



Deploying and Configuring SMF through Ops Center

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	SMF
Applicable Platform(s)	SMI
Feature Default Setting	Disabled - Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	Pre-2020.02.0

Feature Description

The SMF deployment and configuration procedure involves deploying the SMF through the Subscriber Microservices Infrastructure (SMI) Cluster Deployer and configuring the settings or customizations through the SMF Operations (Ops) Center. The Ops Center is based on the ConfD CLI. The SMF configuration includes the NRF profile data configuration and the externally visible IP addresses and ports.

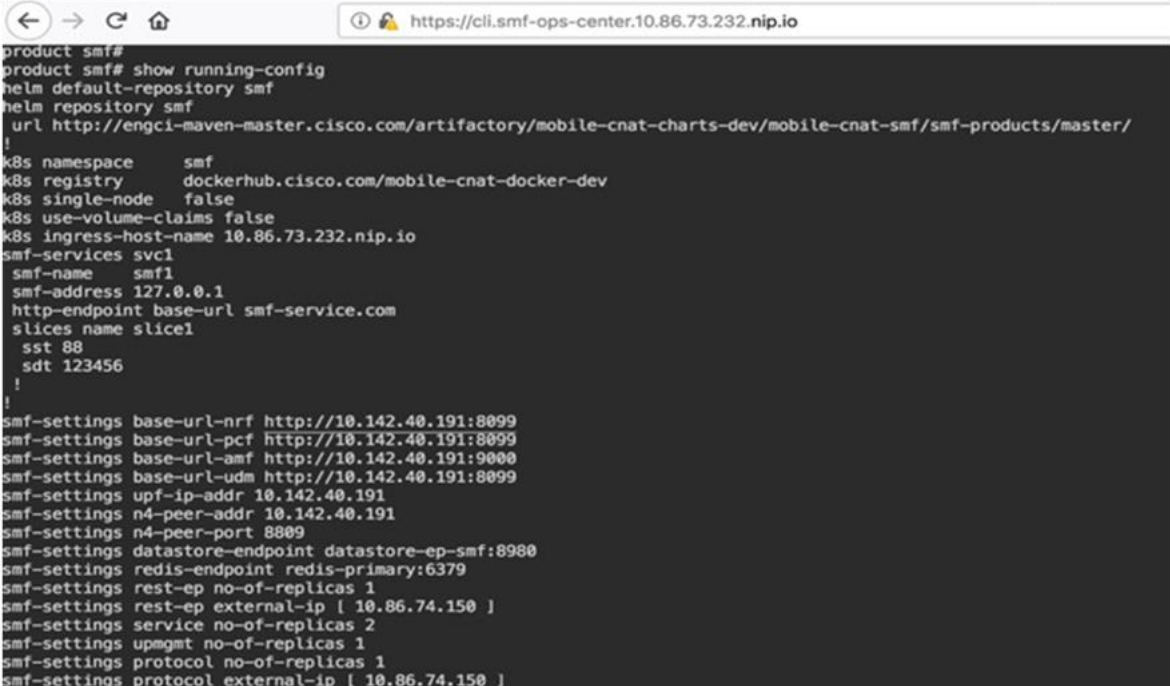
SMF Ops Center

The Ops Center is a system-level infrastructure that provides the following functionality:

- A user interface to trigger a deployment of microservices with the flexibility of providing variable helm chart parameters to control the scale and properties of Kubernetes objects (deployment, pod, services, and so on) associated with the deployment.
- A user interface to push application-specific configuration to one or more microservices through Kubernetes configuration maps.
- A user interface to issue application-specific execution commands (such as show and clear commands). These commands:
 - Invoke some APIs in application-specific pods
 - Display the information returned on the user interface application

The following screenshot is a sample of the web-based command line interface presented to the user.

Figure 1: Web-based CLI of Ops Center



```

product smf#
product smf# show running-config
helm default-repository smf
helm repository smf
  url http://engci-maven-master.cisco.com/artifactory/mobile-cnaf-charts-dev/mobile-cnaf-smf/smf-products/master/
!
k8s namespace      smf
k8s registry        dockerhub.cisco.com/mobile-cnaf-docker-dev
k8s single-node     false
k8s use-volume-claims false
k8s ingress-host-name 10.86.73.232.nip.io
smf-services svc1
  smf-name          smf1
  smf-address       127.0.0.1
  http-endpoint base-url smf-service.com
  slices name slice1
    sst 88
    sdt 123456
!
smf-settings base-url-nrf http://10.142.40.191:8099
smf-settings base-url-pcf http://10.142.40.191:8099
smf-settings base-url-amf http://10.142.40.191:9000
smf-settings base-url-udm http://10.142.40.191:8099
smf-settings upf-ip-addr 10.142.40.191
smf-settings n4-peer-addr 10.142.40.191
smf-settings n4-peer-port 8809
smf-settings datastore-endpoint datastore-ep-smf:8980
smf-settings redis-endpoint redis-primary:6379
smf-settings rest-ep no-of-replicas 1
smf-settings rest-ep external-ip [ 10.86.74.150 ]
smf-settings service no-of-replicas 2
smf-settings upmgmt no-of-replicas 1
smf-settings protocol no-of-replicas 1
smf-settings protocol external-ip [ 10.86.74.150 ]

```

The SMF Ops Center allows you to configure the features such as licensing, SMF engine, REST Endpoint, and CDL.

Prerequisites

Before deploying SMF on the SMI layer:

- Ensure that all the virtual network functions (VNFs) are deployed.
- Run the SMI synchronization operation for the SMF Ops Center and Cloud Native Common Execution Environment (CN-CEE)

Deploying and Accessing SMF

This section describes how to deploy SMF and access the SMF Ops Center.

Deploying SMF

The SMI platform is responsible for deploying and managing the Cloud Native 5G SMF application and other network functions.

For deploying SMF Ops Center on a vCenter environment, see *Deploying and Upgrading the Product* section in the *UCC SMI Cluster Deployer Operations Guide*.

For deploying SMF Ops Center on a OpenStack environment, see *UAME-based VNF Deployment* section in the *UAME-based 4G and 5G VNF Deployment Automation Guide, Release 6.9*

Accessing the SMF Ops Center

You can connect to the SMF Ops Center through SSH or the web-based CLI console.

- SSH:

```
ssh admin@ops_center_pod_ip -p 2024
```

- Web-based console:

1. Log in to the Kubernetes master node.

2. Run the following command:

```
kubectl get ingress <namespace>
```

The available ingress connections get listed.

3. Select the appropriate ingress and access the SMF Ops Center.

4. Access the following URL from your web browser:

```
cli.<namespace>-ops-center.<ip_address>.nip.io
```

By default, the Day 0 configuration is loaded into the SMF.

Day 0 Configuration

To view the Day 0 configuration, run the following command.

show running-config

The following is a sample Day 0 configuration:

```

root@smf-cluster# ssh -p 2024 admin@$(kubect1 get svc -n smf-smf --no-headers | grep
smf-ops-center| grep 2024 |awk '{print $3}')
admin@1.1.1.1's password:
Welcome to the CLI
admin connected from 2.2.2.2 using ssh on ops-center-smf-smf-ops-center-76bbc7f4df-rkrff
product smf# show running-config
helm default-repository base-repos
helm repository base-repos
url
https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnat-smf/smf-products/master/
exit
k8s namespace smