RG specific or generic).
- do not reauthorize blacklisted RG (default implementation).

This feature determines if the RAR received from OCS is generic or to any specific rating-group.

If it is a generic RAR:

- If this CLI command "diameter reauth-blacklisted-content" is configured, then reauthorize all the Rating-Groups (RGs) which are blacklisted. CCR-U forced-reauthorization will be triggered all the RGs.

- If this CLI command "diameter reauth-blacklisted-content content-based-rar" is configured, then RG which are blacklisted will not be reauthorized. CCR-U forced-reauthorization will be triggered only for active RGs alone.

If Rating-Group information is received in RAR:

- If either "diameter reauth-blacklisted-content" or "diameter reauth-blacklisted-content content-based-rar" is configured, then RG gets re-authorized even it is blacklisted. CCR-U forced-reauthorization will be triggered for the received RG.

If this CLI command is not configured, then the default behavior which is not to reauthorize blacklisted RG persists.

**Example**

The following command enables reauthorization of blacklisted content on receiving RG specific RAR:

```bash
diameter reauth-blacklisted-content [ content-based-rar ]
```
**diameter redirect-url-token**

This command allows configuring a token to be used for appending original URL to the redirect address.

---

**Important**

This command is customer specific. For more information contact your Cisco account representative.

---

**Product**

GGSN
HA
IPSG
PDSN
P-GW
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > ACS Configuration > Credit Control Configuration`

`active-charging service service_name > credit-control`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
diameter redirect-url-token string
```

**default diameter redirect-url-token string**

**default**

Configures this command with the default setting.

**string**

The redirect url token name must be an alphanumeric string of size 1 through 63 characters.

---

**Usage Guidelines**

The chassis should perform dynamic Advice of Charge (AoC) redirections (URL provided by Online Charging System (OCS)) for a particular Service ID/Rating Group combination without affecting the flows mapped to other Service ID/Rating Group combinations. Redirections can be removed by OCS for a particular MSCC (Service ID/Rating Group combination) using a RAR message containing a specific Service ID/Rating Group combination.

As part of redirection to an AoC or Top-UP server (302 Moved HTTP message) the PCEF should be able to append the original HTTP URL to the redirected session. This way, once the subscriber has successfully been redirected (and potentially topped up their prepaid account) they can be presented with an option to be redirected back to their original URL. The OCS can indicate to the PCEF if the original URL is to be appended to the redirection by specifying a special character to the end of the AoC redirection — for example, a “?” character. Upon final unit indication a redirect server address will be returned together with the FUI.
On redirection, the redirect URL will be appended with the original URL information using the token name configured with the **diameter redirect-url-token** command so that on completion of AoC, the AoC server may redirect the client back to the original location.

The rules for appending the original URL before redirection are as follows:

1. The "?" character at the end of the AoC page provided by the OCS in the redirect URL will be replaced with the "&" character.
2. A configurable parameter will be appended after the "&" character. The parameter whose name will be defined in a command line in the chassis configuration. The parameter name is case sensitive.
3. An "=" will be appended to the parameter.
4. The subscriber's original URL will be appended to the "=" character.

For example:

When the original URL was http://homepage/

OCS provided URL:

```
http://test.dev.mms.ag/test/
authname=Return&CODE=UPSELL&OCSCode=FWB&SessionID=4:0001-diamproxy.st40gy2;130020198;9243;1b02:12000:12000:H:AOC:1299597546:UPSELL:N&transID=AOCPurchasepage?
```

The text in bold in the following sample indicates the current configuration for implementing the dynamic AoC redirection.

```
http://test.dev.mms.ag/test/
authname=Return&CODE=UPSELL&OCSCode=FWB&SessionID=4:0001-diamproxy.st40gy2;130020198;9243;1b02:12000:12000:H:AOC:1299597546:UPSELL:N&transID=AOCPurchasepage?
```

**Example**

The following command configures the redirect-url-token as *returnUrl*:

```
diameter redirect-url-token returnUrl
```

---

**diameter redirect-validity-timer**

This command allows you to control the starting of validity timer for the FUI-redirect scenario.

**Product**

- GGSN
- HA
- IPSG
- PDSN
- P-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```
Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
diameter redirect-validity-timer { immediate | traffic-start }
default diameter redirect-validity-timer
```

**default**

Configures this command with the default setting. By default, the validity timer is started on receiving the first matching packet.

**immediate**

This keyword will make the redirect-validity-timer to get started immediately.

**traffic-start**

This keyword will make the redirect-validity-timer to get started only on receiving matching traffic. This is the default configuration.

**Usage Guidelines**

Use this CLI command to control the starting of validity timer on receipt of CCA in all cases. Based on the configuration value, DCCA decides when to start the redirect-validity-timer. By default, it is started on receiving the first matching packet.

**Example**

The following command configures the redirect-validity-timer to get started immediately on receiving CCA:

```
diameter redirect-validity-timer immediate
```

---

**diameter result-code**

This command enables sending a GTP Create-PDP-Context-Rsp message with cause code based on the DCCA result code.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
Exec > ACS Configuration > Credit Control Configuration
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
diameter result-code { authorization-rejected | credit-limit-reached | end-user-service-denied | user-unknown } use-gtp-cause-code { apn-access-denied-no-subscription | authentication-failure | no-resource-available | system-failure }
```
default diameter result-code { authorization-rejected | 
  credit-limit-reached | end-user-service-denied | user-unknown }
use-gtp-cause-code

default
Configures this command with the default setting.
In 12.1 and earlier releases: no-resource-available
In 12.2 and later releases: system-failure

authorization-rejected
Result code received as DIAMETER_AUTHORIZATION_REJECTED(5003).

credit-limit-reached
Result code received as DIAMETER_CREDIT_LIMIT_REACHED(4012).

end-user-service-denied
Result code received as DIAMETER_END_USER_DENIED(4010).

user-unknown
Result code received as DIAMETER_USER_UNKNOWN(5030).

use-gtp-cause-code
Cause code to be sent in GTP response.

apn-access-denied-no-subscription
Sends the GTP cause code GTP_APN_ACCESS_DENIED_NO_SUBSCRIPTION in GTP response.
If this keyword is configured and if the CCR-U is received with auth-rejected(5003) or
credit-limit-reached(4012) or user-unknown(5030) or end-user-service-denied(4010), then the GTP result-code
is sent as "apn-access-denied-no-subscription".

authentication-failure
Sends the GTP cause code GTP_USER_AUTHENTICATION_FAILED in GTP response.

no-resource-available
Sends the GTP cause code GTP_NO_RESOURCESAVAILABLE in GTP response.

system-failure
Sends the GTP cause code GTP_SYSTEM_FAILURE in GTP response.

Usage Guidelines
On receiving result-code as AUTHORIZATION-REJECTED, CREDIT_LIMIT_REACHED,
END_USER_DENIED or USER_UNKNOWN from DCCA server, based on this CLI configuration, in GTP
Create-PDP-Context Response message the cause code can either be sent as
GTP_NO_Resource_Available or GTP.AUTHENTICATION_FAILED or GTP.SYSTEM_FAILURE or GTP.APN_ACCESS_DENIED_NO_SUBSCRIPTION.

**Example**

The following command sets the deny cause as user authentication failure when the CCA-Initial has the result code DIAMETER_AUTHORIZATION_REJECTED(5003):

```plaintext
diameter result-code authorization-rejected use-gtp-cause-code authentication-failure
```

---

**diameter send-ccri**

This command configures when to send an initial Credit Control Request (CCR-I) for the subscriber session.

### Product

All

### Privilege

Security Administrator, Administrator

### Command Modes

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```plaintext
[local]host_name(config-dcca)#
```

### Syntax Description

```
diameter send-ccri { session-start | traffic-start }
default diameter send-ccri
```

**default**

Configures this command with the default setting.

Default: **session-start**

**session-start**

Sends CCR-I when the PDP context is being established (on receiving Create-PDP-Context-Request).

**traffic-start**

Delays sending CCR-I until the first data packet is received from the subscriber.

---

**Important**

Please note that the CCR-I will be sent only with the default rulebase and not with Rulebase list even if the rulebase-list configuration is enabled. When the rulebase-list command is used in conjunction with `diameter send-ccri traffic-start` command, the former one's function is invalidated. The rulebase-list is used to allow the OCS to select one of the rulebases from the list configured during the session setup. But in case of `send-ccri traffic-start` the CLI causes the session setup to complete without OCS interaction. For more information on `rulebase-list` command, please see the [ACS Configuration Mode Commands] chapter of the [Command Line Interface Reference].
**Usage Guidelines**

Use this command to configure when to send CCR-Initial for the subscriber session.

**Example**

The following command configures to send CCR-I on traffic detection and not on context creation:

```
diameter send-ccri traffic-start
```

**diameter service-context-id**

This command configures the value to be sent in the Service-Context-Id AVP, which identifies the context in which DCCA is used.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
diameter service-context-id service_context_id
default diameter service-context-id
```

- **default**
  
  Configures this command with the default setting. Currently, the default value is encoded based on the dictionary wherever applicable; when not applicable, it is not encoded.

- **service_context_id**
  
  Specifies the service context as an alphanumeric string of 1 through 63 characters that can contain punctuation characters.

**Usage Guidelines**

If Service-Context-Id is applicable and configured using this command, it will be sent in the AVP Service-Context-Id in the Diameter CCR message.

**Example**

The following command specifies the value `version@customer.com` to be sent in the Service-Context-Id AVP in the Diameter CCR message:

```
diameter service-context-id version@customer.com
```
diameter session failover

This command enables or disables Diameter Credit Control Session Failover. When enabled, the secondary peer is used in the event the main peer is unreachable.

**Product**
- GGSN
- HA
- IPSG
- PDSN
- P-GW

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > ACS Configuration > Credit Control Configuration
- active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
[ default | no ] diameter session failover
```

- **default**
  - Configures this command with the default setting.
  - Default: Depends on the failure-handling configuration

- **no**
  - If the primary server is not reachable, failover is not triggered and the session is torn down. No failover action is taken.

**Usage Guidelines**

Use this command to enable/disable Diameter Credit Control Session Failover.

The failure-handling, on page 748 configuration comes into effect only if `diameter session failover` is present in the configuration. The failover can be overridden by the server in the response message, and it takes precedence.

**Example**

The following command enables Diameter Credit Control Session Failover:

```
diameter session failover
```

diameter suppress-avp

This command specifies to suppress the AVPs like the MVNO-subclass-id and MVNO-Reseller-Id AVPs.
Product

P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration

`active-charging service service_name > credit-control`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

Syntax Description

`diameter suppress-avp reseller-id subclass-id`

[no | default] `diameter suppress-avp reseller-id subclass-id`

`no`

Disables AVP suppression. Whenever PCRF sends the MVNO-subclassid and MVNO-Reseller-id AVPs in the Gx interface, the same is sent in the Gy message.

`default`

Sets the default configuration. AVPs are not suppressed by default. Whenever PCRF sends the MVNO-subclassid and MVNO-Reseller-id AVPs in the Gx interface, the same is sent in the Gy message.

`suppress-avp`

Suppresses both MVNO-subclassid and MVNO-Reseller-id AVPs.

`reseller-id`

Suppresses the MVNO-Reseller-Id AVP.

`subclass-id`

Suppresses the MVNO-Sub-Class-Id AVP.

Usage Guidelines

Use this command to suppress the AVPs like the MVNO-subclass-id and MVNO-Reseller-Id AVPs.

Example

The following command specifies to request quota on receiving a dynamic rule with Online AVP enabled:

```
diameter suppress-avp reseller-id subclass-id
```

diameter update-dictionary-avps

This command enables dictionary control of the AVPs that need to be added based on the version of the specification with which the Online Charging System (OCS) is compliant. This command is applicable to all products that use the dcce-custom8 dictionary for Gy interface implementation.
diameter update-dictionary-avps

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

diameter update-dictionary-avps { 3gpp-rel8 | 3gpp-rel9 | 3gpp-rel10 | 3gpp-rel11 | 3gpp-rel13 }
[ default | no ] diameter update-dictionary-avps

default | no

Configures this command with the default setting.

Default: Compliant with the oldest release (Rel. 7) and send only Rel. 7 AVPs

3gpp-rel8
Select the 3GPP Rel. 8 AVPs for encoding.

3gpp-rel9
Selects the 3GPP Rel. 9 AVPs for encoding.

3gpp-rel10
Select the 3GPP Rel. 10 AVPs for encoding.

3gpp-rel11
Select the 3GPP Rel. 11 AVPs for encoding.

3gpp-rel13
Select the 3GPP Rel. 13 AVPs for encoding.

Usage Guidelines

Important
This command is applicable ONLY to the dcca-custom8 dictionary. If, for any dictionary other than
dcca-custom8, this command is configured with a value other than the default, configuration errors will be
indicated in the output of the show configuration errors section active-charging command.

Use this command to encode the AVPs in the dictionary based on the release version of the specification to
which the OCS is compliant with.
Example
The following command enables encoding of AVPs in the dictionary based on 3GPP Rel. 9:

```
diameter update-dictionary-avps 3gpp-rel9
```

**end**

Exits the current configuration mode and returns to the Exec mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Syntax Description**

**end**

Use this command to return to the Exec mode.

**event-based-session**

This command configures the parameters for event-based Gy session.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

| Syntax Description | [ no ] event-based-session trigger type { location-any | mcc | mnc | timezone } +
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>default event-based-session trigger type</td>
</tr>
</tbody>
</table>

**default**

Configures this command with the default setting.

Default: No triggers.

**no**

Removes the previously configured trigger type.
location-any
Sets the trigger based on change in user location.

mcc
Sets the trigger based on change in Mobile Country Code (MCC) of the serving node (for e.g. SGSN, S-GW).

mnc
Sets the trigger based on change in Mobile Network Code (MNC) of the serving node (for e.g. SGSN, S-GW).

timezone
Sets the trigger based on change in the timezone of UE.

+
Indicates that more than one of the previous keywords can be entered within a single command.

Usage Guidelines
Use this command to enable the credit control reauthorization triggers for event-based-session in the credit-control group.

Example
The following command selects a credit control trigger as mcc:

```
event-based-session trigger type mcc
```

exit
Exits the current mode and returns to the parent configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
exit

Usage Guidelines
Use this command to return to the parent configuration mode.

failure-handling
This command configures Diameter Credit Control Failure Handling (CCFH) behavior in the event of communication failure with the prepaid server or on reception of specific error codes from prepaid server.

Product
All

Privilege
Security Administrator, Administrator
Command Modes

Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local] host_name(config-dcca) #

Syntax Description

default failure-handling { initial-request | terminate-request | update-request }

default failure-handling { initial-request | terminate-request | update-request }

Configures the default CCFH setting.

initial-request: The default setting is terminate.

update-request: The default setting is retry-and-terminate.

terminate-request: The default setting is retry-and-terminate.

initial-request

Specifies the message type as CCR-Initial.

terminate-request

Specifies the message type as CCR-Terminate.

update-request

Specifies the message type as CCR-Update.

continue

Specifies the CCFH setting as continue. The online session is converted into an offline session. The associated PDP Context is established (new sessions) or not released (ongoing sessions).

retry-and-terminate

Specifies the CCFH setting as retry-and-terminate. The user session will continue for the duration of one retry attempt with the prepaid server. If there is no response from both primary and secondary servers, the session is torn down.

terminate

Specifies the CCFH setting as terminate. All type of sessions (initial or update) are terminated in case of failure.

go-offline-after-tx-expiry

Starts offline charging after Tx expiry.
retry-after-tx-expiry

Retries after Tx expiry. Enables secondary-host, if up, to take over after Tx expiry.

Usage Guidelines

Use this command to select the CCFH behavior. The specified behavior is used for sessions when no behavior is specified by the prepaid server. By default, the CCFH is taken care at response-timeout except for terminate setting.

If the Credit-Control-Failure-Handling AVP is received from the server, the received setting will be applied to all the message types.

The following table indicates the CCFH behavior for the combination of different CCFH settings, and the corresponding CLI commands.

<table>
<thead>
<tr>
<th>CCFH Setting</th>
<th>CLI Command</th>
<th>Behavior at Tx</th>
<th>Behavior at RT</th>
<th>Secondary is Up</th>
<th>Secondary is Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial-request Message Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continue</td>
<td>initial-request continue</td>
<td>N/A</td>
<td>Continue</td>
<td>Secondary takes over after RT</td>
<td>Offline after another RT. No more quota requests are performed for any rating group within the session after DCCA failure (even if connectivity to DCCA is restored)</td>
</tr>
<tr>
<td></td>
<td>initial-request continue</td>
<td>Offline</td>
<td>N/A</td>
<td>Offline at Tx</td>
<td>Offline at Tx</td>
</tr>
<tr>
<td></td>
<td>go-offline-after-tx-expiry</td>
<td>N/A</td>
<td>N/A</td>
<td>Secondary takes over after Tx</td>
<td>Offline after another Tx</td>
</tr>
<tr>
<td>Retry-and-terminate</td>
<td>initial-request retry-and-terminate</td>
<td>N/A</td>
<td>Retry</td>
<td>Secondary takes over after RT</td>
<td>Terminate after another RT</td>
</tr>
<tr>
<td></td>
<td>initial-request retry-and-terminate</td>
<td>Retry</td>
<td>N/A</td>
<td>Secondary takes over after Tx</td>
<td>Terminate after another Tx</td>
</tr>
<tr>
<td>Terminate</td>
<td>initial-request terminate</td>
<td>Terminate</td>
<td>N/A</td>
<td>Terminate after Tx</td>
<td>Terminate after Tx</td>
</tr>
</tbody>
</table>

Update-request Message Type
<table>
<thead>
<tr>
<th>CCFH Setting</th>
<th>CLI Command</th>
<th>Behavior at Tx</th>
<th>Behavior at RT</th>
<th>Secondary is Up</th>
<th>Secondary is Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue</td>
<td>update-request continue</td>
<td>N/A</td>
<td>Continue</td>
<td>Secondary takes over after RT</td>
<td>Offline after another RT</td>
</tr>
<tr>
<td></td>
<td>update-request continue go-offline-after-tx-expiry</td>
<td>Offline</td>
<td>N/A</td>
<td>Offline at Tx</td>
<td>Offline at Tx</td>
</tr>
<tr>
<td></td>
<td>update-request continue retry-after-tx-expiry</td>
<td>Continue</td>
<td>N/A</td>
<td>Secondary takes over after Tx</td>
<td>Offline after another Tx</td>
</tr>
<tr>
<td>Retry-and-terminate</td>
<td>update-request retry-and-terminate</td>
<td>N/A</td>
<td>Retry</td>
<td>Secondary takes over after RT</td>
<td>Sends CCR-T after another RT</td>
</tr>
<tr>
<td></td>
<td>update-request retry-and-terminate retry-after-tx-expiry</td>
<td>Retry</td>
<td>N/A</td>
<td>Secondary takes over after Tx</td>
<td>Sends CCR-T after another Tx</td>
</tr>
<tr>
<td>Terminate</td>
<td>update-request terminate</td>
<td>Terminate</td>
<td>N/A</td>
<td>Sends CCR-T after Tx</td>
<td>Sends CCR-T after Tx</td>
</tr>
</tbody>
</table>

**Terminate-request Message Type**

| Continue     | terminate-request continue | N/A | Retry | CCR-T is sent to secondary after RT | Terminate after another RT |
|              | terminate-request continue go-offline-after-tx-expiry | Retry | N/A | CCR-T is sent to secondary after Tx | Terminate after another Tx |
|              | terminate-request continue retry-after-tx-expiry | Retry | N/A | CCR-T is sent to secondary after Tx | Terminate after another Tx |
| Retry-and-terminate | terminate-request retry-and-terminate | N/A | Retry | CCR-T is sent to secondary after RT | Terminate after another RT |
|              | terminate-request retry-and-terminate retry-after-tx-expiry | Retry | N/A | CCR-T is sent to secondary after Tx | Terminate after another Tx |
| Terminate    | terminate-request terminate | Terminate | N/A | Terminate after Tx | Terminate after Tx |

**Example**

The following command sets the Credit Control Failure Handling behavior for initial request message type to **retry-and-terminate**:
This command enables the Gy event triggers for configuration of matching Rf ACR containers.

### gy-rf-trigger-type

Enters the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

### Syntax Description

```
gy-rf-trigger-type { final | forced-reauthorization | holding-time | quota-exhausted | rating-condition-change | threshold | validity-time } { default | no } gy-rf-trigger-type
```

- **default**
  - The "default/no" variant of this command will not enable any of the Gy event-triggers which means the containers would not be closed for any of the event-triggers.

- **final**
  - Enables Gy trigger "final" for Rf

- **forced-reauthorization**
  - Enables Gy trigger "forced-reauthorization" for Rf.

- **holding-time**
  - Enables Gy trigger "qht" for Rf. The trigger "qht" indicates Quota Holding Time.

- **quota-exhausted**
  - Enables Gy trigger "quota-exhausted" for Rf.

- **rating-condition-change**
  - Enables Gy trigger "rating-condition-change" for Rf.
threshold
Enables Gy trigger "threshold" for Rf.

validity-time
Enables Gy trigger "validity-time" for Rf.

**Usage Guidelines**
Use this command to enable the Gy reporting reasons/event triggers.
For all the Gy event triggers a container will be cached at Rf and will be sent based on other events at Rf (for example, max-charging-change-condition, RAT-Change, etc).

**Important**
The CLI command "gy-rf-trigger-type" is currently applicable only for CCR-U and not CCR-T.

For example, when the CLI for QUOTA_EXHAUSTED event trigger is configured under credit-control group configuration, if there is quota_exhausted event then the container should be cached with appropriate change-condition value and ACR-I would be sent out based on other Rf event triggers. Similar behavior is applicable to other event triggers when configured.

**Example**
The following command specifies the validity-time event trigger to be enabled.

```
gy-rf-trigger-type validity-time
```

**imsi-imeisv-encode-format**
This command configures the encoding format of IMSI/IMEISV in the User-Equipment-Info, 3GPP-IMSI and 3GPP-IMEISV AVPs.

**Product**
GGSN  
HA  
IPSG  
PDSN  
P-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**
```
[ default | no ] imsi-imeisv-encode-format { ascii | tbcd }
```
ascii
Sends IMSI/IMEISV as an octet string in ASCII encoded format. By default, the IMSI/IMEISV will be encoded in ASCII format.

tbcd
Sends IMSI/IMEISV as an octet string in Telephony Binary Coded Decimal (TBCD) format, i.e. the nibbles in an octet are inter-changed.

Usage Guidelines
Use this command to configure the encoding format of IMSI/IMEISV in User-Equipment-Info, 3GPP-IMSI and 3GPP-IMEISV AVPs.

Example
The following command specifies the encoding format of IMSI/IMEISV as ASCII:
`imsi-imeisv-encode-format ascii`

mode
This command configures the Prepaid Credit Control mode to RADIUS or Diameter.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > ACS Configuration > Credit Control Configuration
`active-charging service service_name > credit-control`
Entering the above command sequence results in the following prompt:

`[local]host_name(config-dcca)#`

Syntax Description
mode { diameter | radius }
default mode
default
Configures the default prepaid credit control mode.
Default: `diameter`
diameter
Enables Diameter Credit Control Application (DCCA) for prepaid charging.

Important
After you configure this keyword, you must save the configuration and then reload the chassis for the command to take effect. For information on saving the configuration file and reloading the chassis, refer to the System Administration Guide for your deployment.
radius

Enables RADIUS Credit Control for prepaid charging.

---

**Important**

After you configure this keyword, you must save the configuration and then reload the chassis for the command to take effect. For information on saving the configuration file and reloading the chassis, refer to the *System Administration Guide* for your deployment.

---

**Usage Guidelines**

Use this command to configure the prepaid charging application mode to Diameter or RADIUS credit control.

---

**Important**

After you configure this command, you must save the configuration and then reload the chassis for the command to take effect. For information on saving the configuration file and reloading the chassis, refer to the *System Administration Guide* for your deployment.

---

**Example**

The following command specifies to use RADIUS prepaid credit control application:

```
mode radius
```

### offline-session re-enable

This command is configured to re-enable the offline Gy session after failure.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

`active-charging service service_name > credit-control`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
[ no ] offline-session re-enable
```

**no**

Disables the feature. This is the default behavior.

The default configuration is `no offline-session re-enable`.

**Usage Guidelines**

Use this command to re-enable the Offline Gy session back to Online charging, based on indication from PCRF. When `offline-session re-enable` is configured and the PCRF installs/modifies a rule with "Online" AVP value set to 1, then the Offline DCCA will be marked Online.
pending-traffic-treatment

This command controls the pass/drop treatment of traffic while waiting for definitive credit information from the server.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**

active-charging service *service_name* > credit-control

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
pending-traffic-treatment { { { forced-reauth | trigger | validity-expired } drop | pass } | { noquota { buffer | drop | limited-pass volume | pass } } } | { quota-exhausted { buffer | drop | pass } } } default pending-traffic-treatment { forced-reauth | noquota | quota-exhausted | trigger | validity-expired }
```

default

Configures this command with the default setting.

Default: drop

**forced-reauth**

Sets the Diameter credit control pending traffic treatment to forced reauthorization.

**trigger**

Sets the Diameter credit control pending traffic treatment to trigger.

**validity-expired**

Sets the Diameter credit control pending traffic treatment to validity expired.

**noquota**

Sets the Diameter credit control pending traffic treatment to no quota.

**quota-exhausted**

Sets the Diameter credit control pending traffic treatment to quota exhausted.

**buffer**

Specifies to tentatively count/time traffic, and then buffer traffic pending arrival of quota. Buffered traffic will be forwarded and fully charged against the quota when the quota is eventually obtained and the traffic is passed.
**drop**

Drops any traffic when there is no quota present.

**limited-pass volume**

Enables limited access for subscribers when the OCS is unreachable.

*volume* specifies the Default Quota size (in bytes) and must be an integer from 1 through 4294967295.

This feature allows the subscriber to use the network when the OCS response is slow. This configuration enables to set a Default Quota size from which the subscriber can consume quota until response from the OCS arrives. The traffic consumed by the subscriber from the Default Quota at the beginning of the session is reported and counted against the quota assigned from the OCS.

---

**Important**

Default Quota is used only for **noquota** case (Rating Group (RG) seeking quota for the first time) and not for **quota-exhausted**. Default Quota is not used for subsequent credit requests.

If the Default Quota is NOT exhausted before the OCS responds with quota, traffic is allowed to pass. Initial Default Quota usage is counted against initial quota allocated. If quota allocated is less than the actual usage, the actual usage and request additional quota are reported. If no additional quota is available, the traffic is denied.

If the Default Quota is NOT exhausted before the OCS responds with denial of quota, traffic is blocked after the OCS response. The gateway will report usage on Default Quota even in for CCR-U (FINAL) or CCR-T until the OCS responds.

If the Default Quota is exhausted before the OCS responds, the session is dropped.

The default pending-traffic-treatment for **noquota** is drop. The **default pending-traffic-treatment noquota** command removes any Default Quota limit configured.

**pass**

Passes all traffic more or less regardless of quota state.

---

**Usage Guidelines**

Use this command to set the Diameter credit control pending traffic treatment while waiting for definitive credit information from the server.

This CLI command is different than the **failure-handling** command, which specifies behavior in the case of an actual timeout or error, as opposed to the behavior while waiting. See also the **buffering-limit** command in the Active Charging Service Configuration Mode.

---

**Example**

The following command sets the Diameter credit control pending traffic treatment to drop any traffic when there is no quota present:

`pending-traffic-treatment noquota drop`
quota

This command sets various time-based quotas in the prepaid credit control service.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

quota holding_time | validity-time validity_time }
{ default | no } quota { holding-time | validity-time }

holding-time holding_time

Specifies the Quota Holding Time (QHT) in seconds. The value must be an integer from 1 through 4000000000.

validity-time validity_time

Specifies the validity lifetime of the quota, in seconds. The value must be an integer from 1 through 400000.

Usage Guidelines

Use this command to set the prepaid credit control quotas.

Example

The following command sets the prepaid credit control request holding time to 30000 seconds:

quota holding-time 30000

quota request-trigger

This command configures the action on the packet that triggers the credit control application to request quota.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#
Syntax Description

```
quota request-trigger { exclude-packet-causing-trigger |
include-packet-causing-trigger }
{ default | no } quota request-trigger

default quota request-trigger
```

**default**
Configures this command with the default setting. Default: include-packet-causing-trigger

**no**
Same as the default quota request-trigger command.

---

**Important**

In 10.0 and later releases, this keyword is deprecated.

**exclude-packet-causing-trigger**
Excludes the packet causing threshold limit violation trigger.

**include-packet-causing-trigger**
Includes the packet causing the threshold limit violation trigger.

---

**Usage Guidelines**

Use this command to configure action on the packet that triggers the credit control application to request quota, whether the packet should be excluded/included in the utilization information within the quota request.

**Example**
The following command sets the system to exclude the packets causing threshold limit triggers from accounting of prepaid credit of a subscriber:

```
quota request-trigger exclude-packet-causing-trigger
```

---

**quota time-threshold**

This command configures the time threshold limit for subscriber quota in the prepaid credit control service.

---

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```
Syntax Description

quota time-threshold { abs_time_value | percent percent_value }
{ default | no } quota time-threshold

default
Configures this command with the default setting.
Default: Disabled

no
Disables time threshold for prepaid credit control quota.

abs_time_value
Specifies the absolute threshold time (in seconds) for configured time quota in prepaid credit control charging. abs_time_value must be an integer from 1 through 86400. To disable this assign 0. Default: 0 (Disabled)

percent_value
Specifies the time threshold value as a percentage of the configured time quota in DCCA. percent_value must be an integer from 1 through 100.

Usage Guidelines
Use this command to set the time threshold for prepaid credit control quotas.

Example
The following command sets the prepaid credit control time threshold to 400 seconds:
quota time-threshold 400

**quota units-threshold**

This command sets the unit threshold limit for subscriber quota in the prepaid credit control service.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:
[local]host_name(config-dcca)#

Syntax Description

quota unit-threshold { abs_unit_value | percent percent_value }
{ default | no } quota units-threshold

default
Configures this command with the default setting.
Default: Disabled

no
Disables unit threshold for DCCA quota.

**abs_unit_value**
Specifies the absolute threshold value (in units) for the configured units quota in prepaid credit control application. abs_unit_value must be an integer from 1 through 4000000000. To disable this assign 0. Default: 0 (Disabled)

**percent_value**
Specifies the time threshold value as a percentage of the configured units quota in DCCA. percent_value must be an integer from 1 through 100.

**Usage Guidelines**
Use this command to set the units threshold for prepaid credit control quotas.

**Example**
The following command sets the prepaid credit control time threshold to 160400 units:
```bash
quota units-threshold 160400
```

**quota volume-threshold**
This command sets the volume threshold limit for subscriber quota in the prepaid credit control service.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Active > ACS Configuration > Credit Control Configuration

```bash
active-charging service service_name > credit-control
[local]host_name(config-dcca)#
```

**Syntax Description**
```bash
quota volume-threshold { abs_vol_value | percent percent_value }
{ default | no } quota volume-threshold
```

**default**
Configures this command with the default setting.
Default: Disabled

**no**
Disables volume threshold for prepaid credit control quota.
abs_vol_value

Specifies the absolute threshold volume (in bytes) to the configured volume quota in prepaid credit control. abs_vol_value must be an integer from 1 through 4000000000. To disable this assign 0. Default: 0 (Disabled)

If configured, the Credit Control client will seek re-authorization from the server for the quota when the quota contents fall below the specified threshold.

percent percent_value

Specifies the volume threshold value as a percentage of the configured volume quota in prepaid credit control. percent_value must be an integer from 1 through 100.

Usage Guidelines

Use this command to set the volume threshold for prepaid credit control quotas.

Example

The following command sets the prepaid credit control volume threshold to 160400 bytes:

quota volume-threshold 160400

radius usage-reporting-algorithm

This command configures the usage reporting algorithm for RADIUS prepaid using the Diameter Credit-Control Application (DCCA).

Product All

Privilege Security Administrator, Administrator

Command Modes Exec > ACS Configuration > Credit Control Configuration

active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

radius usage-reporting-algorithm { cumulative | relative }
default radius usage-reporting-algorithm

default

Configures this command with the default setting.

Default: cumulative

cumulative

Reports the total accumulated usage of quota in every accounting interim.

relative

Reports the quota usage per accounting interim (since the previous usage report).
Use this command to configure the usage reporting algorithm for RADIUS prepaid using DCCA.

**Example**

The following command configures the usage reporting algorithm for RADIUS prepaid using DCCA to `relative`:

```
radius usage-reporting-algorithm relative
```

**redirect-indicator-received**

This command configures the action on buffered packets when a redirect-indicator is received from the RADIUS server.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
redirect-indicator-received { discard-buffered-packet | reprocess-buffered-packet }
{ default | no } redirect-indicator-received
```

- **default**
  
  Configures this command with the default setting. Default: `discard-buffered-packet`

- **no**
  
  Disables the redirect-indicator-received configuration.

- **discard-buffered-packet**
  
  Discards the buffered packet.

- **reprocess-buffered-packet**
  
  Redirects the buffered packet on receiving a redirect-indicator from the RADIUS server.

**Usage Guidelines**

Use this command to configure the action taken on buffered packet when redirect-indicator is received.

Diameter can return a redirect URL but not a redirect indicator, however RADIUS can return a redirect indicator. In this situation, any subsequent subscriber traffic would match ruledefs configured with `cca redirect-indicator`, and charging actions that have flow action `redirect-url` should be configured. However, some handsets do not retransmit, so there will be no subsequent packets. On configuring
reprocess-buffered-packet, the ruledefs are reexamined to find a new charging action, which may have flow action redirect-url configured.

**Example**
The following command configures the action taken on buffered packet when redirect-indicator is received to reprocess-buffered-packet:

```plaintext
redirect-indicator-received reprocess-buffered-packet
```

# redirect-require-user-agent

This command conditionally verifies the presence of user-agents in the HTTP header, based on which HTTP URL redirection will be applied.

**Product**
- GGSN
- HA
- IPSG
- PDSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
- Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

```
[ no ] redirect-require-user-agent
```

- **no**
  Disables the "user-agent" check in the HTTP header.

**Usage Guidelines**
Use this command to conditionally verify the presence of configured user-agents in the HTTP header. The user agent is configured using the **redirect user-agent** command in the ACS Configuration Mode. The user agent could be, for example, Mozilla, Opera, Google Chrome, etc.

The default configuration is to enable the "user-agent" check, and compare it with the configured list of supported user-agents. The packet will be redirected only when the user-agent is matched with one of the configured user-agents.

If **no redirect-require-user-agent** is configured, the user-agent check is disabled. The packets will be redirected even if it does not contain a "user-agent" information in the HTTP header.
servers-unreachable

This command configures whether to continue or terminate calls when Diameter server or the OCS becomes unreachable.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > ACS Configuration > Credit Control Configuration

```
active-charging service service_name > credit-control
```

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

**Syntax Description**

In 12.1 and earlier releases:

```
servers-unreachable { initial-request { continue | terminate [ after-timer-expiry timeout_period ] } | update-request { continue | terminate [ after-quota-expiry | after-timer-expiry timeout_period ] } } | [ initial-request | update-request ]
```

no servers-unreachable { initial-request | update-request }

In 12.2 and later releases:

```
```

no servers-unreachable { initial-request | update-request }

default servers-unreachable behavior-triggers { initial-request | update-request }

no

Deletes the current servers-unreachable configuration.

In 15.0 and later releases, to remove the error result code configuration, the `no` command syntax is:

```
no servers-unreachable behavior-triggers { initial-request | update-request } result-code { any-error | result-code [ to end-result-code ] };
```
behavior-triggers { initial-request | update-request } { result-code { any-error | result-code [ to end-result-code ] } | transport-failure [ response-timeout | tx-expiry ] }

This keyword is used to determine when to apply server-unreachable action. This supports three configurable options to apply server-unreachable action either at transport failure, Tx expiry or at response timeout. Out of these three options, the transport failure is the default option.

• **initial-request**: Specifies the behavior when Diameter server(s)/OCS become unreachable during initial session establishment.

• **update-request**: Specifies the behavior when Diameter server(s)/OCS become unreachable during mid-session.

• **result-code { any-error | result-code [ to end-result-code ] }**: Specifies to configure any Diameter error result code or a range of result codes to trigger entering server unreachable mode.

  *result-code* must be an integer ranging from 3000 to 5999.

• **transport-failure [ response-timeout | tx-expiry ]**: This keyword specifies to trigger the behavior either at transport failure or response timeout OR at Transport failure or Tx expiry.

**initial-request** { continue | terminate [ after-timer-expiry timeout_period ] }

---

**Important**

This section applies only to 12.1 and earlier releases.

Specifies behavior when Diameter server(s)/OCS become unreachable during initial session establishment.

• **continue**: Specifies to continue call if Diameter server(s) becomes unreachable.

• **terminate**: Specifies to terminate call if Diameter server(s) becomes unreachable.

**after-timer-expiry timeout_period**: On detecting transport failure, this keyword variable specifies the time limit for which the subscriber session will remain in offline state before the call is terminated.

  *timeout_period* specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.

**initial-request** { continue [ { [ after-interim-time timeout_period ] [ after-interim-volume quota_value ] } server-retries retry_count ] | terminate [ { [ after-interim-time timeout_period ] [ after-interim-volume quota_value ] } server-retries retry_count ] | after-timer-expiry timeout_period }

---

**Important**

This section applies only to 12.2 and later releases.

Specifies behavior when Diameter server(s)/OCS become unreachable during initial session establishment.

• **continue**: Specifies to continue call if Diameter server(s) becomes unreachable.

• **terminate**: Specifies to terminate call if Diameter server(s) becomes unreachable.

• **after-interim-time timeout_period**: Specifies to continue or terminate call after the interim timeout period expires.
timeout_period specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.

- **after-interim-volume quota_value**: Specifies to continue or terminate call on exhaustion of the assigned quota.
  
  quota_value specifies the volume-based quota value, in bytes, and must be an integer from 1 through 4294967295.

The **after-interim-volume** and **after-interim-time** can be configured in one of the following ways:

- **after-interim-volume quota_value server-retries retry_count**
- **after-interim-time timeout_period server-retries retry_count**
- **after-interim-volume quota_value after-interim-time timeout_period server-retries retry_count**

- **after-timer-expiry timeout_period**: On detecting transport failure, this keyword variable specifies the time limit for which the subscriber session will remain in offline state before the call is terminated.
  
  timeout_period specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.

- **server-retries retry_count**: Specifies the number of retries that should happen to OCS before allowing the session to terminate/offline.
  
  retry_count specifies the retries to OCS, and must be an integer from 0 through 65535. If the value 0 is defined for this keyword, the retry to OCS will not happen instead the configured action will be immediately applied.

**update-request { continue | terminate [ after-quota-expiry | after-timer-expiry timeout_period ] }**

Important

This section applies only to 12.1 and earlier releases.

Specifies behavior when Diameter server(s)/OCS become unreachable during mid session.

- **continue**: Specifies to continue call if Diameter server(s) becomes unreachable.
- **terminate**: Specifies to terminate call if Diameter server(s) becomes unreachable.

  - **after-quota-expiry**: Specifies to terminate call on exhaustion of all available quota.

  - **after-timer-expiry timeout_period**: On detecting transport failure, this keyword variable specifies the time limit for which the subscriber session will remain in offline state before the call is terminated.

  timeout_period specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.
update-request { continue [{ [ after-interim-time timeout_period ] [ after-interim-volume quota_value ] } server-retries retry_count ] | terminate [{ [ after-interim-time timeout_period ] [ after-interim-volume quota_value ] } server-retries retry_count ] | after-quota-expiry | after-timer-expiry timeout_period ] }

---

**Important**

This section applies only to 12.2 and later releases.

Specifies behavior when Diameter server(s)/OCS become unreachable during mid session.

- **continue**: Specifies to continue call if Diameter server(s) becomes unreachable.

- **terminate**: Specifies to terminate call if Diameter server(s) becomes unreachable.

  - **after-interim-time timeout_period**: Specifies to continue or terminate call after the interim timeout period expires.
    
    *timeout_period* specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.

  - **after-interim-volume quota_value**: Specifies to continue or terminate call on exhaustion of the assigned quota.
    
    *quota_value* specifies the volume-based quota value, in bytes, and must be an integer from 1 through 4294967295.

The **after-interim-volume** and **after-interim-time** can be configured in one of the following ways:

- **after-interim-volume quota_value server-retries retry_count**

- **after-interim-time timeout_period server-retries retry_count**

- **after-interim-volume quota_value after-interim-time timeout_period server-retries retry_count**

- **after-quota-expiry**: Specifies to terminate call on exhaustion of all available quota.

- **after-timer-expiry timeout_period**: On detecting transport failure, this keyword variable specifies the time limit for which the subscriber session will remain in offline state before the call is terminated.

  *timeout_period* specifies the timeout period, in seconds, and must be an integer from 1 through 4294967295.

- **server-retries retry_count**: Specifies the number of retries that should happen to OCS before allowing the session to terminate/offline.

  *retry_count* specifies the retries to OCS, and must be an integer from 0 through 65535. If the value 0 is defined for this keyword, the retry to OCS will not happen instead the configured action will be immediately applied.

---

**Usage Guidelines**

Use this command to configure whether to continue/terminate calls when Diameter server(s)/OCS are unreachable. This command can be used to verify the functionality of the configurable action if the OCS becomes unreachable.

In 12.1 and earlier releases, the OCS is considered down/unreachable when all transport/TCP connections are down for that OCS.
In 12.2 and later releases, the OCS is declared unreachable when all transport connections are down OR message timeouts happen (for example, a Tx expiry or response timeout, for all available OCS servers) owing to slow response from the OCS (may be due to network congestion or other network related issues).

The following set of actions are performed if the servers become unreachable:

- During initial session establishment:
  - Block traffic: Terminate the session.
  - Continue call: Continue by making the session offline.
  - Pass traffic until timer expiration post which terminates the call: Session would be offline while the timer is running.
  - Pass traffic until interim time expiration post which continues or terminates the call.
  - Pass traffic until interim volume expiration post which continues or terminates the call.

- During mid session:
  - Block traffic: Terminate the session.
  - Continue call: Continue by making the session offline.
  - Run out of session quota post which terminates the call.
  - Pass traffic until timer expiration post which terminates the call: Session would be offline while the timer is running.
  - Pass traffic until interim time expiration post which continues or terminates the call.
  - Pass traffic until interim volume expiration post which continues or terminates the call.

This command works on the same lines as the `failure-handling` command, which is very generic for each of the xxx-requests.

The `servers-unreachable` CLI command is specifically for TCP connection error. In the event of TCP connection failure, the `failure-handling` and/or `servers-unreachable` commands can be used. This way, the operator has the flexibility to configure CCFH independent of OCS-unreachable feature, that is having two different failure handlings for same request types.

Please note that the flexibility to configure CCFH independent of OCS-unreachable feature is applicable only to 12.1 and earlier releases. In 12.2 and later releases, if configured, the `servers-unreachable` takes precedence over the `failure-handling` command.

This command can also be used to control the triggering of behavior based on transport failure, response message timeouts or Tx expiry when OCS becomes unreachable. The OCS could be unreachable due to no TCP connection and the message timeout could be due to network congestion or any other network related issues.

The following are the possible and permissible configurations with respect to behavior triggering:

- `servers-unreachable behavior-triggers { initial-request | update-request } transport-failure`
Of these configurations, the first one is considered to be the default configuration and it will take care of backward compatibility with 12.0 implementation.

If the server returns the CC-Failure-Handling AVP, it would apply for transport-failure/response-timeout/tx-expiry when the CLI command `servers-unreachable` is not configured. If the `servers-unreachable` is configured for a set of behavior-triggers, then servers-unreachable configuration will be applied for them. For those behavior-triggers for which servers-unreachable is not configured, the CC-Failure-Handling value provided by the server will be applied.

By default, Result-Code such as 3002 (Unable-To-Deliver), 3004 (Too-Busy) and 3005 (Loop-Detected) falls under delivery failure category and will be treated similar to response-timeout configuration.

**Example**

The following command configures the duration of 1111 seconds, for the subscriber session to be in offline state, after which the initial request calls will be terminated.

```
servers-unreachable initial-request terminate after-timer-expiry 1111
```

`subscription-id service-type`

This command enables required Subscription-Ids for various service types.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
<th>HA</th>
<th>IPSG</th>
<th>PDSN</th>
<th>P-GW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; ACS Configuration &gt; Credit Control Configuration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
active-charging service service_name > credit-control
```

 Entering the above command sequence results in the following prompt:

```
[local] host_name(config-dcca)#
```

| Syntax Description | subscription-id service-type { closedrp | ggsn | ha | ipsg | l2tpls | mipv6ha | pdsn | pgw } { e164 | imsi | nai } |
|--------------------|---------------------------------------------------------------|
|                    | [ no ] subscription-id service-type { closedrp | ggsn | ha | ipsg | l2tpls | mipv6ha | pdsn | pgw } |
**default**

Configures the default timestamp-rounding setting.

Default: **floor**

```
closedrp | ggsn | ha | ipsg | l2tpins | mipv6ha | pdsn | pgw { e164 | imsi | nai }
```

Includes the Subscription-Id for the chosen service type. For example, if ipsg is configured as the keyword option, then the subscription-id is included for the IPSG service.

The following subscription-Id types are available:

- **e164** - Include E164 information in the Subscription-Id AVP
- **imsi** - Include IMSI information in the Subscription-Id AVP
- **nai** - Include NAI information in the Subscription-Id AVP

**Usage Guidelines**

Currently, Subscription-Id AVP is encoded in the Gy CCRs based on dictionary and service-type checks. With the new CLI command, customers will have the provision of enabling required Subscription-Id types for various services.

Each service can have a maximum of three Subscription-Id types (e164, imsi & nai) that can be configured through this CLI command. The DCCA specific changes are made in such a way that, if the CLI command is configured for any particular service, then the CLI takes precedence. Else, it falls back to default (hard-coded) values configured for that service.

The advantage of this CLI command is that any further dictionary additions in DCCA can be minimized.

**Important**

The CLI configured for any of the service will contain the most recent Subscription-Id-types configured for that service (i.e. overrides the previous values).

For an instance, if a customer wants IMSI value to be encoded in Gy CCRs (along with E164) for MIPv6HA service, then this CLI command `subscription-id service-type mipv6ha e164 imsi` should be configured in the Credit Control Configuration mode.

If only imsi is configured through the CLI, then Gy CCRs will only have imsi value.

**Example**

The following command configures imsi type for ggsn service:

```
subscription-id service-type ggsn imsi
```

**timestamp-rounding**

This command configures how to convert exact time into the units that are used in quotas.

**Product**

ACS

**Privilege**

Security Administrator, Administrator
Command Modes

Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

[local]host_name(config-dcca)#

Syntax Description

```
timestamp-rounding { ceiling | floor | roundoff }
default timestamp-rounding
```

**default**

Configures the default timestamp-rounding setting.

Default: **floor**

**timestamp-rounding ceiling**

Round off to the smallest integer greater than the fraction.

If the fractional part of the seconds is greater than 0, add 1 to the number of seconds and discard the fraction.

**timestamp-rounding floor**

Discard the fractional part of the second.

**timestamp-rounding roundoff**

Set the fractional part of the seconds to the nearest integer value. If the fractional value is greater than or equal to 0.5, add 1 to the number of seconds and discard the fractional part of second.

Usage Guidelines

Use this command to configure how to convert exact time into the units that are used in quotas for CCA charging.

The specified rounding will be performed before system attempts any calculation. For example using round-off, if the start time is 1.4, and the end time is 1.6, then the calculated duration will be 1 (i.e., 2 – 1 = 1).

Example

The following command sets the CCA timestamp to nearest integer value second (for example, 34:12.23 to 34:12.00):

```
timestamp-rounding roundoff
```

trigger type

This command enables/disables triggering a credit reauthorization when the named values in the subscriber session changes.

Product

All

Privilege

Security Administrator, Administrator
Command Modes

Exec > ACS Configuration > Credit Control Configuration

**active-charging service service_name > credit-control**

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dcca)#
```

Syntax Description

```
[ no ] trigger type { cellid | lac | mcc | mnc | qos | rat | serving-node | sgsn | timezone } +
default trigger type
```

default

Configures this command with the default setting.

Default: No triggers.

no

Removes the previously configured trigger type.

cellid

Sets the trigger based on change in cell identity or Service Area Code (SAC).

lac

Sets the trigger based on change in Location Area Code.

mcc

Sets the trigger based on change in Mobile Country Code (MCC).

mnc

Sets the trigger based on change in Mobile Network Code (MNC).

qos

Sets the trigger based on change in the Quality of Service (QoS).

rat

Sets the trigger based on change in the Radio Access Technology (RAT).

serving-node

Sets the trigger based on change in serving node. The serving node change causes the credit control client to ask for a re-authorization of the associated quota.

Typically used as an extension to sgsn trigger in P-GW (SAEGW), however, may also be used alone.

sgsn

Sets the trigger based on change in the IP address of SGSN.
timezone
Sets the trigger based on change in the timezone of UE.

+
Indicates that more than one of the previous keywords can be entered within a single command.

Usage Guidelines
Use this command to set the credit control reauthorization trigger.

Example
The following command selects a credit control trigger as lac:

```
trigger type lac
```

timezone

usage-reporting

This command configures the ACS Credit Control usage reporting type.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
active-charging service service_name > credit-control

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-dcca)#
```

Syntax Description

```
usage-reporting quotas-to-report based-on-grant {
  report-only-granted-volume }

default usage-reporting quotas-to-report
```

default

Configures this command with the default setting.

Default: Disabled

```
report-only-granted-volume
```

Suppresses the input and output octets. If the Granted-Service-Unit (GSU) AVP comes with CC-Total-Octets, then the device will send total, input and output octets in Used-Service-Unit (USU) AVP. If it comes with Total- Octets, the device will send only Total-Octets in USU.

Usage Guidelines
Use this command to configure reporting usage only for granted quota. On issuing this command, the Used-Service-Unit AVP will report quotas based on grant i.e, only the quotas present in the Granted-Service-Unit AVP.
With this command only the units for which the quota was granted by the DCCA server will be reported irrespective of the reporting reason.

**Example**

The following command configures to report usage based only on granted quota:

```plaintext
usage-reporting quotas-to-report based-on-grant
```
usage-reporting
Credit Control Service Configuration Mode Commands

The Credit Control Service Configuration Mode is used to create and manage Credit Control Service.

Command Modes

```
Exec > Global Configuration > Context Configuration > Credit Control Service Configuration
configure > context context_name > credit-control-service service_name
```

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- diameter dictionary, on page 777
- diameter endpoint, on page 778
- end, on page 779
- exit, on page 779
- failure-handling, on page 779
- request timeout, on page 780

**diameter dictionary**

This command configures the Diameter dictionary to be used for this Credit Control Service instance.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
Exec > Global Configuration > Context Configuration > Credit Control Service Configuration
```

**Syntax Description**

```
diameter dictionary { custom1 | standard }
default diameter dictionary
```
**diameter endpoint**

This command configures the Diameter Credit Control Interface Endpoint.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Credit Control Service Configuration

`configure > context context_name > credit-control-service service_name`

**Syntax Description**

```
diameter endpoint endpoint_name
  { default | no } diameter endpoint
```

- **default**
  
  Configures the default setting.

- **no**
  
  Removes the previous Diameter endpoint configuration.

- **endpoint_name**
  
  Specifies the Diameter endpoint name as an alpha and/or numeric string of 1 through 63 characters.

**Usage Guidelines**

Use this command to configure the Diameter Credit Control Interface Endpoint.

**Example**

The following command configures the Diameter Credit Control Interface Endpoint named `test135`:

`diameter endpoint test135 default`
**end**

Exits the current configuration mode and returns to the Exec mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Syntax Description**: `end`
- **Usage Guidelines**: Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Syntax Description**: `exit`
- **Usage Guidelines**: Use this command to return to the parent configuration mode.

**failure-handling**

This command configures the Diameter failure handling behavior.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Command Modes**: Exec > Global Configuration > Context Configuration > Credit Control Service Configuration
  
  `configure > context context_name > credit-control-service service_name`

- **Syntax Description**:

  ```
  failure-handling { initial-request | terminate-request | update-request }
  { diameter-result-code result_code [ to result_code ] | peer-unavailable | request-timeout }
  action { continue | retry-and-continue | retry-and-terminate | terminate }
  { default | no }
  ```
default
Configures the default setting.

no
Removes the previous failure handling configuration.

initial-request | terminate-request | update-request
initial-request: Specifies failure handling for Initial Request.
terminate-request: Specifies failure handling for Terminate Request.
update-request: Specifies failure handling for Update Request.

diameter-result-code | peer-unavailable | request-timeout
diameter-result-code \( \text{result} \_\text{code} \ [ \text{to} \ \text{result} \_\text{code} ] \): Specifies Diameter result code(s) for failure handling.
\( \text{result} \_\text{code} \) must be an integer from 3000 through 9999.
to \( \text{result} \_\text{code} \): Specifies the range of Diameter result codes.
peer-unavailable: Specifies failure handling for peer being unavailable.
request-timeout: Specifies failure handling for request timeouts.

action \{ continue | retry-and-continue | retry-and-terminate | terminate \}
Specifies the failure handling action.
continue: Continue the session without credit control.
retry-and-continue: Retry and, even if credit control is not available, continue.
retry-and-terminate: Retry and then terminate.
terminate: Terminate the session.

Usage Guidelines
Use this command to configure the Diameter failure handling behavior.

Example
The following command configures initial request failure handling behavior for Diameter result codes 3001 to 4001 with terminate action:

\[ \text{failure-handling initial-request diameter-result-code 3001 to 4001 action terminate} \]

request timeout
This command configures the timeout period for Diameter requests.

Product
All
Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Credit Control Service Configuration
configure > context context_name > credit-control-service service_name

Syntax Description
request timeout timeout
{ default | no } request timeout

default
Configures the default setting.

no
Removes the previous request timeout configuration.

timeout
Specifies the timeout period in seconds. The value must be an integer from 1 through 300.

Usage Guidelines
Use this command to configure the Diameter request timeout value, after which the request is deemed to have failed. This timeout is an overall timeout, and encompasses all retries with the server(s).

Example
The following command configures the timeout period to 150 seconds:
request timeout 150
CHAPTER 23

CRP Configuration Mode Commands

The CUPS Redundancy Protocol (CRP) Configuration Mode is used to configure BGP status monitoring on the Control Plane or User Plane.

**Command Modes**

Exec > Global Configuration > Context Configuration > CRP Configuration

`configure > context context_name > cups-redundancy-protocol`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crp)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- CRP Configuration Mode Commands, on page 783
- node-type, on page 784
- monitor bgp context, on page 784
- end, on page 785

---

CRP Configuration Mode Commands

The CUPS Redundancy Protocol (CRP) Configuration Mode is used to configure BGP status monitoring on the Control Plane or User Plane.

**Command Modes**

Exec > Global Configuration > Context Configuration > CRP Configuration

`configure > context context_name > cups-redundancy-protocol`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crp)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).
node-type

Enters CUPS Redundancy Protocol Configuration Mode on the Control Plane (CP) or User Plane (UP) on the chassis in this context.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Mode**
Exec > Global Configuration > Context Configuration > CRP Configuration

```
configure > context context_name > cups-redundancy-protocol
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-crp) #
```

**Syntax Description**
`node-type { control-plane | user-plane }
`

**Usage Guidelines**
Enters CUPS Redundancy Protocol Configuration Mode on the Control Plane (CP) or User Plane (UP) on the chassis.

**Example**
The following command enables CRP Configuration Mode on the User Plane:

```
node-type user-plane
```

---

**monitor bgp context**

Configures Border Gateway Protocol (BGP) monitoring on the Control Plane (CP) or User Plane (UP). This command is configured in the CUPS Redundancy Protocol (CRP) Configuration Mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Mode**
Exec > Global Configuration > Context Configuration > CRP Configuration

```
configure > context context_name > cups-redundancy-protocol > user-plane
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-crp-up) #
```

**Syntax Description**
```
[ no ] monitor bgp context bgp-session-context-name [ nexthop-router-ipv4-address | nexthop-router-ipv6-address ] { vrf bgp-session-vrf-name } { group group-number { 1-10 } }
```
**Usage Guidelines**

Configures Border Gateway Protocol (BGP) monitoring on the Control Plane or User Plane (UP).

**Example**

The following command enables BGP monitoring on the User Plane:

```
monitor bgp context one 192.168.201.2 vrf abc group 2
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```
end
```

**Usage Guidelines**

Use this command to return to the Exec mode.
Crypto Group Configuration Mode Commands

The Crypto Group Configuration Mode is used to configure crypto (tunnel) groups that provide fail-over redundancy for IPSec tunnels to packet data networks (PDNs).

**Command Modes**

`Exec > Global Configuration > Context Configuration > Crypto Group Configuration`

`configure > context context_name > crypto group group_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-grp)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 787
- exit, on page 788
- match address, on page 788
- match ip pool, on page 789
- switchover, on page 791

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`end`

**Usage Guidelines**

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Syntax Description exit

Usage Guidelines Use this command to return to the parent configuration mode.

match address

Associates an access control list (ACL) with the crypto group.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

<table>
<thead>
<tr>
<th>Product</th>
<th>ePDG, FA, GGSN, HA, HeNBGW, HNBGW, HSGW, MME, P-GW, PDSN, S-GW, SAEGW, SCM, SecGW, SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Command Modes Exec > Global Configuration > Context Configuration > Crypto Group Configuration
configure > context context_name > crypto group group_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-grp)#

Syntax Description

[ no ] match address acl_name [ preference ]

no
Deletes a previously configured ACL association.

match address acl_name
 Specifies the name of the ACL being matched to the crypto group entered as an alphanumeric string of 1 through 47 characters.

preference
The priority of the ACL.

The ACL preference is factored when a single packet matches the criteria of more than one ACL. preference is an integer from 0 through 4294967295; 0 is the highest priority.

If multiple ACLs are assigned the same priority, the last one entered will be used first.

Important
The priorities are only compared for ACLs matched to other groups or to policy ACLs (those applied to the entire context).

Usage Guidelines
IP ACLs are associated with crypto groups using this command. Both the crypto group and the ACLs must be configured in the same context.

ISAKMP crypto maps can then be associated with the crypto group. This allows user traffic matching the rules of the ACL to be handled according to the policies configured as part of the crypto map.

Example
The following command associates an ACL called corporate_acl to the crypto group:

match address corporate_acl

match ip pool

Matches the specified IP pool to the current crypto group. This command can be used multiple times to match more than one IP pool.

Important
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.
The **match ip pool** command is not supported within a crypto group on the ASR 5500 platform.

**Product**
- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**
- Security Administrator, Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration > Crypto Group Configuration

```
configure > context context_name > crypto group group_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-grp)#
```

**Syntax Description**

```
[ no ] match ip pool pool-name pool_name
```

- **no**
  - Deletes the matching statement for the specified IP pool from the crypto group.

- **match ip pool pool-name pool_name**
  - Specifies the name of an existing IP pool that should be matched entered as an alphanumeric string of 1 through 31 characters.

**Usage Guidelines**
- Use this command to set the names of IP pools that should be matched in the current crypto group.
Example

The following command sets a rule for the current crypto group that will match an IP pool named ippool1:

```
match ip pool pool-name ippool1
```

**switchover**

Configures the fail-over properties for the crypto group as part of the Redundant IPSec Fail-Over feature.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Group Configuration

```
configure > context context_name > crypto group group_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-grp)#
```
Syntax Description

[ no ] switchover auto [ do-not-revert ]

no
Disables the automatic switchover of tunnels. This applies to switching primary-to-secondary and secondary-to-primary.

switchover auto
Allows the automatic switchover of tunnels. Default: Enabled

do-not-revert
Disables the automatic switchover of secondary tunnels to primary tunnels. Default: Disabled

Usage Guidelines

This command configures the fail-over options for the Redundant IPSec Fail-over feature.

If the automatic fail-over options are disabled, tunneled traffic must be manually switched to the alternate tunnel (or manually activated if no alternate tunnel is configured and available) using the following command in the Exec Mode:

crypto-group group_name activate { primary | secondary }

For a definition of this command, see the crypto-group section of the Exec Mode Commands chapter of this guide.

Example

The following command disables the automatic secondary-to-primary switchover:

switchover auto do-not-revert
Crypto Map IPSec Dynamic Configuration Mode
Commands

Modification(s) to an existing dynamic crypto map configuration will not take effect until the related security association has been cleared. Refer to the description of the clear crypto security-association command in the Exec Mode Commands chapter for more information.

Command Modes

The Crypto Map IPSec Dynamic Configuration Mode is used to configure IPSec tunnels that are created as needed to facilitate subscriber sessions using Mobile IP or L2TP.

Exec > Global Configuration > Context Configuration > Crypto Map Dynamic Configuration
configure > context context_name > crypto map policy_name ipsec-dynamic

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-dynamic-map)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 793
- exit, on page 794
- set, on page 794

end

Exits the current configuration mode and returns to the Exec mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

end

Usage Guidelines

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
exit

**Usage Guidelines**
Use this command to return to the parent configuration mode.

---

**set**

Configures parameters for the dynamic crypto map.

---

**Important**
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Map Dynamic Configuration
configure > context context_name > crypto map policy_name ipsec-dynamic

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-dynamic-map)#

Syntax Description

```
set { control-dont-fragment { clear-bit | copy-bit | set-bit } | ikev1 natt [ keepalive sec ] | ip mtu bytes | pfs { group1 | group2 | group5 } | phase1-idtype { id-key-id | ipv4-address } [ mode { aggressive | main } ] | phase2-idtype { ipv4-address | ipv4-address-subnet } | security-association lifetime { keepalive | kilo-bytes kbytes | seconds secs } | transform-set transform_name [ transform-set transform_name2... transform-set transform_name6 ] }

no set { ikev1 natt | pfs | security-association lifetime { keepalive | kilo-bytes | seconds } | phase1-idtype | phase2-idtype | transform-set transform_name [ transform-set transform_name2... transform-set transform_name6 ] }

no
```

Deletes the specified parameter or resets the specified parameter to the default value.

```
control-dont-fragment { clear-bit | copy-bit | set-bit }
```

Controls the don't fragment (DF) bit in the outer IP header of the IPSec tunnel data packet. Options are:

- **clear-bit**: Clears the DF bit from the outer IP header (sets it to 0).
- **copy-bit**:Copies the DF bit from the inner IP header to the outer IP header. This is the default action.
- **set-bit**: Sets the DF bit in the outer IP header (sets it to 1).

```
ikev1 natt [ keepalive sec ]
```

Enables IPSec NAT Traversal.

**keepalive sec**: The time to keep the NAT connection alive in seconds. `sec` must be an integer of from 1 through 3600.

```
ip mtu bytes
```

Specifies the IP Maximum Transmission Unit (MTU) in bytes as an integer from 576 to 2048.

```
mode { aggressive | main }
```

Configures the IKE negotiation mode as AGGRESSIVE or MAIN.

```
pfs { group1 | group2 | group5 }
```

Specifies the modp Oakley group (also known as the Diffie-Hellman [D-H] group) that is used to determine the length of the base prime numbers that are used for Perfect Forward Secrecy (PFS).

- **group1**: Diffie-Hellman Group 1 (768-bit modp)
- **group2**: Diffie-Hellman Group 2 (1024-bit modp)
- **group5**: Diffie-Hellman Group 5 (1536-bit modp)

```
phase1-idtype { id-key-id | ipv4-address } [ mode { aggressive | main } ]
```

Sets the IKE negotiations Phase 1 payload identifier.
Default: ipv4-address

**id-key-id**: Use ID_KEY_ID as the Phase 1 payload identifier.

**ipv4-address**: Use IPV4_ADDR as the Phase 1 payload identifier.

**mode { aggressive | main }**: Specify the IKE mode.

**phase2-idtype { ipv4-address | ipv4-address-subnet }**

Sets the IKE negotiations Phase 2 payload identifier.

Default: ipv4-address-subnet

**ipv4-address**: Use IPV4_ADDR as the Phase 2 payload identifier.

**ipv4-address-subnet**: Use IPV4_ADDR_SUBNET as the Phase 2 payload identifier.

**security-association lifetime { keepalive | kilo-bytes kbytes | seconds secs }**

Defaults:

- **keepalive**: Disabled
- **kilo-bytes**: 4608000 kbytes
- **seconds**: 28800 seconds

This keyword specifies the parameters that determine the length of time an IKE Security Association (SA) is active when no data is passing through a tunnel. When the lifetime expires, the tunnel is torn down. Whichever parameter is reached first expires the SA lifetime.

- **keepalive**: The SA lifetime expires only when a keepalive message is not responded to by the far end.
- **kilo-bytes**: This specifies the amount of data in kilobytes to allow through the tunnel before the SA lifetime expires; entered as an integer from 2560 through 4294967294.
- **seconds**: The number of seconds to wait before the SA lifetime expires; entered as an integer from 1200 through 86400.

---

**Important**

If the dynamic crypto map is being used in conjunction with Mobile IP and the Mobile IP renewal timer is less than the crypto map's SA lifetime (either in terms of kilobytes or seconds), then the **keepalive** parameter **must** be configured.

---

**transform-set transform_name [ transform-set transform_name2 ... transform-set transform_name6 ]**

Specifies the name of a transform set configured in the same context that will be associated with the crypto map. Refer to the command **crypto ipsec transform-set** for information on creating transform sets.

You can repeat this keyword up to 6 times on the command line to specify multiple transform sets.

*transform_name* is the name of the transform set entered as an alphanumeric string from 1 through 127 characters that is case sensitive.

---

**Usage Guidelines**

Use this command to set parameters for a dynamic crypto map.
Example

The following command sets the PFS group to Group1:

```
set pfs group1
```

The following command sets the SA lifetime to 50000 KB:

```
set security-association lifetime kilo-bytes 50000
```

The following command sets the SA lifetime to 10000 seconds:

```
set security-association lifetime seconds 10000
```

The following command enables the SA to re-key when the tunnel lifetime expires:

```
set security-association lifetime keepalive
```

The following command defines transform sets `tset1` and `tset2`:

```
set transform-set tset1 transform-set tset2
```
set
Crypto IPSec Configuration Mode Commands

The Crypto IPSec Configuration Mode is used to configure anti-replay window size and properties for system transform sets.

The anti-replay window may be increased to allow the IPSec decryptor to keep track of more than 64 packets. Transform Sets are used to define IPSec security associations (SAs). IPSec SAs specify the IPSec protocols to use to protect packets.

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto IPSec Configuration

```
configure > context context_name > crypto ipsec
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 799
- exit, on page 800
- replay window-size, on page 800
- transform-set, on page 801

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```
end
```

**Usage Guidelines**

Use this command to return to the Exec mode.
# exit

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

## Syntax Description

**exit**

## Usage Guidelines

Use this command to return to the parent configuration mode.

# replay window-size

Configures the IPSec anti-replay window size in packets (RFC 6479).

<table>
<thead>
<tr>
<th>Product</th>
<th>ePDG, FA, GGSN, HA, HeNBGW, HNBGW, HSGW, MME, P-GW, PDSN, S-GW, SAEGW, SCM, SecGW, SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator</td>
</tr>
</tbody>
</table>

## Syntax Description

**replay window-size** \(<\text{window_size}>\)**

**window_size**

Specifies the size of the anti-replay window in packets. Enter one of the following integers to change the number of packets in the window: 32, 64 (default), 128, 256, 384, 512.

Increasing the anti-replay window size has no impact on throughput and security.
Usage Guidelines

IPSec authentication provides anti-replay protection against an attacker duplicating encrypted packets by assigning a unique sequence number to each encrypted packet. (Security association [SA] anti-replay is a security service in which the receiver can reject old or duplicate packets to protect itself against replay attacks.) The decryptor checks off the sequence numbers that it has seen before. The encryptor assigns sequence numbers in an increasing order. The decryptor remembers the value X of the highest sequence number that it has already seen. N is the window size, and the decryptor also remembers whether it has seen packets having sequence numbers from X-N+1 through X. Any packet with the sequence number X-N is discarded. Currently, N is set at 64, so only 64 packets can be tracked by the decryptor.

At times, however, the 64-packet window size is not sufficient. For example, quality of service (QoS) gives priority to high-priority packets, which could cause some low-priority packets to be discarded even though they could be one of the last 64 packets received by the decryptor. This CLI command allows you to expand the window size, allowing the decryptor to keep track of more than 64 packets.

Example

The following command specifies an IPSec anti-replay window size of 128 packets.

```
crypto ipsec replay window-size 128
```
Syntax Description

transform-set tran_set_name { ah hmac { md5-96 | sha1-96 } | esp hmac { md5-96 | none | sha1-96 } } { cipher { 3des-cbc | aes-cbc-128 | aes-cbc-256 | des-cbc } }

tran_set_name

Specifies the name of the transform set as an alphanumeric string of 1 through 127 characters.

ah hmac { md5-96 | sha1-96 }

Specifies the use of Authentication Header (AH) with a hash-based message authentication code (HMAC) to guarantee connectionless integrity and data origin authentication of IP packets.
Hash options are MD5 Message-Digest Algorithm (md5-96) or Secure Hash Standard 1 (sha1-96).

esp hmac { md5-96 | none | sha1-96 }

Specifies the use of Encapsulating Security Payload (ESP) with a hash-based message authentication code (HMAC) to guarantee connectionless integrity and data origin authentication of IP packets.
Hash options are MD5 Message-Digest Algorithm (md5-96), no hash, or Secure Hash Standard 1 (sha1-96).

cipher

If ESP is enabled, this option must be used to set the encapsulation cipher protocol to one of the following:

- **3des-cbc**: Triple Data Encryption Standard (3DES) in chain block (CBC) mode.
- **aes-cbc-128**: Advanced Encryption Standard (AES) in CBC mode with a 128-bit key.
- **aes-cbc-256**: Advanced Encryption Standard (AES) in CBC mode with a 256-bit key.
- **des-cbc**: DES in CBC mode.

Usage Guidelines

Use this command to configure a transform set that specifies the type of IPSec protocol to use for securing communications.

Example

The following command specifies the use of IPSec AH with HMAC = MD5.

crypto ipsec transform-set tset013 ah hmac md5-96
Crypto Map IPSec Manual Configuration Mode Commands

The Crypto IPSec Map Manual Configuration Mode is used to configure static IPSec tunnel properties. Modification(s) to an existing crypto map manual configuration will not take effect until the related security association has been cleared. Refer to the description of the `clear crypto security-association` command in the Exec Mode Commands chapter for more information.

Because manual crypto map configurations require the use of static security keys (associations), they are not as secure as crypto maps that rely on dynamically configured keys. Therefore, they only be used for testing purposes.

```
Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration
configure > context context_name > crypto map map_name ipsec-manual
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-manual-map)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `end`, on page 804
- `exit`, on page 804
- `match address`, on page 804
- `set control-dont-fragment`, on page 806
- `set ip mtu`, on page 807
- `set ipv6 mtu`, on page 808
- `set peer`, on page 809
- `set session-key`, on page 810
- `set transform-set`, on page 813
end

Exits the current configuration mode and returns to the Exec mode.

Product  All
Privilege  Security Administrator, Administrator
Syntax Description  end
Usage Guidelines  Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

Product  All
Privilege  Security Administrator, Administrator
Syntax Description  exit
Usage Guidelines  Use this command to return to the parent configuration mode.

match address

Matches or associates the crypto map to an access control list (ACL) configured in the same context.

Important  HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product  ePDG
          FA
          GGSN
          HA
          HeNBGW
          HNBGW
          HSGW
          MME
          P-GW
Crypto Map IPSec Manual Configuration Mode Commands

- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

```
configure > context context_name > crypto map map_name ipsec-manual
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-crypto-manual-map)#
```

**Syntax Description**

```
[ no ] match address acl_name [ priority ]
```

- **no**
  Removes a previously matched ACL.

- **match address acl_name**
  Specifies the name of the ACL with which the crypto map is to be matched. `acl_name` is an alphanumeric string of 1 through 47 characters that is case sensitive.

- **priority**
  Specifies the preference of the ACL. The ACL preference is factored when a single packet matches the criteria of more than one ACL. `priority` is an integer from 0 through 4294967295. 0 is the highest priority. Default: 0

**Important**
The priorities are only compared for ACLs matched to other crypto maps or to policy ACLs (those applied to the entire context).

**Usage Guidelines**

ACLs matched to crypto maps are referred to as crypto ACLs. Crypto ACLs define the criteria that must be met in order for a subscriber data packet to routed over an IPSec tunnel.

Prior to routing, the system examines the properties of each subscriber data packet. If the packet properties match the criteria specified in the crypto ACL, the system will initiate the IPSec policy dictated by the crypto map.

**Example**

The following command sets the crypto map ACL to the ACL named `ACLlist1` and sets the crypto maps priority to the highest level.

```
match address ACLlist1 0
```
**set control-dont-fragment**

Controls the Don't Fragment (DF) bit in the outer IP header of the IPSec tunnel data packet.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

---

**Privilege**

Security Administrator, Administrator

---

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

configure > context context_name > crypto map map_name ipsec-manual

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-manual-map)#
```

---

**Syntax Description**

```
[ default ] set control-dont-fragment { clear-bit | copy-bit | set-bit }
```

**default**

Sets or restores default value assigned to a specified parameter.

**clear-bit**

Clears the DF bit from the outer IP header (sets it to 0).
copy-bit
Copies the DF bit from the inner IP header to the outer IP header. This is the default action.

set-bit
Sets the DF bit in the outer IP header (sets it to 1).

Usage Guidelines
Use this command to clear, copy, or set the don't fragment (DF) bit in the outer IP header of the IPSec tunnel data packet.

Example
The following command sets the DF bit in the outer IP header.

```
set control-dont-fragment set-bit
```

set ip mtu

Configures the IPv4 Maximum Transmission Unit (MTU) in bytes.

Product
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

```
configure > context context_name > crypto map map_name ipsec-manual
```

Entering the above command sequence results in the following prompt:
**Syntax Description**

`ip mtu bytes`

`ip mtu bytes`

Specifies the IPv4 MTU in bytes as an integer from 576 to 2048. Default is 1438.

**Usage Guidelines**

Use this command to set the IPv4 MTU in bytes

**Example**

The following command configures an IPv4 MTU of 1024 bytes.

`set ip mtu 1024`

---

**set ipv6 mtu**

Configures the IPv6 Maximum Transmission Unit (MTU) in bytes.

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

`configure > context context_name > crypto map map_name ipsec-manual`

Entering the above command sequence results in the following prompt:

```
<context_name>host_name(config-crypto-manual-map)#
```
Syntax Description

ipv6 mtu bytes

ip mtu bytes

Specifies the IPv6 MTU in bytes as an integer from 576 to 2048. Default is 1438.

Usage Guidelines

Use this command to set the IPv6 MTU in bytes

Example

The following command configures an IPv6 MTU of 1024 bytes.

set ip mtu 1024

set peer

Configures the IP address of the peer security gateway that the system will establish the IPsec tunnel with.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege

Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

```plaintext
configure > context context_name > crypto map map_name ipsec-manual
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-manual-map)#
```

**Syntax Description**

```
[ no ] set peer gw_address
```

- **no**
  - Removes a previously configured peer address.

- **set peer gw_address**
  - Specifies the IP address of the peer security gateway with which the IPSec tunnel will be established. The IP address can be in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**Usage Guidelines**

Once the manual crypto map is fully configured and applied to an interface, the system will establish an IPSec tunnel with the security gateway specified by this command.

Because the tunnel relies on statically configured parameters, once created, it never expires; it exists until its configuration is deleted.

**Example**

The following command configures a security gateway address of 192.168.1.100 for the crypto map with which to establish a tunnel.

```
set peer 192.168.1.100
```

**set session-key**

Configures session key parameters for the manual crypto map.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

ePDG

FA

GGSN

HA

HeNBGW

HNBGW

HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

configure > context context_name > crypto map map_name ipsec-manual

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-manual-map)#

Syntax Description

set session-key { inbound | outbound } { ah ah_spi [ encrypted ] key ah_key | esp esp_spi [ encrypted ] cipher encryption_key [ encrypted ] authenticator auth_key }

no set session-key { inbound | outbound }

no

Removes previously configured session key information.

inbound

Specifies that the key(s) will be used for tunnels carrying data sent by the security gateway.

outbound

Specifies that the key(s) will be used for tunnels carrying data sent by the system.

ah ah_spi

Configures the Security Parameter Index (SPI) for the Authentication Header (AH) protocol. The SPI is used to identify the AH security association (SA) between the system and the security gateway. ah_spi is an integer from 256 through 4294967295.

encrypted

Indicates the key provided is encrypted.

The encrypted keyword is intended only for use by the system while saving configuration scripts. The system displays the encrypted keyword in the configuration file as a flag that the variable following the key, cipher, and/or authenticator keyword is the encrypted version of the plain text key. Only the encrypted key is saved as part of the configuration file.
key ah_key

Configures the key used by the system to de/encapsulate IP packets using Authentication Header (AH) protocol. ah_key must be entered as either an alphanumeric string or a hexadecimal number beginning with "0x".

The length of the configured key must match the configured algorithm.

esp esp_spi

Configures SPI for the Encapsulating Security Payload (ESP) protocol. The SPI is used to identify the ESP security association (SA) between the system and the security gateway. esp_spi is an integer from 256 through 4294967295.

The length of the configured key must match the configured algorithm.

cipher encryption_key

Specifies the key used by the system to de/encrypt the payloads of IP packets using the ESP protocol. encryption_key must be entered as either an alphanumeric string or a hexadecimal number beginning with "0x".

The length of the configured key must match the configured algorithm.

authenticator auth_key

Specifies the key used by the system to authenticate the IP packets once encryption has been performed. auth_key must be entered as either an alphanumeric string or a hexadecimal number beginning with "0x".

The length of the configured key must match the configured algorithm.

Usage Guidelines

Manual crypto maps rely on the use of statically configured keys to establish IPSec tunnels. This command allows the configuration of the static keys.

Identical keys must be configured on both the system and the security gateway in order for the tunnel to be established.

The length of the configured key must match the configured algorithm.

This command can be entered up to two time for the same crypto map: once to configure inbound key properties, and once to configure outbound key properties.

Example

The following command configures a manual crypto map with the following session key properties:

• Keys are for tunnels initiated by the system to the security gateway.
• ESP will be used with an SPI of 310.
• Encryption key is sd23r9skd0fi3as.
• Authentication key is sfd23408imi9yn.

set session-key outbound esp 310 cipher sd23r9skd0fi3as authenticator sfd23408imi9yn
**set transform-set**

Configures the name of a transform set that the crypto map is associated with.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG  
FA  
GGSN  
HA  
HeNBGW  
HNBGW  
HSGW  
MME  
P-GW  
PDSN  
S-GW  
SAEGW  
SCM  
SecGW  
SGSN  

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map Manual Configuration

configure > context context_name > crypto map map_name ipsec-manual

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-manual-map)>
```

**Syntax Description**

```
[ no ] set transform-set transform_name

no
```

`no`

Removes a previously configured transform set association.
**set transform-set transform_name**

Specifies the name of the transform set expressed as an alphanumeric string of 1 through 127 characters that is case sensitive.

**Usage Guidelines**

System transform sets contain the IPSec policy definitions for crypto maps. Refer to the `crypto ipsec transform-set` command for information on creating transform sets.

**Important**

Transform sets must be configured prior to configuring session key information for the crypto map.

**Example**

The following command associates a transform set named `esp_tset` with the crypto map:

```
set transform-set esp_tset
```
Crypto Map IKEv2-IPv4 Configuration Mode Commands

The Crypto Map IKEv2-IPv4 Configuration Mode is used to configure an IKEv2 IPsec policy for secure X3 interface tunneling between a P-GW and a lawful intercept server.

Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv4 Configuration

configure > context context_name > crypto map template_name ikev2-ipv4

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-crypto-ikev2-ipv4-map)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- allow-cert-enc cert-hash-url, on page 816
- authentication, on page 816
- blacklist, on page 818
- ca-certificate list, on page 818
- ca-crl list, on page 819
- certificate, on page 821
- control-dont-fragment, on page 822
- end, on page 823
- exit, on page 823
- ikev2-ikesa, on page 824
- keepalive, on page 826
- match, on page 827
- natt, on page 829
- ocsp, on page 830
- payload, on page 831
- peer, on page 832
- remote-secret-list, on page 833
- whitelist, on page 834
allow-cert-enc cert-hash-url

Enables support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Product**
Security gateway products

**Privilege**
Security Administrator

**Syntax Description**

```plaintext
[ no ] allow-cert-enc cert-hash-url
```

**no**
Disables support for hash and URL encoding type in CERT and CERTREQ payloads.

**Usage Guidelines**
Enable support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Example**
The following command enables hash and URL encoding type in CERT and CERTREQ payloads:

```plaintext
allow-cert-enc cert-hash-url
```

**authentication**

Configures the subscriber authentication method used for this crypto map.

**Important**
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privacy
Security Administrator

Syntax Description

```
authentication { local { certificate | pre-shared-key } { encrypted key value | key value } | min-key-size min_key_size | remote { certificate | pre-shared-key } { encrypted key value | key value } }
[ no | default ] authentication min-key-size
```

**local** | **remote**
Specifies which authentication method will be used by the crypto map – local or remote.

[ no | default ] authentication min-key-size

**no** Disables minimum key size validation feature.

**default** Sets default key size. Default is 255.

**min-key-size min_key_size**

Specifies Minimum Cert Key size. Default is 255.
`min_key_size` must be an integer between 255 and 8192.

**certificate**

Specifies that a certificate will be used by this crypto map for authentication.

**pre-shared-key { encrypted key value | key value }**

Specifies that a pre-shared key will be used by this crypto map for authentication.

**encrypted key value**: Specifies that the pre-shared key used for authentication is encrypted and expressed as an alphanumeric string of 1 through 255 characters for releases prior to 15.0, or 16 to 496 characters for release 15.0 and higher.

**key value**: Specifies that the pre-shared key used for authentication is clear text and expressed as an alphanumeric string of 1 through 32 characters for releases prior to 14.0 or 1 through 255 characters for release 14.0 and higher.

Usage Guidelines

Use this command to specify the type of authentication performed for IPSEC peers attempting to access the system via this crypto map.
Example

The following command sets the authentication method to an open key value of 6d7970617373776f7264:

```
authentication pre-shared-key key 6d7970617373776f7264
```

blacklist

Enables or disables a blacklist (access denied) for this map.

**Product**

All products supporting IPSec blacklisting

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] blacklist
```

**no**

Disables blacklisting for this crypto map. By default blacklisting is disabled.

**Usage Guidelines**

Use this command to enable blacklisting for this crypto map. A blacklist is a list or register of entities that are denied a particular privilege, service, mobility, access or recognition. With blacklisting, any peer is allowed to connect as long as it does not appear in the list. For additional information on blacklisting, refer to the System Administration Guide.

Example

The following command enables blacklisting:

```
blacklist
```

ca-certificate list

Used to bind an X.509 Certificate Authority (CA) certificate to a crypto map.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.
### Syntax Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ca-certificate list ca-cert-name name [ ca-cert-name name ]</code></td>
<td>Binds the named X.509 Certificate Authority (CA) certificate to a crypto map. <code>name</code> is an alphanumeric string of 1 through 129 characters. You can chain multiple (max 4) certificates in a single command instance.</td>
</tr>
<tr>
<td><code>no ca-certificate</code></td>
<td>Unbinds the ca-certificate(s) bound to the crypto map.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines

Used to bind an X.509 CA certificate to a map.

#### Example

Use the following example to add a CA certificate to a list:

```
ca-certificate list ca-cert-name CA_list1
```
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**

Security Administrator

**Syntax Description**

```
ca-crl list ca-crl-name name [ ca-crl-name name ] +
no ca-crl
```

- **no**
  
  Removes the CA-CRL configuration from this map.

- **ca-crl-name name**
  
  Specifies the CA-CRL to associate with this crypto map. *name* must be the name of an existing CA-CRL expressed as an alphanumeric string of 1 through 129 characters.

  + indicates that a list of multiple CA-CRLs can be configured for a crypto map. You can chain multiple (max four) CA-CRLs in a single command instance.

**Usage Guidelines**

Use this command to associate a CA-CRL name with this crypto map.

CA-CRLs are configured in the Global Configuration Mode. For more information about configuring CA-CRLs, refer to the `ca-crl name` command in the *Global Configuration Mode Commands* chapter.
Example
The following example binds CA-CRLs named CRL-5 and CRL-7 to this crypto map:

```
ca-crl list ca-crl-name CRL-5 ca-crl-name CRL-7
```

**certificate**

Used to bind a single X.509 trusted certificate to a crypto map.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] certificate name
```

- **no**
  Unbinds a certificate from crypto map.
**name**

Specifies the name of a X.509 trusted certificate to bind to a crypto map. *name* is an alphanumeric string of 1 through 129 characters.

**Usage Guidelines**

Use this command to bind an X.509 certificate to a map.

**Example**

Use the following example to prevent a certificate from being included in the Auth Exchange payload:

```
no certificate
```

**control-dont-fragment**

Controls the Don't Fragment (DF) bit in the outer IP header of the IPSec tunnel data packet.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**

Security Administrator
Syntax Description

control-dont-fragment { clear-bit | copy-bit | set-bit }

clear-bit
Clears the DF bit from the outer IP header (sets it to 0).

copy-bit
Copies the DF bit from the inner IP header to the outer IP header. This is the default action.

set-bit
Sets the DF bit in the outer IP header (sets it to 1).

Usage Guidelines

A packet is encapsulated in IPsec headers at both ends. The new packet can copy the DF bit from the original unencapsulated packet into the outer IP header, or it can set the DF bit if there is not one in the original packet. It can also clear a DF bit that it does not need.

Example
The following command sets the DF bit in the outer IP header:
control-dont-fragment set-bit

end

Exits the current configuration mode and returns to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.
ikev2-ikesa

Configures parameters for the IKEv2 IKE Security Associations within this crypto template.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**

Security Administrator

**Syntax Description**


default ikev2-ikesa { allow-empty-ikesa | max-retransmissions | policy error-notification | rekey [ disallow-param-change ] | setup-timer }

no ikev2-ikesa { allow-empty-ikesa name | policy { error-notification | use-rfc5996-notification } | rekey sec | transform-set list }

no ikev2-ikesa

Disables a previously enabled parameter.
**allow-empty-ikesa**

Default is not to allow-empty-ikesa. Activate to have the IKEv2 stack keep the IKE SA when all the Child SAs have been deleted.

**max-retransmissions number**

Specifies the maximum number of retransmissions of an IKEv2 IKE Exchange Request if a response has not been received. number must be an integer from 1 through 8. Default: 5


Specifies the default policy for generating an IKEv2 Invalid Message ID error when PDIF receives an out-of-sequence packet.

- **error-notification**: Sends an Error Notify Message to the MS for Invalid IKEv2 Exchange Message ID and Invalid IKEv2 Exchange Syntax for the IKE_SA_INIT Exchange.
- **[invalid-major-version]**: Sends an Error Notify Message for Invalid Major Version
- **[invalid-message-id]**: Sends an Error Notify Message for Invalid IKEv2 Exchange Message ID.
- **[invalid-syntax]**: Sends an Error Notify Message for Invalid IKEv2 Exchange Syntax.
- **use-rfc5996-notification**: Enables support for TEMPORARY_FAILURE and CHILDSA_NOT_FOUND notify payloads.

**rekey [ disallow-param-change ]**

Specifies if IKESA rekeying should occur before the configured lifetime expires (at approximately 90% of the lifetime interval). Default is not to re-key.

The **disallow-param-change** option does not allow changes in negotiation parameters during rekey.

**retransmission-timeout msec**

Specifies the timeout period (in milliseconds) before a retransmission of an IKEv2 IKE exchange request is sent (if the corresponding response has not been received). msec must be an integer from 300 to 15000. Default: 500

**exponential**

Specifies that the subsequent retransmission delays are exponentially increased with a maximum limit of 15000ms.

**setup-timer sec**

Specifies the number of seconds before a IKEv2 IKE Security Association that is not fully established is terminated. sec must be an integer from 1 through 3600. Default: 16

**transform-set list name1**

Specifies the name of a context-level configured IKEv2 IKE Security Association transform set. name1 ...name6 must be an existing IKEv2 IKESA Transform Set expressed as an alphanumeric string of 1 through 127 characters.
The transform set is a space-separated list of IKEv2-IKESA SA transform sets to be used for deriving IKEv2 IKE Security Associations from this crypto template. A minimum of one transform-set is required; maximum configurable is six.

**Usage Guidelines**

Use this command to configure parameters for the IKEv2 IKE Security Associations within this crypto template.

**Example**

The following command configures the maximum number of IKEv2 IKESA request retransmissions to 7:

```
ikev2-ikesa max-retransmissions 7
```

The following command configures the IKEv2 IKESA request retransmission timeout to 400 milliseconds:

```
ikev2-ikesa retransmission-timeout 400
```

The following command configures the IKEv2 IKESA transform set `ikesa43`:

```
ikev2-ikesa transform-set list ikesa43
```

**keepalive**

Configures keepalive or dead peer detection for security associations used within this crypto template.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator

Syntax Description
```plaintext
keepalive [ interval sec ] [ timeout sec [ num-retry num ]
no keepalive
```

no
Disables keepalive messaging.

interval sec
Specifies the amount of time (in seconds) that must elapse before the next keepalive request is sent. sec must be an integer from 10 through 3600. Default: 10

timeout sec
Specifies the amount of time (in seconds) which must elapsed during which no traffic is received from the IKE_SA peer or any CHILD_SAs derived from the IKE_SA for Dead Peer Detection to be initiated. sec must be an integer from 10 through 3600. Default: 10

num-retry num
Specifies the number of times the system will retry a non-responsive peer before defining the peer as off-line or out-of-service. num must be an integer from 1 through 100. Default: 2

Usage Guidelines
Use this command to set parameters associated with determining the availability of peer servers.

Example
The following command sets a keepalive interval to three minutes (180 seconds):
```plaintext
keepalive interval 180
```

match
Matches or associates the crypto map to an access control list (ACL) configured in the same context.

Important
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product
ePDG
FA
match

GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator

Syntax Description
match address acl_name [ priority ]
no match address acl_name

no
Removes a previously matched ACL.

match address acl_name
Specifies The name of the ACL with which the crypto map is to be matched. acl_name is an alphanumeric string of 1 through 79 characters that is case sensitive.

priority
Specifies the preference of the ACL as integer from 0 through 4294967295. 0 is the highest priority. Default: 0
The ACL preference is factored when a single packet matches the criteria of more than one ACL.

Important
The priorities are only compared for ACLs matched to other crypto maps or to policy ACLs (those applied to the entire context).

Usage Guidelines
ACLs matched to crypto maps are referred to as crypto ACLs. Crypto ACLs define the criteria that must be met in order for a subscriber data packet to routed over an IPSec tunnel.
Prior to routing, the system examines the properties of each subscriber data packet. If the packet properties match the criteria specified in the crypto ACL, the system will initiate the IPSec policy dictated by the crypto map.
**Example**
The following command sets the crypto map ACL to the ACL named \textit{acl-list1} and sets the crypto maps priority to the highest level.

```
match address acl-list1 0
```

### natt

Configures Network Address Translation - Traversal (NAT-T) for all security associations associated with this crypto template. This feature is disabled by default.

**Syntax Description**

```
[ default | no ] natt [ include-header ] [ send-keepalive [ idle-interval idle_secs ] [ interval interval_secs ] ]
```

**default**
Disables NAT-T for all security associations associated with this crypto template.

**no**
Disables NAT-T for all security associations associated with this crypto template.

**include-header**
Includes the NAT-T header in IPSec packets.

**send-keepalive [ idle-interval idle_secs ] [ interval interval_secs ]**
Sends NAT-Traversal keepalive messages.

- **idle-interval idle_secs**: Specifies the number of seconds that can elapse without sending NAT keepalive packets before sending NAT keepalive packets is started. \textit{idle_secs} is an integer from 20 to 86400. Default: 60.
- **interval interval_secs**: Specifies the number of seconds between the sending of NAT keepalive packets. \textit{interval_secs} is an integer from 20 to 86400. Default: 60.

**Usage Guidelines**
Use this command to configure NAT-T for security associations within this crypto template.

**Example**
The following command disables NAT-T for this crypto template:

```
no natt
```
**ocsp**

Enables use of Online Certificate Status Protocol (OCSP) from a crypto template. OCSP provides a facility to obtain timely information on the status of a certificate.

**Product**

All products supporting IPSec

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```plaintext
ocsp [ nonce | responder-address ipv4_address [ port port_value ] ]
no ocsp [ nonce | responder-address [ port ] ]
default ocsp [ nonce ]

no
Disables the use of OCSP.

default
Restores the default value assigned for ocsp nonce.

nonce
Enables sending nonce (unique identifier) in OCSP requests.

responder-address ipv4_address
Configures the OCSP responder address that is used when absent in the peer (device) certificate.

ipv4_address is an IPv4 address specified in dotted decimal format.

port port_value
Configures the port for OCSP responder.

port_value is an integer value between 1 and 65535. The default port is 8889.
```

**Usage Guidelines**

This command enables the use of Online Certificate Protocol (OCSP) from a crypto map/template. OCSP provides a facility to obtain timely information on the status of a certificate.

OCSP messages are exchanged between a gateway and an OCSP responder during a certificate transaction. The responder immediately provides the status of the presented certificate. The status can be good, revoked or unknown. The gateway can then proceed based on the response.

**Example**

The following command enables OCSP:
payload

Creates a new, or specifies an existing, crypto map payload and enters the Crypto Map Payload Configuration Mode.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege

Security Administrator

Syntax Description

payload name match ipv4
no payload name

payload name

Specifies the name of a new or existing crypto template payload as an alphanumeric string of 1 through 127 characters.

match ipv4

Filters IPSec IPv4 Child Security Association creation requests for subscriber calls using this payload. Further filtering can be performed by applying the following:
Usage Guidelines

Use this command to create a new or enter an existing crypto template payload. The payload mechanism is a means of associating parameters for the Security Association (SA) being negotiated.

Two payloads are required: one each for MIP and IKEv2. The first payload is used for establishing the initial Child SA Tunnel Inner Address (TIA) which will be torn down. The second payload is used for establishing the remaining Child SAs. Note that if there is no second payload defined with home-address as the \textit{ip-address-allocation} then no MIP call can be established, just a Simple IP call.

Currently, the only available match is for ChildSA, although other matches are planned for future releases.

Entering this command results in the following prompt:

\[ \texttt{ctxt_name}\ hostname(cfg-crypto-<name>-ikev2-tunnel-payload)#} \]

Crypto Template IKEv2-IPv4 Payload Configuration Mode commands are defined in the Crypto Template IKEv2-IPv4 Payload Configuration Mode Commands chapter.

Example

The following command configures a crypto template payload called \textit{payload5} and enters the Crypto Template IKEv2-IPv4 Payload Configuration Mode:

\texttt{payload \ payload5 \ match \ ipv4}\n
peer

Configures the IP address of a peer IPSec.

\underline{Important}

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator

Syntax Description
peer ip_address
no peer

no
Removes the configured peer IP address.

peer ip_address
Specifies the IP address of a peer IPSec server in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

Usage Guidelines
Use this command to specify a peer IPsec peer server. The IPsec peer server can also be the Lawful Intercept server.

Example
The following command configures the system to recognize an IPsec peer server with an IPv6 address of fe80::200:f8ff:fe21:67cf:

peer fe80::200:f8ff:fe21:67cf

remote-secret-list

Enables the use of a Remote Secret List containing up to 1000 pre-shared keys.

Product
All Security Gateway products

Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

Privilege
Security Administrator

Syntax Description
remote-secret-list list_name
no remote-secret-list

no
Disables use of a Remote Secret List.
### list_name

Specifies the name of an existing Remote Secret List as an alphanumeric string of 1 through 127 characters.

**Usage Guidelines**

Enable the use of a Remote Secret List containing up to 1000 pre-shared keys.

Only one active remote-secret-list is supported per system.

For additional information, refer to the Remote Secret List Configuration Commands chapter of the Command Line Interface Reference and the System Administration Guide.

**Example**

The following command enables a remote-secret-list named `rs-list`:

```
remote-secret-list rs-list
```

---

### whitelist

Enables or disables a whitelist (access granted) for this crypto map.

**Product**

All products supporting IPSec whitelisting

---

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] whitelist
```

- **no**

  Disables whitelisting for this crypto map. By default whitelisting is disabled.

**Usage Guidelines**

Use this command to enable whitelisting for this crypto map. A whitelist is a list or register of entities that are being provided a particular privilege, service, mobility, access or recognition. With whitelisting, no peer is allowed to connect unless it appears in the list. For additional information on whitelisting, refer to the System Administration Guide.

**Example**

The following command enables whitelisting:

```
whitelist
```
CHAPTER 29

Crypto Map IPSec IKEv1 Configuration Mode Commands

Modification(s) to an existing IKEv1 crypto map configuration will not take effect until the related security association has been cleared. Refer to the description of the `clear crypto security-association` command in the `Exec Mode Commands` chapter for more information.

**Command Modes**

The Crypto Map IPSec IKEv1 Configuration Mode is used to configure properties for IPSec tunnels that will be created using the Internet Key Exchange (IKE) that operates within the framework of the Internet Key Exchange version 1 (IKEv1).

Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration

`configure > context context_name > crypto map policy_name ipsec-ikev1`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-map)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `end`, on page 835
- `exit`, on page 836
- `ipsec-on-demux`, on page 836
- `match address`, on page 837
- `match crypto group`, on page 838
- `match ip pool`, on page 840
- `set`, on page 841

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All
exit

Exits the current mode and returns to the parent configuration mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

exit

Usage Guidelines

Use this command to return to the parent configuration mode.

ipsec-on-demux

Enable spawning of IPSec manager for this Crypto map on Demux Card.

Product

IPSec (IKEv1/IKEv2 ACL Mode)

Privilege

Security Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration

configure > context context_name > crypto map policy_name ipsec-ikev1

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-map)#

Syntax Description

[ no ] ipsec-on-demux

no

Disables the spawning of IPSec manager for Crypto map on Demux Card.

ipsec-on-demux

Enables the spawning of IPSec manager for this Crypto map on Demux Card.

Important

If the configuration is removed using no option, then this Crypto map must be removed and added again for this configuration to work.
Example

The following configuration enables spawning of IPSec manager for this Crypto map on Demux Card.

```plaintext
ipsec-on-demux
```

### match address

Matches or associates the crypto map to an access control list (ACL) configured in the same context.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**

Security Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration
- `configure > context context_name > crypto map policy_name ipsec-ikev1`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-map)#
```
**Syntax Description**

```
[ no ] match address acl_name priority
```

**no**

Removes a previously matched ACL.

**match address acl_name**

Specifies the name of the ACL with which the crypto map is to be matched as an alphanumeric string of 1 through 79 characters that is case sensitive.

**priority**

Specifies the preference of the ACL. The ACL preference is factored when a single packet matches the criteria of more than one ACL.

The preference is an integer value from 0 to 4294967295; 0 is the highest priority. Default: 0

---

**Important**

The priorities are only compared for ACLs matched to other crypto maps or to policy ACLs (those applied to the entire context).

---

**Usage Guidelines**

ACLs matched to crypto maps are referred to as crypto ACLs. Crypto ACLs define the criteria that must be met in order for a subscriber data packet to routed over an IPSec tunnel.

Prior to routing, the system examines the properties of each subscriber data packet. If the packet properties match the criteria specified in the crypto ACL, the system will initiate the IPSec policy dictated by the crypto map.

**Example**

The following command sets the crypto map ACL to the ACL named `ACLlist1` and sets the crypto maps priority to the highest level.

```
match address ACLlist1 0
```

---

**match crypto group**

Matches or associates the crypto map a crypto group configured in the same context.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

- ePDG
- FA
- GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration

configure > context context_name > crypto map policy_name ipsec-ikev1

Entering the above command sequence results in the following prompt:
/context_name> host_name(config-crypto-map)#

Syntax Description
[ no ] match crypto group group_name { primary | secondary }

no
Deletes a previously configured crypto group association.

match crypto group group_name

Specifies the name of the crypto group entered as an alphanumeric string of 1 through 127 characters that is case sensitive.

primary
Specifies that the policies configured as part of this crypto map will be used for the primary tunnel in the Redundant IPSec Tunnel Failover feature.

secondary
Specifies that the policies configured as part of this crypto map will be used for the secondary tunnel in the Redundant IPSec Tunnel Failover feature.

Usage Guidelines
Use this command to dictate the primary and secondary tunnel policies used for the Redundant IPSec Tunnel Failover feature.

At least two policies must be configured to use this feature. One policy must be configured as the primary, the other as the secondary.
Example

The following command associates the crypto map to a crypto group called `group1` and dictates that it will serve as the primary tunnel policy:

```
machine crypto group group1 primary
```

**match ip pool**

Matches the specified IP pool to the current IKEv1 crypto map. This command can be used multiple times to change more than one IP pool.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Important**

The `match ip pool` command is not supported on the ASR 5500 platform.

**Product**

ePDG  
FA  
GGSN  
HA  
HeNBGW  
HNBGW  
HSGW  
MME  
P-GW  
PDSN  
S-GW  
SAEGW  
SCM  
SecGW  
SGSN

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration
configure > context context_name > crypto map policy_name ipsec-ikev1

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-map)#

Syntax Description

```
[ no ] match ip pool pool-name pool_name [ destination-network ip_address [ /mask ]
```

<table>
<thead>
<tr>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete the matching statement for the specified IP pool from the crypto map.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>match ip pool pool-name pool_name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the name of an existing IP pool that should be matched as an alphanumeric string of 1 through 31 characters.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>destination-network ip_address [/mask ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the IP address of the destination network in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.</td>
</tr>
</tbody>
</table>

/`mask` specifies the subnet mask bits (representing the subnet mask). This variable must be entered in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal CIDR notation.

An IP pool attached to the crypto map can have multiple IPSec tunnels according to the destination of the packet being forwarded to internet.

Important

Each invocation of this command will add another destination network to the IP pool, with a maximum of eight destination networks per crypto map.

Usage Guidelines

Use this command to set the names of IP pools that should be matched in the current crypto map.

Important

If an IP address pool that is matched to a IKEv1 crypto map is resized, removed, or added, the corresponding security association must be cleared in order for the change to take effect. Refer to the `clear crypto` command in the Exec mode for information on clearing security associations.

Example

The following command sets a rule for the current crypto map that will match an IP pool named `ippool1`:

```
match ip pool pool-name ippool1
```

set

Configures parameters for the dynamic crypto map.
Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege

Security Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Map IPSec IKEv1 Configuration

configure > context context_name > crypto map policy_name ipsec-ikev1

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-crypto-map)#

Syntax Description

```
set { bgp peer_address | control-dont-fragment { clear-bit | copy-bit | set-bit } | ikev1 natt { keepalive sec 1 | ip mtu bytes | ipv6 mtu bytes | mode { aggressive | main } | peer peer_address | pfs { group1 | group2 | group5 } | phase1-idtype { id-key-id | ipv4-address [ mode { aggressive | main } ] } | phase2-idtype { ipv4-address | ipv4-address-subnet } | security-association lifetime { disable-phase2-rekey | keepalive | kilo-bytes kbytes | seconds secs } transform-set transform_name [ transform-set transform_name2 ... transform-set transform_name6 ]

no set { ikev1 natt | pfs | phase1-idtype | phase2-idtype | security-association lifetime { disable-phase2-rekey | keepalive | kilo-bytes | seconds } transform-set transform_name [ transform-set transform_name2 ... transform-set transform_name6 ]

bgp peer_address
```

Specifies the IP address of the BGP peer in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.
control-dont-fragment { clear-bit | copy-bit | set-bit }

Controls the don't fragment (DF) bit in the outer IP header of the IPSec tunnel data packet. Options are:

- **clear-bit**: Clears the DF bit from the outer IP header (sets it to 0).
- **copy-bit**: Copies the DF bit from the inner IP header to the outer IP header. This is the default action.
- **set-bit**: Sets the DF bit in the outer IP header (sets it to 1).

ikev1 natt [ keepalive time ]

---

**Important**

NAT Traversal (NATT) for IKEv1 IPSec session is not supported.

Specifies IKE parameters.

- **natt**: Enables IPSec NAT Traversal.
- **keepalive time**: The time to keep the NAT connection alive in seconds. *time* must be an integer of from 1 through 3600.

**ip mtu bytes**

Specifies the IPv4 Maximum Transmission Unit (MTU) in bytes as an integer from 576 to 2048.

**ipv6 mtu bytes**

Specifies the IPv6 Maximum Transmission Unit (MTU) in bytes as an integer from 576 to 2048.

**mode { aggressive | main }**

Configures the IKE negotiation mode as AGGRESSIVE or MAIN.

**peer peer_address**

Specifies the peer IP address of a remote gateway in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**pfs { group1 | group2 | group5 }**

Specifies the modp Oakley group (also known as the Diffie-Hellman [D-H] group) that is used to determine the length of the base prime numbers that are used for Perfect Forward Secrecy (PFS).

- **group1**: Diffie-Hellman Group1 (768-bit modp)
- **group2**: Diffie-Hellman Group2 (1024-bit modp)
- **group5**: Diffie-Hellman Group5 (1536-bit modp)

**phase1-idtype { id-key-id | ipv4-address [ mode { aggressive | main } ]**

Sets the IKE negotiations Phase 1 payload identifier. Default: id-key-id

id-key-id: ID KEY ID
ipv4-address: ID IPV4 Address
  • **mode**: Configures IKE mode
  • **aggressive**: IKE negotiation mode: AGGRESSIVE
  • **main**: IKE negotiation mode: MAIN

phase2-idtype { ipv4-address | ipv4-address-subnet }
Sets the IKE negotiations Phase 2 payload identifier.
Default: ipv4-address-subnet
  • **ipv4-address**: Use IPV4_ADDR as the Phase 2 payload identifier.
  • **ipv4-address-subnet**: Use IPV4_ADDR_SUBNET as the Phase 2 payload identifier.

security-association lifetime { disable-phase2-rekey | keepalive | kilo-bytes kbytes | seconds secs }
Defaults:
  • **disable-phase2-rekey**: Rekeying is enabled by default
  • **keepalive**: Disabled
  • **kilo-bytes**: 4608000 kbytes
  • **seconds**: 28800 seconds

Specifies the parameters that determine the length of time an IKE Security Association (SA) is active when no data is passing through a tunnel. When the lifetime expires, the tunnel is torn down. Whichever parameter is reached first expires the SA lifetime.
  • **disable-phase2-rekey**: If this keyword is specified, the Phase2 SA is not rekeyed when the lifetime expires.
  • **keepalive**: The SA lifetime expires only when a keepalive message is not responded to by the far end.
  • **kilo-bytes**: This specifies the amount of data (n kilobytes) to allow through the tunnel before the SA lifetime expires. *kbytes* must be an integer from 2560 through 4294967294.
  • **seconds**: The number of seconds to wait before the SA lifetime expires. *secs* must be an integer from 1200 through 86400.

---

**Important**
If the dynamic crypto map is being used in conjunction with Mobile IP and the Mobile IP renewal timer is less than the crypto map's SA lifetime (either in terms of kilobytes or seconds), then the keepalive parameter must be configured.

transform-set transform_name [ transform-set transform_name2 ... transform-set transform_name6 ]
Specifies the name of a transform set configured in the same context that will be associated with the crypto map. Refer to the command `crypto ipsec transform-set` for information on creating transform sets.
You can repeat this keyword up to 6 times on the command line to specify multiple transform sets.

*transform_name* is the name of the transform set entered as an alphanumeric string of 1 through 127 characters that is case sensitive.

**no**
Deletes the specified parameter or resets the specified parameter to the default value.

**Usage Guidelines**
Use this command to set parameters for a dynamic crypto map.

**Example**
The following command sets the PFS group to Group1:

```
set pfs group1
```

The following command sets the SA lifetime to 50000 KB:

```
set security-association lifetime kilo-bytes 50000
```

The following command sets the SA lifetime to 10000 seconds:

```
set security-association lifetime seconds 10000
```

The following command enables the SA to re-key when the tunnel lifetime expires:

```
set security-association lifetime keepalive
```

The following command defines transform sets *tset1* and *tset2*:

```
set transform-set tset1 transform-set tset2
```
set
Crypto Map IKEv2-IPv4 Payload Configuration Mode Commands

The Crypto Map IKEv2-IPv4 Payload Configuration Mode is used to assign the correct IPSec transform-set from a list of up to four different transform-sets, and to assign Mobile IP addresses.

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv4 > Crypto Map IKEv2-IPv4 Payload Configuration

```
configure > context context_name > crypto map map_name ikev2-ipv4 > payload payload_name match ipv4
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-ikev2-ipv4-payload)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 847
- exit, on page 848
- ipsec, on page 848
- lifetime, on page 849
- rekey, on page 850

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**end**

**Usage Guidelines**

Use this command to return to the Exec mode.
**exit**

Exits the current mode and returns to the parent configuration mode.

<table>
<thead>
<tr>
<th>Product</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Syntax Description**

`exit`

**Usage Guidelines**

Use this command to return to the parent configuration mode.

---

**ipsec**

Configures the IPSec transform set to be used for this crypto template payload.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

<table>
<thead>
<tr>
<th>Product</th>
<th>ePDG, FA, GGSN, HA, HNBGW, HNBGW, HSGW, MME, P-GW, PDSN, S-GW, SAEGW, SCM, SecGW, SGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator</td>
</tr>
</tbody>
</table>
Syntax Description

```
ipsec transform-set list transform_set_name transform_set_name transform_set_name transform_set_name

no ipsec transform-set list
```

`ipsec transform-set list transform_set_name`

Specifies the context-level IKEv2 IPSec Child Security Association (SA) transform sets to be used in the crypto template payload. This is a space-separated list. Up to four transform sets can be entered. `transform_set_name` is an alphanumeric string of 1 through 127 characters.

Usage Guidelines

Use this command to list the IPSec transform set(s) to use in this crypto template payload.

Example

The following command configures IPSec transform sets named `ipset1` and `ipset2` for use in this crypto template payload:

```
ipsec transform-set list ipset1 ipset2
```

lifetime

Configures the number of seconds and/or kilobytes for IPSec Child SAs derived from this crypto template payload to exist.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Security Administrator

Syntax Description

```
lifetime { sec [ kilo-bytes kbytes ] | kilobytes kbytes }
default lifetime
```

**default**

Returns the lifetime value to the default setting of 86400 seconds.

**sec**

Specifies the number of seconds for IPSec Child Security Associations derived from this crypto template payload to exist. `sec` must be an integer from 60 through 604800. Default: 86400

**kilo-bytes kbytes**

Specifies lifetime in kilobytes for IPSec Child Security Associations derived from this Crypto Map. `kbytes` must be an integer from 1 through 2147483648.

Usage Guidelines

Use this command to configure the number of seconds and/or kilobytes for IPSec Child Security Associations derived from this crypto template payload to exist.

**Example**

The following command configures the IPSec child SA lifetime to be 120 seconds:

```
lifetime 120
```

---

**rekey**

Configures child security association rekeying.

**Important**

In Release 20 and later, HNBGW is not supported. This command must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- FNG
- GGSN
- HA
- HNBGW
- P-GW
PDSN
SAEGW
SCM
SGSN

Privilege
Security Administrator

Syntax Description
```
rekey [ keepalive ]
[ default | no ] rekey
```

default
Returns the feature to the default setting of disabled.

no
Disables this feature.

keepalive
If specified, a session will be rekeyed even if there has been no data exchanged since the last rekeying operation. By default rekeying is only performed if there has been data exchanged since the previous rekey.

Usage Guidelines
Use this command to enable or disable the ability to rekey IPSec Child SAs after approximately 90% of the Child SA lifetime has expired. The default, and recommended setting, is not to perform rekeying. No rekeying means the P-GW will not originate rekeying operations and will not process CHILD SA rekeying requests from the MS.

Example
The following command disables rekeying:
```
no rekey
```
crypto map ikev2-ipv4
payload configuration mode commands

rekey
Crypto Map IKEv2-IPv6 Configuration Mode

The Crypto Map IKEv2-IPv6 Configuration Mode is used to configure an IKEv2 IPsec policy for secure X3 interface tunneling between a P-GW and a lawful intercept server.

Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv6 Configuration

```
configure > context context_name > crypto map map_name ikev2-ipv6
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-ikev2-ipv6-map)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- allow-cert-enc cert-hash-url, on page 854
- authentication, on page 854
- blacklist, on page 855
- ca-certificate list, on page 856
- ca-crl list, on page 857
- certificate, on page 858
- control-dont-fragment, on page 860
- end, on page 861
- exit, on page 861
- ikev2-ikesa, on page 861
- keepalive, on page 864
- match, on page 865
- ocsp, on page 867
- payload, on page 868
- peer, on page 869
- remote-secret-list, on page 870
- whitelist, on page 871
allow-cert-enc cert-hash-url

Enables support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Product**
Security gateway products

**Privilege**
Security Administrator

**Syntax Description**

```
[ no ] allow-cert-enc cert-hash-url
```

**no**
Disables support for hash and URL encoding type in CERT and CERTREQ payloads.

**Usage Guidelines**
Enable support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Example**
The following command enables hash and URL encoding type in CERT and CERTREQ payloads:

```
allow-cert-enc cert-hash-url
```

authentication

Configures the subscriber authentication method used for this crypto map.

---

**Important**
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**
Security Administrator

**Syntax Description**

```
authentication { local | remote } { certificate | pre-shared-key { encrypted key value | key value }
```

- **local | remote**
  Specifies which authentication method will be used by the crypto map – local or remote.

- **certificate**
  Specifies that a certificate will be used by this crypto map for authentication.

- **pre-shared-key { encrypted key value | key value }**
  Specifies that a pre-shared key will be used by this crypto map for authentication.

  - **encrypted key value**: Specifies that the pre-shared key used for authentication is encrypted and expressed as an alphanumeric string of 1 through 255 characters for releases prior to 15.0, or 16 to 444 characters for release 15.0 and higher.

  - **key value**: Specifies that the pre-shared key used for authentication is clear text and expressed as an alphanumeric string of 1 through 32 characters for releases prior to 14.0 or 1 through 255 characters for release 14.0 and higher.

**Usage Guidelines**
Use this command to specify the type of authentication performed for subscribers attempting to access the system via this crypto map.

**Example**
The following command sets the authentication method to an open key value of 6d7970617373776f7264:

```
authentication pre-shared-key key 6d7970617373776f7264
```

**blacklist**
Enables or disables a blacklist (access denied) for this map.

**Product**
All products supporting IPSec blacklisting
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] blacklist
```

**no**

Disables blacklisting for this crypto map. By default blacklisting is disabled.

**Usage Guidelines**

Use this command to enable blacklisting for this crypto map. A blacklist is a list or register of entities that are denied a particular privilege, service, mobility, access or recognition. With blacklisting, any peer is allowed to connect as long as it does not appear in the list. For additional information on blacklisting, refer to the System Administration Guide.

**Example**

The following command enables blacklisting:

```
blacklist
```

### ca-certificate list

Used to bind an X.509 Certificate Authority (CA) certificate list to a crypto template.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege
Security Administrator

Syntax Description
ca-certificate list ca-cert-name cert_name [ ca-cert-name cert_name ] [ ca-cert-name cert_name ] ... [ ca-cert-name cert_name ]
no ca-certificate

no
Removes a CA certificate list from the crypto map.

ca-cert-name cert_name
Adds the named X.509 CA certificate to a list of CAs associated with a crypto map. cert_name is an alphanumeric string of 1 through 129 characters.

Usage Guidelines
Used to bind an X.509 CA certificate list to a crypto map.

Example
Use the following example to add a CA root certificate named CAS_list1 to a list:

ca-certificate list ca-cert-name CA_list1

ca-crl list

Binds one or more Certificate Authority-Certificate Revocation Lists (CA-CRLs) to this crypto template.

Important
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product
ePDG
FA
GGSN
HA
HeNBGW
Privilege

Security Administrator

Syntax Description

```
ca-crl list ca-crl-name name [ ca-crl-name name ] [ ca-crl-name cacrl_name ]
... [ ca-crl-name cacrl_name ]
no ca-crl
```

- **no**
  Removes the CA-CRL configuration from this template.

- **ca-crl-name cacrl_name**
  Specifies the CA-CRL to associate with this crypto template. `cacrl_name` must be the name of an existing CA-CRL expressed as an alphanumeric string of 1 through 129 characters. Multiple lists can be configured for a crypto template.

  You can chain multiple CA-CRLs in a single command instance.

Usage Guidelines

Use this command to associate a CA-CRL name with this crypto template.

CA-CRLs are configured in the Global Configuration Mode. For more information about configuring CA-CRLs, refer to the `ca-crl name` command in the Global Configuration Mode Commands chapter.

Example

The following example binds CA-CRLs named CRL-5 and CRL-7 to this crypto template:

```
ca-crl list ca-crl-name CRL-5 ca-crl-name CRL-7
```

certificate

Used to bind a single X.509 trusted certificate to a crypto map.
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product:
- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

Privilege:
Security Administrator

Syntax Description:

```
certificate cert_name [ validate ]
no certificate [ validate ]
```

**no**
Removes any applied certificate or prevents the certificate from being included in the Auth Exchange response payload.

**cert_name**
Specifies the name of a X.509 trusted certificate to bind to a crypto map. *name* is an alphanumeric string of 1 through 127 characters.

**validate**
Enables validation for the self-certificate.

Usage Guidelines:
Can be used to bind an X.509 certificate to a template, or include or exclude it from the Auth Exchange response payload.
Example

Use the following example to prevent a certificate from being included in the Auth Exchange payload:

```
no certificate validate
```

**control-dont-fragment**

Controls the Don't Fragment (DF) bit in the outer IP header of the IPSec tunnel data packet.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

**Privilege**

Security Administrator

**Syntax Description**

```
control-dont-fragment { clear-bit | copy-bit | set-bit }
```

**clear-bit**

Clears the DF bit from the outer IP header (sets it to 0).
**copy-bit**
Copies the DF bit from the inner IP header to the outer IP header. This is the default action.

**set-bit**
Sets the DF bit in the outer IP header (sets it to 1).

**Usage Guidelines**
A packet is encapsulated in IPsec headers at both ends. The new packet can copy the DF bit from the original unencapsulated packet into the outer IP header, or it can set the DF bit if there is not one in the original packet. It can also clear a DF bit that it does not need.

**Example**
The following command sets the DF bit in the outer IP header:

```
control-dont-fragment set-bit
```

**end**
Exits the current configuration mode and returns to the Exec mode.

**exit**
Exits the current mode and returns to the parent configuration mode.

**ikev2-ikesa**
Configures parameters for the IKEv2 IKE Security Associations within this crypto map.
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**

Security Administrator

**Syntax Description**

```plaintext
default ikev2-ikesa { allow-empty-ikesa | max-retransmissions number | policy { error-notification | use-rfc5996-notification } | rekey [ disallow-param-change ] | retransmission-timeout msec | setup-timer sec | transform-set list name }

no ikev2-ikesa { allow-empty-ikesa | max-retransmissions | policy error-notification | rekey | setup-timer }

default

Restores the selected keyword to its default value.

no

Disables a previously enabled parameter.
```
allow-empty-ikesa
Default is not to allow-empty-ikesa. Activate to have the IKEv2 stack keep the IKE SA when all the Child SAs have been deleted.

max-retransmissions number
Specifies the maximum number of retransmissions of an IKEv2 IKE exchange request if a response has not been received.

number must be an integer from 1 to 8.
Default: 5

policy { error-notification | use-rfc5996-notification }
Notifies error policy.

error-notification: Error Notify Messages will be sent to MS for Invalid IKEv2 Exchange Message ID and Invalid IKEv2 Exchange Syntax for the IKE_SA_INIT Exchange.

use-rfc5996-notification: Enables sending and receive processing for RFC 5996 notifications - TEMPORARY_FAILURE and CHILD_SA_NOT_FOUND.

rekey [ disallow=param-change ]
Specifies if IKESA rekeying should occur before the configured lifetime expires (at approximately 90% of the lifetime interval).

Default is not to re-key.
The disallow-param-change option prevents changes in negotiation parameters during rekey.

retransmission-timeout msec
Specifies the timeout period in milliseconds before a retransmission of an IKEv2 IKE exchange request is sent (if the corresponding response has not been received).

msec must be an integer from 300 to 15000.
Default: 500

setup-timer sec
Specifies the number of seconds before an IKEv2 IKE Security Association that is not fully established is terminated.

sec must be an integer from 16 to 3600.
Default: 60

transform-set list name
A space-separated list of context-level configured IKEv2 IKE Security Association transform sets to be used for deriving IKEv2 IKE Security Associations from this crypto map.

name must be an existing IKEv2 IKESA Transform Set expressed as an alphanumeric string of 1 through 127 characters. A minimum of one transform set is required; maximum configurable is six.
Usage Guidelines

Use this command to configure parameters for the IKEv2 IKE Security Associations within this crypto map.

Example

The following command configures the maximum number of IKEv2 IKESA request retransmissions to 7:

```plaintext
ikev2-ikesa max-retransmissions 7
```

keepalive

Configures keepalive or dead peer detection for security associations used within this crypto template.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege

Security Administrator, Administrator

Syntax Description

```plaintext
keepalive [ interval sec ] [ timeout ] [ num-retry num ]
default keepalive [ interval ] [ timeout ] [ num-retry ]
no keepalive
```
no
Disables keepalive messaging.

interval sec
Specifies the amount of time (in seconds) that must elapse before the next keepalive request is sent. sec must be an integer from 10 through 3600. Default: 10

timeout sec
 Specifies the amount of time (in seconds) which must elapse during which no traffic is received from the IKE_SA peer or any CHILD_SAs derived from the IKE_SA for Dead Peer Detection to be initiated. sec must be an integer from 10 through 3600. Default: 10

num-retry num
Specifies the number of times the system will retry a non-responsive peer before defining the peer as off-line or out-of-service. num must be an integer from 1 through 100. Default: 2

Usage Guidelines
Use this command to set parameters associated with determining the availability of peer servers.

Example
The following command sets a keepalive interval to three minutes (180 seconds):

keepalive interval 180

match
Matches or associates the crypto map to an access control list (ACL) configured in the same context.

Important
HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product
ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
**Syntax Description**

```
match address acl_name [ priority ]
no match address
```

**no**

Removes a previously matched ACL.

**match address acl_name**

Specifies The name of the ACL with which the crypto map is to be matched. `acl_name` is an alphanumeric string of 1 through 79 characters that is case sensitive.

**priority**

Specifies the preference of the ACL as integer from 0 through 4294967295. 0 is the highest priority. Default: 0

The ACL preference is factored when a single packet matches the criteria of more than one ACL.

---

**Usage Guidelines**

ACLs matched to crypto maps are referred to as crypto ACLs. Crypto ACLs define the criteria that must be met in order for a subscriber data packet to routed over an IPSec tunnel.

Prior to routing, the system examines the properties of each subscriber data packet. If the packet properties match the criteria specified in the crypto ACL, the system will initiate the IPSec policy dictated by the crypto map.

**Example**

The following command sets the crypto map ACL to the ACL named `acl-list1` and sets the crypto maps priority to the highest level.

```
match address acl-list1 0
```
ocsp

Enables use of Online Certificate Status Protocol (OCSP) from a crypto template. OCSP provides a facility to obtain timely information on the status of a certificate.

**Product**

All products supporting IPSec

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
ocsp [ nonce | responder-address ipv4_address [ port port_value ] ]
nocsp [ nonce | responder-address [ port ] ]
default ocsp [ nonce ]
```

- **no**
  
  Disables the use of OCSP.

- **default**
  
  Restores the default value assigned for ocsp nonce.

- **nonce**
  
  Enables sending nonce (unique identifier) in OCSP requests.

- **responder-address ipv4_address**
  
  Configures the OCSP responder address that is used when absent in the peer (device) certificate.

  *ipv4_address* is an IPv4 address specified in dotted decimal format.

- **port port_value**
  
  Configures the port for OCSP responder.

  *port_value* is an integer value between 1 and 65535. The default port is 8889.

**Usage Guidelines**

This command enables the use of Online Certificate Protocol (OCSP) from a crypto map/template. OCSP provides a facility to obtain timely information on the status of a certificate.

OCSP messages are exchanged between a gateway and an OCSP responder during a certificate transaction. The responder immediately provides the status of the presented certificate. The status can be good, revoked or unknown. The gateway can then proceed based on the response.

**Example**

The following command enables OSCP:
payload

Creates a new, or specifies an existing, crypto template payload and enters the Crypto Template Payload Configuration Mode.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
- SCM
- SecGW
- SGSN

**Privilege**

Security Administrator

**Syntax Description**

```
payload name match ipv6
no payload name
```

- **payload name**
  Specifies the name of a new or existing crypto template payload as an alphanumeric string of 1 through 127 characters.

- **match ipv6**
  Filters IPSec IPv6 Child Security Association creation requests for subscriber calls using this payload. Further filtering can be performed by applying the following:
Usage Guidelines

Use this command to create a new or enter an existing crypto template payload. The payload mechanism is a means of associating parameters for the Security Association (SA) being negotiated.

Two payloads are required: one each for MIP and IKEv2. The first payload is used for establishing the initial Child SA Tunnel Inner Address (TIA) which will be torn down. The second payload is used for establishing the remaining Child SAs. Note that if there is no second payload defined with home-address as the `ip-address-allocation` then no MIP call can be established, just a Simple IP call.

Currently, the only available match is for ChildSA, although other matches are planned for future releases.

Entering this command results in the following prompt:

```
[ctxt_name]hostname(cfg-crypto-<name>-ikev2-tunnel-payload)#
```

Crypto Template IKEv2-IPv6 Payload Configuration Mode commands are defined in the Crypto Template IKEv2-IPv6 Payload Configuration Mode Commands chapter.

Example

The following command configures a crypto template payload called `payload5` and enters the Crypto Template IKEv2-IPv6 Payload Configuration Mode:

```
payload payload5 match ipv6
```

**peer**

Configures the IP address of a peer IPSec server.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

- ePDG
- FA
- GGSN
- HA
- HeNBGW
- HNBGW
- HSGW
- MME
- P-GW
- PDSN
- S-GW
- SAEGW
remote-secret-list

Enables the use of a Remote Secret List containing up to 1000 pre-shared keys.

Product
All Security Gateway products

Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

Privilege
Security Administrator

Syntax Description
remote-secret-list list_name
no remote-secret-list

no
Disables use of a Remote Secret List.

remote-secret-list

Enables the use of a Remote Secret List containing up to 1000 pre-shared keys.

Product
All Security Gateway products

Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

Privilege
Security Administrator

Syntax Description
remote-secret-list list_name
no remote-secret-list

no
Disables use of a Remote Secret List.
**list_name**

Specifies the name of an existing Remote Secret List as an alphanumeric string of 1 through 127 characters.

**Usage Guidelines**

Enable the use of a Remote Secret List containing up to 1000 pre-shared keys.

Only one active remote-secret-list is supported per system.

For additional information, refer to the *Remote Secret List Configuration Commands* chapter of the *Command Line Interface Reference* and the *System Administration Guide*.

**Example**

The following command enables a remote-secret-list named `rs-list`:

```
remote-secret-list rs-list
```

**whitelist**

Enables or disables a whitelist (access granted) for this crypto map.

**Product**

All products supporting IPSec whitelisting

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] whitelist
```

**no**

Disables whitelisting for this crypto map. By default whitelisting is disabled.

**Usage Guidelines**

Use this command to enable whitelisting for this crypto map. A whitelist is a list or register of entities that are being provided a particular privilege, service, mobility, access or recognition. With whitelisting, no peer is allowed to connect unless it appears in the list. For additional information on whitelisting, refer to the *System Administration Guide*.

**Example**

The following command enables whitelisting:

```
whitelist
```
Crypto Map IKEv2-IPv6 Payload Configuration Mode Commands

The Crypto Map IKEv2-IPv6 Payload Configuration Mode is used to assign the correct IPSec transform-set from a list of up to four different transform-sets, and to assign Mobile IP addresses.

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv6 Configuration > Crypto Map IKEv2-IPv6 Payload Configuration

`configure > context context_name > crypto map map_name ikev2-ipv6 > payload payload_name match ipv6`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-ikev2-ipv6-payload)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- **end**, on page 873
- **exit**, on page 874
- **ipsec**, on page 874
- **lifetime**, on page 875
- **rekey**, on page 877

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`end`

**Usage Guidelines**

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`exit`

**Usage Guidelines**

Use this command to return to the parent configuration mode.

ipsec

Configures the IPSec transform sets to be used for this crypto map payload.

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

**Product**

ePDG  
FA  
GGSN  
HA  
HeNBGW  
HNBGW  
HSGW  
MME  
P-GW  
PDSN  
S-GW  
SAEGW  
SCM  
SecGW  
SGSN

**Privilege**

Security Administrator
Command Modes
Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv6 Configuration > Crypto Map IKEv2-IPv6 Payload Configuration

```
configure > context context_name > crypto map map_name ikev2-ipv6 > payload payload_name match ipv6
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-ikev2-ipv6-payload)#
```

Syntax Description

```
ipsec transform-set list transform_set_name [ transform_set_name ] [ transform_set_name ]
no ipsec transform-set list
```

no

Disables the transform set list.

```
ipsec transform-set list transform_set_name
```

Specifies the context-level name of the IKEv2 IPsec Child Security Association (SA) transform set to be used in the crypto map payload. This is a space-separated list. From 1 to 4 transform sets can be entered. `transform_set_name` is an alphanumeric string of 1 through 127 characters.

Usage Guidelines

Use this command to list the IPsec transform set(s) to use in this crypto map payload.

Example

The following command configures IPsec transform sets named `ipset1` and `ipset2` to be used in this crypto template payload:

```
ipsec transform-set list ipset1 ipset2
```

lifetime

Configures the number of seconds and/or kilobytes for IPsec Child SAs derived from this crypto template payload to exist.

Important

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

Product

ePDG
FA
GGSN
HA
HeNBGW
HNBGW
HSGW
MME
P-GW
PDSN
S-GW
SAEGW
SCM
SecGW
SGSN

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv6 Configuration > Crypto Map IKEv2-IPv6 Payload Configuration

configure > context context_name > crypto map map_name ikev2-ipv6 > payload payload_name match ipv6

Entering the above command sequence results in the following prompt:
[context_name]host_name(cfg-crypto-ikev2-ipv6-payload)#

Syntax Description
lifetime { sec [ kilo-bytes kbytes ] | kilobytes kbytes }
default lifetime

default
Returns the lifetime value to the default setting of 86400 seconds.

sec
Specifies the number of seconds for IPSec Child Security Associations derived from this crypto template payload to exist. sec must be an integer from 60 through 604800. Default: 86400

kilo-bytes kbytes
Specifies lifetime in kilobytes for IPSec Child Security Associations derived from this Crypto Map. kbytes must be an integer from 1 through 2147483648.

Usage Guidelines
Use this command to configure the number of seconds and/or kilobytes for IPSec Child Security Associations derived from this crypto template payload to exist.

Example
The following command configures the IPSec child SA lifetime to be 120 seconds:
lifetime 120
rekey

Configures child security association rekeying.

---

**Important**

HNBGW is not supported from Release 20 and later, and HeNBGW is not supported in Releases 20, 21.0 and 21.1. This command must not be used for HNBGW and HeNBGW in these releases. For more information, contact your Cisco account representative.

---

**Product**

ePDG  
FA  
GGSN  
HA  
HeNBGW  
HNBGW  
HSGW  
MME  
P-GW  
PDSN  
S-GW  
SAEGW  
SCM  
SecGW  
SGSN

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Map IKEv2-IPv6 Configuration > Crypto Map IKEv2-IPv6 Payload Configuration

`configure > context context_name > crypto map map_name ikev2-ipv6 > payload payload_name match ipv6`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-ikev2-ipv6-payload)#
```

**Syntax Description**

```
rekey [ keepalive ]  
[ default | no ] rekey
```

**default**

Returns the feature to the default setting of disabled.
no

Disables this feature.

keepalive

If specified, a session will be rekeyed even if there has been no data exchanged since the last rekeying operation. By default rekeying is only performed if there has been data exchanged since the previous rekey.

Usage Guidelines

Use this command to enable or disable the ability to rekey IPSec Child SAs after approximately 90% of the Child SA lifetime has expired. The default, and recommended setting, is not to perform rekeying. No rekeying means the P-GW will not originate rekeying operations and will not process CHILD SA rekeying requests from the MS.

Example

The following command disables rekeying:

no rekey
Crypto Template Configuration Mode Commands

The Crypto Template Configuration Mode is used to configure an IKEv2 IPSec policy. It includes most of the IPSec parameters and IKEv2 dynamic parameters for cryptographic and authentication algorithms. A security gateway service will not function without a configured crypto template. Only one crypto template can be configured per service.

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template Configuration
configure > context context_name > crypto template template_name ikev2-dynamic

Entering the above command sequence results in the following prompt:

[context_name] host_name(crf-crypto-tmpl-ikev2-tunnel)#

Important

Available commands or keywords/variables vary based on platform type, product version, and installed license(s).

- allow-cert-enc cert-hash-url, on page 880
- allow-custom-fqdn-idr, on page 880
- authentication, on page 881
- blacklist, on page 883
- ca-certificate list, on page 884
- ca-crl list, on page 884
- certificate, on page 885
- configuration-payload, on page 886
- control-dont-fragment, on page 887
- dns-handling, on page 887
- dos cookie-challenge notify-payload, on page 888
- ecn, on page 889
- end, on page 890
- exit, on page 890
- identity local, on page 891
- ikev2-ikesa, on page 892
- ikev2-ikesa ddos, on page 896
- ikev2-ikesa dscp, on page 898
- ip, on page 898
allow-cert-enc cert-hash-url

Enables support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Syntax**

```
[ no ] allow-cert-enc cert-hash-url
```

**Usage Guidelines**

Enable support for a certificate encoding type other than the default. When enabled hash and URL encoding type are supported in CERT and CERTREQ payloads.

**Example**

The following command enables hash and URL encoding type in CERT and CERTREQ payloads:

```
allow-cert-enc cert-hash-url
```

allow-custom-fqdn-idr

Allows non-standard FQDN (Fully Qualified Domain Name) strings in the IDR (Identification - Responder) payload of IKE_AUTH messages received from the UE with the payload type as FQDN.

**Product**

All services using IKEv2 IPSec

**Privilege**

Security Administrator
Syntax Description

[ default | no ] allow-custom-fqdn-idr

no
Does not allow non-standard FQDN strings in the IDr payload of IKE_AUTH messages received from the UE with the payload type as FQDN.

default
Restores the default setting, which does not allow non-standard FQDN strings in the IDr payload of IKE_AUTH messages received from the UE with the payload type as FQDN.

You can chain multiple CA-CRLs in a single command instance.

Usage Guidelines

Use this command to configure the system to skip the syntax check for the IDr payload in IKE_AUTH messages received from the UE with the payload type as FQDN. This allows non-standard FQDN strings such as APN names in the IDr payload.

Example

The following command configures the system to allow non-standard FQDN strings in the IDr payload of IKE_AUTH messages received from the UE with the payload type as FQDN:

allow-custom-fqdn-idr

authentication

Configures the gateway and subscriber authentication methods to be used by this crypto template.

Product

All IPSec-related services

Privilege

Security Administrator

Syntax Description

authentication { eap-profile name [ second-phase eap-profile name ] | local { certificate | pre-shared-key { encrypted key value | key clear_text } } | min-key-size min_key_size | pre-shared-key { encrypted key value | key clear_text [ second-phase eap-profile name ] } | remote { certificate | eap-profile name [ second-phase eap-profile name ] | pre-shared-key { encrypted key value | key clear_text [ second-phase eap-profile name ] } } } | no authentication local { certificate | min-key-size | pre-shared-key } | default authentication min-key-size

default
Returns the command to its default setting.

no
Removes the authentication parameters from the configuration.
**eap-profile name [ second-phase eap-profile name]**

Specifies that authentication is to be performed using a named Extensible Authentication Protocol (EAP) profile. *name* is an alphanumeric string of 1 through 127 characters. Entering this keyword places the CLI in the EAP Authentication Configuration Mode.

The **second-phase eap-profile name** is only required for installations using multiple authentications. *name* must be an alphanumeric string of 1 through 127 characters.

**local { certificate | pre-shared-key { encrypted key **value** | key **clear_text**}**

Specifies the local authentication method required for services using the crypto template.

**certificate**: Specifies that the certificate method of authentication must be used for services using the crypto template.

**min-key-size**: Sets minimum certificate key size. **min_key_size** must be an integer between 255 to 8192. Default is 255.

**pre-shared-key { encrypted key **value** | key **clear_text**}**: Specifies that a pre-shared key is to be used for services using the crypto template. **encrypted key** value configures an encrypted pre-shared key used for authentication. **value** must be an alphanumeric string of 16 through 255 characters for releases prior to 15.0, or 15 through 444 characters for release 15.0 and higher. **key clear_text** configures a clear text pre-shared key used for authentication. **clear_text** must be an alphanumeric string of 1 through 255 characters.

**pre-shared-key { encrypted key **value** | key **clear_text**}**

Specifies that a pre-shared key is to be used for services using the crypto template.

**encrypted key value**: Specifies that the pre-shared key used for authentication is encrypted. **value** must be an alphanumeric string of 1 through 255 characters for releases prior to 15.0, or 15 through 444 characters for release 15.0 and higher.

**key clear_text**: Specifies that the pre-shared key used for authentication is clear text. **clear_text** must be an alphanumeric string of 1 through 255 characters.

**remote { certificate | eap-profile name [ second-phase eap-profile name ] | pre-shared-key { encrypted key **value** | key **clear_text**}**

Specifies the remote authentication method required for services using the crypto template.

**certificate**: Specifies that the certificate method of remote authentication must be used for services using the crypto template.

**eap-profile name [ second-phase eap-profile name ]**: Specifies that remote authentication is to be performed using a named EAP profile. *name* must be an alphanumeric string of 1 through 127 characters. Entering this keyword places the CLI in the EAP Authentication Configuration Mode.

The **second-phase eap-profile name** is only required for installations using multiple authentications. *name* must be an alphanumeric string of 1 through 127 characters.

**pre-shared-key { encrypted key **value** | key **clear_text**}**: Specifies that a pre-shared key is to be used for services using the crypto template. **encrypted key** value configures an encrypted pre-shared key used for authentication. **value** must be an alphanumeric string of 1 through 255 characters for releases prior to 15.0, or 15 through 444 characters for release 15.0 and higher. **key value** configures a clear text pre-shared key used for authentication. **clear_text** must be an alphanumeric string of 1 through 255 characters.
**Usage Guidelines**

Use this command to specify the type of authentication performed for subscribers or gateways attempting to access the service using this crypto template.

Entering the `authentication eap-profile` command results in the following prompt:

```
[context_name]hostname(cfg-crypto-tmpl-eap-key)#
```

EAP Authentication Configuration Mode commands are defined in the *EAP Authentication Configuration Mode Commands* chapter.

**Example**

The following command enables authentication via an EAP profile named `eap23` for subscribers using the service with this crypto template:

```
authentication eap-profile eap23
```

## blacklist

Enables the use of a blacklist (access denied) file to be used by a security gateway.

**Product**

All products supporting IPSec blacklisting

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator

**Syntax Description**

```
[ no ] blacklist
```

- **no**
  
  Disables the use of a blacklist.

**Usage Guidelines**

Enable the use of a previously created blacklist to deny access to prohibited peers via a security gateway.

A blacklist is a list or register of entities that are being denied a particular privilege, service, mobility, access or recognition. With blacklisting, any peer is allowed to connect as long as it does not appear in the list.

Each entry in the blacklist file should contain the ID type so that the validation is performed for that ID type. In every entry, the ID type and ID value should be separated by a space. Only DOS and UNIX file formatting are supported. For additional information, refer to the *System Administration Guide*.

**Example**

The following command enables use of a blacklist:

```
blacklist
```
ca-certificate list

Used to bind an X.509 Certificate Authority (CA) certificate to a crypto template.

Product
All IPSec-related services

Privilege
Security Administrator, Administrator

Syntax Description
ca-certificate list ca-cert-name name [ ca-cert-name name ] [ ca-cert-name name ]
no ca-certificate

no
Unbinds the ca-certificate(s) bound to the crypto template.

cert-name name
Binds the named X.509 Certificate Authority (CA) root certificate to a crypto template. name is an alphanumeric string of 1 through 129 characters.

You can chain multiple certificates (maximum 4) in a single command instance.

Usage Guidelines
Used to bind an X.509 CA certificate to a template.

Example
Use the following example to add a CA certificate named CA_list1 to a list:
ca-certificate list CA_list1

ca-crl list

Binds one or more Certificate Authority-Certificate Revocation Lists (CA-CRLs) to this crypto template.

Product
All IPSec-related services

Privilege
Security Administrator

Syntax Description
ca-crl list ca-crl-name name [ ca-crl-name name ] [ ca-crl-name name ]
no ca-crl

no
Removes the CA-CRL configuration from this template.
**ca-crl-name name**

Specifies the CA-CRL to associate with this crypto template. *name* must be the name of an existing CA-CRL expressed as an alphanumeric string of 1 through 129 characters. Multiple lists (maximum 4) can be configured for a crypto template.

You can chain multiple CA-CRLs in a single command instance.

**Usage Guidelines**

Use this command to associate a CA-CRL name with this crypto template.

CA-CRLs are configured in the Global Configuration Mode. For more information about configuring CA-CRLs, refer to the **ca-crl name** command in the *Global Configuration Mode Commands* chapter.

**Example**

The following example binds CA-CRLs named **CRL-5** and **CRL-7** to this crypto template:

```plaintext
cacrl list ca-crl-name CRL-5 ca-crl-name CRL-7
```

---

**certificate**

Used to bind a single X.509 trusted certificate to a crypto template.

**Product**

All IPSec-related services

**Privilege**

Security Administrator

**Syntax Description**

```
certificate name [ validate ]
no certificate [ validate ]
```

**no**

Removes any applied certificate or prevents the certificate from being included in the Auth Exchange response payload.

**name**

Specifies the name of a X.509 trusted certificate to bind to a crypto template. *name* is an alphanumeric string of 1 through 129 characters.

**validate**

Enable validations for the self-certificate.

**Usage Guidelines**

Can be used to bind an X.509 certificate to a template, or include or exclude it from the Auth Exchange response payload.

**Example**

Use the following example to prevent a certificate from being included in the Auth Exchange payload:

```plaintext
no certificate
```
configuration-payload

This command is used to configure mapping of the configuration payload attributes.

**Product**
All IPSec-related services

**Privilege**
Security Administrator

**Syntax Description**

```
configuration-payload private-attribute-type { imei integer \| p-cscf-v4 v4_value \| p-cscf-v6 v6_value }
[ no | default ] configuration-payload private-attribute-type { imei \| p-cscf-v4 \| p-cscf-v6 }
```

**no**
Removes mapping of the configuration payload attributes.

**default**
Restores the default value for mapping of the configuration payload attributes.

**private-attribute-type**
Defines the private payload attribute.

**imei integer**
Defines an International Mobile Equipemnt Identity number as an integer from 16384 to 32767.

**p-cscf-v4 v4_value**
Defines the IPv4 pcscf payload attribute value. Default value is 16384.

**v4_value** is an integer from 16384 to 32767.

**p-cscf-v6 v6_value**
Defines IPv6 pcscf payload attribute value. Default value is 16390.

**v6_value** is an integer from 16384 to 32767.

**Usage Guidelines**
Use this command to configure mapping of the configuration payload attributes.

**Example**
The following command configures the mapping of the configuration payload attributes p-cscf-v6 to 17001.

```
configuration-payload private-attribute-type p-cscf-v6 17001
```
control-dont-fragment

Controls the Don't Fragment (DF) bit in the outer IP header of the IPSec tunnel data packet.

**Product**
All IPSec-related services

**Privilege**
Security Administrator

**Syntax Description**
```
control-dont-fragment { clear-bit | copy-bit | set-bit }
```

- **clear-bit**
  Clears the DF bit from the outer IP header (sets it to 0).

- **copy-bit**
  Copies the DF bit from the inner IP header to the outer IP header. This is the default action.

- **set-bit**
  Sets the DF bit in the outer IP header (sets it to 1).

**Usage Guidelines**
A packet is encapsulated in IPSec headers at both ends. The new packet can copy the DF bit from the original unencapsulated packet into the outer IP header, or it can set the DF bit if there is not one in the original packet. It can also clear a DF bit that it does not need.

**Example**
The following command sets the DF bit in the outer IP header:
```
control-dont-fragment set-bit
```

dns-handling

Adds a custom option to define the ways a DNS address is returned based on proscribed circumstances described below.

**Product**
PDIF

**Privilege**
Security Administrator

**Syntax Description**
```
[ default ] dns-handling { custom | normal }
```

- **default**
  Configures the default condition as **normal**. By default, PDIF always returns the DNS address in the config payload in the second authentication phase if one is received from either the configuration or the HA.
**dns-handling custom**

Configures the PDIF to behave as described in the Usage section below.

**dns-handling normal**

This is the default action. The service always returns the DNS address in the config payload in the second authentication phase if one is received from either the configuration or the HA.

### Usage Guidelines

During IKEv2 session setup, MS may or may not include INTERNAL_IP4_DNS in the Config Payload (CP). PDIF may obtain one or more DNS addresses for the subscriber in DNS NVSE from a proxy-MIP Registration Reply message. If Multiple Authentication is used, these DNS addresses may be also received in Diameter AVPs during the first authentication phase, or in RADIUS attributes in the Access Accept messages during the second authentication phase.

In **normal** mode, by default PDIF always returns the DNS address in the config payload in the second authentication phase if one is received from either the configuration or the HA.

In **custom** mode, depending on the number of INTERNAL_IP4_DNS, PDIF supports the following behaviors:

- If MS includes no INTERNAL_IP4_DNS in Config Payload: PDIF does not return any INTERNAL_IP4_DNS option to MS, whether or not PDIF has received one in DNS NVSE from HA or from local configurations.

- If MS requests one or more INTERNAL_IP4_DNS(s) in Config Payload, and if P-MIP NVSE doesn't contain any DNS address or DNS address not present in any config, PDIF omits INTERNAL_IP4_DNS option to MS in the Config Payload.

- And if P-MIP NVSE includes one DNS address (a.a.a.a / 0.0.0.0), then PDIF sends one INTERNAL_IP4_DNS option in Config Payload back to the MS.

- If the Primary DNS is a.a.a.a and the Secondary DNS is 0.0.0.0, then a.a.a.a is returned (only one instance of DNS attribute present in the config payload).

- If the Primary DNS is 0.0.0.0 and the Secondary DNS is a.a.a.a, then a.a.a.a is returned (only one instance of DNS attribute present in the config payload). PDIF does not take 0.0.0.0 as a valid DNS address that can be assigned to the MS.

- And if P-MIP NVSE includes two DNS addresses (a.a.a.a and b.b.b.b) or configurations exists for these two addresses, then PDIF sends two INTERNAL_IP4_DNSs in the CP for the MS (typically known as primary and secondary DNS addresses).

### Example

The following configuration applies the **custom** dns-handling mode:

```

dns-handling custom
```

**dos cookie-challenge notify-payload**

Configure the cookie challenge parameters for IKEv2 INFO Exchange notify payloads for the given crypto template.
Product

All IPSec-related services

Privilege

Security Administrator

Syntax Description

\texttt{dos cookie-challenge notify-payload [ half-open-sess-count start integer stop integer] [ default | no ] cookie-challenge detect-dos-attack}

\textbf{default}

Default is to disabled condition.

\textbf{no}

Prevents Denial of Service cookie transmission. This is the default condition.

\textbf{half-open-sess-count start integer stop integer}

The \texttt{half-open-sess-count} is the number of half-open sessions per IPSec manager.

A session is considered half-open if a PDIF has responded to an IKEv2 INIT Request with an IKEv2 INIT Response, but no further message was received on that particular IKE SA.

- \texttt{start integer}: Starts when the current half-open-sess-count exceeds the start count. The start count is an integer from 0 to 100000.

- \texttt{stop integer}: Stops when the current half-open-sess-count drops below the stop count. The stop count number is an integer from 0 to 100000. It is always less than or equal to the start count number.

\textbf{Important}

The start count value 0 is a special case whereby this feature is always enabled. In this event, both \texttt{start} and \texttt{stop} must be 0.

\textbf{Usage Guidelines}

This feature (which is disabled by default) helps prevent malicious Denial of Service attacks against the server by sending a challenge cookie. If the response from the sender does not incorporate the expected cookie data, the packets are dropped.

\textbf{Example}

The following example configures the cookie challenge to begin when the half-open-sess-count reaches 50000 and stops when it drops below 20000:

\texttt{dos cookie-challenge notify-payload half-open-sess-count start 50000 stop 20000}

\textbf{ecn}

This command enables explicit congestion notification (ECN) in normal mode or compatible mode for the IPsec tunnel over the SWu interface.
Crypto Template Configuration Mode Commands

**Product**
ePDG

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration

```plaintext
configure > context context_name > crypto template template_name ikev2-dynamic
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(crf-crypto-tmp1-ikev2-tunnel)#
```

**Syntax Description**

```
[ no ] ecn
```

- **no**
  Enables ECN in compatible mode for IPsec tunnel over SWu interface. The default mode is the compatible mode, supported for backward compatibility.

- **ecn**
  Specifies ECN over IPsec tunnel in normal mode.

**Usage Guidelines**

Use this command to enable ECN in normal mode or compatible mode for the IPsec tunnel over SWu interface.

**Example**

The following command enables ECN in normal mode for the IPsec tunnel:

```
ecn
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**

```
end
```

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator
Syntax Description | `exit`
---|---
Usage Guidelines | Use this command to return to the parent configuration mode.

### identity local

Configures the identity of the local IPSec Client (IKE ID).

#### Product
All Security Gateway products

#### Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

#### Privilege
Security Administrator

#### Syntax Description
```
identity local id-type type id name
no identity local
```

- **no**
  - Resets the ID to the IP address of the interface to which the crypto template is associated (type = IPv4 or IPv6).

- **id-type type**
  - Configures the IKE identity that the local client uses when authenticating to the gateway. Valid values are:
    - `der-ans1-dn`: configures NAI Type DER ASN1_DN (Distinguished Encoding Rules, ASN.1 encoding, Distinguished Name)
    - `fqdn`: configures NAI Type ID_FQDN (Internet Fully Qualified Domain Name).
    - `ip-addr`: configures NAI Type ID_IP_ADDR (IP Address).
    - `key-id`: configures NAI Type ID_KEY_ID (opaque octet string).
    - `rfc822-addr`: configures NAI Type ID_RFC822_ADDR (RFC 822 email address).

- **id name**
  - Specifies the identifier for the local IKE client as an alphanumeric string of 1 through 127 characters.

#### Usage Guidelines
Use this command to configure the identity of the local IPSec Client.

#### Example
The following command configures the local IPSec Client.

```
identity local id-type der-ans1-dn id system14
```
ikev2-ikesa

Configures parameters for the IKEv2 IKE Security Associations within this crypto template.

**Product**
All IPSec-related services

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration

```
configure > context context_name > crypto template template_name ikev2-dynamic
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(crf-crypto-tmp1-ikev2-tunnel)#
```

**Syntax Description**

```
ikev2-ikesa { allow-empty-ikesa | cert-sign { pkcs1.5 | pkcs2.0 } | configuration-attribute p-cscf-v6 { iana | private } length { 16 | 17 } | emergency { keepalive [ interval interval ] timeout seconds num-retry val } | fragmentation | idi peer_idi_value { common-id | request-eap-identity } | ignore-notify-protocol-id | ignore-rekeying-requests | keepalive-user-activity | max-retransmissions number | mobike [ cookie-challenge ] | policy { congestion-rejection { notify-status-value value | notify-error-value value } | error-notification [ invalid-major-version ] [ invalid-message-id [ invalid-major-version | invalid-syntax ] ] | invalid-syntax [ invalid-major-version ] | use-rfc5996-notification } | rekey [ disallow-param-change ] | retransmission-timeout msec | setup-timer sec | transform-set list name1 name2 name3 name4 name5 name6 }
```

```
default ikev2-ikesa { allow-empty-ikesa | cert-sign | configuration-attribute p-cscf-v6 { iana | private } length | fragmentation | ignore-notify-protocol-id | ignore-rekeying-requests | keepalive-user-activity | max-retransmissions | mobike | policy | error-notification | rekey [ disallow-param-change ] | retransmission-timeout | setup-timer }
```

```
no ikev2-ikesa { allow-empty-ikesa | auth-method-set | fragmentation | idi peer_idi_value | ignore-notify-protocol-id | ignore-rekeying-requests | keepalive-user-activity | list name | mobike | policy | error-notification | rekey }
```

```
default
```

Restores the configuration to its default value.

```
no
```

Disables a previously enabled parameter.
allow-empty-ikesa

Default is not to allow-empty-ikesa. Activate to have the IKEv2 stack keep the IKE SA when all the Child SAs have been deleted.

cert-sign { pkcs1.5 | pkcs2.0 }

Specifies the certificate sign to be used. Default: pkcs1.5

pkcs1.5: Use the Public-Key Cryptography Standards (PKCS) version 1.5, RSA Encryption Standard.
pkcs2.0: Use the PKCS version 2.0, RSA Encryption Standard.

configuration-attribute p-cscf-v6 { iana | private } length { 16 | 17 }

Specifies the P-CSCF IPv6 configuration attribute length for both IANA and private attribute values. As per RFC 7651, the configuration attribute length for IANA is 16 bytes.

Default (iana): 16 bytes
Default (private): 17 bytes

emergency { keepalive [ interval interval ] timeout seconds num-retry val }

Configures emergency call related parameters.

Keepalive: Configures Keepalive Functionality (Dead Peer Detection) to be enabled for all emergency Security Associations derived from this Crypto Template and this will override generic keep alive configuration for emergency calls.

interval: The number of seconds which must elapse during which no traffic is received from the given IKE_SA peer or any CHILD_SAs derived from the IKE_SA for Dead Peer Detection to be initiated (Default: 3) - integer 2..3600

timeout: Configures the Keepalive (Dead Peer Detection) Timeout in seconds. This value configures the number of seconds which must elapse after a Keepalive has been sent, and no response has been received before another keepalive is sent.

seconds: The number of seconds which must elapse after a Keepalive has been sent, and no response has been received, before another Keepalive is send. Default is 3 seconds and the Interval should be between 2 and 3600 seconds.

num-retry: Configure the number of Keepalive (Dead Peer Detection) Retry attempts. If Keepalive (Dead Peer Detection) has been initiated this value configures the number of retry attempts which will be made if no response is received from the peer, before the peer is declared dead.

val: The number of retry attempts which will be made if no response is received from the peer before the peer is declared dead Default is 2 seconds and the Interval should be between 1 and 30 seconds.

fragmentation

Enables IKESA fragmentation (Tx) and re-assembly (Rx).

Default: IKESA fragmentation and re-assembly is allowed.

idi peer_idi_value { common-id | request-eap-identity }

Specifies the IDI related configuration to match IDI from peer which enables the ePDG to request the real identity using EAP-Identity Request. peer_idi_value is a string of 1 through 127 characters.
request-eap-identity: Requests the EAP-Identity from peer.

common-id: Requests the Common IDi from peer.

ignore-notify-protocol-id
Ignores IKEv2 Informational Exchange Notify Payload Protocol-ID values for strict RFC 4306 compliance.

ignore-rekeying-requests
Ignores received IKE_SA Rekeying Requests.

keepalive-user-activity
Default is no keepalive-user-activity. Activate to reset the user inactivity timer when keepalive messages are received from peer.

max-retransmissions number
Specifies the maximum number of retransmissions of an IKEv2 IKE Exchange Request if a response has not been received. number must be an integer from 1 through 8. Default: 5

mobike [ cookie-challenge ]
IKEv2 Mobility and Multihoming Protocol (MOBIKE) allows the IP addresses associated with IKEv2 and tunnel mode IPSec Security Associations to change. A mobile Virtual Private Network (VPN) client could use MOBIKE to keep the connection with the VPN gateway active while moving from one address to another. Similarly, a multi-homed host could use MOBIKE to move the traffic to a different interface if, for instance, the one currently being used stops working.
Default: Disabled

cookie-challenge: Use this keyword to enable the return routability check. The Gateway performs a return routability check when MOBIKE is enabled along with this keyword. A return routability check ensures that the other party can receive packets at the claimed address. Default: Disabled

policy { congestion-rejection { notify-status-value value | notify-error-value value } | error-notification [ invalid-major-version ] [ invalid-message-id [ invalid-major-version | invalid-syntax ] ] [ invalid-syntax [ invalid-major-version ] ] use-rfc5996-notification }
Specifies the default policy for generating an IKEv2 Invalid Message ID error when PDIF receives an out-of-sequence packet.

congestion-rejection: Sends an Error Notify Message to the MS as a reply to an IKE_SA_INIT Exchange when no more IKE_SA sessions can be established.

notify-status-value value: Notify Message will be sent to MS as a reply to an IKE_SA_INIT Exchange when no more IKE_SA sessions can be established. value is RFC 4306 IKEv2 Private Use Status Range - integer 40960 through 65535.

notify-error-value value: Notify Message will be sent to MS as a reply to an IKE_SA_INIT Exchange when no more IKE_SA sessions can be established. value is RFC 4306 IKEv2 Private Use Error Range - integer 8192 through 16383.

error-notification: Sends an Error Notify Message to the MS for Invalid IKEv2 Exchange Message ID and Invalid IKEv2 Exchange Syntax for the IKE_SA_INIT Exchange.
**invalid-major-version:** Sends an Error Notify Message for Invalid Major Version

**invalid-message-id:** Sends an Error Notify Message for Invalid IKEv2 Exchange Message ID.

**invalid-syntax:** Sends an Error Notify Message for Invalid IKEv2 Exchange Syntax.

**use-rfc5996-notification:** Enable sending and receive processing for RFC 5996 notifications - TEMPOARY_FAILURE and CHILD_SA_NOT_FOUND

**rekey [ disallow-param-change ]**

Specifies if IKE_SA rekeying should occur before the configured lifetime expires (at approximately 90% of the lifetime interval). Default is not to re-key.

The **disallow-param-change** option prevents changes in negotiation parameters during rekey.

**retransmission-timeout msec**

Specifies the timeout period (in milliseconds) before a retransmission of an IKEv2 IKE exchange request is sent (if the corresponding response has not been received). *msec* must be an integer from 300 to 15000. Default: 500

**setup-timer sec**

Specifies the number of seconds before a IKEv2 IKE Security Association that is not fully established is terminated. *sec* must be an integer from 1 through 3600. Default: 16

**transform-set list name1**

Specifies the name of a context-level configured IKEv2 IKE Security Association transform set. *name1* ...

...*name6* must be an existing IKEv2 IKESA Transform Set expressed as an alphanumeric string of 1 through 127 characters.

The transform set is a space-separated list of IKEv2-IKESA SA transform sets to be used for deriving IKEv2 IKE Security Associations from this crypto template. A minimum of one transform-set is required; maximum configurable is six.

**Usage Guidelines**

Use this command to configure parameters for the IKEv2 IKE Security Associations within this crypto template.

**Example**

The following command enables IKEv2 IKESA fragmentation and re-assembly:

```
ikev2-ikesa fragmentation
```

The following command configures the maximum number of IKEv2 IKESA request re-transmissions to 7:

```
ikev2-ikesa max-retransmissions 7
```

The following command configures the IKEv2 IKESA request retransmission timeout to 400 milli seconds:

```
ikev2-ikesa retransmission-timeout 400
```
The following command configures the IKEv2 IKE SA list, consisting of a transform set named as *ikesa43*:

```plaintext
ikev2-ikesa transform-set list ikesa43
```

### ikev2-ikesa ddos

Configures distributed denial of service (DDoS) mitigation parameters for the IKEv2 IKE Security Associations within this crypto template.

#### Product
- ePDG
- HeNBGW
- HNBGW
- WSG

#### Privilege
- Security Administrator

#### Command Modes
- Exec
- Global Configuration
- Context Configuration
- Crypto Template Configuration

##### configure context context_name crypto template template_name ikev2-dynamic

Entering the above command sequence results in the following prompt:

```
[context_name]host_name (crf-crypto-tmpl-ikev2-tunnel)#
```

#### Syntax Description

```plaintext
ikev2-ikesa ddos { decrypt-fail-count failure_count | half-open-sa-timer half_open_timer_duration | ikev2-req-rate ikev2_req_rate_count [ interval interval ]| max-cert-size cert_size | message-queue-size queue_size | rekey-rate rekey_rate_value }

{ default | no } ikev2-ikesa ddos { decrypt-fail-count | half-open-sa-timer
| ikev2-req-rate | max-cert-size | message-queue-size | rekey-rate }

default

Restores the configuration to its default value.

no

Disables a previously enabled configuration.

**decrypt-fail-count failure_count**

Specifies the maximum tolerable consecutive IKE_AUTH message decryption failure count. During session establishment, if IKE_AUTH decryption failure exceeds the configured threshold, the IKEv2 IKE SA tunnel is cleared. If IKE_AUTH decryption failure exceeds the configured threshold after the session is established, alarms are triggered.

Default: 30

*failure_count* must be an integer between 1 and 100.
half-open-sa-timer half_open_timer_duration
Specifies the half-open IKE SA timeout duration. The half-open IKE SA timer starts when an IKE_SA_INIT request is received. If an IKE_AUTH message is not received before the timer expires, the half-open IKEv2 IKE SA is cleared.
Default: 60
half_open_timer_duration must be an integer between 1 and 1800.

ikev2-req-rate ikev2_req_rate_count [ interval interval ]
ikev2-req-rate ikev2_req_rate_count: Configures the maximum number of IKEv2 requests allowed per configured interval. ikev2_req_rate_count must be an integer from 1 to 3000.
Default: 10
interval interval : Configures the interval for monitoring IKEv2 requests. interval must be an integer from 1 to 300.
Default: 1 second

max-cert-size cert_size
Specifies the maximum certificate size for IKE SA. Use this keyword to detect bad certificates from illegitimate URLs in earlier stages, and thus avoid downloading large certificates.
Default: 2048 bytes
cert_size must be an integer between 512 and 8192.

message-queue-size queue_size
Specifies the queue size for incoming IKE messages per IKE SA. When the incoming queued IKE messages (per IKE SA) exceeds the specified limit, the IKE messages exceeding the limit are dropped.
Default: 20
queue_size must be an integer between 1 and 50.

rekey-rate rekey_rate_value
Specifies the rate at which the rekey request will be processed per second. When the specified number of Child SA rekey requests per second is exceeded, a TEMPOARY_FAILURE notification will be sent to the peer to indicate that the peer must slow down their requests.
Default: 5
rekey_rate_value must be an integer between 1 and 50.

Usage Guidelines
Use this command to configure parameters for Distributed Denial of Service (DDoS) mitigation for the IKEv2 IKE Security Associations within this crypto template.

Example
The following command configures the half-open IKE SA timeout duration to 300 seconds:
ikev2-ikesa ddos half-open-sa-timer 300
**ikev2-ikesa dscp**

Configures the Differentiated Services Code Point (DSCP) value in the IPv4 and IPv6 headers of the IKEv2 packets sent to the peer for this crypto template.

**Product**
- ePDG
- HeNBGW
- HNBGW
- SecGW

**Privilege**
Security Administrator

**Command Modes**
- Exec > Global Configuration > Context Configuration > Crypto Template Configuration
- `configure > context context_name > crypto template template_name ikev2-dynamic`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(crf-crypto-tmpl-ikev2-tunnel)#
```

**Syntax Description**

- `ikev2-ikesa dscp` *dscp_hex_value*
  
- `default ikev2-ikesa dscp`
  
- `default`
  
  Restores the configuration to its default value.

- `dscp` *dscp_hex_value*
  
  Specifies the DSCP value in the IKEv2 packets sent to the peer.
  
  Default: 0x00

  *dscp_hex_value* must be an hexa-decimal value between 0x00 and 0x3F.

**Usage Guidelines**

Use this command to configure the Differentiated Services Code Point (DSCP) value in the IPv4 and IPv6 headers of the IKEv2 packets sent to the peer for this crypto template.

**Example**

The following command configures the DSCP value to 0x2A:

```
ikev2-ikesa dscp 0x2A
```

**ip**

Configures IPv4 related information.

**Product**
- All IPSec-related services
Crypto Template Configuration Mode Commands

ip

Privilege
Security Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Template Configuration

configure > context context_name > crypto template template_name ikev2-dynamic

Entering the above command sequence results in the following prompt:

[context_name]host_name(crf-crypto-tmpl-ikev2-tunnel)#

Syntax Description

ip { fragment { inner | outer } | ikev2-mtu mtu_size | mtu size }
default ip { fragment | ikev2-mtu | mtu }

default
Sets / Restores default value assigned for IPv4 related information. The default value for fragment is outer. The default value for ikev2-mtu is 1384. The default value for mtu is 1438.

fragment { inner | outer }
Configures the fragment type when User Payload is IPv4 type and DF bit not set.

Default: outer

inner: Fragments the IPv4 payload and encapsulate in the IPSec tunnel.

outer: Fragment to happen after the IPSec encapsulation.

ikev2-mtu mtu_size
Configures MTU size of the IKEv2 Payload for IPv4 tunnel.

mtu_size is an integer between 460 and 1932.

mtu size
Configures MTU of the User Payload for IPv4 tunnel.

size is an integer between 576 and 2048.

Usage Guidelines
Use this command to configure IPv4 related information for given ePDG services configured on this system.

For IPSec, use this command to set the Maximum Transmission Unit (MTU) size for the IKEv2 payload over IPv4 tunnels.

Example
The following command sets the IKEv2 MTU size to 1500:

ip ikev2-mtu 1500

The following command sets the MTU size to 1500:

ip mtu 1500
ipv6

Configures the MTU (Maximum Transmission Unit) of the user payload for IPv6 tunnels in bytes.

**Product**
All IPSec-related services

ePDG

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration
`configure > context context_name > crypto template template_name ikev2-dynamic`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(crf-crypto-tmpl1-ikev2-tunnel)#
```

**Syntax Description**

For ePDG:

```
ipv6 mtu size
default ipv6 mtu
```

For IPSec:

```
ipv6 ikev2-mtu mtu-size
default ipv6 ikev2-mtu
```

**default**

Sets the IPv6 tunnel MTU to its default size.

**mtu size**

Specifies the MTU size of a packet to accommodate IPSec headers added to a packet.

Default: 1422

`size` must be an integer from 1280 through 2048.

**ikev2-mtu mtu_size**

Configures MTU size of the IKEV2 Payload for IPv6 tunnel.

Default: 1364

`mtu_size` must be an integer from 1144 through 1912.

**Usage Guidelines**

For ePDG, use this command to increase the MTU size of a packet to accommodate IPSec headers added to a packet and thus avoid sending an ICMP Fragmentation Needed packet.

For IPSec, use this command to set the Maximum Transmission Unit (MTU) size for the IKEv2 payload over IPv6 tunnels.
Example
The following command sets the IKEv2 MTU size to 1500:
`ipv6 ikev2-mtu 1500`
The following command sets the MTU size to 1800:
`ipv6 mtu 1800`

keepalive

Configures keepalive or dead peer detection for security associations used within this crypto template.

Product  All products supporting IPSec
Privilege Security Administrator

Syntax Description
```
keepalive [ interval sec ]
default keepalive [ interval ]
no keepalive
```

no
Disables keepalive messaging.

interval sec
Specifies the amount of time (in seconds) that must elapse before the next keepalive request is sent. sec must be an integer from 10 through 3600. Default: 10

Usage Guidelines
Use this command to set parameters associated with determining the availability of peer servers.

Example
The following command sets a keepalive interval to three minutes (180 seconds):
`keepalive interval 180`

max-childsa

Defines a soft limit for the number of child Security Associations (SAs) per IKEv2 policy.

Product  All products supporting IPSEcv2
Privilege Security Administrator

Syntax Description
```
max-childsa integer [ overload-action { ignore | terminate } ]
```
max-childsa integer

Specifies a soft limit for the maximum number of Child SAs per IKEv2 policy as an integer from 1 to 4 for releases prior to 15.0, or 1 to 5 for 15.0 and higher. Default = 2.

overload-action { ignore | terminate }

Specifies the action to be taken when the specified soft limit for the maximum number of Child SAs is reached. The options are:

- **ignore**: The IKEv2 stack ignores the specified soft limit for Child SAs.
- **terminate**: The IKEv2 stack rejects any new Child SAs if the specified soft limit is reached.

Usage Guidelines

Two maximum Child SA values are maintained per IKEv2 policy. The first is a system-enforced maximum value, which is four Child SAs per IKEv2 policy. The second is a configurable soft maximum value, which can be a value between one and four. This command defines the soft limit for the maximum number of Child SAs per IKEv2 policy.

Example

The following command specifies a soft limit of four Child SAs with the overload action of terminate.

```
max-childsa 4 overload-action terminate
```

nai

Configures the Network Access Identifier (NAI) parameters to be used for the crypto template IDr (recipient's identity).

Product

Important

This command is deprecated from 15.0 and later releases.

All Security Gateway products

Privilege

Security Administrator

Syntax Description

```
nai { idr name [ id-type { der-asn1-dn | der-asn1-gn | fqdn | ip-addr | key-id | rfc822-addr } ] | use-received-idr }
default nai idr
no nai { idr | use-received-idr }
```

default

Configures the default command **no nai idr**. As a result, the default behavior is for the PDIF-service IP address to be sent as the IDr value of type ID_IP_ADDR.
no

no nai idr configures the value whereby the service IP address is sent as the IDr value with the type ID_IP_ADDR. This is the default condition.

idr name

Specifies the name of the IDr crypto template as an alphanumerical string of 1 through 79 characters.

id-type { der-asn1-dn | der-asn1-gn | fqdn | ip-addr | key-id | rfc822-addr }

Configures the NAI IDr type parameter. If no id-type is specified, then rfc822-addr is assumed.

  • der-asn1-dn: configures NAI Type DER_ASN1_DN (Distinguished Encoding Rules, ASN.1 encoding, Distinguished Name)
  • der-asn1-gn: configures NAI Type DER_ASN1_GN (Distinguished Encoding Rules, ASN.1 encoding, General Name)
  • fqdn: configures NAI Type ID_FQDN (Internet Fully Qualified Domain Name).
  • ip-addr: configures NAI Type ID_IP_ADDR (IP Address).
  • key-id: configures NAI Type ID_KEY_ID (opaque octet string).
  • rfc822-addr: configures NAI Type ID_RFC822_ADDR (RFC 822 email address).

use-received-idr

Specifies that the received IDr be used in the crypto template.

Usage Guidelines

The configured IDr is sent to the MS in the first IKEv2 AUTH response.

Example

The following command configures the NAI IDr to the default condition.

default naiidr idr

natt

Configures Network Address Translation - Traversal (NAT-T) for all security associations associated with this crypto template. This feature is disabled by default.

Important

IKEv2 ACL with NAT-T is not supported.

Product

All Security Gateway products

Privilege

Security Administrator

Syntax Description

[ default | no ] natt [ include-header ] [ send-keepalive [ idle-interval idle_secs ] [ interval interval_secs ] ]
**notify-payload**

This command configures the parameters to be sent in NOTIFY payload.

**Product**

All products supporting IPSec OCSP

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template Configuration

`configure > context context_name > crypto template template_name ikev2-dynamic`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(crf-crypto-tmp1-ikev2-tunnel)#
```

**Syntax Description**

```
notify-payload { device-id | error-message-type { network-permanent | network-transient-major | network-transient-minor | ue } base value }

default notify-payload { device-id | error-message-type { network-permanent | network-transient-major | network-transient-minor | ue } base }

no notify-payload device-id
```
default
Sets / restores default value assigned for the parameters to be sent in NOTIFY payload.

no
If previously configured, removes the configuration.

device-id
Enables ePDG to request for the IMEI or IMEI SV information using the DEVICE_IDENTITY notify payload in the IKE_AUTH_RESP message from the UE, if the UE does not share this information in the first IKE_AUTH_REQ message in the configuration attributes.
Default: Enabled

error-message-type
This command configures the type of notify error message.

Error Categories:

- **network-permanent**: Configures the value for permanent network errors. Default is 11000.
- **network-transient-major**: Configures the value for major transient network errors. Default is 10500.
- **network-transient-minor**: Configures the value for minor transient network errors. Default is 10000.
- **ue**: Configures the value for UE related errors. Default is 9000.

**base value**: Configures the base value for the chosen error category. Only private range supported 8192-16383. value must be an integer between 8192 and 16383.

Usage Guidelines
Use this command to configure the parameters to be sent in NOTIFY payload.

Example
The following command configure the notify payload parameter **error-message-type network-transient-minor base** to value 10000.
```
notify-payload error-message-type network-transient-minor base 10000
```

ocsp

Enables use of Online Certificate Status Protocol (OCSP) from a crypto template. OCSP provides a facility to obtain timely information on the status of a certificate.

Product

All products supporting IPSec

Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.
Syntax Description

```
ocsp [ nonce | responder-address ipv4_address [ port port_value ] ]
no ocsp [ nonce | responder-address [ port ] ]
default ocsp [ nonce ]
```

**no**
Disables the use of OCSP.

**default**
Restores the default value assigned for ocsp nonce.

**nonce**
Enables sending nonce (unique identifier) in OCSP requests.

**responder-address ipv4_address**
Configures the OCSP responder address that is used when absent in the peer (device) certificate.

`ipv4_address` is an IPv4 address specified in dotted decimal format.

**port port_value**
Configures the port for OCSP responder.

`port_value` is an integer value between 1 and 65535. The default port is 8889.

Usage Guidelines

This command enables the use of Online Certificate Protocol (OCSP) from a crypto map/template. OCSP provides a facility to obtain timely information on the status of a certificate.

OCSP messages are exchanged between a gateway and an OCSP responder during a certificate transaction. The responder immediately provides the status of the presented certificate. The status can be good, revoked or unknown. The gateway can then proceed based on the response.

Example

The following command enables OSCP:

```
ocsp
```

payload

Creates a new, or specifies an existing, crypto template payload and enters the Crypto Template Payload Configuration Mode.

**Product**
All Security Gateway products

**Privilege**
Security Administrator
Syntax Description

[ no ] payload name match childsa [ match { any | ipv4 | ipv6 } ]

no

Removes a currently configured crypto template payload.

payload name

Specifies the name of a new or existing crypto template payload as an alphanumeric string of 1 through 127 characters.

match { any | ipv4 | ipv6 }

Filters IPSec Child Security Association creation requests for subscriber calls by applying the following options:

• any: Configures this payload to be applicable to IPSec Child Security Association requests for IPv4 and/or IPv6.
• ipv4: Configures this payload to be applicable to IPSec Child Security Association requests for IPv4 only.
• ipv6: Configures this payload to be applicable to IPSec Child Security Association requests for IPv6 only.

Usage Guidelines

Use this command to create a new or enter an existing crypto template payload. The payload mechanism is a means of associating parameters for the Security Association (SA) being negotiated.

Two payloads are required: one for MIP and IKEv2. The first payload is used for establishing the initial Child SA Tunnel Inner Address (TIA) which will be torn down. The second payload is used for establishing the remaining Child SAs. Note that if there is no second payload defined with home-address as the ip-address-allocation then no MIP call can be established, just a Simple IP call.

Currently, the only available match is for ChildSA, although other matches are planned for future releases. Omitting the second match parameter for either IPv4 or IPv6 will make the payload applicable to all IP address pools.

Crypto Template Payload Configuration Mode commands are defined in the Crypto Template IKEv2-Dynamic Payload Configuration Mode Commands chapter.

Example

The following command configures a crypto template payload called payload5 and enters the Crypto Template Payload Configuration Mode:

```
payload payload5 match childsa
```

**peer network**

Configures a list of allowed peer addresses on this crypto template.

**Product**

All IPSec-related services

**Privilege**

Security Administrator
**Syntax Description**

```plaintext
peer network ip_address [ /mask ] [ encrypted pre-shared-key encrypt_key ]
pre-shared-key key ]

no peer network ip_address/ mask
```

**Usage Guidelines**

Use this command to configure a list or range of allowed peer network IP addresses for this template.

**Example**

The following command configures a set of IP addresses with starting address of 10.2.3.4 and a bit mask of 8:

```
peer network 10.2.3.4/8
```

---

**remote-secret-list**

Enables the use of a Remote Secret List containing up to 1000 pre-shared keys.

**Product**

All Security Gateway products

**Important**

This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

**Privilege**

Security Administrator
Syntax Description

```
remote-secret-list list_name
no remote-secret-list
```

no

Disables use of a Remote Secret List.

```
list_name
```

Specifies the name of an existing Remote Secret List as an alphanumeric string of 1 through 127 characters.

Usage Guidelines

Enable the use of a Remote Secret List containing up to 1000 pre-shared keys.
Only one active remote-secret-list is supported per system.
For additional information, refer to the Remote Secret List Configuration Commands chapter of the Command Line Interface Reference and the System Administration Guide.

Example

The following command enables a remote-secret-list named rs-list:
```
remote-secret-list rs-list
```

server certificate

Configure server certificate for a given Crypto Template.

Product
ePDG

Privilege
Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template Configuration
```
configure > context context_name > crypto template template_name ikev2-dynamic
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(crf-crypto-tmpl-ikev2-tunnel)#
```

Syntax Description

```
server-certificate certificate_name ca-certificate-list ca_certificate_list_name

no server-certificate certificate_name [validate]
```

```
certificate_name
```

configures server certificate for a given Crypto Template, certificate name should a string of size between 1 and 128.

```
ca_certificate_list_name
```

configures server certificate list name for a given Crypto Template, certificate name should a string of size between 1 and 128.
Usage Guidelines
Use the below command to configure server certificate for a given Crypto Template:

Example
The following command configures Server Certificate 20 and CA Certificate List 10:

```bash
server-certificate 20 ca-certificate-list 10
```

timeout

Sets the OCSP Certificate Server timeout interval in seconds. This is the interval within which the response from an external OCSP or HASH-url server should be received.

Product
ePDG

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Template Configuration
```bash
configure > context context_name > crypto template template_name ikev2-dynamic
```
Entering the above command sequence results in the following prompt:

```
(context_name)host_name(crf-crypto-tmp1-ikev2-tunnel)#
```

Syntax Description
```
timeout cert-server timeout_value

default timeout cert-server
```

default
Sets / Restores default value assigned for Certificate Server timeout in seconds. Default is 20 seconds.

timeout_value
Specifies the timeout value in seconds which is an integer between 1 through 60.

Usage Guidelines
Use this command to configure Certificate Server timeout in seconds.

Example
The following command configures Certificate Server timeout as 50 seconds:

```bash
timeout cert-server 50
```

vendor-policy

Associate a vendor policy to this crypto template.

Product
ePDG
HeNBGW
HNBGW
WSG

Privilege
Security Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Template Configuration

configure > context context_name > crypto template template_name ikev2-dynamic

Entering the above command sequence results in the following prompt:

[context_name]host_name(crfr-crypto-tmp1-ikev2-tunnel)#

Syntax Description

vendor-policy policy_name

no vendor-policy

no

Removes association of the vendor policy to this crypto template.

policy_name

doesn’t have to be an alphanumeric string of 1 through 127 characters.

Usage Guidelines

Use this command to associate a vendor policy to this crypto template.

Example

The following command associates a vendor policy named atlpcy to this crypto template:

vendor-policy atlpcy

whitelist

Enables the use of an existing whitelist (access permitted) file by a security gateway.

Product
All products supporting IPSec whitelisting

Important
This command appears in the CLI for this release. However, it has not been qualified for use with any current Cisco StarOS gateway products.

Privilege
Security Administrator

Syntax Description

[ no ] whitelist
Usage Guidelines

Enable the use of a previously created whitelist to allow privileged peers access via a security gateway.

A whitelist is a list or register of entities that are being provided a particular privilege, service, mobility, access or recognition. With whitelisting, no peer is allowed to connect unless it appears in the list.

Each entry in the whitelist file should contain the ID type so that the validation is performed for that ID type. In every entry, the ID type and ID value should be separated by a space. Only DOS and UNIX file formatting are supported. For additional information, refer to the System Administration Guide.

Example

The following command enables the use of a whitelist:

```
whitelist
```
Crypto Template IKEv2-Dynamic Payload Configuration Mode Commands

The Crypto Template IKEv2-Dynamic Payload Configuration Mode is used to assign the correct IPSec transform-set from a list of up to four different transform-sets, and to assign Mobile IP addresses. There should be two payloads configured. The first must have a dynamic addressing scheme from which the ChildSA gets a TIA address. The second payload supplies the ChildSA with a HoA, which is the default setting for `ip-address-allocation`.

**Command Modes**

```
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration
```

```
configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name match childsa match { any | ipv4 | ipv6 }
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload) #
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `end`, on page 913
- `exit`, on page 914
- `ignore-rekeying-requests`, on page 914
- `ip-address-allocation`, on page 915
- `ipsec transform-set`, on page 916
- `lifetime`, on page 916
- `maximum-child-sa`, on page 917
- `rekey`, on page 918
- `tsi`, on page 919
- `tsr`, on page 920

**end**

Exits the current configuration mode and returns to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

Product
All

Privilege
Security Administrator, Administrator

Syntax Description
exit

Usage Guidelines
Use this command to return to the parent configuration mode.

ignore-rekeying-requests

Ignores CHILD SA rekey requests from the Packet Data Interworking Function (PDIF).

Product
All Security Gateway products

Privilege
Security Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name
match childsa match { any | ipv4 | ipv6 }

Entering the above command sequence results in the following prompt:

(config-context_name)host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#

Syntax Description
ignore-rekeying-requests

Usage Guidelines
Prevents creation of a CHILD SA based on this crypto template.

Example

The following command prevents creation of a CHILD SA based on this crypto template:

ignore-rekeying-requests
ip-address-allocation

Configures IP address allocation for subscribers using this crypto template payload. Configure two payloads per crypto template. The first must have a dynamic address to assign a tunnel inner address (TIA) to the ChildSA. The second payload is configured after a successful MAnaged IP (MIP) initiation and can use the default Home Address (HoA) option.

Product
All Security Gateway products

Privilege
Security Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name
match childsa match { any | ipv4 | ipv6 }

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#

Syntax Description

```
ip-address-allocation { dynamic | home-address }
```

default ip-address-allocation

default
Sets IP address allocation to the home-address.

**ip-address-allocation dynamic**

Specifies that the IP address for the subscriber is allocated from a dynamic IP pool.

**ip-address-allocation home-address**
The IP address for the subscriber is allocated by the Home Agent. This is the default setting for this command.

Usage Guidelines

Use this command to configure how ChildSA payloads are allocated IP addresses for this crypto template.

Example

The following command is for the first ChildSA and will ensure that it gets a TIA address from an IP address pool:

```
ip-address-allocation dynamic
```

The following command is for the second ChildSA and will ensure that it gets a HoA address from the HA:

```
default ip-address-allocation
```
ipsec transform-set

Configures the IPSec transform set to be used for this crypto template payload.

**Product**
All Security Gateway products

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

```
configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name
match childsa match { any | ipv4 | ipv6 }
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#
```

**Syntax Description**

```
[ no ] ipsec transform-set list name [name2] [name3] [name4]
```

- **no**
  Specifies the IPSec transform set to be deleted. This is a space-separated list. From 1 to 4 transform sets can be entered. *name* must be an alphanumeric string of 1 through 127 characters.

- **name**
  Specifies the context configured IPSec transform set name to be used in the crypto template payload. This is a space-separated list. From 1 to 4 transform sets can be entered. *name* must be an alphanumeric string of 1 through 127 characters.

**Usage Guidelines**
Use this command to list the IPSec transform set(s) to use in this crypto template payload.

**Example**
The following command configures IPSec transform sets named *ipset1* and *ipset2* to be used in this crypto template payload:

```
ipsec transform-set list ipset1 ipset2
```

**lifetime**

Configures the number of seconds for IPSec Child SAs derived from this crypto template payload to exist.

**Product**
All Security Gateway products

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration
configure > context \textit{context\_name} > crypto template \textit{template\_name} ikev2-dynamic > payload \textit{payload\_name} \\
match childsa match \{ any | ipv4 | ipv6 \}

Entering the above command sequence results in the following prompt:

\[\textit{context\_name}\] \textit{host\_name}(cfg-crypto-tmpl-ikev2-tunnel-payload)\$

### Syntax Description

**lifetime { sec \[ kilo-bytes \textit{kbytes} \] | kilo-bytes \textit{kbytes} \}**

default lifetime

**sec**

Specifies the number of seconds for IPSec Child Security Associations derived from this crypto template payload to exist. \textit{sec} must be an integer from 60 through 604800. Default: 86400

**kilo-bytes \textit{kbytes}**

Specifies lifetime in kilobytes for IPSec Child Security Associations derived from this crypto template payload. \textit{kbytes} must be an integer from 1 through 2147483647.

**default lifetime**

Sets the lifetime to its default value of 86400 seconds.

### Usage Guidelines

Use this command to configure the number of seconds and/or kilobytes for IPSec Child Security Associations derived from this crypto template payload to exist.

### Example

The following command configures the IPSec child SA lifetime to be 120 seconds:

```
lifetime 120
```

## maximum-child-sa

Configures the maximum number of IPSec child security associations that can be derived from a single IKEv2 IKE security association.

### Product

All Security Gateway products

### Privilege

Security Administrator

### Command Modes

\textit{Exec} > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

```
configure > context \textit{context\_name} > crypto template \textit{template\_name} ikev2-dynamic > payload \textit{payload\_name} \\
match childsa match \{ any | ipv4 | ipv6 \}
```

Entering the above command sequence results in the following prompt:

\[\textit{context\_name}\] \textit{host\_name}(cfg-crypto-tmpl-ikev2-tunnel-payload)\$
**Syntax Description**

Syntax: `maximum-child-sa num`

This command specifies the maximum number of IPSec child security associations that can be derived from a single IKEv2 IKE security association. `num` must be 1. Default: 1

**Usage Guidelines**

Use this command to configure the maximum number of IPSec child security associations that can be derived from a single IKEv2 IKE security association.

**Example**

The following command configures the maximum number of child SAs to 1:

`maximum-child-sa 1`

---

**rekey**

Configures IPSec Child Security Association rekeying.

**Product**

All Security Gateway products

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

```
configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name
match childsa match { any | ipv4 | ipv6 }
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#
```

**Syntax Description**

Syntax: `[ no ] rekey [ keepalive ]`

- **no**
  - Disables this feature.

- **keepalive**
  - If specified, a session will be rekeyed even if there has been no data exchanged since the last rekeying operation. By default, rekeying is only performed if there has been data exchanged since the previous rekey.

**Usage Guidelines**

Use this command to enable or disable the ability to rekey IPSec Child SAs after approximately 90% of the Child SA lifetime has expired. The default, and recommended setting, is not to perform rekeying. No rekeying
means the PDIF will not originate rekeying operations and will not process CHILD SA rekeying requests from the UE.

**Example**
The following command disables rekeying:

```
no rekey
```

### tsi

Configures the IKEv2 Traffic Selector-Initiator (TSi) payload address options.

<table>
<thead>
<tr>
<th>Product</th>
<th>All Security Gateway products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator</td>
</tr>
<tr>
<td>Command Modes</td>
<td>Exec &gt; Global Configuration &gt; Context Configuration &gt; Crypto Template Configuration &gt; Crypto Template IKEv2-Dynamic Payload Configuration</td>
</tr>
<tr>
<td></td>
<td>configure &gt; context context_name &gt; crypto template template_name ikev2-dynamic &gt; payload payload_name match childsa match { any</td>
</tr>
</tbody>
</table>

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#
```

**Syntax Description**

```
tsi start-address { any end-address any | endpoint end-address endpoint }
```

- **any end-address any**
  Configures the TSi payload to allow all IP addresses.

- **endpoint end-address endpoint**
  Configures the TSi payload to allow only the Mobile endpoint address. (Default)

**Usage Guidelines**

On receiving a successful IKE_SA_INIT Response from PDIF, the MS sends an IKE_AUTH Request for the first EAP-AKA authentication. If the MS is capable of doing multiple-authentication, it includes the MULTI_AUTH_SUPPORTED Notify payload in the IKE_AUTH Request. MS also includes an IDi payload containing the NAI, SA, TSi, TSr, and CP (requesting IP address and DNS address) payloads.

**Example**

Use the following example to configure a TSi payload that allows all addresses:

```
tsi start-address any end-address any
```
tsr

Configures the IKEv2 Traffic Selector-Responder (TSr) payload address options.

**Product**
All Security Gateway products

**Privilege**
Security Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Crypto Template Configuration > Crypto Template IKEv2-Dynamic Payload Configuration

```
configure > context context_name > crypto template template_name ikev2-dynamic > payload payload_name
match childsa match { any | ipv4 | ipv6 }
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl-ikev2-tunnel-payload)#
```

**Syntax Description**

```
[ no ] tsr start-address ip address end-address ip address
```

- **no**
  Disables the specified tsr address range.

- **start-address ip address**
  Specifies the starting IP address of the TSr payload in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.
  See the limitations listed in the *Usage* section.

- **end-address ipv4 address**
  Specifies the ending IP address of the TSr payload in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.
  See the limitations listed in the *Usage* section.

**Usage Guidelines**

This command is used to specify an IP address range in the single TSr payload that the PDG/TTG returns in the last IKE_AUTH message. This TSr is Child SA-specific.

This command is subject to the following limitations:

- The configuration is restricted to a maximum of four TSrs per payload and per childsa.
- Overlapping TSrs are not allowed either inside the same payload or across different payloads.
- When a TSr is configured via this command, only the configured TSr will be considered for narrowing-down. For example, if one IPv4 TSr is configured, and the gateway receives an IPv6 TSr, the gateway will reject the call with a TS_UNACCEPTABLE notification.
- The UE/PEER must send both INTERNAL_IP4_ADDRESS and INTERNAL_IP6_ADDRESS in the Configuration Payload, whenever it needs both IPv4 and IPv6 addresses in TSrs. Otherwise, the gateway will respond back with only one type depending upon the type of address received in the Configuration Payload. For example, if the gateway receives only INTERNAL_IP4_ADDRESS in the Configuration Payload but both IPv4 and IPv6 addresses are in the TSrs, the GW will narrow down only the IPv4 address, and ignore the IPv6 TSrs.
• IPv4 TSrs are not allowed inside IPv6 payloads.
• IPv6 TSrs are not allowed inside IPv4 payloads.

Example
Use the following example to configure a TSr payload that specifies an IPv4 address range for the payload:

```
tsr start-address 10.2.3.4 end-address 10.2.3.155
```
The Crypto Template IKEv2-Vendor Configuration Mode is used to configure an IKEv2 IPSec policy for a vendor. It includes most of the IPSec parameters and IKEv2 dynamic parameters for cryptographic and authentication algorithms.

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration

configure > context context_name > crypto template template_name ikev2-vendor

Entering the above command sequence results in the following prompt:

{context_name} host_name{cfg-crypto-tmpl-ikev2-vendor}#

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- configuration-payload, on page 923
- do show, on page 924
- end, on page 925
- exit, on page 925
- ikev2-ikesa, on page 925
- keepalive, on page 927
- payload, on page 928

**configuration-payload**

This command is used to configure mapping of the configuration payload attributes for a crypto vendor template.

**Product**

All IPSec-related services

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration
**Syntax Description**

```bash
configuration-payload private-attribute-type { imei integer | p-cscf-v4 v4_value | p-cscf-v6 v6_value }
remove configuration-payload private-attribute-type { imei | p-cscf-v4 | p-cscf-v6 }
```

**Example**

The following command configures the mapping of the configuration payload attributes p-cscf-v6 to 17001.

```bash
configuration-payload private-attribute-type p-cscf-v6 17001
```

**do show**

Executes all `show` commands while in Configuration mode.

**Usage Guidelines**

Use this command to configure mapping of the configuration payload attributes for a crypto vendor template.

**private-attribute-type**

Defines the private payload attribute.

**imei integer**

Defines an International Mobile Equipment Identity number. Default value is 16391. 

`integer` must be an integer from 16384 to 32767.

**p-cscf-v4 v4_value**

Defines the IPv4 pcscf payload attribute value. Default value is 16384. 

`v4_value` is an integer from 16384 to 32767.

**p-cscf-v6 v6_value**

Defines IPv6 pscsf payload attribute value. Default value is 16390. 

`v6_value` is an integer from 16384 to 32767.
**Syntax Description**

**do show**

Use this command to run all Exec mode *show* commands while in Configuration mode. It is not necessary to exit the Config mode to run a *show* command.

The pipe character | is only available if the command is valid in the Exec mode.

**Caution**

There are some Exec mode *show* commands which are too resource intensive to run from Config mode. These include: *do show support collection*, *do show support details*, *do show support record* and *do show support summary*. If there is a restriction on a specific *show* command, the following error message is displayed:

Failure: Cannot execute 'do show support' command from Config mode.

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**end**

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**exit**

**Usage Guidelines**

Use this command to return to the parent configuration mode.

**ikev2-ikesa**

Configures parameters for the IKEv2 IKE Security Associations within this vendor template.

**Product**

All IPSec-related services

**Privilege**

Security Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration

```plaintext
configure > context context_name > crypto template template_name ikev2-vendor
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmpl1-ikev2-vendor)#
```

**Syntax Description**

```plaintext
ikev2-ikesa { fragmentation | ignore-rekeying-requests | mobike [ cookie-challenge ] | rekey [ disallow-param-change ] | transform-set list
remove ikev2-ikesa { fragmentation | ignore-rekeying-requests | mobike | rekey | transform-set list }
remove
```

Disables a previously enabled ikev2-ikesa configuration.

**fragmentation**

Enables IKESA fragmentation (Tx) and re-assembly (Rx).

Default: IKESA fragmentation and re-assembly is allowed.

**ignore-rekeying-requests**

Ignores received IKE_SA Rekeying Requests.

**mobike [ cookie-challenge ]**

IKEv2 Mobility and Multihoming Protocol (MOBIKE) allows the IP addresses associated with IKEv2 and tunnel mode IPSec Security Associations to change. A mobile Virtual Private Network (VPN) client could use MOBIKE to keep the connection with the VPN gateway active while moving from one address to another. Similarly, a multi-homed host could use MOBIKE to move the traffic to a different interface if, for instance, the one currently being used stops working. Default: Disabled

**cookie-challenge**: Use this keyword to enable the return routability check. The Gateway performs a return routability check when MOBIKE is enabled along with this keyword. A return routability check ensures that the other party can receive packets at the claimed address. Default: Disabled

**rekey [ disallow-param-change ]**

Specifies if IKESA rekeying should occur before the configured lifetime expires (at approximately 90% of the lifetime interval). Default is not to re-key.

The **disallow-param-change** option prevents changes in negotiation parameters during rekey.

**transform-set list**

Specifies the name of a context-level configured IKEv2 IKE Security Association transform set.

*name1* through *name6* must be an existing IKEv2 IKESA Transform Set expressed as an alphanumeric string of 1 through 127 characters.

The transform set is a space-separated list of IKEv2-IKESA SA transform sets to be used for deriving IKEv2 IKE Security Associations from this crypto template. A minimum of one transform-set is required; maximum configurable is six.
Usage Guidelines

Use this command to configure parameters for the IKEv2 IKE Security Associations within this vendor template.

Example

The following command enables IKESA fragmentation and re-assembly:

```bash
ikev2-ikesa fragmentation
```

The following command configures the IKEv2 IKESA list, consisting of transform sets named `ikesa43` and `ikesa326`:

```bash
ikev2-ikesa transform-set list ikesa43 ikesa326
```

keepalive

Configures keepalive or dead peer detection for security associations used within this vendor template.

Product

All products supporting IPSec

Privilege

Security Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration

```bash
configure > context context_name > crypto template template_name ikev2-vendor
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmp1-ikev2-vendor)#
```

Syntax Description

```bash
keepalive [ interval seconds [ timeout timeout_seconds [ num-retry retry_seconds ] ] ]
{ no | remove } keepalive
```

- **no**
  Disables keepalive messaging.

- **remove**
  Removes previously configured keepalive messaging.

- **interval sec**
  Specifies the duration (in seconds) after which the next keepalive request is sent.
  `sec` must be an integer from 10 through 3600.
  Default: 3600 seconds

- **timeout timeout_seconds**
  Specifies the duration (in seconds) after which keepalive times out.
timeout_seconds must be an integer from 10 through 3600. Default: 10

num-retry retry_seconds

Specifies the total number of times to resend the keepalive request after timing out.
retry_seconds must be an integer from 1 through 100. Default: 2

Usage Guidelines

Use this command to set parameters associated with determining the availability of peer servers.

Example

The following command sets a keepalive interval to three minutes (180 seconds) with a timeout value of 1 minute (60 seconds):

```
keepalive interval 180 timeout 60
```

payload

Creates a new, or specifies an existing, crypto template vendor payload, and enters the Crypto Template IKEv2 Vendor Payload Configuration Mode.

Product

All Security Gateway products

Privilege

Security Administrator

Command Modes

```
configure > context context_name > crypto template template_name ikev2-vendor
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmp1-ikev2-vendor)#
```

Syntax Description

```
[ remove ] payload payload_name
```

no

Removes a previously configured crypto template IKEv2 vendor payload.

vendor_payload

```
vendor_payload
```

vendor_payload must be an alphanumeric string of 1 through 127 characters.

Usage Guidelines

Use this command to create a new or enter an existing crypto template IKEv2 vendor payload. The payload mechanism is a means of associating parameters for the Security Association (SA) being negotiated.

Crypto Template IKEv2 Vendor Payload Configuration Mode commands are defined in the Crypto Template IKEv2-Vendor Payload Configuration Mode Commands chapter.
Example

The following command configures a crypto template IKEv2 vendor payload called `payload5` and enters the Crypto Template IKEv2 Vendor Payload Configuration Mode:

`payload payload5`
CHAPTER 36

Crypto Template IKEv2-Vendor Payload Configuration Mode Commands

The Crypto Template IKEv2-Vendor Payload Configuration Mode is used to assign the correct IPSec transform-set from a list of up to four different transform-sets, and to assign Mobile IP addresses. There should be two payloads configured. The first must have a dynamic addressing scheme from which the ChildSA gets a TIA address. The second payload supplies the ChildSA with a HoA, which is the default setting for ip-address-allocation.

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration > Crypto Template IKEv2-Vendor Payload Configuration

configure > context context_name > crypto template template_name ikev2-vendor > payload payload_name

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(cfg-crypto-tmpl-ikev2-vendor-payload) #
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- do show, on page 931
- end, on page 932
- exit, on page 932
- ignore-rekeying-requests, on page 932
- ipsec, on page 933
- lifetime, on page 934
- rekey, on page 935

**do show**

Executes all show commands while in Configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator
Syntax Description:

`do show`

Use this command to run all Exec mode `show` commands while in Configuration mode. It is not necessary to exit the Config mode to run a `show` command.

The pipe character `|` is only available if the command is valid in the Exec mode.

Caution:

There are some Exec mode `show` commands which are too resource intensive to run from Config mode. These include: `do show support collection`, `do show support details`, `do show support record` and `do show support summary`. If there is a restriction on a specific `show` command, the following error message is displayed:

Failure: Cannot execute 'do show support' command from Config mode.

**end**

Exits the current configuration mode and returns to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**ignore-rekeying-requests**

Ignores CHILD SA rekey requests from the Packet Data Interworking Function (PDIF).
Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration > Crypto Template IKEv2-Vendor Payload Configuration

configure > context context_name > crypto template template_name ikev2-vendor > payload payload_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-crypto-tmpl-ikev2-vendor-payload)#

Syntax Description

[ remove ] ignore-rekeying-requests

remove

If previously configured, removes the ignore-rekeying-requests configuration.

Usage Guidelines

Prevents creation of a CHILD SA based on this crypto vendor template.

Example

The following command prevents creation of a CHILD SA based on this crypto vendor template:

ignore-rekeying-requests

ipsec

Configures the IPsec transform set to be used for this crypto template vendor payload.

Product

All Security Gateway products

Privilege

Security Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration > Crypto Template IKEv2-Vendor Payload Configuration

configure > context context_name > crypto template template_name ikev2-vendor > payload payload_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(cfg-crypto-tmpl-ikev2-vendor-payload)#

Syntax Description

ipsec transform-set list name [name2 ] [name3 ] [name4 ]

remove ipsec transform-set list

remove

Specifies the IPsec transform set to be deleted.

name

Specifies the context configured IPsec transform set name to be used in the crypto template vendor payload. This is a space-separated list. A maximum of 4 transform sets can be entered.

name must be an alphanumeric string of 1 through 127 characters.
Usage Guidelines

Use this command to list the IPSec transform set(s) to use in this crypto template vendor payload.

Example

The following command configures IPSec transform sets named `ipset1` and `ipset2` to be used in this crypto template vendor payload:

```
ipsecc transform-set list ipset1 ipset2
```

lifetime

Configures the number of seconds for IPSec Child SAs derived from this crypto template vendor payload.

Product

All Security Gateway products

Privilege

Security Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration > Crypto Template IKEv2-Vendor Payload Configuration

```
configure > context context_name > crypto template template_name ikev2-vendor > payload payload_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmp1-ikev2-vendor-payload)#
```

Syntax Description

```
lifetime { sec [ kilo-bytes kbytes ] | kilo-bytes kbytes | seqno sequence }
```

```
remove lifetime
```

remove

Removes the previously enabled lifetime configuration.

```
sec
```

`sec` must be an integer from 60 through 604800. Default: 86400

```
kilo-bytes kbytes
```

Specifies lifetime in kilobytes for IPSec Child Security Associations derived from this crypto template vendor payload.

`kbytes` must be an integer from 1 through 2147483647.

```
seqno sequence
```

Specifies lifetime in sequence number for IPSec Child Security Associations derived from this crypto vendor template.

`sequence` must be an integer from 10 through 4293918720.
**Usage Guidelines**

Use this command to configure the number of seconds and/or kilobytes, or sequence number for IPSec Child Security Associations derived from this crypto template vendor payload.

**Example**

The following command configures the IPSec child SA lifetime to be 120 seconds:

```
lifetime 120
```

---

**rekey**

Configures IPSec Child Security Association rekeying.

**Product**

All Security Gateway products

**Privilege**

Security Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Template IKEv2-Vendor Configuration > Crypto Template IKEv2-Vendor Payload Configuration

```
configure > context context_name > crypto template template_name ikev2-vendor > payload payload_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(cfg-crypto-tmp1-ikev2-vendor-payload)#
```

**Syntax Description**

```
rekey [ keepalive ]
```

**remove rekey**

**remove**

Removes a previously enabled rekey configuration.

**keepalive**

If specified, a session will be rekeyed even if there has been no data exchanged since the last rekeying operation. By default, rekeying is only performed if there has been data exchanged since the previous rekey.

**Usage Guidelines**

Use this command to enable or disable the ability to rekey IPSec Child SAs after approximately 90% of the Child SA lifetime has expired. The default, and recommended setting, is not to perform rekeying. No rekeying means the PDIF will not originate rekeying operations and will not process CHILD SA rekeying requests from the UE.

**Example**

The following command disables rekeying:

```
remove rekey
```
Crypto IPSec Transform Set Configuration Mode Commands

The Crypto IPSec Transform Set Configuration Mode is used to configure properties for system transform sets. Transform Sets are used to define IPSec security associations (SAs). IPSec SAs specify the IPSec protocols to use to protect packets.

**Command Modes**

```
Exec > Global Configuration > Context Configuration > Crypto IPSec Transform Set Configuration
configure > context context_name > crypto ipsec transform-set transform_set_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-trans)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 937
- exit, on page 938
- mode, on page 938

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

**end**

**Usage Guidelines**

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
exit

**Usage Guidelines**
Use this command to return to the parent configuration mode.

mode

Configures the IPSec encapsulation mode for an existing or new transform set. For a new transform set, you must specify transform set parameters as described for the `crypto ipsec transform-set` command in the *Context Configuration Mode Commands* chapter.

**Product**
PDSN
HA
GGSN
PDIF

**Privilege**
Security Administrator

**Syntax Description**
mode { transport | tunnel }

**transport**
Specifies that the transform set only protects the upper layer protocol data portions of an IP datagram, leaving the IP header information unprotected. Default: Disabled

---

**Important**
This mode should only be used if the communications end-point is also the cryptographic end-point.

**tunnel**
Specifies that the transform set protects the entire IP datagram.
This mode should be used if the communications end-point is different from the cryptographic end-point as in a VPN. Default: Enabled

**Usage Guidelines**
This command specifies the encapsulation mode for the transform set.
Example

The following command configures the transforms set's encapsulation mode to transport:

```
mode transport
```
mode
CHAPTER 38

Crypto Vendor Policy Configuration Mode Commands

The Crypto Vendor Policy Configuration Mode can be used to assign priorities to vendors for cryptographic configurations. A maximum of 32 vendor policies can be configured.

**Command Modes**

Exec > Global Configuration > Context Configuration > Crypto Vendor Policy Configuration

`configure > context context_name > crypto vendor-policy policy_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-vendor-policy)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- `do show`, on page 941
- `end`, on page 942
- `exit`, on page 942
- `precedence`, on page 942

**do show**

Executes all `show` commands while in Configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`do show`

**Usage Guidelines**

Use this command to run all Exec mode `show` commands while in Configuration mode. It is not necessary to exit the Config mode to run a `show` command.

The pipe character `|` is only available if the command is valid in the Exec mode.
There are some Exec mode `show` commands which are too resource intensive to run from Config mode. These include: `do show support collection`, `do show support details`, `do show support record` and `do show support summary`. If there is a restriction on a specific `show` command, the following error message is displayed:

```
Failure: Cannot execute 'do show support' command from Config mode.
```

---

**end**

Exits the current configuration mode and returns to the Exec mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Syntax Description**: `end`
- **Usage Guidelines**: Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Syntax Description**: `exit`
- **Usage Guidelines**: Use this command to return to the parent configuration mode.

**precedence**

Use this command to associate a vendor ID with a vendor template, and set precedence for it.

- **Product**: ePDG
- **Privilege**: Security Administrator
- **Command Modes**: Exec > Global Configuration > Context Configuration > Crypto Vendor Policy Configuration

```
configure > context context_name > crypto vendor-policy policy_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-crypto-vendor-policy)#
```
Syntax Description

```
precedence precedence_value vendor-id id vendor-template template_name
no precedence precedence_value

no
Restores the configuration to its default value.

precedence_value

precedence_value must be an integer from 1 through 64.

vendor-id id

Specifies the vendor ID to match the vendor template.

id must be an alphanumeric string from 1 to 256 characters.

vendor-template template_name

Specifies the vendor template to associate with the vendor ID.

template_name must be an alphanumeric string from 1 to 127 characters.
```

Usage Guidelines

Use this command to associate a vendor ID with a vendor template, and set precedence for it. A maximum of 64 vendor templates can be associated with a vendor policy.

Example

The following command associate a vendor ID called atl23 and associate it to a vendor template called atlcryptpl with the precedence value of 2:

```
precedence 2 vendor-id atl23 vendor-template atlcryptpl
```
CSS Delivery Sequence Configuration Mode Commands

The CSS Delivery Sequence Configuration Mode is used to configure the order in which traffic is delivered to Content Service Steering (CSS) services and their associated content servers.

**Important**

This is a restricted configuration mode. In 9.0 and later releases, this configuration mode is deprecated.

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 945
- exit, on page 945
- recovery, on page 946
- server-interface, on page 946

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

```plaintext
end
```

**Usage Guidelines**

Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.
recovery

In 9.0 and later releases, this command is deprecated.

server-interface

In 9.0 and later releases, this command is deprecated.
DDN APN Profile Configuration Mode Commands

**Command Modes**

DDN APN Profile Configuration Mode provides commands that support downlink data notification (DDN) access point name (APN) support on the S-GW and SAEGW. A Voice over LTE (VoLTE) license must be installed to access DDN APN Profile Configuration Mode.

`Exec > Global Configuration > DDN APN Profile Configuration`

`configure > ddn-apn-profile ddn_apn_profile_name`

Entering the above command sequence results in the following prompt:

```
[local] host_name (ddn-apn-profile profile_name)#
```

**Important**

The commands or keyword/variables that are available are dependent on platform type, product version, and installed license(s).

- `end`, on page 947
- `exit`, on page 947
- `isr-sequential-paging`, on page 948
- `qci`, on page 948

**end**

Exits the current configuration mode and returns to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

---

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>end</code></td>
<td>Use this command to return to the Exec mode.</td>
</tr>
</tbody>
</table>
### isr-sequential-paging

This command initiates paging first towards the last known RAT, then towards the other RAT for the Idle Mode Signaling Reduction (ISR) feature.

**Product**
- SGW
- SAEGW

**Privilege**
- Administrator, Security Administrator

**Command Modes**
- Exec > Global Configuration > DDN APN Profile Configuration
  - configure > ddn-apn-profile ddn_apn_profile_name

Entering the above command sequence results in the following prompt:

```
[local] host_name (ddn-apn-profile profile_name)#
```

**Syntax Description**

```
[ remove ] isr-sequential-paging
```

- remove
  - Removes the ISR sequential paging configuration from the DDN APN Profile.

- isr-sequential-paging
  - Enables the ISR sequential paging configuration for the DDN APN Profile.

**Usage Guidelines**
- usage

**Example**

Use the following example to enable ISR sequential paging on the S-GW or SAEGW:

```
isr-sequential-paging
```

### qci

This command configures various DDN parameters for a quality of class identifier (QCI) in a DDN APN Profile.

**Product**
- SGW
Privilege

Administrator, Security Administrator

Command Modes

Exec > Global Configuration > DDN APN Profile Configuration
configure > ddn-apn-profile ddn_apn_profile_name

Entering the above command sequence results in the following prompt:

[local] host_name (ddn-apn-profile profile_name)#

Syntax Description

```
qci qci_number ddn { failure-action pkt-drop-timer duration_seconds |
ignore-ddn-timers | min-buf-size size_kb
[ remove ] qci qci_number
```

remove qci qci_number

Removes the DDN configuration for the specified QCI value.

qci

Specifies the quality of class identifier (QCI) to be configured. Valid entries are from 1 to 254. A maximum of 4 QCI values are supported for configuration per ddn-apn-profile.

ddn

Specifies a DDN parameter to be configured.

failure-action pkt-drop-timer duration_seconds

This is the time for which no data for UE is buffered. This timer activates the moment a DDN failure is received. This value supersedes the one configured at sgw-service level. When a DDN failure is received, the minimum of the pkt-drop-timer configured for all QCI's having data is started.

ignore-ddn-timers

If the DDN Delay timer is started and data arrives on a bearer with a QCI for which this flag is set, then the S-GW will stop that timer and send the DDN. The ignore-ddn-timers configuration is applicable only to the DDN delay timer. This helps to send DDN for preferential bearers immediately on receiving new data. This is '0' by default and does not affect any DDN timers.

min-buf-size size_kb

This is the buffer allocated for storing data packets for each bearer when the UE is in the idle state. This field is used to set higher buffer value for preferential bearers. Valid entries are from 2 to 4 KB. The default is 2 KB.

It is recommended not to set this field to a value higher than 2KB only for QCI values corresponding to preferential bearers (like VoLTE). If the default buffer size of all QCI values is increased, it would decrease the system performance due to higher memory consumption and such a configuration is NOT recommended.

Usage Guidelines

Use this command to configure various DDN parameters for a specified QCI.
Example

The following example configures the minimum buffer size as 3 KB for QCI 3.

qci 3 ddn min-buf-size 3
Decor Profile Configuration Mode Commands

The Decor Profile Configuration Mode is used to create and configure the DECOR profile. The DECOR profile represents the Dedicated Core Network (DCN) as deployed by the operator.

**Command Modes**

Exec > Global Configuration > Decor Profile Configuration

`configure > decor-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-decor-profile<profile_name>)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- dcn-id, on page 951
- description, on page 952
- dns, on page 953
- do show, on page 953
- end, on page 954
- exit, on page 954
- mmegi, on page 954
- plmn-id, on page 955
- served-dcn, on page 956
- ue-usage-types, on page 957

**dcn-id**

This command allows you to configure the dedicated core network (DCN) identifier for the specified decor-profile.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Decor Profile Configuration
configure > decor-profile profile_name

Entering the above command sequence results in the following prompt:

{context_name}host_name(config-decor-profile-profile_name)#

Syntax Description

dcn-id dcn_id

no dcn-id

no

Removes the specified DCN identifier from decor-profile.

dcn-id dcn_id

Configures the DCN identifier for the specified decor-profile. dcn_id is an integer from 0 to 65535.

Usage Guidelines

Use this configuration to configure the DCN identifier for the specified decor-profile.

Example

The following command configures the DCN ID as 12345:

dcn-id 12345

description

Allows you to enter descriptive text for this configuration.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Decor Profile Configuration

configure > decor-profile profile_name

Entering the above command sequence results in the following prompt:

{context_name}host_name(config-decor-profile-profile_name)#

Syntax Description

description text

no description

no

Clears the description for this configuration.

text

Enter descriptive text as an alphanumeric string of 1 to 100 characters.

If you include spaces between words in the description, you must enclose the text within double quotation marks (" "), for example, "AAA BBBB".
Usage Guidelines

The description should provide useful information about this configuration.

dns

This command allows you to configure the service parameters to select peer nodes for the specified decor-profile.

Product

MME

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Decor Profile Configuration

configure > decor-profile profile_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-decor-profile-profile_name)#

Syntax Description

dns service-param ue-usage-type

no dns service-param

no

Removes the service parameter configuration from decor-profile.

service-param

Configures the service parameter types used for DNS peer lookup.

ue-usage-type

Configures the UE Usage type that will be used for DNS service parameter.

Usage Guidelines

Use this configuration to configure the UE Usage Type or DCN-ID for S-GW / P-GW / MME / S4-SGSN / MMEGI lookup using DNS.

do show

Executes all show commands while in Configuration mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

do show

Usage Guidelines

Use this command to run all Exec mode show commands while in Configuration mode. It is not necessary to exit the Config mode to run a show command.

The pipe character | is only available if the command is valid in the Exec mode.
There are some Exec mode `show` commands which are too resource intensive to run from Config mode. These include: `do show support collection`, `do show support details`, `do show support record` and `do show support summary`. If there is a restriction on a specific `show` command, the following error message is displayed:

Failure: Cannot execute 'do show support' command from Config mode.

---

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`end`

**Usage Guidelines**
Use this command to return to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`exit`

**Usage Guidelines**
Use this command to return to the parent configuration mode.

**mmegi**

This command allows you to configure an MME Group Identifier (MMEGI) of the configured dedicated core network (DCN).

**Product**
MME

**Privilege**
Security Administrator, Administrator

**Command Modes**
`configure > decor-profile profile_name`

Entering the above command sequence results in the following prompt:

```
/context_name/host_name(config-decor-profile-profile_name)#
```
Syntax Description

[ no ] mmegi { mmegi_value | dns }

no
Removes the specified MMEGI value.

mmegi { mmegi_value | dns }
Identifies the MMEGI of the configured DCN. mmegi_value is an integer value from 32768 to 65535.
dns: Enables DNS for MMEGI retrieval using UE Usage Type

Usage Guidelines

Use this configuration to configure the MME Group Identifier (MMEGI) value of the configured DCN. In 21.6 and later releases, DNS-based MMEGI selection is supported.

A new MME is selected from the MMEGI. If no valid MME can be obtained from the MMEGI, the MME is selected from a common core network.

Example

The following command configures the MMEGI value as 38888:

mmegi 38888

plmn-id

This command allows you to configure the PLMN identifier for the specified decor-profile.

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

Command Modes

configure > decor-profile profile_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-decor-profile-profile_name)#

Syntax Description

plmn-id mcc mcc_id mnc mnc_id

no plmn-id

no
Removes the specified PLMN identifier from decor-profile.

plmn-id mcc mcc_id mnc mnc_id

Configures the PLMN identifier for the specified decor-profile.

mcc mcc_id: Configures the mobile country code (MCC) for the specified decor-profile. mcc_id is a 3-digit number between 000 to 999.
**mnc mnc_id**: Configures the mobile network code (MNC) for the specified decor-profile. `mnc_id` is a 2- or 3-digit number between 00 to 999.

**Usage Guidelines**

Use this configuration to configure the PLMN identifier for the specified decor-profile. This supports network sharing with different MME GIs for different PLMNs.

**Example**

The following command configures the PLMN identifier with MCC of 555 and MNC of 20:

```
plmn-id mcc 555 mnc 20
```

### served-dcn

This command allows you to configure the MME that is serving the dedicated core network (DCN) and its relative capacity.

**Product**

MME

**Privilege**

Security Administrator, Administrator

**Command Modes**

`Exec > Global Configuration > Decor Profile Configuration`

```
configure > decor-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-decor-profile-profile_name)#
```

**Syntax Description**

```
served-dcn [ relative-capacity capacity ]
no served-dcn
```

`no`

Removes the specified configuration from decor-profile.

```
served-dcn [ relative-capacity capacity ]
```

Configures the MME that is serving the DCN.

**relative-capacity capacity**: Sets the relative capacity of the DCN. `capacity` must be an integer from 0 to 255. The default relative-capacity is 255.

**Usage Guidelines**

Use this configuration to configure the MME that is serving the DCN and relative capacity.

These values are sent by MME to eNodeB during S1 Setup Response to indicate DCN-IDs served by the MME and their relative capacity.

**Example**

The following command configures the served DCN with relative capacity set to 100:

```
served-dcn relative-capacity 100
```
**ue-usage-types**

This command allows you to configure the number of UE Usage Types in the dedicated core network (DCN).

<table>
<thead>
<tr>
<th>Product</th>
<th>MME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privilege</td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

Exec > Global Configuration > Decor Profile Configuration

`configure > decor-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-decor-profile-profile_name)#
```

**Syntax Description**

```
[ no ] ue-usage-types num_ue_usage_types +
```

- **no**
  
  Removes the specified MMEGI value.

- **ue-usage-types num_ue_usage_types**
  
  Specifies the number of UE Usage Types in the dedicated core network. `num_ue_usage_types` is an integer from 0 to 255.

  A maximum number of 20 UE Usage Types are supported per DCN.

  +
  
  Multiple UE usage types can be entered (up to 20 in a single line, separated by spaces).

**Usage Guidelines**

Use this command to configure the number of UE Usage Types in the DCN.

The UE Usage Type is a subscription information parameter stored in the HSS, used by the serving network to select the DCNs that must serve the UE. The operator can configure DCNs and its serving UE Usage Type as required. Multiple UE Usage Types can be served by the same DCN. The HSS provides the UE Usage Type value in the subscription information of the UE to the MME/SGSN/MSC.

**Example**

The following command configures 25 UE Usage Types:

```
ue-usage-types 25
```
DHCP Client Profile Configuration Mode

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration

```
configure > context context_name > dhcp-client-profile profile_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-dhcp-client-profile)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- client-identifier, on page 959
- dhcpv6-client-unicast, on page 960
- disable, on page 961
- enable, on page 962
- end, on page 963
- exit, on page 963
- request, on page 963

**client-identifier**

Configures the client-identifier which is sent to the external DHCP server.

**Product**

GGSN
P-GW
SAEGW

**Privilege**

Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration

`configure > context context_name > dhcp-client-profile profile_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-client-profile)#
```

**Syntax Description**

```
client-identifier { imsi | msisdn }

default client-identifier
```

**default**

Specifies that the subscriber's IMSI be included in the client-identifier option of relevant DHCP messages.

**imsi**

Specifies that the subscriber's IMSI be included in the client-identifier option of relevant DHCP messages.

**Important**

The `imsi` option is not supported in this release.

**msisdn**

Specifies that the subscriber's MSISDN be included in the client-identifier option of relevant DHCP messages.

**Usage Guidelines**

Use this command to configure which information is included in the DHCP client-identifier option of DHCP messages to external DHCP servers.

**Example**

The following command specifies that a subscriber's MSISDN be included in the DHCP client-identifier option of DHCP messages to external DHCP servers:

```
client-identifier msisdn
```

**dhcppv6-client-unicast**

Configures the client unicast address which is sent to the external DHCP server.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration

`configure > context context_name > dhcp-client-profile profile_name`

Entering the above command sequence results in the following prompt:
**Syntax Description**

dhcpv6-client-unicast

Enables client to send messages on unicast address towards the server.

**Usage Guidelines**

Use this command to send messages on unicast address towards the server.

**Example**

The following command specifies that messages are sent on unicast address to external DHCP servers:

dhcpv6-client-unicast

---

**disable**

Disables the specified options on the DHCP client.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration

configure > context context_name > dhcp-client-profile profile_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-client-profile)#

**Syntax Description**

disable { dhcp-message-spray | rapid-commit-dhcpv4 | rapid-commit-dhcpv6 | user-class-option }

**dhcp-message-spray**

Disables DHCP client from spraying a DHCP message to all configured DHCP servers in the PDN.

**rapid-commit-dhcpv4**

Disables support of the rapid commit feature for DHCPv4 client functionality.

**rapid-commit-dhcpv6**

Disables support of the rapid commit feature for DHCPv6 client functionality.
**user-class-option**
Disables sending the "User_Class_Option" in the DHCPv6 messages from P-GW/GGSN to the external DHCPv6 server during DHCPv6 Prefix Delegation Setup.

**Usage Guidelines**
Use this command to disable options on the DHCP client.

**Example**
The following command disables support of the rapid commit feature for DHCPv6 client functionality:

```bash
disable rapid-commit-dhcpv6
```

**enable**
Enables the specified options on the DHCP client.

**Product**
GGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration
```bash
configure > context context_name > dhcp-client-profile profile_name
```
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-client-profile)#
```

**Syntax Description**
```bash
enable { dhcp-message-spray | rapid-commit-dhcpv4 | rapid-commit-dhcpv6 | user-class-option { imsi | msisdn } }
```

**dhcp-message-spray**
Enables DHCP client to spray a DHCP message to all configured DHCP servers in the PDN.
By default, this is disabled. With rapid commit, there can only be one server to which this can be sent.

**rapid-commit-dhcpv4**
Enables support of the rapid commit feature for DHCPv4 client functionality.
By default, this is enabled.

**rapid-commit-dhcpv6**
Enables support of the rapid commit feature for DHCPv6 client functionality.
By default, this is enabled.
user-class-option { imsi | msisdn }

Enables P-GW/GGSN to send USER_CLASS_OPTION in DHCPv6 messages to external DHCPv6 server during Prefix Delegation Setup.

**imsi**: Triggers sending the "User_Class_Option" with UE's IMSI in the DHCPv6 Request message from P-GW to the external DHCPv6 server during DHCPv6 Prefix Setup (for network behind UE).

**msisdn**: Triggers sending the "User_Class_Option" with UE's MSISDN in the DHCPv6 Request message from P-GW to the external DHCPv6 server during DHCPv6 Prefix Setup (for network behind UE).

By default, this is enabled.

**Usage Guidelines**

Use this command to enable options on the DHCP client.

**Example**

The following command enables support of the rapid commit feature for DHCPv6 client functionality:

```
enable rapid-commit-dhcpv6
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.

**request**

Configures DHCP options which can be requested by the DHCP client.
### Product
- GGSN
- P-GW
- SAEGW

### Privilege
Security Administrator, Administrator

### Command Modes
Exec > Global Configuration > Context Configuration > DHCP Client Profile Configuration

```
configure > context context_name > dhcp-client-profile profile_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-dhcp-client-profile)#
```

### Syntax Description

```
[ default ] request dhcp-option { dns-address | netbios-server-address | sip-server-address }
no { dns-address | netbios-server-address | sip-server-address }
```

- **default**
  Returns the command to its default setting.

- **no**
  Disables a DHCP option requested by the DHCP client.

**dhcp-option { dns-address | netbios-server-address | sip-server-address }
**

The following DHCP options can be requested by the DHCP client:

- **dns-address**: request for DNS address
- **netbios-server-address**: request for NetBIOS server address
- **sip-server-address**: request for SIP server address

### Usage Guidelines
Use this command to enable/disable options which can be requested by the DHCP client.

### Example
The following command enables the DHCP client to request DNS address:
```
request dhcp-option dns-address
```
DHCP Server Profile Configuration Mode

Commands

The Dynamic Host Configuration Protocol (DHCP) Server Profile Configuration Mode is used to create and manage DHCP server profile parameters. DHCP server profiles are associated with APNs.

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Server Profile Configuration

configure > context context_name > dhcp-server-profile profile_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-server-profile)#

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- dhcpv6-server-preference, on page 965
- disable, on page 966
- enable, on page 967
- end, on page 968
- exit, on page 968
- process, on page 969

**dhcpv6-server-preference**

Specifies the waiting time for DHCPv6 client before response.

**Product**

- GGSN
- P-GW
- SAEGW

**Privilege**

- Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Server Profile Configuration
configure > context context_name > dhcp-server-profile profile_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-server-profile)#

Syntax Description

\texttt{dhcpv6-server-preference \textit{pref\_value}}

\texttt{default dhcpv6-server-preference}

\texttt{default}

Returns the command to its default setting of 0.

\texttt{pref\_value}

Specifies the DHCP server preference value as an integer from 1 through 255. If a DHCP server responds with a preference value of 255, DHCPv6 client need not wait any longer.

Default: 0

Usage Guidelines

According to RFC-3315, DHCPv6 client should wait for a specified amount of time before considering responses to its queries from DHCPv6 servers. Use this command to specify the waiting time (DHCP server preference value) for DHCPv6 client before response.

Example

The following command sets the DHCP server preference value to 200:

\texttt{dhcpv6-server-preference 200}

disable

Disables the specified options on the DHCP server.

Product

GGSN

P-GW

SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Server Profile Configuration

\texttt{configure > context context_name > dhcp-server-profile profile_name}

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-server-profile)#

Syntax Description

\texttt{disable \{ dhcpv6-server-reconf | dhcpv6-server-unicast | rapid-commit-dhcpv4 | rapid-commit-dhcpv6 \}}
**usage**

**Usage Guidelines**

Use this command to disable options on the DHCP server.

**Example**

The following command disables support of the rapid commit feature for DHCPv6 server functionality:

```bash
disable rapid-commit-dhcpv6
```

**enable**

Enables the specified options on the DHCP server.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Server Profile Configuration

```bash
configure > context context_name > dhcp-server-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-server-profile)#
```

**Syntax Description**

```bash
enable { dhcpv6-server-reconf | dhcpv6-server-unicast | rapid-commit-dhcpv4 | rapid-commit-dhcpv6 }
```

**dhcpv6-server-reconf**

Enables support for reconfiguration messages from the DHCPv6 server.

By default, this is disabled.
**dhcpv6-server-unicast**
Disables server unicast option for DHCPv6 server.
By default, this is disabled.

**rapid-commit-dhcpv4**
Enables support of the rapid commit feature for DHCPv4 server functionality.
By default, this is disabled.

**rapid-commit-dhcpv6**
Enables support of the rapid commit feature for DHCPv6 server functionality.
By default, this is disabled; this is done to ensure that if there are multiple DHCPv6 servers in a network, with rapid-commit-option, they would all end up reserving resources for the UE.

### Usage Guidelines
Use this command to enable options on the DHCP server.

### Example
The following command enables support of the rapid commit feature for DHCPv6 server functionality:

```
enable rapid-commit-dhcpv6
```

### end
Exits the current configuration mode and returns to the Exec mode.

### Product
All

### Privilege
Security Administrator, Administrator

### Syntax Description
**end**

### Usage Guidelines
Use this command to return to the Exec mode.

### exit
Exits the current mode and returns to the parent configuration mode.

### Product
All

### Privilege
Security Administrator, Administrator

### Syntax Description
**exit**

### Usage Guidelines
Use this command to return to the parent configuration mode.
**process**

Configures what order the configuration options should be processed for a given client request.

### Product
- GGSN
- P-GW
- SAEGW

### Privilege
Security Administrator, Administrator

### Command Modes
Exec > Global Configuration > Context Configuration > DHCP Server Profile Configuration

```plaintext
configure > context context_name > dhcp-server-profile profile_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-server-profile)#
```

### Syntax Description

```plaintext
process dhcp-option-from { AAA | LOCAL | PDN-DHCP } priority priority
default process dhcp-option-from
```

**default**

AAA (priority 1) is preferred over PDN-DHCP (priority 2) which is preferred over LOCAL (priority 3) configuration.

**dhcp-option-from { AAA | LOCAL | PDN-DHCP }**

For a given client request, configuration values can be obtained from the following:

- AAA
- LOCAL
- PDN-DHCP

**priority priority**

Specifies the priority for dhcp-option-from options.

*priority* is an integer from 1 through 3. 1 is the highest priority.

### Usage Guidelines
Use this command to configure what order the configuration options should be processed for a given client request.

### Example

The following command sets configuration options from a PDN DHCP server at the highest priority of 1 for a given client request:

```plaintext
process dhcp-option-from PDN-DHCP priority 1
```
CHAPTER 44

DHCP Service Configuration Mode Commands

The Dynamic Host Control Protocol (DHCP) Configuration Mode is used to create and manage DHCP service instances for the current context.

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-service)#

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- allow, on page 972
- bind, on page 973
- default, on page 975
- dhcp chaddr-validate, on page 976
- dhcp client-identifier, on page 977
- dhcp deadtime, on page 979
- dhcp detect-dead-server, on page 980
- dhcp ip vrf, on page 981
- dhcp server, on page 982
- dhcp server selection-algorithm, on page 984
- end, on page 985
- exit, on page 985
- lease-duration, on page 985
- lease-time, on page 986
- max-retransmissions, on page 987
- retransmission-timeout, on page 988
- T1-threshold, on page 989
- T2-threshold, on page 989
allow

Allows the specified options on the DHCP service.

**Product**

P-GW
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Service Configuration
configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-dhcp-service)#

**Syntax Description**

```
[ no ] allow { dhcp-client rapid-commit | dhcp-inform |
   dhcp-parameter-request-list-option { router | subnet-mask } |
   dhcp-relay-agent-auth-suboption | dhcp-relay-agent-option | dhcp-server |
   rapid-commit }
```

**no**

Disables an option on the DHCP service.

**dhcp-client rapid-commit**

Enables support of the rapid commit feature for DHCP client functionality, as defined in RFC 4039.

**dhcp-inform**

Enables the sending of DHCP inform after configuration for address recovery.

**dhcp-parameter-request-list-option { router | subnet-mask }**

Enables the sending of DHCP parameter request list option in all outgoing messages.

- **router**: Send DHCP parameter request list option with router flag in all outgoing messages.
- **subnet-mask**: Send DHCP parameter request list option with subnet mask flag in all outgoing messages.

**dhcp-relay-agent-auth-suboption**

Enables the sending of DHCP relay agent authentication suboption in all outgoing messages.

**dhcp-relay-agent-option**

Enables the sending of DHCP relay agent option in all outgoing messages.

**dhcp-server rapid-commit**

Enables support of the rapid commit feature for DHCP server functionality, as defined in RFC 4039.
Usage Guidelines

Use this command to enable/disable options on the DHCP service.

Example

The following command enables support of the rapid commit feature for DHCP server functionality:

```
allow dhcp-server rapid-commit
```

**bind**

Binds the DHCP service to a logical IP interface facilitating the system's connection to the DHCP server. This command also configures traffic from the specified DHCP service bind address to use the specified Multiple Protocol Label Switching (MPLS) labels.

**Product**

ASN-GW
eWAG
GGSN
HA
P-GW
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

```
configure > context context_name > dhcp-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

**Syntax Description**

```
bind address ip_address [ nexthop-forwarding-address nexthop_ip_address [ mpls-label input in_mpls_label_value output out_mpls_label_value1 [ out_mpls_label_value2 ] ] ] ]

no bind address ip_address
```

**no**

Removes a previously configured binding.

**address ip_address**

Specifies the IP address of an interface in the current context through which communication with the DHCP server occurs.

`ip_address` must be expressed in IPv4 dotted-decimal notation.
**Important**

In the case of DeWAG service, this IP address must be the same as the IP address configured with the `dhcp server` CLI command under the same DHCP Service Configuration mode. Also, this IP address must match the DeWAG service's IP address so that the WLC can relay the DHCP unicast packets to the DeWAG service IP address and are processed by this DHCP service.

```
nexthop-forwarding-address nexthop_ip_address
```

Specifies the next hop gateway address for in MPLS network to which the packets with MPLS labels will be forwarded.

`nexthop_ip_address` must be expressed in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.

**Important**

In the case of DeWAG service, this option must not be configured.

```
mpls-label input in_mpls_label_value
```

Specifies the MPLS label to identify inbound traffic destined for the configured DHCP service bind address `ip_address`.

`in_mpls_label_value` is the MPLS label that will identify inbound traffic destined for the configured DHCP service and must be an integer from 16 through 1048575.

**Important**

This keyword is license-enabled and available with valid MPLS feature license only.

**Caution**

For DHCP over MPLS feature to work in StarOS 9.0 onward the `dhcp ip vrf` command must be configured in DHCP service. Without `dhcp ip vrf` command the DHCP service using MPLS labels will not be started as a part of a DHCP over MPLS configuration. In release 9.0 onward this keyword is a critical parameter for the DHCP-Service. Any change in its value will result in DHCP-service restart and clearing of the existing calls.

**Important**

In the case of DeWAG, this option must not be configured.

```
output out_mpls_label_value1 [out_mpls_label_value2]
```

Adds the MPLS label to the outbound traffic sent from the configured DHCP service bind address `ip_address`. The labels `out_mpls_label_value1` and `out_mpls_label_value2` identify the MPLS labels to be added to packets sent from the specified dhcp service bind address.

`out_mpls_label_value1` is the inner output label and must be an integer from 16 through 1048575.

`out_mpls_label_value2` is the outer output label and must be an integer from 16 through 1048575.
This keyword is license-enabled and available with valid MPLS feature license only.

Important

In the case of DeWAG, this option must not be configured.

Usage Guidelines

Use this command to associate or tie the DHCP service to a specific logical IP address previously configured in the current context and bound to a port. Once bound, the logical IP address or interface is used in the giaddr field of the DHCP packets.

When this command is executed, the DHCP service is started and begins the process of requesting addresses from the DHCP server and storing them in cache memory for allocation to PDP contexts.

This command can also be used to configure MPLS labels for inbound and outbound traffic through this DHCP address.

Only one interface can be bound to a service.

For DHCP over MPLS feature to work in StarOS 9.0 onward `dhcp ip vrf` command must be configured in DHCP service. Without `dhcp ip vrf` command the DHCP service using MPLS labels will not be started.

Caution

As a part of DHCP over MPLS configuration, the `mpls-label input` keyword in the `bind address` command is also a critical parameter for the DHCP-Service. Any change in its value will result in DHCP-service restart and clearing of the existing calls.

Example

The following command binds the DHCP service to the interface with an IP address of 192.168.1.210:

```
bind address 192.168.1.210
```

default

Restores DHCP service parameters to their factory default settings.

Product

GGSN
ASN-GW
HA
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Service Configuration
configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

{context_name}host_name(config-dhcp-service)#

**Syntax Description**

default { T1-threshold | T2-threshold | dhcp { chaddr-validate | client-identifier | deadtime | detect-dead-server { consecutive-failures } | server selection-algorithm } | lease-duration | max-retransmissions | retransmission-timeout }

dhcp { deadtime | detect-dead-server { consecutive-failures } | server-selection-algorithm }

Restores the following DHCP parameters to their respective default settings:

- **deadtime**: Default 10 minutes
- **detect-dead-server { consecutive-failures }**: Default 5
- **server-selection-algorithm**: Default First-server

**lease-duration**

Restores the lease-duration parameter to its default setting of 86400 seconds.

**max-retransmissions**

Restores the max-retransmissions parameter to its default setting of 5.

**retransmission-timeout**

Restores the retransmission-timeout parameter to its default setting of 3000 milli-seconds.

**T1-threshold**

Restores the T1-threshold parameter to its default setting of 50%.

**T2-threshold**

Restores the T2-threshold parameter to its default setting of 88%.

**Usage Guidelines**

After system parameters have been modified, this command is used to set/restore specific parameters to their default values.

**Example**

The following command restores the DHCP deadtime parameter to its default setting of 10 minutes:

```
default dhcp deadtime
```

dhcp chaddr-validate

Configures the behavior of the client hardware address (chaddr) validation in DHCP messages.
DHCP Service Configuration Mode Commands

dhcp client-identifier

Configures the behavior relating to inclusion of a client identifier DHCP option in DHCP messages.

Product

- GGSN
- HA
- HNB-GW
- P-GW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Service Configuration
configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-service)#

Syntax Description

[ default | no ] dhcp chaddr-validate

default

Validates the chaddr value received in a DHCPACK message with the chaddr value sent in a DHCPREQUEST message.

no

Disables validation of the chaddr value received in DHCPACK message with the chaddr value sent in a DHCPREQUEST message.

Important

The chaddr information value in the DHCPACK message will be parsed but not be validated against the value maintained with client. The chaddr information value in DHCPACK will be ignored and not be stored internally.

Usage Guidelines

Use this command to configure behavior relating to the validation of chaddr information validation in the DHCPACK messages.

Example

The following command specifies that the chaddr will not be validated in the DHCP messages:

no dhcp chaddr-validate

dhcp client-identifier

Configures the behavior relating to inclusion of a client identifier DHCP option in DHCP messages.

Product

- GGSN
- HA
- HNB-GW
- P-GW
DHCP Service Configuration Mode Commands

dhcp client-identifier

SAEGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > DHCP Service Configuration

configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-service)#

Syntax Description
dhcp client-identifier { ike-id | link-layer-identifier | mac-address | msisdn | none }
default dhcp client-identifier

default
Sets the behavior of DHCP client identifier to default – do not to include client identifier option in any DHCP message.

ike-id

Important
In Release 20 and later, HNBGW is not supported. This keyword must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

Specifies the Internet Key Exchange Protocol version 2 id of HNB as the DHCP client-identifier option in any DHCP message to DHCP server in Discover and Request messages.

Important
This keyword is HNB-GW license controlled.

link-layer-identifier
Specifies the subscribers link-layer-identifier as the DHCP client-identifier option in the DHCP message,

mac-address
Specifies the subscribers mac-address as the DHCP client-identifier option in any DHCP message.

msisdn
Specifies that the subscriber's MSISDN be included in the client-identifier option of the relevant DHCP messages. Default: disabled

Important
This keyword is GGSN and P-GW/SAEGW license controlled.
none

Specifies that DHCP client-identifier option would not be included in any DHCP messages. This is the default behavior. Default: enabled

Usage Guidelines

Use this command to configure behavior relating to inclusion or exclusion of DHCP client identifier option from DHCP messages.

Example

The following command specifies that DHCP client-identifier option be excluded from DHCP messages:

```
dhcp client-identifier none
```

dhcp deadtime

Configures the amount of time that the system waits prior to re-communicating with a DHCP server that was previously marked as down.

Product

GGSN
ASN-GW
HA
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Service Configuration
```
configure > context context_name > dhcp-service service_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-dhcp-service)#
```

Syntax Description

dhcp deadtime max_time

```
max_time
```

Specifies the maximum amount of time (in minutes) to wait before communicating with a DHCP server that was previously unreachable. max_time is an integer value from 1 through 65535. Default: 10

Usage Guidelines

If the system is unable to communicate with a configured DHCP server, after a pre-configured number of failures the system marks the server as being down.

This command specifies the amount of time that the system waits prior to attempting to communicate with the downed server.
If all DHCP servers are down, the system will immediately treat all DHCP servers as active, regardless of the deadtime that is specified.

Refer to the `dhcp detect-dead-server` and `max-retransmissions` commands for additional information on the process the system uses to mark a server as down.

**Example**

The following command configures the system to wait 20 minutes before attempting to re-communicate with a dhcp server that was marked as down:

```
dhcp deadtime 20
```

### dhcp detect-dead-server

Configures the number of consecutive communication failures that could occur before the system marks a DHCP server as down.

**Product**

- GGSN
- ASN-GW
- HA
- P-GW
- SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
Exec > Global Configuration > Context Configuration > DHCP Service Configuration
configure > context context_name > dhcp-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

**Syntax Description**

```
dhcp detect-dead-server consecutive-failures max_number
```

**consecutive-failures max_number**

Specifies the number of failures that could occur before marking a DHCP server as down as an integer from 1 through 1000. Default: 5

**Usage Guidelines**

This command works in conjunction with the `max-retransmissions` parameter to set a limit to the number of communication failures that can occur with a configured DHCP server.

The `max-retransmissions` parameter limits the number of attempts to communicate with a server. Once that limit is reached, the system treats it as a single failure. This parameter limits the number of consecutive failures that can occur before the system marks the server as down and communicate with the server of next highest priority.
If all of the configured servers are down, the system ignores the detect-dead-server configuration and attempt to communicate with highest priority server again.

If the system receives a message from a DHCP server that was previously marked as down, the system immediately treats it as being active.

**Example**

The following command configures the system to allow 8 consecutive communication failures with a DHCP server before it marks it as down:

```
dhcp detect-dead-server consecutive-failures 8
```

### dhcp ip vrf

Enables DHCP-over-MPLS support and associates the specific DHCP service with a pre-configured Virtual Routing and Forwarding (VRF) Context instance for virtual routing and forwarding.

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privilege</strong></td>
<td>Security Administrator, Administrator</td>
</tr>
</tbody>
</table>

**Command Modes**

configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

**Syntax Description**

- `dhcp ip vrf vrf_name`
- `no dhcp ip vrf`
- `no dhc ip vrf`

**vrf_name**

Specifies the name of a pre-configured VRF context instance to be associated with a DHCP service. `vrf_name` is the name of a pre-configured VRF context configured in Context Configuration mode and associated with the IP Pool used by the DHCP service.

**Usage Guidelines**

Use this command to enable the DHCP-over-MPLS support and to associate/disassociate a pre-configured VRF context to a DHCP service for this feature.

By default the VRF is NULL, which means that DHCP service is bound with binding address given by `bind address` command only.

VRF is not a critical parameter for the DHCP Service but `bind address` is a critical parameter for DHCP Service, and while starting DHCP Service, if this command is configured, then the `bind address` should be present in that VRF, and If this command is not configured, `bind address` should be present in the context where DHCP Service is configured.
For the DHCP over MPLS feature to work in StarOS 9.0 onward this command must be configured in the DHCP service. Without this command the DHCP service using MPLS labels will not be started.

Caution
As a part of this configuration the mpls-label input keyword in the bind address command is also a critical parameter for the DHCP-Service. Any change in its value will result in DHCP-service restart and clearing of the existing calls.

Example
Following command associates VRF context instance dhcp_vrf1 with this DHCP service:

dhcp ip vrf dhcp_vrf1

**dhcp server**

Configures DHCP servers with which the DHCP service is to communicate.

**Product**

ASN-GW
eWAG
GGSN
HA
HNB-GW
P-GW
SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

{context_name}host_name(config-dhcp-service)#

**Syntax Description**

dhcp server { ip_address | port port_num [ priority priority ]}

no dhcp server ip_address

default dhcp port

default

Sets the default value of UDP port on DHCP server; 67 for DHCP messaging.

no

Deletes a previously configured DHCP server.
**ip_address**

Specifies the IP address of the DHCP server expressed in IPv4 dotted-decimal notation.

**Important**

In the case of DeWAG service, this IP address must be the same as the IP address configured with the `bind address` CLI command under the same DHCP Service Configuration mode.

**port port_num**

Specifies the port number to send DHCP messages to non-standard UDP ports of the server if multiple servers are configured.

`port_num` is an integer from 0 through 65535.

**Important**

In Release 20 and later, HNBGW is not supported. This keyword must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

**Important**

While configuring HNB-GW for DHCP proxy support, operator must define 61610 as UDP port for DHCP server. The source port used by HNBGW will be standard DHCP port, irrespective of the server port that is configured.

**priority priority**

Specifies the priority of the server if multiple servers are configured.

`priority` is an integer from 1 through 1000. 1 is the highest priority.

**Important**

In the case of DeWAG, this option must not be configured.

**Usage Guidelines**

Use this command to configure the DHCP server(s) that the system is to communicate with. Multiple servers can be configured each with their own priority. Up to 20 DHCP servers can be configured.

All DHCP messages are sent/received on UDP port 67.

**Important**

If a server is removed, all calls having an IP address allocated from the server will be released.

**Example**

The following command configures a DHCP server with an IP address of `192.168.1.200` and a priority of `1`:

```
dhcp server 192.168.1.200 priority 1
```
dhcp server selection-algorithm

Specifies the algorithm used to select DHCP servers with which to communicate when multiple servers are configured.

---

Important

In Release 20 and later, HNBGW is not supported. This command must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

---

Product

- GGSN
- ASN-GW
- HA
- HNB-GW
- P-GW
- SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

`configure > context context_name > dhcp-service service_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

Syntax Description

```
dhcp server selection-algorithm { first-server | round-robin | use-all }
```

**first-server**

Uses the first-server algorithm. This algorithm dictates that the system select the DHCP servers according to their priority starting with the highest priority server. The system communicates with the server of the next highest priority only when the previous server is unreachable. Default: Enabled

**round-robin**

Uses the round-robin algorithm. This algorithm dictates that the system communicates with the servers in a circular queue according to the server's configured priority starting with the highest priority server. The next request is communicated with the next highest priority server, and so on until all of the servers have been used. At this point, the system starts from the highest priority server. Default: Disabled

**use-all**

Default: Disabled

This algorithm dictates that the system to communicate with all the DHCP servers configured on system.

Usage Guidelines

Use this command to determine how configured DHCP servers are utilized by the system.
Example
The following command configures the DHCP service to use the round-robin selection algorithm:

```
dhcp server selection-algorithm round-robin
```

end

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
end
```

**Usage Guidelines**
Use this command to return to the Exec mode.

exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
exit
```

**Usage Guidelines**
Use this command to return to the parent configuration mode.

**lease-duration**

Configures the minimum and maximum allowable lease times that are accepted in responses from DHCP servers.

**Product**
GGSN
ASN-GW
HA
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCP Service Configuration
configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-service)#

**Syntax Description**

`lease-duration min min_time max max_time`

**min min_time**
Specifies the minimum acceptable lease time (in seconds) as an integer from 600 through 3600. Default: 600

**max max_time**
Specifies the maximum acceptable lease time (in seconds) as an integer from 10800 through 4294967295. Default: 86400

**Usage Guidelines**

To reduce the call setup time, the system requests IP addresses from the DHCP server in blocks rather than on a call-by-call basis. Each address received has a corresponding lease time, or time that it is valid. The values configured by command represent the minimum and maximum times that the system allows and negotiates for the lease(s).

If the DHCP server responds with values that are out of the range specified by the min and max values, the system accumulates warning statistics. Responses that fall below the minimum value are rejected by the system and the system contacts the DHCP server with the next highest priority. Responses that are greater than the maximum value are accepted.

When half of the lease time has expired, the system automatically requests a lease renewal from the DHCP server. This is configured using the T1-threshold command.

**Example**

The following command configures the minimum allowable lease time for the system to be 1000 and the maximum to be 36000:

`lease-duration min 1000 max 36000`

**lease-time**

Configures the local DHCP Server lease time in seconds.

**Product**

ASN-GW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcp-service)#
Syntax Description

```
lease-time time
default lease-time
```

default

Returns the command to its default setting of 600.

time

Specifies the IP address lease time from the local DHCP server (in seconds) as an integer from 600 through 4294967295. Default: 600

Usage Guidelines

Use this command to configure the lease time of the IP address from the local DHCP server.

Example

The following command sets the lease time of the IP address from the local DHCP server to 20 minutes (1200 seconds):

```
lease-time 1200
```

max-retransmissions

Configures the maximum number of times that the system attempts to communicate with an unresponsive DHCP server before it is considered a failure.

Product

GGSN
ASN-GW
HA
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCP Service Configuration

```
configure > context context_name > dhcp-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

Syntax Description

```
max-retransmissions max_number
```

max_number

Specifies the maximum number of re-attempts the system tries when no response is received from a DHCP server. max_number is an integer from 1 through 20. Default: 5
Usage Guidelines

This command works in conjunction with the `dhcp detect-dead-server` parameter to set a limit to the number of communication failures that can occur with a configured DHCP server.

When the value specified by this parameter is met, a failure is logged. The `dhcp detect-dead-server` command specifies the number of consecutive failures that could occur before the server is marked as down.

In addition, the `retransmission-timeout` command controls the amount of time between re-tries.

Example

The following command configures the maximum number of times the system re-attempts communication with a DHCP server that is unresponsive to 5:

```
max-retransmissions 5
```
retransmission-timeout 1000

**T1-threshold**

Configures the DHCP T1 timer as a percentage of the allocated IP address lease.

**Product**

- GGSN
- ASN-GW
- HA
- P-GW
- SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration > DHCP Service Configuration
- configure > context context_name > dhcp-service service_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

**Syntax Description**

```
T1-threshold percentage
```

**percentage**

Specifies the percentage of the allocated IP address lease time at which the DHCP call-line state is changed to "RENEWING". percentage is an integer from 40 through 66. Default: 50

**Usage Guidelines**

This command is used to identify the time at which a subscriber must renew their DHCP lease as a percentage of the overall lease time. (Refer to the lease-duration command in this chapter for information on configuring the IP address lease period.)

For example, if the lease-duration was configured to have a maximum value of 12000 seconds, and this command is configured to 40%, then the subscriber would enter the RENEWING state after 4800 seconds.

**Example**

The following command configures the T1 threshold to 40%:

```
T1-threshold 40
```

**T2-threshold**

Configures the DHCP T2 timer as a percentage of the allocated IP address lease.

**Product**

- GGSN
**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCP Service Configuration

```
configure > context context_name > dhcp-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcp-service)#
```

**Syntax Description**

```
T2-threshold percentage
```

*percentage*

Specifies the percentage of the allocated IP address lease time at which the DHCP call-line state is changed to "REBINDING". *percentage* is an integer from 67 through 99. Default: 88

**Usage Guidelines**

This command is used to identify the time at which a subscriber re-binds their DHCP leased IP address as a percentage of the overall lease time. (Refer to the `lease-duration` command in this chapter for information on configuring the IP address lease period.)

For example, if the lease-duration was configured to have a maximum value of 12000 seconds, and this command is configured to 70%, then the subscriber would enter the REBINDING state after 8400 seconds.

**Example**

The following command configures the T2 threshold to 70%:

```
T2-threshold 70
```
DHCPv6 Client Configuration Mode Commands

The Dynamic Host Configuration Protocol (DHCP) for Internet Protocol Version 6 (IPv6) Client Configuration Mode is used to create and manage DHCPv6 client parameters to support DHCPv6-based address assignment.

Command Modes

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Client Configuration

configure > context context_name > dhcpv6-service service_name > dhcpv6-client

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcpv6-client)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 991
- exit, on page 992
- max-retransmissions, on page 992
- server-dead-time, on page 993
- server-ipv6-address, on page 994
- server-resurrect-time, on page 995

end

Exits the current configuration mode and returns to the Exec mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

end

Usage Guidelines

Use this command to return to the Exec mode.
**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`exit`

**Usage Guidelines**
Use this command to return to the parent configuration mode.

**max-retransmissions**

Configures the maximum number of times that the system attempts to communicate with an unresponsive DHCPv6 server before it is considered a failure.

**Product**
GGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Client Configuration

`configure > context context_name > dhcpv6-service service_name > dhcpv6-client`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-client)#
```

**Syntax Description**
- `max-retransmissions max_number`
- `default max-retransmissions`

**default**

Returns the command to its default setting of 20.

**max_number**

Specifies the maximum number of re-attempts the system tries when no response is received from a DHCPv6 server. `max_number` is an integer from 1 through 20. Default: 20

**Usage Guidelines**
This command works in conjunction with the `detect-dead-server` DHCPv6 service command to set a limit to the number of communication failures that can occur with a configured DHCPv6 service.

When the value specified by this parameter is met, a failure is logged. The `detect-dead-server` DHCPv6 service parameter specifies the number of consecutive failures that could occur before the server is marked as down.
**Example**

The following command configures the maximum number of times the system re-attempts communication with a DHCPv6 server that is unresponsive to 5:

```
max-retransmissions 5
```

**server-dead-time**

Configures the amount of time that the client attempts to communicate with an unresponsive DHCPv6 server. DHCPv6 server is considered to be dead if it doesn't respond after given tries from client.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Client Configuration

```
configure > context context_name > dhcpv6-service service_name > dhcpv6-client
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-client)#
```

**Syntax Description**

```
server-dead-time dead_time
default server-dead-time
```

**default**

Returns the command to its default setting of 5.

**dead_time**

Specifies the maximum amount of time (in seconds) that the client attempts to communicate with an unresponsive DHCPv6 server.

`dead_time` must be an integer value from 1 through 1932100.

Default: 5

**Usage Guidelines**

Use this command to specify the maximum amount of time (in seconds) that the client attempts to communicate with an unresponsive DHCPv6 server.

This command works in conjunction with the `max-retransmissions` command to set a limit to the number of times that the system attempts to communicate with an unresponsive DHCPv6 server before it is considered a failure.
Example

The following command configures the client to continue trying to communicate with an unresponsive DHCPv6 server for no more than 10 seconds:

```
server-dead-time 10
```

server-ipv6-address

Configures DHCPv6 server(s) with which the DHCPv6 client is to communicate.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Client Configuration

```
configure > context context_name > dhcpv6-service service_name > dhcpv6-client
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-client)#
```

**Syntax Description**

```
server-ipv6-address ipv6_address [ port port_number ] [ priority priority ] [ -noconfirm ]
no server-ipv6-address ipv6_address
```

**no**

Deletes a previously configured DHCPv6 server.

**ipv6_address**

Specifies the IP address of the DHCPv6 server expressed in IPv6 colon-separated-hexadecimal notation.

Default: FF02::1:2

**port port_number**

Specifies the port used for communicating with the DHCPv6 server.

`port_number` must be an integer from 1 through 65535. If unspecified, the default port is 547.

**priority priority**

Specifies the priority of the server if multiple servers are configured.

`priority` is an integer from 1 through 1000. 1 is the highest priority.
Executes the command without prompting for further input from the user.

Usage Guidelines

Use this command to configure the DHCPv6 server(s) that the client is to communicate with. Multiple servers can be configured, each with their own priority.

Example

The following command configures a DHCPv6 server with an IP address of 1234:245:3456:4567:5678:6789:7890:8901, a port of 300, and a priority of 1:

```
server-ipv6-address 1234:245:3456:4567:5678:6789:7890:8901 port 300 priority 1
```

server-resurrect-time

Configures the amount of time that a DHCPv6 client waits before considering a dead DHCPv6 server alive again.

Product

GGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Client Configuration

```
configure > context context_name > dhcpv6-service service_name > dhcpv6-client
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-client)#
```

Syntax Description

```
server-resurrect-time revive_time
default server-resurrect-time
```

**default**

Returns the command to its default setting of 20.

**revive_time**

Specifies the maximum amount of time (in seconds) that a DHCPv6 client waits before considering a dead DHCPv6 server alive again.

```
revive_time
```

```
must be an integer value from 1 through 1932100.
```

Default: 20
Usage Guidelines

Use this command to specify the amount of time that a DHCPv6 client waits before considering a dead DHCPv6 server alive again.

Example

The following command configures the client to wait 25 seconds before considering a dead DHCPv6 server alive again:

```
server-resurrect-time 25
```
CHAPTER 46

DHCPv6 Server Configuration Mode Commands

The Dynamic Host Configuration Protocol (DHCP) for Internet Protocol Version 6 (IPv6) Server Configuration Mode is used to create and manage DHCPv6 server parameters to support DHCPv6-based address assignment.

Command Modes

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

configure > context context_name > dhcpv6-service service_name > dhcpv6-server

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-dhcpv6-server)##

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 997
- exit, on page 998
- ipv6, on page 998
- preferred-lifetime, on page 999
- prefix-delegation, on page 999
- rebind-time, on page 1000
- renew-time, on page 1001
- valid-lifetime, on page 1002

end

Exits the current configuration mode and returns to the Exec mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

end

Usage Guidelines

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
exit

**Usage Guidelines**
Use this command to return to the parent configuration mode.

**ipv6**

Configures M/O flag for neighbor discovery protocol.

**Product**
GGSN
P-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

```bash
configure > context context_name > dhcpv6-service service_name > dhcpv6-server
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-server)#
```

**Syntax Description**
ipv6 nd { managed-config-flag | other-config-flag }

- nd { managed-config-flag | other-config-flag }
  Configure M/O flag for neighbor discovery protocol.
  - `managed-config-flag`: Configure M flag.
  - `other-config-flag`: Configure O flag.

**Usage Guidelines**
Use this command to specify the M/O flag for neighbor discovery protocol.

**Example**
The following command configures the M flag for neighbor discovery protocol:

```bash
ipv6 nd managed-config-flag
```
preferred-lifetime

Configures the preferred lifetime for prefixes assigned by the DHCPv6 service.

**Product**
- GGSN
- P-GW
- SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

`configure > context context_name > dhcpv6-service service_name > dhcpv6-server`

Entering the above command sequence results in the following prompt:

`(context_name)host_name(config-dhcpv6-server)#`

**Syntax Description**

- `preferred-lifetime pref_lifetime`
- `default preferred-lifetime`

- `default`
  Returns the command to its default setting of 900.

- `pref_lifetime`
  Specifies the preferred lifetime (in seconds) for prefixes assigned by the DHCPv6 service.
  `pref_lifetime` must be an integer value from 1 through 1932100.
  Default: 900

**Usage Guidelines**
Use this command to specify the preferred lifetime for prefixes assigned by the DHCPv6 service.

**Example**
The following command configures the preferred lifetime for 1001 seconds:

`preferred-lifetime 1001`

prefix-delegation

Configures the lifetime parameters that can be used by a particular DHCPv6 service to allocate delegated prefixes.

**Product**
GGSN

**Privilege**
Security Administrator, Administrator
prefix-delegation valid-lifetime valid_lifetime preferred-lifetime pref_lifetime

valid-lifetime valid_lifetime
Specifies the valid lifetime (in seconds) for prefixes for which the delegated prefix is valid. After this is exhausted, delegated prefix is deemed invalid.

pref_lifetime must be an integer value from 1 through 1932100.
Default: 900

preferred-lifetime pref_lifetime
Specifies the preferred lifetime (in seconds) for which new connections can be established by these delegated prefixes. Once it is exhausted, no new connections can be made.

pref_lifetime must be an integer value from 1 through 1932100.
Default: 900

Usage Guidelines
Use this command to specify the valid and preferred lifetime for prefixes assigned by the DHCPv6 service for prefix delegation.

Example
The following command configures the valid lifetime to 1500 seconds and preferred lifetime to 1200 seconds for prefix delegation:

prefix-delegation valid-lifetime 1500 preferred-lifetime 1200

rebind-time
Configures the rebind time for prefixes assigned by the DHCPv6 service.

Product
GGSN
P-GW
SAEGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

configure > context context_name > dhcpv6-service service_name > dhcpv6-server
Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-server)#
```

### Syntax Description

**rebind-time**  
`rebind_time`  

**default**  
`rebind_time`

**default**  
Returns the command to its default setting of 900.

**rebind_time**  
Specifies the rebind time (in seconds) for prefixes assigned by the DHCPv6 service.  
`rebind_time` must be an integer value from 1 through 1932100.  
Default: 900

### Usage Guidelines

Use this command to specify the rebind time for prefixes assigned by the DHCPv6 service.

### Example

The following command configures the rebind time for 1001 seconds:  

```
rebind-time 1001
```

---

### renew-time

Configures the renewal time for prefixes assigned by the DHCPv6 service.

**Product**  
GGSN  
P-GW  
SAEGW

**Privilege**  
Security Administrator, Administrator

**Command Modes**  
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

```
configure > context context_name > dhcpv6-service service_name > dhcpv6-server
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-server)#
```

### Syntax Description

**renew-time**  
`renewal_time`  

**default**  
`renew-time`

**default**  
Returns the command to its default setting of 900.
renewal_time

Specifies the renewal time (in seconds) for prefixes assigned by the DHCPv6 service.

renewal_time must be an integer value from 1 through 1932100.

Default: 900

Usage Guidelines

Use this command to specify the renewal time for prefixes assigned by the DHCPv6 service.

Example

The following command configures the renewal time for 1001 seconds:

renew-time 1001

valid-lifetime

Configures the valid lifetime for prefixes assigned by the DHCPv6 service.

Product

GGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration > DHCPv6 Server Configuration

configure > context context_name > dhcpv6-service service_name > dhcpv6-server

Entering the above command sequence results in the following prompt:

(context_name)host_name(config-dhcpv6-server)#

Syntax Description

valid-lifetime valid_lifetime
default valid-lifetime

default

Returns the command to its default setting of 900.

valid_lifetime

Specifies the valid lifetime (in seconds) for prefixes assigned by the DHCPv6 service.

valid_lifetime must be an integer value from 1 through 1932100.

Default: 900

Usage Guidelines

Use this command to specify the valid lifetime for prefixes assigned by the DHCPv6 service.
Example
The following command configures the valid lifetime for 1001 seconds:

`valid-lifetime 1001`
valid-lifetime
CHAPTER 47

DHCPv6 Service Configuration Mode Commands

The Dynamic Host Configuration Protocol (DHCP) for Internet Protocol Version 6 (IPv6) Service Configuration Mode is used to create and manage DHCPv6 service instances for the current context.

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration

```plaintext
configure > context context_name > dhcpv6-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-service)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

**Important**

- bind, on page 1005
- deadtime, on page 1006
- detect-dead-server, on page 1007
- dhcpv6-client, on page 1008
- dhcpv6-server, on page 1009
- end, on page 1010
- exit, on page 1010
- server, on page 1010

**bind**

Binds the DHCPv6 service to a logical IP interface facilitating the system's connection to the DHCPv6 server.

**Product**

GGSN
P-GW
SAEGW
SaMOG

**Privilege**

Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration

`configure > context context_name > dhcpv6-service service_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-service)#
```

**Syntax Description**

`bind address ipv6_address [ port port_number ]`

`no bind address`

- **no**
  
  Removes a previously configured binding.

- **address ipv6_address**
  
  Specifies the IP address of an interface in the current context through which the communication with the DHCPv6 server occurs. `ipv6_address` must be expressed in IPv6 colon-separated-hexadecimal notation.

- **port port_number**
  
  Specifies the listen port and is used to start the DHCPv6 server bound to it.
  
  `port_number` must be an integer from 1 through 65535. If unspecified, the default port is 547.

**Usage Guidelines**

Use this command to associate or tie the DHCPv6 service to a specific logical IP address previously configured in the current context and bound to a port.

When this command is executed, the DHCPv6 service is started and begins the process of requesting addresses from the DHCPv6 server and storing them in cache memory for allocation to PDP contexts.

Only one interface can be bound to a service.

**Example**

The following command binds the DHCPv6 service to the interface with an IP address of `1234:245:3456:4567:5678:6789:7890:8901`:

```
```

**deadtime**

Configures the amount of time that the system waits prior to re-communicating with a DHCPv6 server that was previously marked as down.

**Product**

- GGSN
- P-GW
- SAEGW

**Privilege**

Security Administrator, Administrator
**Command Modes**
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration
configure > context context_name > dhcpv6-service service_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-dhcpv6-service)#

**Syntax Description**
`deadtime` `max_time`
`default` `deadtime`

- **default**
  Returns the command to its default setting of 120.

- **max_time**
  Specifies the maximum amount of time (in seconds) to wait before communicating with a DHCPv6 server that was previously unreachable.
  `max_time` must be an integer value from 1 through 1932100.
  Default: 120

**Usage Guidelines**
If the system is unable to communicate with a configured DHCPv6 server, after a pre-configured number of failures the system marks the server as being down.
This command specifies the amount of time that the system waits prior to attempting to communicate with the downed server.

- **Important**
  If all DHCPv6 servers are down, the system will immediately treat all DHCPv6 servers as active, regardless of the `deadtime` that is specified.

Refer to the `detect-dead-server` and `max-retransmissions` commands for additional information on the process the system uses to mark a server as down.

**Example**
The following command configures the system to wait 600 seconds before attempting to re-communicate with a DHCPv6 server that was marked as down:
`deadtime 600`

---

**detect-dead-server**

Configures the number of consecutive communication failures that could occur before the system marks a DHCPv6 server as down.

**Product**
GGSN
P-GW
SAEGW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration

`configure > context context_name > dhcpv6-service service_name`

Entering the above command sequence results in the following prompt:

`[context_name]host_name(config-dhcpv6-service)#`

Syntax Description
`detect-dead-server consecutive-failures max_number`
`default detect-dead-server consecutive-failures`

default

Returns the command to its default setting of 5.

`consecutive-failures max_number`

Specifies the number of failures that could occur before marking a DHCPv6 server as down.

`max_number` must be an integer from 1 through 1000.

Default: 5

Usage Guidelines
This command works in conjunction with the `max-retransmissions` DHCPv6 client command to set a limit to the number of communication failures that can occur with a configured DHCPv6 server.

The `max-retransmissions` DHCPv6 client parameter limits the number of attempts to communicate with a server. Once that limit is reached, the system treats it as a single failure. This parameter limits the number of consecutive failures that can occur before the system marks the server as down and communicate with the server of next highest priority.

If all of the configured servers are down, the system ignores the `detect-dead-server` configuration and attempts to communicate with the highest priority server again.

If the system receives a message from a DHCPv6 server that was previously marked as down, the system immediately treats it as being active.

Example
The following command configures the system to allow 8 consecutive communication failures with a DHCPv6 server before it marks it as down:

`detect-dead-server consecutive-failures 8`

dhcpv6-client

Enters the DHCPv6 Client Configuration Mode.

Product
GGSN
P-GW
DHCPv6 Service Configuration Mode Commands

dhcpv6-server

Enters the DHCPv6 Server Configuration Mode.

Product

GGSN
P-GW
SAEGW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration
configure > context context_name > dhcpv6-service service_name

Entering the above command sequence results in the following prompt:
context_name host_name(config-dhcpv6-service)#

dhcpv6-server

Syntax Description

dhcpv6-server

Usage Guidelines

Use this command to cause the system to enter the DHCPv6 Server Configuration Mode where parameters are configured for the DHCPv6 server.

Entering this command results in the following prompt:
context_name hostname(config-dhcpv6-server)#

DHCPv6 Server Configuration Mode commands are defined in the DHCPv6 Server Configuration Mode Commands chapter.
Multiple DHCPv6 servers can be configured by entering the **dhcpv6-server** command multiple times. A maximum of 3 DHCPv6 servers can be configured.

---

**end**

Exits the current configuration mode and returns to the Exec mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`end`

**Usage Guidelines**

Use this command to return to the Exec mode.

---

**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Syntax Description**

`exit`

**Usage Guidelines**

Use this command to return to the parent configuration mode.

---

**server**

Configures DHCPv6 servers with which the DHCPv6 service is to communicate and specifies the algorithm used to select DHCPv6 servers with which to communicate when multiple servers are configured.

**Product**

GGSN

P-GW

SAEGW

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DHCPv6 Service Configuration

`configure > context context_name > dhcpv6-service service_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dhcpv6-service)#
```
Syntax Description

server { ipv6_address [ priority priority ] | selection-algorithm { first-server | round-robin } }

default server selection-algorithm

no server ipv6_address

default
Uses the first-server algorithm.

no
Deletes a previously configured DHCPv6 server.

ipv6_address
Specifies the IP address of the DHCPv6 server expressed in IPv6 colon-separated-hexadecimal notation.

priority priority
Specifies the priority of the server if multiple servers are configured.
priority is an integer from 1 through 1000. 1 is the highest priority.

selection-algorithm { first-server | round-robin }
Specifies the algorithm used to select DHCPv6 servers with which to communicate when multiple servers are configured.

first-server: Uses the first-server algorithm. This algorithm dictates that the system select the DHCPv6 servers according to their priority, starting with the highest priority server. The system communicates with the server of the next highest priority only when the previous server is unreachable.
Default: Enabled

round-robin: Uses the round-robin algorithm. This algorithm dictates that the system communicates with the servers in a circular queue according to the server's configured priority, starting with the highest priority server. The next request is communicated with the next highest priority server, and so on until all of the servers have been used. At this point, the system starts from the highest priority server.
Default: Disabled

Usage Guidelines

Use this command to configure the DHCPv6 server(s) that the system is to communicate with. Multiple servers can be configured, each with their own priority. Up to 20 DHCPv6 servers can be configured.

In addition, use this command to determine how configured DHCPv6 servers are utilized by the system.

Important
If a server is removed, all calls having an IP address allocated from the server will be released.

Example
The following command configures a DHCPv6 server with an IP address of 1234:245:3456:4567:5678:6789:7890:8901 and a priority of 1:

server 1234:245:3456:4567:5678:6789:7890:8901 priority 1
server
CHAPTER 48

Diameter Endpoint Configuration Mode Commands

Diameter Endpoint Configuration Mode is accessed from the Context Configuration Mode. The base Diameter protocol operation is configured in this mode.

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

---

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- app-level-retransmission, on page 1014
- associate, on page 1015
- cea-timeout, on page 1016
- connection retry-timeout, on page 1017
- connection timeout, on page 1018
- description, on page 1018
- destination-host-avp, on page 1019
- device-watchdog-request, on page 1021
- dpa-timeout, on page 1021
- dscp, on page 1022
- dynamic-peer-discovery, on page 1023
- dynamic-peer-failure-retry-count, on page 1024
- dynamic-peer-realm, on page 1025
- dynamic-route, on page 1026
- end, on page 1026
- exit, on page 1027
- load-balancing-algorithm, on page 1027
- max-outstanding, on page 1028
- origin address, on page 1029
app-level-retransmission

This command enables/disables setting "T" bit and retaining the same End-to-End Identifier (E2E ID) for application-level retransmissions.

<table>
<thead>
<tr>
<th>Product</th>
<th>eHRPD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GGSN</td>
</tr>
<tr>
<td></td>
<td>P-GW</td>
</tr>
</tbody>
</table>

| Privilege        | Security Administrator, Administrator |

| Command Modes    | Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration |

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

Syntax Description

[ default | no ] app-level-retransmission { retain-e2e | set-retransmission-bit }

default

Configures this command with the default setting.
The default behavior is not to set the retransmission bit for a retried Diameter message.

retain-e2e

Sends the same End-to-End Identifier for a retried Diameter message.
**set-retransmission-bit**

Sets the retransmission bit for retried Diameter messages.

**Usage Guidelines**

Use this command to enable application-level transmission with "T" bit set.

'T' bit setting is done only for DIABASE protocol-based rerouting and not for application-based retransmissions. In order to identify such retransmissions, the server expects the T bit to be set at all levels (both DIABASE and application) of retransmission, which can be achieved with this CLI command.

In addition to using this CLI command for setting the T-bit in a retried message, it is also possible to retain the same End-to-End ID. With this feature turned on, the server can detect any duplicate/re-transmitted messages sent by Diameter clients or agents. Note that this feature is applicable to Gy and Rf messages as well.

Similar CLI command for setting T-bit is also present under Credit Control Group configuration mode, which when configured will take effect for Gy messages else endpoint configuration will be used.

**Example**

The following command specifies to set retransmission bit and retain e2e:

```
app-level-retransmission set-retransmission-bit retain-e2e
```

**associate**

This command associates/disassociates a Stream Control Transmission Protocol (SCTP) parameter template with the Diameter endpoint.

**Product**

- ePDG
- MME

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

- `associate sctp-parameters-template template_name`
- `no associate sctp-parameters-template`

**no**

Disassociates an SCTP parameter template with the Diameter endpoint.

- `sctp-parameters-template template_name`

Associates a previously created SCTP parameter template with the Diameter endpoint. `template_name` specifies the name for a pre-configured SCTP parameter template. For more information on SCTP parameter templates,
Usage Guidelines

Use this command to associate a configured SCTP parameter template with the Diameter endpoint.

The SCTP parameter template allows for SCTP timer values to be configured for the interface using the Diameter endpoint configuration. For more information on SCTP parameters, refer to the *SCTP Parameter Template Configuration Mode Commands* chapter in this guide.

**Important**

Only one SCTP parameter template can be associated with the Diameter endpoint configuration. The SCTP parameter template should be configured prior to issuing this command.

Only the following parameters from the template will be associated with the endpoint. When no SCTP parameter template is associated with the endpoint, the following default values are used:

- `sctp-cookie-life` 60000 (default for the parameter template as well)
- `sctp-max-init-retx` 5 (default for the parameter template as well)
- `sctp-max-path-retx` 10 (default in the parameter template is 5)
- `sctp-rto-initial` 3000 (default for the parameter template as well)
- `sctp-rto-max` 60000 (default for the parameter template as well)
- `sctp-rto-min` 1000 (default for the parameter template as well)
- `sctp-sack-period` 200 (default for the parameter template as well)
- `timeout sctp-heart-beat` 30 (default for the parameter template as well)

**Example**

The following command associates a pre-configured SCTP parameter template called `sctp1` to the Diameter endpoint:

```
associate sctp-parameters-template sctp1
```

**cea-timeout**

This command configures the Capabilities-Exchange-Answer (CEA) message timeout duration for Diameter sessions.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```
Syntax Description

cea-timeout timeout
default cea-timeout

default
Configures this command with the default setting.
Default: 30 seconds

timeout
Specifies the timeout duration (in seconds) to make the system wait for this duration for a CEA message.
timeout must be an integer from 1 through 120.

Usage Guidelines

Use this command to configure the CEA timer, i.e., how long to wait for the Capabilities-Exchange-Answer message.

Example

The following command sets the Diameter CEA timeout to 16 seconds:

cea-timeout 16

connection retry-timeout

This command configures the Diameter Connection Retry Timeout parameter.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

Syntax Description

connection retry-timeout timeout
default connection retry-timeout

default
Configures this command with the default setting.
Default: 30 seconds

timeout
Specifies the connection retry timeout duration in seconds. The timeout must be an integer from 1 through 3600.
Usage Guidelines
Use this command to configure the Diameter Connection Retry Timeout parameter.

Example
The following command sets the Diameter Connection Retry Timer to 120 seconds:
connection retry-timeout 120

connection timeout
This command configures the Diameter Connection Timeout parameter.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration
configure > context context_name > diameter endpoint endpoint_name
Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx-diameter)#

Syntax Description
connection timeout timeout
default connection timeout
default
Configures this command with the default setting.
Default: 30 seconds

timeout
Specifies the connection timeout duration (in seconds) as an integer from 1 through 30.

Usage Guidelines
Use this command to configure the Diameter Connection Timeout parameter.

Example
The following command sets the Diameter connection timeout to 16 seconds:
connection timeout 16

description
Allows you to enter descriptive text for this configuration.

Product
All
Syntax Description

description text

no description

no

Clears the description for this configuration.

text

Enter descriptive text as an alphanumeric string of 1 to 100 characters.
If you include spaces between words in the description, you must enclose the text within double quotation marks (" "), for example, "AAA BBBB".

Usage Guidelines

The description should provide useful information about this configuration.

destination-host-avp

This command controls encoding of the Destination-Host AVP in initial/retried requests.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

Syntax Description

destination-host-avp { always | initial-request [ redirected-request ] | retried-request [ redirected-request ] | session-binding [ redirected-request ] }
default destination-host-avp

default

Configures this command with the default setting. Default: session-binding

always

Includes the Destination-Host AVP in all types of request messages.

session-binding [ redirected-request ]

Includes the Destination-Host AVP when the Diameter session is bound with a host.

redirected-request: Includes the Destination-Host AVP in any redirected request message when the Diameter session is bound with a host.
initial-request

Includes the Destination-Host AVP in an initial request but not in a retried request.

redirected-request: Includes the Destination-Host AVP in any redirected request message.

retried-request

Includes the Destination-Host AVP in a retried request but not in an initial request.

redirected-request: Includes the Destination-Host AVP in any redirected request message.

Usage Guidelines

Use this command to control encoding of the Destination-Host AVP in initial/retried requests.

This command has been introduced in release 12.0, in earlier releases, the Destination-Host AVP is not sent in session-setup/initial request (first message sent on that interface for that subscriber. The message will vary with different interfaces. For example, CCR-Initial for Gx, ACR-start for Rx, and so on). Also, Destination-Host AVP was not sent in retried requests. For example, CCR-Update failed to be responded by server. The message was retransmitted to alternate server.

In both these scenarios, it is not known which server will respond to the initial/retried message, so the Destination-Realm is encoded but not the Destination-Host. Only after a response for this message is received from one of the hosts present in that realm, the session is considered to be BOUND with that server. Any message sent after this binding will have the Destination-Host AVP encoded.

If the application has selected one of the servers using application-level commands like the peer-select command for credit-control or the diameter authentication or accounting server command in a AAA group, encoding of this AVP in initial/retried request is configurable.

When an application receives the Result-Code 3006 -DIAMETER_REDIRECT INDICATION from the AAA server, the Diameter request message is forwarded to the Redirect-Host specified in the server's response. The message gets routed properly in case the Diameter host is directly connected to the AAA server. If there is a DRA between P-GW/ePDG and AAA server, the message goes into a loop as DRA always routes the packet to the AAA server which had redirected the message. To avoid the unnecessary looping, a new configurable option redirected-requests is added to the destination-host-avp CLI command. This new option allows encoding the Destination-Host AVP in any type of Diameter redirected messages.

In releases prior to 19, the Destination-Host AVP was encoded in the redirected message only if the original request included Destination-Host AVP. In release 19 and beyond, encoding of Destination-Host AVP in redirected message is based on the configuration of redirected-request in the destination-host-avp command. If the CLI command is enabled, Destination-Host AVP will be included in any type of Diameter redirected messages. As per the current implementation, it is not possible to send retried messages to a different host using the same peer. This behavior is applicable for normal retry and failure-handling scenarios.

Since any redirected request is considered as retried request, if the option "retried-request" is used, by default Update (Interims) or Terminate (Stop) retried-request will be encoded with Destination-Host AVP without the "redirected-request" option being configured. The reason to configure "redirected-request" as part of "retried-request" option is, in case of Initial-Retried request the Destination-Host AVP is not encoded if "retried-request" option alone is configured. To enable encoding Destination-Host AVP for Initial-Retried request, "redirected-request" is supported as an extension to "retried-request" as well.

Example

The following command specifies to include the Destination-Host AVP in initial request but not in retried request:
destination-host-avp initial-request

**device-watchdog-request**

This command manages the transport failure algorithm and configures the number of Device Watchdog Requests (DWRs) that will be sent before a connection is closed.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Command Modes**: Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

- `device-watchdog-request max-retries retry_count`
- `default device-watchdog-request max-retries`  

**Syntax Description**

- `default`  
  Configures this command with the default setting. Default: 1

- `retry_count`
  Specifies the maximum number of DWRs, and it must be an integer from 1 through 10.

**Usage Guidelines**

Use this command to configure the number of DWRs to be sent before closing the connection from a Diameter endpoint.

**Example**

The following command sets the DWRs to 3:

```
device-watchdog-request max-retries 3
```

**dpa-timeout**

This command configures the Disconnect-Peer-Answer (DPA) message timeout duration for Diameter sessions.

- **Product**: All
- **Privilege**: Security Administrator, Administrator
- **Command Modes**: Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

**Usage Guidelines**

Use this command to configure the DPA message timeout duration.
Entering the above command sequence results in the following prompt:

\[(\text{context\_name})\text{host\_name(config-ctx-diameter)}\]#

**Syntax Description**

- **dpa-timeout**: timeout
- **default dpa-timeout**

**default**

Configures this command with the default setting.

Default: 30 seconds

**timeout**

Specifies the DPA message timeout duration (in seconds) as an integer from 1 through 60.

**Usage Guidelines**

Use this command to set the timer for DPA message timeout during Diameter connection session. This makes the system wait for this duration for DPA message.

**Example**

The following command sets the Diameter DPA timeout to 16 seconds:

```
 dpa-timeout 16
```

---

**dscp**

This command sets the Differential Services Code Point (DSCP) value in the IP header of the Diameter messages sent from the Diameter endpoint.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
 configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

- **dscp**: value | af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | be | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef
- **default dscp**

**value**

Specifies to configure a unique DSCP as an integer in the range of 0 through 63.
af
Specifies the use of an assured forwarding xx per hop behavior (PHB).

be
Specifies the use of best effort forwarding PHB. This is the default.

csx
Specifies the use of class selector x per PHB.

ef
Specifies the use of expedited forwarding PHB.

**Usage Guidelines**
Use this command to set the DSCP in the IP header of the Diameter messages sent from the Diameter endpoint. In addition to the recommended PHBs the user may configure their own DSCP as an integer in the range of 0 through 63.

**Example**
The following command sets the DSCP to be:

```
dscp be
```

**dynamic-peer-discovery**
This command configures the system to dynamically locate peer Diameter servers by means of DNS.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
dynamic-peer-discovery [ protocol { sctp | tcp } ]
{ default | no } dynamic-peer-discovery
```

default
Configures this command with the default setting.
Default: disabled
no

Removes the configuration.

protocol { sctp | tcp }

Configures peer discovery to use a specific protocol. Default: TCP

sctp: Uses Streaming Control Transmission Protocol (SCTP) for peer discovery.


Usage Guidelines

Use this command to configure the system to dynamically locate peer Diameter servers by means of DNS.

Configure the dynamic-peer-realm command to locate Diameter servers using Naming Authority Pointer (NAPTR) queries. If the peer realm command is not configured, configuring this command will still allow applications to trigger an NAPTR query on their chosen realms.

The preferred transport protocol is TCP to resolve instances were multiple NAPTR responses with the same priority are received. The one using the TCP transport protocol will be chosen. If the transport protocol is configured through the CLI, then the configured protocol is given preference.

The IP address version will be the same as that of the origin host address configured for the endpoint. For IPv4 endpoints, A-type DNS queries will be sent to resolve Fully Qualified Domain Names (FQDNs). For IPv6 endpoints, AAAA-type queries are sent.

Example

The following command configures the system to dynamically locate peer Diameter servers using SCTP:

dynamic-peer-discovery protocol sctp

dynamic-peer-failure-retry-count

This command configures the number of times the system will attempt to connect to a dynamically discovered Diameter peer.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

dynamic-peer-failure-retry-count no_of_retries

default dynamic-peer-failure-retry-count
default
Configures this command with the default setting.
Default: 8

no_of_retries
Specifies the number of retry attempts to connect to a dynamically discovered Diameter peer. The value must be an integer from 0 through 255.

Usage Guidelines
Use this command to configure the number of times the system attempts to connect to a dynamically discovered Diameter peer.

After the specified number of attempts if the peer is still not open, the peer is moved into blacklist and other peers are tried. The blacklisted peer will be retried after a time period of one hour.

Example
The following command sets the retry attempts to 10:

    dynamic-peer-failure-retry-count 10

dynamic-peer-realm

This command configures the name of the realm where peer Diameter servers can be dynamically discovered.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

    configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

    [context_name]host_name(config-ctx-diameter) #

Syntax Description
[ no ] dynamic-peer-realm realm_name

no
Removes the specified dynamic peer realm name from this endpoint configuration.

realm_name
Specifies the name of the peer realm where peer Diameter server are to be dynamically discovered. realm_name must be an existing realm, and must be an alphanumeric string of 1 through 127 characters.

Usage Guidelines
Use this command to locate Diameter servers using Naming Authority Pointer (NAPTR) queries.

Multiple realms can be configured. Even if the dynamic-peer-discovery command is not enabled, the realm configuration(s) will trigger dynamic peer discovery on all diabase instances.
Example

The following command configures a peer realm, used for dynamic peer discovery, with a name of service-provider.com:

dynamic-peer-realm service-provider.com

dynamic-route

This command configures the expiration time for dynamic routes created after a Diameter destination host is reached.

Product
All

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

dynamic-route expiry-timeout value
default dynamic-route expiry-timeout

default

Configures this command with the default setting. Default: 86400 seconds (1 day)

value

Specifies the time (in seconds) that a dynamic route to a Diameter host will expire. The value must be an integer from 1 through 86400000.

Usage Guidelines

Use this command to set expiration times for dynamic routes that are set up after a Diameter host has been reached.

Example

The following command sets the dynamic route expiration to 43200 seconds:

dynamic-route expiry-timeout 43200

der

Exits the current configuration mode and returns to the Exec mode.
**exit**

Exits the current mode and returns to the parent configuration mode.

**load-balancing-algorithm**

This command configures the behavior for load balancing Diameters peers in the event of a failure of an active server.

**Syntax Description**

```plaintext
load-balancing-algorithm { highest-weight | lowest-weight-borrowing

min-active-servers number }

default load-balancing-algorithm

default

Configures this command with the default setting.
Default: highest-weight

highest-weight

Selects an idle server with the highest weight in failure scenarios. If multiple servers have the same high weight, load balancing is performed among those servers.
lowest-weight-borrowing min-active-servers number

Borrows an idle server with the lowest weight and adds it to the group of servers where load balancing is performed. number specifies the number of servers that must always be available as active for load balancing. number must be an integer from 2 through 4000.

Usage Guidelines

Use this command to configure the behavior for load balancing Diameter peers in the event of a failure of an active server.

Example

The following command configures the load balancing behavior for Diameter peers to borrowing minimally active servers (lower weight) and maintaining an active server group of 30 servers:

load-balancing-algorithm lowest-weight-borrowing min-active-servers 30

max-outstanding

This command configures the maximum number of Diameter messages that any application can send to any one peer, while awaiting responses.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration
configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

Syntax Description

max-outstanding messages
{ default | no } max-outstanding

no

Disables the maximum outstanding messages configuration.

default

Configures this command with the default setting.
Default: 256

messages

Specifies the maximum outstanding peer transmit window size setting. The input must be an integer from 1 through 4096.
Note that, in StarOS 14.1 and later releases, though the configuration allows up to 4K Diameter messages, it is restricted to queue up to 512 Diameter messages per peer to avoid any delay in the recovery of Diameter sessions.

**Usage Guidelines**

Use this command to set the unanswered Diameter messages that any application may send to any one peer, while awaiting responses. An application will not send any more Diameter messages to that peer until it has disposed of at least one of those queued messages. It disposes a message by either receiving a valid response or by discarding the message due to no response.

**Example**

The following command sets the Diameter maximum outstanding messages setting to 1024:

```
max-outstanding 1024
```

**origin address**

This command has been deprecated. See the origin host, on page 1029 and origin realm, on page 1031 commands.

**origin host**

This command sets the origin host for the Diameter endpoint.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
origin host host_name address ipv4_address | ipv6_address [ port port_number ] [ accept-incoming-connections ] [ address ipv4_address_secondary | ipv6_address_secondary ]

no origin host host_name address ipv4_address | ipv6_address [ port port_number ]
```

**no**

Removes the origin host configuration.

**origin host host_name**

Specifies the host name to bind the Diameter endpoint. `host_name` must be the local Diameter host name. In releases prior to 16.0, the host name must be an alphanumeric string of 1 through 64 characters.

In 16.0 and later releases, the host name must be an alphanumeric string of 1 through 255 characters.
address ipv4_address | ipv6_address

Specifies the IP address to bind the Diameter endpoint using IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. This address must be one of the addresses of a chassis interface configured within the context in which Diameter is configured.

port port_number

Specifies the port number for the Diameter endpoint (on inbound connections). The port number must be an integer from 1 through 65535. Default: 3868

---

**Important**

When multiple diamproxies are running in the chassis, it is highly recommended that port number is NOT specified.

Port number in the origin host should be configured only when the chassis is running in server mode, i.e. when accept-incoming-connections is configured.

In this case it will open a listening socket on the specified port. For configurations where chassis is operating as a client, port number should not be included. In this case, a random source port will be chosen for outgoing connections. This is applicable for both with or without multi-homing.

---

**Important**

Currently if multi-homing is configured, then the specified port is used instead of randomly chosen port. This is done so that application knows which port is used by the kernel as it will have to use the same port while adding/removing IP address from the association. Nevertheless, configuring port number in origin host for client mode is not supported.

accept-incoming-connections

Accepts inbound connection requests for the specified host (enables server mode).

---

**Important**

MME only: This keyword is not supported. The MME acts only in client mode; setting the S6a (HSS) endpoint to 'accept-incoming-connections' will prevent the initialization of the S6a connection to the HSS.

address ipv4_address_secondary | ipv6_address_secondary

Specifies the secondary bind address for the Diameter endpoint in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. This address must be one of the addresses of a chassis interface configured within the context in which Diameter is configured.

When a secondary IP address is dynamically added or removed from an SCTP association, the affected host notifies its peer of the change in configuration using the Address Configuration Change Chunk (ASCONF) chunk without terminating the SCTP connection.

**Usage Guidelines**

Use this command to set the bind address for the Diameter endpoint.

Diameter agent on the chassis listens to standard TCP port 3868 and also supports the acceptance of any incoming TCP connection from external server.
The command `origin host host-name` must be entered exactly once. Alternatively, the `origin host host-name address ipv4/ipv6_address [ port port_number ]` command may be entered one or more times.

This command allows the user to configure multiple endpoints with the same origin host name. That is, it allows multiple endpoints (specifically those that are used under S6a, S13 and SLg) to share the same Origin Host/Origin Realm.

Please be noted it is not possible to associate/map origin-host across endpoints to a specific diamproxy instance or maintain a constant origin host–instance mapping. Origin hosts are a pool of host entries and will be assigned on need basis. Endpoint in itself is an independent encapsulated entity.

**Example**
The following command sets the origin host name to `test` and the IP address to `10.1.1.1`:

```
origin host test address 10.1.1.1
```

### origin realm

This command configures the realm to use in conjunction with the origin host.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
[ no ] origin realm realm_name
```

`no`

Removes the origin realm configuration.

`realm_name`

Specifies the realm to bind the Diameter endpoint. The `realm_name` must be an alphanumeric string of 1 through 127 characters. The realm is the Diameter identity. The originator's realm must be present in all Diameter messages. The origin realm can typically be a company or service name.

**Usage Guidelines**

Use this command to set the realm for the Diameter endpoint.

Diameter agent on the chassis listens to standard TCP port 3868 and also supports the acceptance of any incoming TCP connection from external server.
The following command sets the origin realm to `companyx`:
```
origin realm companyx
```

### osid-change

This command stores the Origin-State-Id AVP of a diameter peer node on the P-GW. This enables the P-GW to detect and clear sessions whenever there is a change in the Origin-State-Id of the diameter peer node. This command is introduced at the diameter endpoint level.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration
```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-ctx-diameter)>
```

**Syntax Description**
```
[ no ] osid-change action [clear-subscribers]
```
- **no**
  Disables the command.
- **action**
  Specifies the action to be taken.
- **clear subscribers**
  Clears subscribers connected to the peer.

**Usage Guidelines**
Use this command to store the Origin-State-Id AVP of a diameter peer node on the P-GW. This enables the P-GW to detect and clear sessions whenever there is a change in the Origin-State-Id of the diameter peer node. This command is introduced at the diameter endpoint level.

This command is disabled by default.

**Example**
The following command clears subscribers whose origin state IDs have changed.
```
:

diameter endpoint PGW-Gx use-proxy
    origin host PGW-Gx address 30.30.30.1 osid-change action
clear-subscribers no watchdog-timeout response-timeout 7
```
connection timeout 5
connection retry-timeout 2
peer PGW-Gx-server realm PGW-Gx.com address 30.30.30.2 port 5333
#exit

**peer**

This command specifies a peer address for the Diameter endpoint.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
peer [*] peer_name [*] [ realm realm_name ] [ destination-host-name host_name ] { address ipv4/ipv6_address [ [ load-ratio load_ratio_range ] [ port port_number ] [ connect-on-application-access ] [ send-dpr-before-disconnect disconnect-cause disconnect_cause ] [ sctp ] ] + | fqdn fqdn [ [ port port_number ] [ send-dpr-before-disconnect disconnect-cause disconnect_cause ] [ rlf-template rlf_template_name enable-snmp-traps ] ] ]
no peer peer_name [ realm realm_name ]
```

**no**

Removes the specified peer configuration.

**[*] peer_name[*]**

Specifies the peer's name as an alphanumeric string of 1 through 63 characters that allows punctuation characters.

The Diameter server endpoint can now be a wildcarded peer name (with * as a valid wildcard character). Client peers which satisfy the wild-carded pattern are treated as valid peers and the connection will be accepted. The wildcarded token indicates that the peer name is wildcarded and any "*" in the preceding string is treated as a wildcard.

**realm realm_name**

Specifies the realm of this peer as an alphanumeric string of 1 through 127 characters. The realm name can be a company or service name.

**destination-host-name host_name**

Specifies the destination host name as an alphanumeric string of 1 through 63 characters. Note that this is an optional keyword.
If a peer is selected by Diameter base protocol to forward an application request, then the host name specified through the "destination-host-name" option will be used to encode the Destination-Host AVP.

This keyword "destination-host-name" is made optional for backward compatibility. That means, if the destination-host-name is not specified in the CLI, the peer name itself is copied to the destination-host-name for backward compatibility.

In releases prior to 17.0, the endpoint configuration allows each SCTP association to be uniquely identified by a Diameter peer name. But there was a requirement where two SCTP associations are identified with the same peer name. This kind of reused peer-name was used by HSS peers which act as Active and Standby HSS nodes. The SCTP associations in HSS behave in a manner such that one association is always SCTP active (for the active HSS) while the other SCTP association with the standby HSS would be closed and would keep flapping. To avoid this scenario and address customer's requirement, in 17.0 and later releases, this optional keyword "destination-host-name" has been introduced in the peer CLI command to allow multiple unique peers (Diameter HSS servers) to be configured with the same host name.

With this enhancement, MME will be capable of provisioning multiple Diameter SCTP associations to reach the same HSS peer name. This configuration will also ensure that all the Diameter messages are exchanged properly with the configured destination host.

Internally the peers are identified with unique peer-name. But the Origin-host AVP provided by the server (in CER/CEA/App-msgs) is validated against both peer-name and destination-host-name provided in the CLI. Even if multiple peers are responding with same Origin-Host, this can be validated and accepted based on the CLI configuration.

**address ipv4/ipv6_address**

Specifies the Diameter peer IP address in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation. This address must be the IP address of the device with which the chassis is communicating.

**load-ratio load_ratio_range**

Specifies the Load Ratio for the peer. The Load Ratio can be configured in the range of 0 through 65535.

As a default behavior, the CLI command is not enabled for a peer and the default Load Ratio is 1, which will be used in load balancing only when at least one peer has non-default Load Ratio configured.

Not specifying the load-ratio load_ratio_range keyword from peer configuration will put the peer in default Load Ratio, and when all the peers have default Load Ratio, Diameter load balancing will be round robin.

The CLI takes effect when Diameter applications starts using an endpoint for sending messages.

**fqdn fqdn**

Specifies the Diameter peer FQDN as an alphanumeric string of 1 through 127 characters.

**port port_number**

Specifies the port number for this Diameter peer. The port number must be an integer from 1 through 65535.

**connect-on-application-access**

Activates peer on first application access.
**send-dpr-before-disconnect**
Sends Disconnect-Peer-Request (DPR).

**disconnect-cause**
Sends Disconnect-Peer-Request to the specified peer with the specified disconnect reason. The disconnect cause must be an integer from 0 through 2, for one of the following:

- REBOOTING(0)
- BUSY(1)
- DO_NOT_WANT_TO_TALK_TO_YOU(2)

**rlf-template rlf_template_name**
Specifies the RLF template to be associated with this Diameter peer.

*rlf_template_name* must be an alphanumeric string of 1 through 127 characters.

---

**Important**
Rate Limiting Function (RLF) is a license-controlled feature. A valid feature license must be installed prior to configuring this feature. Contact your Cisco account representative for more information.

---

**Important**
Peer level RLF template takes precedence over the endpoint level template.

---

**enable-snmp-traps**
Enables the Diameter RLF related SNMP Traps. Skipping this keyword will disable sending of RLF related traps.

By default, the Diameter RLF related traps (“over-threshold”, “over-limit” and “normal-state”) notifications will not be enabled.

This keyword is meaningful only with a valid RLF template. As such, the command has the following meaning:

- **rlf-template rlf_template_name**: Use the RLF template. Disable traps if previously configured.
- **rlf-template rlf_template_name enable-snmp-traps**: Use the RLF template and enable traps.
- Skip the whole RLF template block from the peer configuration line to detach the RLF from the peer along with the traps.

**sctp**
Uses Stream Control Transmission Protocol (SCTP) for this peer.

+ Indicates that more than one of the previous keywords can be entered within a single command.
Usage Guidelines

Use this command to add a peer to the Diameter endpoint.

If the Diameter server side endpoint is catering to multiple peers, there has to be an entry for each peer in the peer list for that endpoint.

In cases where the client like GGSN does not use a diameter proxy, the peer list can be as large as the number of session managers on a GGSN. This might lead to a very complex configuration at the Diameter server endpoint.

To simplify the configurations, the Diameter server endpoint accepts a wildcarded peer name (with * as a valid wildcard character).

The client peers which satisfy the wild-carded pattern are treated as valid peers and the connection will be accepted. The new token 'wildcarded*' indicates that the peer name is wildcarded and any '*' in the preceding string should be treated as a wildcard.

For example, if the peer name is prefixed and suffixed with *ggsn* (* wildcard character) and an exact match is not found for the peer name portions peers like 0001-sessmgr.ggsn-gx, 0002-sessmgr.ggsn-gx, will be treated as valid peers at the Diameter server endpoint.

Example

The following command adds the peer named test with IP address 10.1.1.1 using port 126:

```
peer test address 10.1.1.1 port 126
```

peer-backoff-timer

This command configures the time interval after which the Diameter peer will resume sending CCR-I messages to the PCRF server.

Product

GGSN
HA
P-GW

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

Syntax Description

```
peer-backoff-timer timeout [ send-app-level-term-req ]
{ default | no } peer-backoff-timer
```

**default | no**

Removes the configured peer backoff timer from Diameter endpoint configuration.

Default value of peer-backoff-timer is 7 seconds.
**timeout**

Specifies the peer backoff timeout duration in seconds, and must be an integer from 1 through 3600.

**send-app-level-term-req**

Sends termination request from application irrespective of whether or not the peer-backoff-timer is running.

**Usage Guidelines**

Use this command to configure a peer backoff timer which will be started when the server (primary or secondary PCRF) is busy. That is, the backoff-timer is started when the result code DIAMETER_TOO_BUSY (3004) is received from the PCRF. This PCRF is then marked as unavailable for the period configured by the backoff timer.

No CCR-I messages will be sent to the server until this timer expires. This timer will be per session manager level and will be applicable only to that instance.

**Example**

The following command sets the peer backoff timeout to 20 seconds:

```
peer-backoff-timer 20
```
Usage Guidelines

Use this command to configure a timer which is started at the reception of the "DO_NOT_WANT_TO_TALK_TO_YOU" disconnect cause from the Diameter peer in Disconnect-Peer-Request message. After the timer expiry, the Diameter endpoint will automatically try to reconnect to the disconnected peer.

Currently in the system, the "DO_NOT_WANT_TO_TALK_TO_YOU" in the disconnect peer request is treated as an admin disable. Hence when the system gets into this state the connection will not be retried and the connection must be enabled by the administrator using the diameter enable endpoint command in the Exec mode.

Example

The following command sets the reconnect timeout to 100 seconds:

```
reconnect-timeout 100
```

response-timeout

This command configures the Response Timeout parameter. Response timeout specifies the maximum allowed response time for request messages sent from Diameter applications to Diameter server. On failure of reception of response for those request message within this specified time, this will be handled as failure by the corresponding applications and appropriate failure action will be initiated.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

- `response-timeout timeout`
- `default response-timeout`

`default`

Configures this command with the default setting.

Default: 60 seconds

`timeout`

Specifies the response timeout duration in seconds, and the value must be an integer from 1 through 300.

**Usage Guidelines**

Use this command to configure the Response Timeout parameter.
Example
The following command sets the response timeout to 100 seconds:
response-timeout 100

rlf-template
This command configures the RLF template to be used for the Diameter endpoint for throttling and rate control.

Important
RLF template cannot be deleted if it is bound to any application (peers/endpoints).

Product
GGSN
P-GW

Privilege
Security Administrator, Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration
configure > context context_name > diameter endpoint endpoint_name
Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx-diameter)#

Syntax Description
[ no ] rlf-template rlf_template_name [ enable-snmp-traps ]

no
Remove the specified RLF template from global configuration.

Important
Do not use "no rlf-template rlf_template_name" in endpoint configuration mode. This CLI attempts to delete the specified RLF template. This CLI is part of global configuration, and not endpoint configuration.

rlf_template_name
The name of the RLF template to be used for Diameter endpoint configuration. rlf_template_name must be an alphanumeric string of 1 through 127 characters.

enable-snmp-traps
Enables the Diameter RLF related SNMP Traps. Skipping this keyword will disable sending of RLF related traps.
By default, the Diameter RLF related traps (“over-threshold”, “over-limit” and “normal-state”) notifications will not be enabled.
This keyword is meaningful only with a valid RLF template. As such, the command has the following meaning:
• **rlf-template rlf_template_name**: Use the RLF template. Disable traps if previously configured.
  
• **rlf-template rlf_template_name enable-snmp-traps**: Use the RLF template and enable traps.
  
• **no rlf-template rlf_template_name**: Detach the RLF from the endpoint along with traps.

### Usage Guidelines

Use this command to configure the RLF Template to be used for the Diameter endpoint for throttling and rate control. This CLI command should be defined in the Diameter endpoint application to enable RLF module.

**Important**

Rate Limiting Function (RLF) is a license-controlled feature. A valid feature license must be installed prior to configuring this feature. Contact your Cisco account representative for more information.

**Important**

This CLI command takes effect only if the RLF template is defined in the Global Configuration mode and the connection to the peer is open.

Currently in the deployment of the Diameter applications (Gx, Gy, etc.), many operators make use of "**max-outstanding <number>**" as a means of achieving some rate-limiting on the outgoing control traffic. With RLF in place, this is no longer required since RLF takes care of rate-limiting in all cases. If RLF is used and **max-outstanding** is also used, there might be undesirable results.

**Important**

If RLF is being used with an "**diameter endpoint**", then set the **max-outstanding** value of the peer to be 255.

RLF provides only the framework to perform the rate limiting at the configured Transactions Per Second (TPS). The applications (like Diameter) should perform the configuration specific to each application.

For more information on this feature, refer to the rlf-template command in the *Global Configuration Mode Commands* chapter in this guide. For more information on RLF template configuration commands, refer to the *RLF Template Configuration Mode Commands* chapter in this guide.

### Example

The following command configures an RLF template named rlf_1 for Diameter endpoint:

```plaintext
global-template rlf_1
```

---

**route-entry**

This command creates an entry in the route table for Diameter peer.

<table>
<thead>
<tr>
<th><strong>Product</strong></th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privilege</strong></td>
<td>Security Administrator, Administrator</td>
</tr>
<tr>
<td><strong>Command Modes</strong></td>
<td>Exec &gt; Global Configuration &gt; Context Configuration &gt; Diameter Endpoint Configuration</td>
</tr>
</tbody>
</table>
configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
route-entry { [ host [ * ] host_name ] [ peer peer_id [ weight priority ] ] [ realm [ * ] realm_name [ application credit-control peer peer_id ] [ weight value ] | peer peer_id [ weight value ] ] } |
```

**no**

Disables the specified route-entry table configuration.

**host [ * ] host_name**

Specifies the Diameter server's host name as an alphanumeric string of 1 through 63 characters. In 18.0 and later releases, the host name can additionally accept wildcard character (*). The support for wildcard entry is provided to allow routing of Diameter messages destined to any host @ any realm through the next-hop peer.

**realm [ * ] realm_name**

Specifies the realm name as an alphanumeric string of 1 through 127 characters. The realm may typically be a company or service name. In 18.0 and later releases, the realm name can additionally accept wildcard character (*). The support for wildcard entry is provided to allow routing of Diameter messages destined to any host @ any realm through the next-hop peer.

**application credit-control**

Specifies the credit control application — DCCA or RADIUS.

**peer peer_id**

Specifies the peer ID of the Diameter endpoint route as an alphanumeric string of 1 through 63 characters.

**weight priority**

Specifies the priority for a peer in the route table as an integer from 0 through 255. Default: 10

The peer with the highest weight is used. If multiple peers have the highest weight, selection is by round-robin mechanism.

**Usage Guidelines**

Use this command to create a route table for Diameter application.

When a Diameter client starts to establish a session with a realm/application, the system searches the route table for the best match. If an entry has no host specified, the entry is considered to match the requested value. Similarly, if an entry has no realm or application specified, the entry is considered to match any such requested value. The best match algorithm is to prefer specific matches for whatever was requested, either realm/application or host/realm/application. If there are no such matches, then system looks for route table entries that have wildcards.

Wildcard (*) based Diameter realm routing is supported in 18.0 and later releases. With this feature turned ON, the customers can avoid configuring individual Diameter peers and/or realms for all possible Diameter servers in their network.
The wild card Diameter routes can be statically configured under a Diameter endpoint configuration using the CLI "route-entry realm * peer peer_name".

These route entries are treated as default route entries to be used to send a message when there is no matching host@realm based or realm based route entry available.

The wild card Diameter route is added along with other realm based route entries in diabase. The wild card route entry will be selected to route a message only if the message's destination realm does not match with any of the other static realm based routes.

For example,

route-entry realm abc.com peer peer1
route-entry realm def.com peer peer2
route-entry realm * peer peer-default

If the message's destination realm is abc.com then the message will be routed to peer1. If the message's destination realm is def.com then the message will be routed to peer2. If the destination realm is xyz.com then the message will be routed to "peer-default".

When multiple wild card route entries are configured with same weights, then the routes are selected in a round robin fashion. When multiple wild card route entries are configured with different weights, then the route with the highest weight will be selected.

In case when there are multiple wild card routes with higher and equal weights and some routes with lower weights, then only the higher weight routes will be selected in round robin-fashion. The lower weight route can be selected only when the higher weight routes are not valid because of the peers being not in good state.

Example

The following command creates a route entry with the hostname dcca_host1 and peer ID dcca_peer with priority weight of 10:

route-entry host dcca_host1 peer dcca_peer weight 10

route-failure

This command controls what action is performed for the route table after failure or recovery after failure.

Product

All

Privilege

Security Administrator, Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-ctx-diameter)#

Syntax Description

route-failure { deadtime seconds | recovery-threshold percent percentage | result-code result_code | threshold counter }
default route-failure { deadtime | recovery-threshold | threshold }

no route-failure result-code result_code

no
Disables the route-failure configuration.

default
Configures the default setting for the specified parameter.

deadtime seconds
Specifies the time duration (in seconds) for which the system keeps the route in FAILED status. When this time expires, the system changes the status to AVAILABLE.

seconds must be an integer from 1 through 86400. Default: 60

recovery-threshold percent percentage
Specifies the percentage value at which the failure counter is reset when provisionally changing the status from FAILED to AVAILABLE.

For example, if a failure counter of 16 caused the status to change to FAILED. After the configured deadtime expires, the status changes to AVAILABLE. If this keyword is configured with 75 percent, the failure counter will be reset to 12 (75 percent of 16).

percentage must be an integer from 1 through 99. Default: 90

result-code result_code
Configures which answer messages are to be treated as failures, in addition to requests that time out. Up to 16 different result codes can be specified.

result_code must be an integer from 0 through 4294967295.

threshold counter
Configures the number of errors that causes the status to become FAILED. The counter value must be an integer from 0 through 4294967295. Default: 16

The error counter begins at zero, and whenever there is a good response it decrements (but not below zero) or increments (but not above this threshold).

Usage Guidelines
Use this command to control how failure/recovery is performed for the route table. After a session is established, it is possible for the session to encounter errors or Diameter redirection messages that cause the Diameter protocol to re-use the route table to switch to a different route.

Each Diameter client within the chassis maintains counters relating to the status of each of its connections to different hosts (when the destination is realm/application without a specific host, the host name is kept as ",", i.e., blank).

Moreover, those counters are further divided according to which peer is used to reach each host. Each Diameter client maintains a status of each peer-to-host combination. Under normal good conditions the status will be AVAILABLE, while error conditions might cause the status to be FAILED.
Only combinations that are AVAILABLE will be used. If none are AVAILABLE, then system attempts the secondary peer if failover is configured and system can find an AVAILABLE combination there. If nothing is AVAILABLE, the system uses a FAILED combination.

**Example**
The following command configures the time duration for route failure to 90 seconds:

```
route-failure deadtime 90
```

### server-mode

This command configures the Diameter endpoint to establish the system as the server side endpoint of the connection.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```
server-mode [ demux-mode ]
```

**demux-mode**

Specifies that the Diameter proxy is to use the demux manager to identify the appropriate session manager. If this keyword is not enabled, the proxy will route the request directly to a session manager.

**Usage Guidelines**

Use this command to configure the Diameter endpoint to establish this system as the server side endpoint of the connection. When the Diameter proxy receives an incoming request, the proxy identifies the endpoint for the request. If the system is in client mode, the proxy extracts the instance ID of the session manager which serves as the session-ID of the request. If this command is enabled, the extraction of the instance ID is disabled.

**Example**
The following command sets the system as the server side of the Diameter endpoint and instructs the Diameter proxy to use the demux manager to identify the appropriate session manager where the request is to be routed:

```
server-mode demux-mode
```
session-id include imsi

This command associates/disassociates a Stream Control Transmission Protocol (SCTP) parameter template with the Diameter endpoint.

This command has been added under the diameter endpoint configuration mode to include IMSI in Diameter session-ID per Diameter endpoint at Gx, Gy, and Gz (Rf). Configuration changes will be applicable only to new Sessions at Gx, Gy and Rf. Configuration changes will not have any impact on existing sessions behavior at Gx, Gy, and Rf. For Gy, multiple Diameter sessions can be initiated per subscriber and the session ID format setting will bind to the subscriber. The setting will be taken to effect when the first Diameter session is established and following Gy sub sessions will keep using the session ID format used in first session.

Product
All

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

configure > context context_name > diameter endpoint endpoint_name

Entering the above command sequence results in the following prompt:
[context_name]host_name(config-ctx-diameter)#

Syntax Description

session-id include imsi
[no] session-id include imsi

no
Disables this feature, that is, IMSI is not included in the Diameter Session-ID, which is the default behavior.

include
Includes configured information in Diameter Session-ID.

imsi
Includes International Mobile Subscriber Identification (IMSI) in Diameter Session-ID.

session-id
Describes Diameter Session-ID format.

Usage Guidelines
Use this command to include IMSI in Diameter session-ID per Diameter endpoint at Gx, Gy, and Gz (Rf).

Example
The following command includes IMSI in Diameter session-ID per Diameter endpoint at Gx, Gy, and Gz (Rf):

```
session-id include imsi
```
This command enables/disables the Transport Layer Security (TLS) support between a Diameter client and Diameter server node.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
(context_name)host_name(config-ctx-diameter)#
```

**Syntax Description**

```
tls { certificate certificate | password password | privatekey private_key } default tls
```

- **default**
  Disables the TLS support at Diameter endpoint.

- **certificate certificate**
  Specifies the certificate for TLS support. The certificate must appear encrypted, and must be an alphanumeric string of 700 through 900 characters.

- **password password**
  Specifies the password for TLS support. The password must be encrypted, and must be an alphanumeric string of 6 through 50 characters.

- **privatekey private_key**
  Specifies the private key for TLS support. The private key must be encrypted, and must be an alphanumeric string of 900 through 1500 characters.

**Usage Guidelines**
Use this command to configure TLS support between a Diameter client and Diameter server node. By default, TLS is disabled.

**Important**
Both the Diameter client and server must be configured with TLS enabled or TLS disabled; otherwise, the Diameter connection will be rejected.

**Example**
The following commands enable the TLS between a Diameter client and Diameter server node:

```
tls certificate "-----BEGIN CERTIFICATE-----
```

use-proxy

This command enables(disables) Diameter proxy for the Diameter endpoint. By default this command is disabled.
**Product**
IPCF

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration

```command
configure > context context_name > diameter endpoint endpoint_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

```plaintext
use-proxy [ server-mode [ demux-mode ] ]
no use-proxy
```

**no**

Disables Diameter proxy for the current endpoint.

This command at endpoint level will equip an application to use Diameter proxy to route all its messages to an external peer.

**server-mode**

Specifies that the Diameter endpoint to establish the Diameter proxy as the server side endpoint of the connection.

**demux-mode**

Specifies that the Diameter endpoint to establish the Diameter proxy to use the Demux manager to identify the appropriate session manager. If this keyword is not enabled, the proxy will route the request directly to a session manager.

IPCF uses BindMux to identify the appropriate session manager.

**Usage Guidelines**

Use this command to establish a Diameter proxy to route all its messages to an external peer. The proxy acts as an application gateway for Diameter. It gets the configuration information at process startup and decides which Diameter peer has to be contacted for each application. It establishes the peer connection upon finding no peer connection already exists.

IPCF uses Bindmux as a Demux manager to help distribute new incoming sessions across available Sessmgrs on the system.

All the incoming Diameter requests/responses land on Diamproxy. Diamproxy checks if a Sessmgr is already serving this session based on parameters like session-id and peer-id of the request/response.

If no Sessmgr is allocated to the request and the Demux mode is ON, the DiamProxy forwards the new request to Demux/Bindmux for sessmgr allocation. Demux/Bindmux has updated information about the load on all the Sessmgrs and assigns the optimal Sessmgr to the Diameter session. Once a Sessmgr is allocated for the session, a mapping of session-id to Sessmgr is added at Diamproxy. All further requests for this session will be directly routed to Sessmgr.

Each proxy task will automatically select one of the host names configured with the `origin host` command. Multiple proxy tasks will not use the same host names, so there should be at least as many host names as proxy tasks. Otherwise, some proxy tasks will not be able to perform Diameter functionality. The chassis automatically selects which proxy tasks are used by which managers (i.e., ACSMgrs, Sessmgrs), without verifying whether the proxy task is able to perform Diameter functionality.
To be able to run this command, the Diameter proxy must be enabled. In the *Global Configuration Mode Commands* chapter, see the description of the `require diameter-proxy` command.

In 17.0 and later releases, when a PCEF is connected to OCS via multiple Diameter proxies, PCEF will choose the same Diameter proxy for the subsequent messages as long as it is available. Any subsequent messages (CCR-U/CCR-T) to the same host are sent via the same peer. Once the next-hop is chosen via round-robin method, the subsequent message for the session is sent to the same next-hop (peer).

In releases prior to 18.0, when the chassis is in standby state, all the Diameter proxies are stopped. In 18.0 and later releases, all the Diameter proxies will be running even when the chassis is in standby mode. Any change in ICSR grouping mask will lead to stopping and restarting of all the diamproxies on the standby chassis.

**Example**

The following command enables Diameter proxy for the current endpoint:

```
use-proxy
```

The following command disables Diameter proxy for the current endpoint:

```
no use-proxy
```

**vsa-support**

This command allows DIABASE to use vendor IDs configured in the dictionary for negotiation of the Diameter peers' capabilities regardless of the supported vendor IDs received in Capabilities-Exchange-Answer (CEA) messages.

**Product**

- GGSN
- PDSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration > Diameter Endpoint Configuration
- `configure > context context_name > diameter endpoint endpoint_name`

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-ctx-diameter)#
```

**Syntax Description**

- `vsa-support { all-from-dictionary | negotiated-vendor-ids }`
- `default vsa-support`

**default**

Configures this command with the default setting.

Default: `negotiated-vendor-ids`

- `all-from-dictionary`

Allows DIABASE to use the vendor IDs from the dictionary as indicated in the Capabilities-Exchange-Request (CER) messages from Diameter peers.
negotiated-vendor-ids

Allows DIABASE to use the supported vendor IDs satisfying capability negotiation.

Usage Guidelines

Use this command to set DIABASE to use the vendor IDs from the dictionary or use the vendor IDs satisfying the capabilities negotiation.

Example

The following command enables DIABASE to use the vendor IDs specified in the dictionary:

```
vsa-support all-from-dictionary
```

**watchdog-timeout**

This command configures the Watchdog Timeout parameter.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
exec > global configuration > context configuration > diameter endpoint configuration
```

**Syntax Description**

```
watchdog-timeout timeout

{ default | no } watchdog-timeout

no

Disables the watchdog timeout configuration.

default

Configures this command with the default setting.

Default: 30 seconds

timeout

Specifies the timeout duration (in seconds) as an integer from 6 through 30.

Usage Guidelines

Use this command to configure the Watchdog Timeout parameter for the Diameter endpoint. If this timer expires before getting a response from the destination, other route to the same destination is tried, as long as the retry count setting has not exceeded (see the CLI command) and as long as the response timer has not expired (see the CLI command).

If the watchdog timer expires, the gateway sends the heartbeat message to Diameter endpoint. The timer is allowed to have the value up to a maximum of +2 or -2 seconds from the configured value.
Example

The following command sets the watchdog timeout setting to 15 seconds:

```
watchdog-timeout 15
```
watchdog-timeout
Diameter HDD Module Configuration Mode Commands

The HDD Module Configuration Mode allows you to configure Hard Disk Drive (HDD) module to store the failed CCR-T messages during OCS failure.

Important

The commands in this configuration mode are license dependent. For more information, contact your Cisco account representative.

Command Modes

Exec > Global Configuration > Context Configuration > Diameter HDD Module Configuration

configure > context context_name > diameter-hdd-module

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-diameter-hdd)#

Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- diameter-event, on page 1053
- end, on page 1058
- exit, on page 1058
- file, on page 1058

diameter-event

This command allows you to configure the HDD specific parameters.

Important

This command is license dependent. For more information, contact your Cisco account representative.
P-GW

Security Administrator, Administrator

**Privilege**

Exec > Global Configuration > Context Configuration > Diameter HDD Module Configuration

**Command Modes**

configure > context context_name > diameter-hdd-module

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-diameter-hdd)#
```

**Syntax Description**

diameter-event { purge { storage-limit storage_limit | time-limit time_limit } [ max-files max_records_to_purge ] | push-interval push_interval | push-trigger space-usage-percent trigger_percentage | remove-file-after-transfer | transfer-mode { pull [ module-only ] | push primary { encrypted-url encrypted_url | url url } [ [ max-files max_records ] [ max-tasks task_num ] [ module-only ] [ secondary { encrypted-secondary-url encrypted_secondary_url | secondary-url secondary_url } ] [ via local-context ] + ] | use-harddisk } default diameter-event { purge | push-interval | push-trigger space-usage-percent | remove-file-after-transfer | transfer-mode [ module-only | push via ] | use-harddisk ] +

**default**

Configures the default setting for the specified keyword(s):

- **purge**: Disabled
- **push-interval**: 300 seconds
- **push-trigger**: 80 percent
- **remove-file-after-transfer**: Disabled
- **transfer mode**: Pull
- **push via**: Line Card (LC) is used for push
- **use-harddisk**: Disabled

**Important**

The **use-harddisk** keyword is available only on the ASR 5000 and ASR 5500 chassis.

**no**

If previously configured, disables the specified configuration:

- **purge**: Disables purging of Diameter records.
- **remove-file-after-transfer**: Retains a copy of the Diameter file even after it has been pushed or pulled to another server.
- **use-harddisk**: Disables data storage on the ASR 5000 SMC hard disk or ASR 5500 hard disk array.
The **use-harddisk** keyword is available only on the ASR 5000 and ASR 5500 chassis.

```plaintext
purge { storage-limit storage_limit | time-limit time_limit } { max-files max_records_to_purge }
```

Specifies to purge/delete the Diameter records based on "time" or "volume" limit.

When the configured threshold limit is reached on the hard disk drive, the records that are created dynamically in the `/mnt/hd-raid/data/records/` directory are automatically deleted. Files that are manually created should be deleted manually.

- **storage-limit storage_limit**: Specifies to start deleting files when the specified megabytes of space is used for storage. `storage_limit` specifies the volume limit for the record files, in megabytes, and must be an integer from 10 through 143360.

- **time-limit time_limit**: Specifies to start deleting files older than the specified time limit. `time_limit` specifies the time limit for the record files, and must be an integer from 600 through 2592000.

- **max-files max_records_to_purge**: Specifies the maximum number of records to purge.

  `max_records_to_purge` can be 0, or an integer from 1000 through 10000. If the value is set to 0, during each cycle, the records will be deleted until the purge condition is satisfied. If the value is set between 1000 and 10000, during each cycle, the records will be deleted until either the purge condition is satisfied or the number of records deleted equals the configured `max-files` value.

  Default: 0

```plaintext
push-interval push_interval
```

Specifies the transfer interval (in seconds) to push Diameter files to an external file server. `push_interval` must be an integer from 60 through 3600.

Default: 300

```plaintext
push-trigger space-usage-percent trigger_percentage
```

Specifies the record disk space utilization percentage, upon reaching which an automatic push is triggered and files are transferred to the configured external server.

`trigger_percentage` specifies the record disk utilization percentage for triggering push, and must be an integer from 10 through 80.

Default: 80

```plaintext
remove-file-after-transfer
```

Specifies that the system must delete Diameter files after they are transferred to the external file server. Default: Disabled

```plaintext
transfer-mode { pull [ module-only ] | push primary { encrypted-url encrypted_url | url url } [ [ max-files max_records ] [ max-tasks task_num ] [ module-only ] ] secondary { encrypted-secondary-url encrypted_secondary_url | secondary-url secondary_url } ] [ via local-context ] + }
```

Specifies the file transfer mode—how the Diameter files are transferred to an external file server.
• **pull**: Specifies that the external server is to pull the Diameter files.

• **push**: Specifies that the system is to push Diameter files to the configured external server.

• **max-files** \(max\_records\): Specifies the maximum number of files sent per iteration based on configured file size.
  
  Default: 4000

• **max-tasks** \(task\_num\): Specifies the maximum number of tasks (child processes) that will be spawned to push the files to the remote server. The \(task\_num\) must be an integer from 4 through 8.
  
  Default: 4

  __Important__

  Note that increasing the number of child processes will improve the record transfer rate. However, spawning more child will consume additional resource. So, this option needs to be used with proper resource analysis.

• **module-only**: Specifies that the transfer-mode is only applicable to the HDD module. This enables to support individual record transfer-mode configuration for each module.

• **primary encrypted-url** \(encrypted\_url\): Specifies the primary URL location in encrypted format to which the system pushes the Diameter files.
  
  \(encrypted\_url\) must be the location in an encrypted format, and must be an alphanumeric string of 1 through 1024 characters.

• **primary url** \(url\): Specifies the primary URL location to which the system pushes the Diameter files.
  
  \(url\) must be the location, and must be an alphanumeric string of 1 through 1024 characters in the "/user:password@host:[port]/directory" format.

• **secondary encrypted-secondary-url** \(encrypted\_secondary\_url\): Specifies the secondary URL location in encrypted format to which the system pushes the Diameter files when the primary location is unreachable or fails.
  
  \(encrypted\_secondary\_url\) must be the secondary location in an encrypted format, and must be an alphanumeric string of 1 through 1024 characters in the "/user:password@host:[port]/directory" format.

• **secondary secondary-url** \(secondary\_url\): Specifies the secondary location to which the system pushes the Diameter files when the primary location is unreachable or fails.
  
  \(secondary\_url\) must be the secondary location, and must be an alphanumeric string of 1 through 1024 characters in the "/user:password@host:[port]/directory" format.

• **via local-context**: Configuration to select LC/SPIO for transfer of Diameter records. The system pushes the Diameter files via SPIO in the local context.

**use-harddisk**

__Important__

The **use-harddisk** keyword is available only on the ASR 5000 and ASR 5500 chassis.
**Usage Guidelines**

Use this command to configure how the Diameter records are moved and stored.

On the ASR 5000 or ASR 5500 chassis, you must run this command only from the local context. If you run this command in any other context it will fail and result in an error message.

If PUSH transfer mode is configured, the external server URL to which the Diameter files need to be transferred to must be specified. The configuration allows a primary and a secondary server to be configured. Configuring the secondary server is optional. Whenever a file transfer to the primary server fails for four consecutive times, the files will be transferred to the secondary server. The transfer will switch back to the original primary server when:

- Four consecutive transfer failures to the secondary server occur.
- After switching from the primary server, 30 minutes elapses.

When changing the transfer-mode from pull to push, disable the PULL from the external server and then change the transfer mode to push. Make sure that the push server URL configured is accessible from the local context. Also, make sure that the base directory that is mentioned contains the "diameter" directory created within it.

When changing the transfer mode from push to pull, after changing, enable PULL on the external server. Any of the ongoing PUSH activity will continue till all the scheduled file transfers are completed. If there is no PUSH activity going on at the time of this configuration change, all the PUSH related configuration is nullified immediately.

The `use-harddisk` command is available only on the ASR 5000 and ASR 5500 chassis. This command can be run only in a context where CDRMOD is running. Configuring in any other context will result in failure with the message "Failure: Please Check if CDRMOD is running in this context or not."

The `use-harddisk` command is configured to store EDR/UDR/EVENT/DIAMETER files. Configuring in one of the modules will prevent the configuration to be applied in the other module. Any change to this configuration must be done in the module in which it was configured, the change will be applied to all the record types.

The VPNMgr can send a maximum of 4000 files to the remote server per iteration. However, if the individual file size is big (say when compression is not enabled), then while transferring 4000 files SFTP operation takes a lot of time. To prevent this, the `transfer-mode push` command can be configured with the keyword `max-files`, which allows operators to configure the maximum number of files sent per iteration based on configured file size.

**Limitations:**

- When an ICSR event occurs unexpectedly before the CCR-T message is written, the CCR-T will not written to the HDD and hence the usage will be lost.
It is expected that the customers requiring this feature should monitor the HDD and periodically pull and delete the files so that the subsequent records can be buffered.

**Example**
The following command retains a copy of the Diameter file after it has been transferred to the storage location:

```
no diameter-event remove-file-after-transfer
```

**end**
Exits the current configuration mode and returns to the Exec mode.

---

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
end
```

**Usage Guidelines**
Use this command to return to the Exec mode.

---

**exit**
Exits the current mode and returns to the parent configuration mode.

---

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
```
exit
```

**Usage Guidelines**
Use this command to return to the parent configuration mode.

---

**file**
This command allows you to configure the file creation properties for Diameter records.

---

**Important**
This command is license dependent. For more information, contact your Cisco account representative.

---

**Product**
HA
P-GW

**Privilege**
Security Administrator, Administrator
Command Modes

Exec > Global Configuration > Context Configuration > Diameter HDD Module Configuration

configure > context context_name > diameter-hdd-module

Entering the above command sequence results in the following prompt:

[context_name]host_name(config-diameter-hdd)#

Syntax Description

file [ compression { gzip | none } ] [ current-prefix string ] [ delete-timeout seconds ] [ directory directory_name ] [ exclude-checksum-record ] [ field-separator { hyphen | omit | underscore } ] [ name file_name ] [ reset-indicator ] [ rotation [ num-records number | tariff-time minute ] minute_value ] [ hour hour_value ] [ time time_value ] [ seconds seconds_value ] [ volume bytes ] [ sequence-number num-records num-value ] [ time-stamp { expanded-format | rotated-format | unix-format } ] [ default file [ compression ] [ current-prefix ] [ delete-timeout ] [ directory ] [ field-separator ] [ name ] [ reset-indicator ] [ rotation { num-records | tariff-time | time | volume } ] [ sequence-number ] [ time-stamp ] [ trailing-text ] [ trap-on-file-delete ] [ xor-final-record ] +

default

Configures the default setting for the specified keyword(s).

compression { gzip | none }

Specifies compression of Diameter files.

• gzip: Enables GNU zip compression of the Diameter file at approximately 10:1 ratio.
• none: Disables Gzip compression.

Default: none

current-prefix string

Specifies a string to add to the beginning of the Diameter file that is currently being used to store Diameter records.

string must be an alphanumeric string of 1 through 31 characters.

Default: curr

delete-timeout seconds

Specifies a timeout period (in seconds) when completed Diameter files are deleted. By default, files are never deleted.

seconds must be an integer from 3600 through 31536000.

Default: Disabled
**directory directory_name**

Specifies a subdirectory in the default directory in which to store Diameter files.

`directory_name` must be an alphanumeric string of 1 through 191 characters.

Default: `/records/diameter`

**exclude-checksum-record**

When entered, this keyword excludes the final record containing #CHECKSUM followed by the 32-bit Cyclic Redundancy Check (CRC) of all preceding records from the Diameter file.

Default: Disabled (inserts checksum record into the Diameter file)

**field-separator [ hyphen | omit | underscore ]**

Specifies the field inclusion/exclusion type of separators between two fields of Diameter file name:

- **hyphen**: Specifies to use ".-" (hyphen) as the field separator.
- **omit**: Excludes the field separator.
- **underscore**: Specifies to use "._" (underscore) as the field separator. This is the default field separator.

**name file_name**

Specifies a string to be used as the base file name for Diameter files.

Default: `diameter`

`file_name` must be an alphanumeric string of 1 through 31 characters.

**reset-indicator**

Specifies inclusion of the reset indicator counter value, from 0 through 255, in the Diameter file name, and is incremented (by one) whenever any of the following conditions occur:

- An ACSMgr/SessMgr process fails.
- A peer chassis has taken over in compliance with the Interchassis Session Recovery feature.
- The sequence number has rolled over to zero.

**rotation { num-records number | tariff-time minute minute_value hour hour_value | time seconds | volume bytes }**

Specifies when to close a Diameter file and create a new one.

- **num-records number**: Specifies the number of records that should be added to the file. When the number of records in the file reaches the specified value, the file is complete.
  
  `number` must be an integer from 100 through 10240.
  
  Default: 1024

- **time seconds**: Specifies the period of time (in seconds) to wait before closing the Diameter file and creating a new one.
seconds must be an integer from 30 through 86400.
Default: 3600

- tariff-time minute minute_value hour hour_value: Specifies the time of day (hour and minute) at which
  the files are rotated once per day.

  minute_value is an integer value from "0" up to "59".
  hour_value is an integer value from "0" up to "23".

Important The options time and tariff-time are mutually exclusive and only any one of
  them can be configured. Other file rotation options can be used with either of
  them.

- volume bytes: Specifies the maximum size (in bytes) of the Diameter file before closing it and creating
  a new one.

  bytes must be an integer from 51200 through 62914560.
Default: 102400
Note that a higher setting may improve the compression ratio when the compression keyword is set to
gzip.

sequence-number { length length | omit | padded | padded-six-length | unpadded }

Specifies including/excluding sequence number in the file name.

- length length: Includes the sequence number with the specified length.

  length must be the length of the file sequence number, with preceding zeroes, in the file name, and must
  be an integer from 1 through 9.

- omit: Excludes the sequence number from the file name.

- padded: Includes the padded sequence number with preceding zeros in the file name. This is the default
  setting.

- padded-six-length: Includes the padded sequence number with six preceding zeros in the file name.

- unpadded: Includes the unpadded sequence number in the file name.

storage-limit limit

Specifies deleting files when the specified amount of space (in bytes) is used up for Diameter file storage
RAM on packet processing cards.

limit must be an integer from 10485760 through 536870912. Default: 33554432

Important The total storage limit is 536870912 bytes (512 MB). This limit is for all the record
(EDR/UDR/EVENT/Diameter) files.
time-stamp { expanded-format | rotated-format | unix-format }

Specifies the timestamp of when the file was created to be included in the file name.

- **expanded-format**: Specifies the UTC MMDDYYYYHHMMSS format. This is the default setting.
- **rotated-format**: Specifies the time stamp format to YYYYMMDDHHMMSS format.
- **unix-format**: Specifies the UNIX format of \( x.y \), where \( x \) is the number of seconds since 1/1/1970 and \( y \) is the fractional portion of the current second that has elapsed.

trailing-text string

Specifies the inclusion of an arbitrary text string in the file name.

*string* must be an alphanumeric string of 1 through 30 characters.

Default: Disabled

trap-on-file-delete

Instructs the system to send an SNMP notification (starCDRFileRemoved) when the Diameter file is deleted due to lack of space.

Default: Disabled

xor-final-record

Specifies inserting an XOR checksum (in place of the CRC checksum) into the Diameter file header if the exclude-checksum-record is left at its default setting.

Default: Disabled

+

Indicates that multiple keywords can be specified in a single command entry. When the “+” appears in the syntax, any of the keywords that appear prior to the “+” can be entered in any order.

**Usage Guidelines**

Use this command to configure file characteristics for Diameter records.

**Example**

The following command sets the prefix of the current active Diameter file to *Current*:

```
file current-prefix Current
```
Diameter Failure Handling Template Configuration Mode Commands

Command Modes

Diameter Failure Handling Template Configuration Mode is accessed from the Global Configuration Mode. This mode allows an operator to configure failure handling template that can be associated to different Diameter services.

Exec > Global Configuration > Failure Handling Template Configuration

configure > failure-handling-template template_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-fh-template)#

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 1063
- exit, on page 1064
- msg-type, on page 1064

end

Exits the current configuration mode and returns to the Exec mode.

Product

All

Privilege

Security Administrator, Administrator

Syntax Description

end

Usage Guidelines

Use this command to return to the Exec mode.
exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
exit

**Usage Guidelines**
Use this command to return to the parent configuration mode.

msg-type

This command specifies the failure handling behavior in the event of a communication failure with the prepaid server.

**Product**
GGSN
HA
HSGW
IPSG
PDSN
P-GW
S-GW
SAEGW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Failure Handling Template Configuration

configure > failure-handling-template template_name

Entering the above command sequence results in the following prompt:

[local]host_name(config-fh-template)#

**Syntax Description**

msg-type { any | authentication info request | authorization-request | check-identity-request | credit-control-initial | credit-control-terminate | credit-control-update | eap-request | eap-termination-request | notify-request | profile-update-request | purge-ue-request | update-location-request | user-data-request } failure-type { any | diabase-error | diameter result-code { any-error | result-code [ to end-result-code ] } } | diameter exp-result-code { any-error | result-code [ to end-result-code ] } } | resp-timeout | tx-expiry } action { continue [ discard-traffic | local-fallback { without-retry } | retry-server-on-event | send-ccrt-on-call-termination { without-retry } | retry-and-terminate }
Diameter Failure Handling Template Configuration Mode Commands

```
[ max-transmissions | without-term-req ] | terminate [ without-term-req ]

no msg-type { any | authentication info request | authorization-request
| check-identity-request | credit-control-initial |
credit-control-terminate | credit-control-update | eap-request |
eap-termination-request | notify-request | profile-update-request |
| purge-ue-request | update-location-request | user-data-request }

failure-type { any | diabase-error | diameter result-code { any-error |
result-code [ to end-result-code ] } | diameter exp-result-code { any-error |
result-code [ to end-result-code ] } | resp-timeout | tx-expiry }
```

no

Removes the configuration associated with the failure handling template.

```
-msg-type { any | authentication info request | authorization-request
| check-identity-request | credit-control-initial |
credit-control-terminate | credit-control-update | eap-request |
eap-termination-request | notify-request | profile-update-request |
| purge-ue-request | update-location-request | user-data-request }

failure-type { any | diabase-error | diameter result-code { any-error |
result-code [ to end-result-code ] } | diameter exp-result-code { any-error |
result-code [ to end-result-code ] } | resp-timeout | tx-expiry }
```

Defines the failure handling behavior based on the failures in the following request messages:

- Any request
- Authentication-Information Request through S6a or S13 Diameter interface
- Authorization Request through PDIF-EAP, STa, S6b, or Wm interface
- Check-Identity-Information-Request through S6a or S13 interface
- Credit-Control-Initial-Request (CCR-I) through Gx, Gy or Ty interface
- Credit-Control-Terminate-Request (CCR-T) through Gx, Gy or Ty interface
- Credit-Control-Update-Request (CCR-U) through Gx, Gy or Ty interface
- EAP request through Cx, PDIF-EAP, STa, S6b, or Wm interface
- EAP Termination request through Cx, PDIF-EAP, STa, S6b, or Wm interface
- Notify-Request through S6a or S13 interface
- Profile-Update-Request through Sh interface
- Purge-UE-Request through S6a or S13 interface
- Update-Location-Request through S6a or S13 interface
- User-Data-Request through Sh interface

Defines the failure handling behavior based on the different types of failure, for example, Diabase error or any error due to expiry of response timeout or Tx timer, etc.
result-code [ to end-result-code ]: result-code specifies the result code number, must be an integer from 3000 through 9999. end-result-code specifies the upper limit of a range of result codes. end-result-code must be greater than result-code.


Configures the action to be taken in the event of a communication failure with the server from one of the following:

- **continue** – In the event of a failure the user session continues. DCCA/Diameter will make periodic request and/or connection retry attempts and/or will attempt to communicate with a secondary peer depending on the peer configuration and session-binding setting.

  - **discard-traffic** – Continue the session but blocks/discards the data traffic.

  Use this command to specify the behavior in the event of a communication failure with the prepaid server. If there are different failure handling configurations present within the template for the same message type, the action is applied as per the latest error encountered.

  If previously configured, use the `no msg-type { credit-control-initial | credit-control-terminate | credit-control-update } failure-type any action continue discard-traffic` CLI command to remove the configuration associated with the failure handling template.

  The **discard-traffic** keyword takes effect when "continue" action is configured and Gy failure happens.

  This CLI option is disabled by default.

- **local-fallback** – Continue the session with the PCC rules defined in the local policy.

  - **without-retry** – Continue the session without retrying the secondary PCRF server. By default, the message will be retried to secondary PCRF before falling back to the local policy.

  The **without-retry** keyword is introduced to support Overload Control on Diameter interfaces such as Gx, S6b and SWm and also to prevent network overload and outages. For more information on Diameter Overload Control feature, refer to the AAA Interface Administration and Reference guide.

- **retry-server-on-event** – Reconnects to PCRF server on update and termination requests or re-authorization from server, for failure-handling CONTINUE sessions.

  **Important** This option is valid only for credit-control-update request though it is allowed to configure for all the requests.

- **send-ccrt-on-call-termination** – Sends CCR-T to PCRF on call termination for failure-handling CONTINUE.

  **Important** This option is valid only for credit-control-update request though it is allowed to configure for all the requests.
• **without-retry** – Continue the session without retrying the secondary PCRF.

• **retry-and-terminate** – In the event of a failure the user session continues for the duration of one retry attempt with the server. If this retry attempt also fails, the session is terminated.

• **max-transmissions number-of-retries**: Specifies the maximum number of retries to the server. The maximum server retries that can be configured is 5 and the default value for retries is 1. When max-retries are exhausted, session termination happens.

CCR-U is retried for a maximum of number of retries configured in the failure handling template when experimental result code (4198 - DIAMETER_PENDING_TRANSACTION) is received from PCRF in CCA-U.

**Important**

In releases prior to 17, CCR-U is retried for a maximum of number of times configured in the failure handling template when experimental result code with a proprietary value "4198 - DIAMETER_PENDING_TRANSACTION" is received from PCRF in CCA-U. In release 17 and later, support is added for Negotiation of Pending Transactions (PT) in initial session establishment, and the standards-defined experimental result code (4144) is used in CCA/RAA to advertise the support of the PT feature.

• **without-term-req** – Terminate the session without sending the termination request (CCR-T).

• **terminate** – In the event of a failure the user session is terminated.

• **without-term-req** – Terminate the session without sending the termination request (CCR-T).

**Usage Guidelines**

Use this command to specify the behavior in the event of a communication failure with the prepaid server. If there are different failure handling configurations present within the template for the same message type, the action is applied as per the latest error encountered.

Lookup is done first to identify if there is an exact match for **message-type** and **failure-type**. If not present, lookup is done for 'any' match for message and failure type.

That is, when there are multiple matches, it is preferred to find a match to a specifically configured value over a match to something configured with **any** or **any-error**. If there are multiple best matches, the one with a specifically configured **msg-type** over a match to **msg-type any** is preferred.

There are two levels of possible communication failure:

• The TCP connection failed

• DIAMETER routing failed to deliver a request or failed to receive a response.

The specified behavior is used for sessions when no behavior is specified by the server, such as by the CC-Failure-Handling AVP in DIAMETER messages. This command may be entered once for each type of message.

The following are the default action for Diameter result codes:

• For all protocol error codes 3000 to 3999, the default action is **terminate**. For all transient error codes 4000, 4001, 4004 to 4180, and 4182 to 4999, the default action is **continue**.

• For transient error codes 4002, 4003, and 4181, the default action is retry-and-terminate.
• For error code 4001, the default action is **terminate**.
• For permanent error codes 5000 to 5999, the default action is **terminate**.

**Example**

The following command configures to terminate the session when the Diameter application encounters a failure due to Diabase error in the Credit-Control Initial Request (CCR-I) message:

```
msg-type credit-control-initial failure-type diabase-error action terminate
```
Diameter Host Select Configuration Mode Commands

Diameter Host Select Configuration Mode is accessed from the Global Configuration Mode. This mode allows an operator to configure Diameter host tables of peer servers that can be shared by different services.

### Command Modes

```
Exec > Global Configuration > Diameter Host Select Configuration
configure > diameter-host-template template_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-host-template)#
```

### Important

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- end, on page 1069
- exit, on page 1070
- host-select row-precedence, on page 1070
- host-select table, on page 1073

### end

Exits the current configuration mode and returns to the Exec mode.

### Product

All

### Privilege

Security Administrator, Administrator

### Syntax Description

**end**

Use this command to return to the Exec mode.
**exit**

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**
`exit`

**Usage Guidelines**
Use this command to return to the parent configuration mode.

---

**host-select row-precedence**

This command configures individual rows of peer servers within the Diameter host table.

**Product**
GGSN
HA
HSGW
IPSG
PDSN
P-GW
SCM
SAEGW
S-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Diameter Host Select Configuration

`configure > diameter-host-template template_name`

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-host-template)#
```

**Syntax Description**
In StarOS 14.1 and earlier releases:

```
host-select row-precedence precedence table { 1 | 2 } host host_name [ realm realm_id ] [ secondary host sec_host_name realm sec_realm_id ] [ -noconfirm ]

host-select row-precedence precedence table prefix-table { 1 | 2 } msisdn-prefix-from msisdn_prefix_from msisdn-prefix-to msisdn_prefix_to host host_name [ realm realm_id ] [ secondary host sec_host_name realm sec_realm_id ] [ -noconfirm ]
```

---
no host-select row-precedence precedence table { 1 | 2 | prefix-table { 1 | 2 } } [-noconfirm]

In StarOS 15.0 and later releases:

host-select row-precedence precedence table { 1 | 2 } host host_name [ realm realm_id ] [ secondary host sec_host_name realm sec_realm_id ] ] [-noconfirm ]

host-select row-precedence precedence table { { range-table { 1 | 2 } { imsi-based { [ prefix | suffix ] imsi-value [ to imsi-value ] } | msisdn-based { [ prefix | suffix ] msisdn-value [ to msisdn-value ] } } host host_name [ realm realm_id ] [ secondary host sec_host_name realm sec_realm_id ] algorithm { active-standby | round-robin } ] } [-noconfirm ]

no host-select row-precedence precedence table { 1 | 2 | range-table { 1 | 2 } } [-noconfirm ]

no

Removes the specified row from the primary or secondary table or primary/secondary MSISDN prefix table for 14.0 and earlier releases, or IMSI/MSISDN range table for 15.0 and later releases.

row-precedence precedence

Specifies the row in the table as an integer from 1 through 128. Note that the row precedence number in IMSI/MSISDN configuration must be unique.

---

**Important**

In StarOS release 14.0 and later, `precedence` may be an integer from 1 through 256 for SCM.

---

**Table**

`table { 1 | 2 }

Specifies the Diameter host table that will be edited.

- 1: Specifies the primary table
- 2: Specifies the secondary table

---

**Important**

This command syntax is applicable to StarOS release 14.1 and earlier.

**Prefix Table**

`prefix-table { 1 | 2 }`: Specifies a primary or secondary table containing ranges of MSISDN prefixes.

**msisdn-prefix-from** `msisdn_prefix_from` `msisdn-prefix-to` `msisdn_prefix_to`: Specifies the starting and ending Mobile Station International Subscriber Directory Number (MSISDN) prefixes for a row in the prefix-table.

**host** `host_name`: Identifies the primary Diameter peer server to be added to this row by its host name. `host_name` can be entered as an IP address or a DNS hostname (1 through 128 alphanumeric characters).
**secondary host** host_name: Identifies the secondary Diameter peer server to be added to this row by its host name. host_name can be entered as an IP address or a DNS hostname (1 through 128 alphanumeric characters).

**realm** realm_id: Specifies an optional realm ID as an alphanumeric string of 1 through 128 characters.

**table** {{ range-table { 1 | 2 } { imsi-based { [ prefix | suffix ] imsi-value [ to imsi-value ] } | msisdn-based { [ prefix | suffix ] msisdn-value [ to msisdn-value ] } } host host_name [ realm realm_id ] [ secondary host sec_host_name realm sec_realm_id ] } [ algorithm { active-standby | round-robin } ] }}

**Usage Guidelines**

Use this command to add or modify individual rows in Diameter host server tables. Each table may contain up to 256 rows.

In Releases 15.0 and later, the existing CLI command "**host-select row-precedence**" in the Diameter Host Template Configuration mode is modified to enable the selection of Diameter peer based on the configured prefix/suffix/range values of IMSI or MSISDN of subscriber. This configuration change allows the overlapping range of IMSI or MSISDN values.

PCRF peer selection is based on the first match of prefix/suffix/range on row precedence priorities. If the subscriber's IMSI/MSISDN does not match with any configured IMSI/MSISDN range, then IMS Authorization application selects the default peer.

**Important**

The length of IMSI or MSISDN range is the same in any IMSI or MSISDN host template configuration list.

Once a row is selected the failure handling for the subscriber is done based on this configuration. With this feature being turned on, the primary and the secondary hosts configured can be picked up in an active standby mode or in round robin fashion.
Example
The following command adds a row to a Diameter peer server table with the following parameters:

- row (precedence) = 1
- table = 1 (primary)
- Diameter peer server hostname = minid
- realm = namerica

`host-select row-precedence 1 table 1 host minid realm namerica`

**host-select table**

This command configures a table of peer servers associated with the Diameter host template.

**Product**
GGSN
HA
HSGW
IPSG
PDSN
P-GW
SCM
SAEGW
S-GW

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Diameter Host Select Configuration
```
configure > diameter-host-template template_name
```

Entering the above command sequence results in the following prompt:
```
[local] host_name(config-host-template) #
```

**Syntax Description**
In StarOS 14.1 and earlier releases:
```
host-select table { 1 | 2 | prefix-table { 1 | 2 } } algorithm {
  ip-address-modulus [ prefer-ipv4 | prefer-ipv6 ] | msisdn-modulus |
  round-robin }
no host-select table
```

In StarOS 15.0 and later releases:
```
host-select table { 1 | 2 | range-table { 1 | 2 } } algorithm {
  ip-address-modulus [ prefer-ipv4 | prefer-ipv6 ] | msisdn-modulus |
```
**host-select table**

**round-robin**

**no host-select table**

**no**

Removes the table associated with the Diameter host template.

**table { 1 | 2 | prefix-table { 1 | 2 } }**

**Important**

This command syntax is applicable to StarOS release 14.1 and earlier.

Specifies the Diameter host table that will be edited.

- **1**: Specifies the primary table
- **2**: Specifies the secondary table
- **prefix-table { 1 | 2 }**: Specifies a primary or secondary table containing ranges of MSISDN prefixes.

This keyword option enables activating the configured table.

**table { 1 | 2 | range-table { 1 | 2 } }**

**Important**

This command syntax is applicable to StarOS release 15.0 and later.

Specifies the Diameter host table that will be edited.

- **1**: Specifies the primary table
- **2**: Specifies the secondary table
- **range-table { 1 | 2 }**: Specifies a primary or secondary table containing ranges of IMSI or MSISDN prefix/suffix.

This keyword option enables activating the configured table.

**algorithm { ip-address-modulus [ prefer-ipv4 | prefer-ipv6 ] | msisdn-modulus | round-robin }**

Specifies the algorithm to be used when selecting a row in this table.

- **ip-address-modulus**: Use an IP address (in binary) to select a row.
  - **prefer-ipv4**: If both IPv4 and IPv6 addresses are available, use the IPv4 address.
  - **prefer-ipv6**: If both IPv4 and IPv6 addresses are available, use the IPv6 address.
- **msisdn-modulus**: Use an MSISDN (without leading "+") to select a row.
- **round-robin**: Select a row in round-robin manner for each new session.
The Round Robin algorithm is effective only over a large number of selections, and not at a granular level.

Important

Usage Guidelines

Use this command to add or modify a Diameter host server table associated with a Diameter host template.

Example

The following command adds a primary table that uses the `ip-address-modulus` algorithm for selecting a row:

```
host-select table 1 algorithm ip-address-modulus
```
host-select table
DNS Client Configuration Mode Commands

The DNS Client Configuration Mode is used to manage the system's DNS interface and caching parameters.

**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration

configure > context context_name > dns-client client_name

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-dns-client)#
```

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- bind, on page 1077
- cache algorithm, on page 1078
- cache size, on page 1079
- cache ttl, on page 1080
- case-sensitive, on page 1081
- description, on page 1082
- end, on page 1082
- exit, on page 1082
- randomize-answers, on page 1083
- resolver, on page 1083
- round-robin answers, on page 1084

**bind**

Binds the DNS client to a pre-configured logical IP interface.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration
**Syntax Description**

```plaintext
bind { address ip_address [ port number ] | query-over-gtp }
no bind address
```

- **no**
  - Removes the binding of the client to a specified interface.

- **bind address ip_address**
  - Specifies the IP address of the interface to which the DNS client is being bound in IPv4 dotted-decimal notation.

- **bind port number**
  - Specifies the UDP port number of the interface to which the DNS client is being bound as an integer from 1 to 65535. Default: 6011

- **bind query-over-gtp**
  - Specifies that DNS client query is to be performed over GTP.

**Usage Guidelines**

Use this command to associate the client with a specific logical IP address.

**Example**

The following command binds the DNS client to a logical interface with an IP address of 10.2.3.4 and a port number of 6000:

```
bind address 10.2.3.4 port 6000
```

---

**cache algorithm**

Configures the method of use for the DNS VPN and session cache.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration

**configure > context context_name > dns-client client_name**

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```
**Syntax Description**

```
cache algorithm { central | local } { FIFO | LRU | LFU }
default cache algorithm { central | local }

default
Sets the DNS VPN and session cache method to default setting.

central | local
central: Specifies the central proclet (VPN manager)
local: Specifies the local proclet (session manager)

FIFO | LRU | LFU
FIFO: First in first out. This is the default setting for the central proclet.
LRU: Least recently used. This is the default value for the local proclet.
LFU: Least frequently used.
```

**Usage Guidelines**

Use this command to configure the method by which entries are added and removed from the DNS cache.

**Example**

The following command configures the cache algorithm for the central proclet to least frequently used (LFU):

```
cache algorithm central lfu
```

---

**cache size**

Configures the maximum number of entries allowed in the DNS cache.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

```
configure > context context_name > dns-client client_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)>
```

**Syntax Description**

```
cache size { central | local } max_size
default cache size { central | local }

default
Sets the maximum number of entries allowed in the DNS cache to default setting.
```
Usage Guidelines

Use this command to configure the maximum number of entries allowed in the DNS cache.

Example

The following command configures the cache size of the central proclet to 20000:

```
cache size central 20000
```
The DNS client is always reinitialized when the `ip name-servers` CLI configuration is changed for a context. As a result, the `cache ttl negative` value is reset to the default value if `no cache ttl negative` CLI is configured for the DNS client in the context. Therefore, check and reconfigure the `no cache ttl negative` CLI after the `ip name-servers` CLI configuration is changed on the node.

**positive seconds**: Specifies the time to live for positive responses. As an integer from 60 through 86400. Default: 86400 (1 day).

**Usage Guidelines**

Use this command to adjust the DNS cache time to live.

**Example**

The following commands set the TTL DNS cache to 90 seconds for negative responses and 43200 seconds for positive responses:

```
cache ttl negative 90
cache ttl positive 43200
```

---

### `case-sensitive`

Configures the case sensitivity requirement for responses to DNS requests.

**Product**

All

**Privilege**

Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration

```
configure > context context_name > dns-client client_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```

**Syntax Description**

```
[ default | no ] case-sensitive response
```

**default**

Returns the command to its default setting of disabled.

**no**

Disables the requirement for case sensitivity in DNS responses.

**case-sensitive response**

Enables the requirement for case sensitivity in DNS responses.

**Usage Guidelines**

Use this command to require case sensitivity (identical case usage between request and response) on all responses to DNS request messages.
### description

Allows you to enter descriptive text for this configuration.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**

- **description**
  - `text`
  - `no description`

  **no**
  Clears the description for this configuration.

  **text**
  Enter descriptive text as an alphanumeric string of 1 to 100 characters.
  If you include spaces between words in the description, you must enclose the text within double quotation marks (" "), for example, "AAA BBBB".

**Usage Guidelines**
The description should provide useful information about this configuration.

### end

Exits the current configuration mode and returns to the Exec mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**

- **end**

**Usage Guidelines**
Use this command to return to the Exec mode.

### exit

Exits the current mode and returns to the parent configuration mode.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Syntax Description**

- **exit**

**Usage Guidelines**
Use this command to return to the parent configuration mode.
### randomize-answers

Configures the DNS client to return DNS answers in random fashion if multiple results are available for a DNS query.

**Product**
All

**Privilege**
Security Administrator, Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > DNS Client Configuration

```bash
configure > context context_name > dns-client client_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```

**Syntax Description**

```bash
[no | default] randomize-answers
```

- **no**
  Removes the configured random method for DNS answers.

- **default**
  Disables the random method for DNS answers.

- **randomize-answers**
  Enables the random method for DNS answers.

**Usage Guidelines**

Use this command to configure the DNS client to return the DNS results in a random fashion if multiple results are available for a DNS query.

Only one valid option can be used for distribution of DNS answers: default, round-robin, or randomized.

**Example**

The following command configures the DNS client to use randomize the DNS query answers if multiple results are available for a DNS query:

```bash
randomize-answers
```

### resolver

Configures the number of DNS query retries and the retransmission interval once the response timer expires.

**Product**
All

**Privilege**
Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration

```
configure > context context_name > dns-client client_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```

**Syntax Description**

```
resolver { number-of-retries retries | retransmission-interval time }
default resolver { number-of-retries | retransmission-interval }
```

**default**

Resets the specified resolver configuration to the default.

**number-of-retries retries**

Configures the number of DNS query retries on DNS response timeout as an integer from 0 through 4. Default: 2.

**retransmission-interval time**

Configures the initial retransmission interval (in seconds) for retransmission after the DNS response timeout as an integer from 2 to 5. Default is 3 seconds. The retransmission interval doubles after each retry when only one server is configured. In case both primary and secondary servers are configured, the retransmission time is doubled for the last retry.

**Usage Guidelines**

Set the DNS retransmission retries or the retransmission interval. Issue the command twice to configure both parameters, one-at-a-time.

**Example**

The following command sets the DNS resolver retries to 4:

```
resolver number-of-retries 4
```

**round-robin answers**

Configures the DNS client to return the DNS results in round-robin fashion if multiple results are available for a DNS query.

**Product**

All

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > Context Configuration > DNS Client Configuration

```
configure > context context_name > dns-client client_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-dns-client)#
```
Syntax Description

\[ \text{no} \mid \text{default} \] \text{round-robin-answers}

\text{no}
Removes the configured round robin method for DNS answer.

\text{default}
Disables the round robin method for DNS answer.

\text{round-robin-answers}
Enables the round robin method for DNS answer.

Usage Guidelines

Use this command to configure the DNS client to return the DNS results in round-robin fashion if multiple results are available for a DNS query.

Example

The following command configures the DNS client to use round robin method for DNS query answers:

\text{round-robin-answers}
round-robin answers
DSCP Template Configuration Mode Commands

**Command Modes**

The DSCP Template Configuration Mode provides the commands to configure DSCP marking for control packets and data packets for Gb over IP. Any number of DSCP templates can be generated in the SGSN Global configuration mode and then a template can be associated with one or more GPRS Services via the commands in the GPRS Service configuration mode.

Exec > Global Configuration > SGSN Global Configuration > DSCP Template Configuration

**configure > context context_name > sgsn-global > dscp-template template_name**

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-dscp-template-template_name)#
```

**Important**

The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

- control-packet, on page 1087
- end, on page 1089
- exit, on page 1089
- data-packet, on page 1090

**control-packet**

Configures the diffserv code point marking (DSCP) value for 3GPP quality of service (QoS) class downlink control packets.

**Important**

In Release 20 and later, HNBGW is not supported. This command must not be used for HNBGW in Release 20 and later. For more information, contact your Cisco account representative.

**Product**

HNB-GW

SGSN

**Privilege**

Security Administrator, Administrator
**Command Modes**

Exec > Global Configuration > SGSN Global Configuration > DSCP Template Configuration

**configure > context context_name > sgsn-global > dscp-template template_name**

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-dscp-template-template_name)#
```

**Syntax Description**

```
control-packet qos-dscp { af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | be | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef }
default control-packet
```

**default**

Resets the quality of service (QoS) DSCP setting to the 'BE' (best effort) default value.

**DSCP marking option**

Select one of the following downlink DSCP options for the control packets:

- **af11**: Assured Forwarding 11 per-hop-behavior (PHB)
- **af12**: Assured Forwarding 12 PHB
- **af13**: Assured Forwarding 13 PHB
- **af21**: Assured Forwarding 21 PHB
- **af22**: Assured Forwarding 22 PHB
- **af23**: Assured Forwarding 23 PHB
- **af31**: Assured Forwarding 31 PHB
- **af32**: Assured Forwarding 32 PHB
- **af33**: Assured Forwarding 33 PHB
- **af41**: Assured Forwarding 41 PHB
- **af42**: Assured Forwarding 42 PHB
- **af43**: Assured Forwarding 43 PHB
- **be**: Best Effort for Forwarding
- **cs1**: Class Selector 1 PHB
- **cs2**: Class Selector 2 PHB
- **cs3**: Class Selector 3 PHB
- **cs4**: Class Selector 4 PHB
- **cs5**: Class Selector 5 PHB
- **cs6**: Class Selector 6 PHB
- **cs7**: Class Selector 7 PHB
- **ef**: Expedited forwarding PHB

**Usage Guidelines**

This command configures the QoS DSCP marking type for downlink control packets.

**Related commands for SGSN:**
• To create/delete a DSCP template, use the `dscp-template` in the SGSN Global configuration mode (see the *SGSN Global Configuration Mode Commands* section).

• To associate a specific DSCP template with a specific GPRS service configuration, use the `associate-dscp-template downlink` documented in the *GPRS Service Configuration Mode Commands* section.

• To check values configured for DSCP templates, use the `show sgsn-mode` command documented in the *Exec Mode Commands* section.

**Related commands for HNB-GW:**

• To create/delete a DSCP template, use the `dscp-template` in the *SGSN Global Configuration Mode*.

• To associate a specific DSCP template with a system for a PSP instance in SS7 routing domain, use `associate-dscp-template downlink` documented in the *SGSN PSP Configuration Mode Commands* section.

**Example**

Use a command similar to the following to set expedited forward per-hop behavior for the downlink control packets:

```
control-packet qos-dscp ef
```

Use the following command to reset the default best effort per-hop behavior:

```
default control-packet
```

**end**

Exits the current configuration mode and returns to the Exec mode.

**exit**

Exits the current mode and returns to the parent configuration mode.
Usage Guidelines

Use this command to return to the parent configuration mode.

**data-packet**

Configures the different code point marking (DSCP) value for 3GPP quality of service (QoS) class downlink data packets.

**Product**

SGSN

**Privilege**

Security Administrator, Administrator

**Command Modes**

Exec > Global Configuration > SGSN Global Configuration > DSCP Template Configuration

```
configure > context context_name > sgsn-global > dscp-template template_name
```

Entering the above command sequence results in the following prompt:

```
[local] host_name(config-dscp-template-template_name)#
```

**Syntax Description**

```
color-control-packet { background | conversationa | interactive { priority1 | priority2 | priority3 } | streaming } qos-dscp { af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | be | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef }
default data-packet { background | conversationa | interactive { priority1 | priority2 | priority3 } | streaming }

default
```

**default**

 Resets the quality of service (QoS) DSCP setting to the **be** (best effort) default value.

**background | conversationa | interactive | streaming**

Select the QoS traffic class of service for the downlink data packets.

**priority1 | priority2 | priority3**

Select the traffic handling priority to be applied to the specified traffic class.

**DSCP option**

Select one of the following DSCP settings for the selected traffic class. Default is best effort (**be**) for all traffic classes settings.

- **af11**: Assured Forwarding 11 per-hop-behavior (PHB)
- **be**: Best Effort for Forwarding
- **af12**: Assured Forwarding 12 PHB
- **cs1**: Class Selector 1 PHB
- **af13**: Assured Forwarding 13 PHB
- **cs2**: Class Selector 2 PHB
- **af21**: Assured Forwarding 21 PHB
- **cs3**: Class Selector 3 PHB
Usage Guidelines

This command configures the QoS DSCP marking type for downlink data packets. DSCP levels indicate how packets are to be handled.

Related commands:

- To create/delete a DSCP template, use the `dscp-template` in the SGSN Global configuration mode (see the SGSN Global Configuration Mode Commands section).
- To associate a specific DSCP template with a specific GPRS service configuration, use the `associate-dscp-template downlink` documented in the GPRS Service Configuration Mode Commands section.
- To check values configured for DSCP templates, use the `show sgsn-mode` command documented in the Exec Mode Commands section.

Example

Use a command similar to the following to set expedited forward per-hop behavior for the downlink control packets:

```
control-packet qos-dscp ef
```

Use the following command to reset the default best effort per-hop behavior:

```
default control-packet
```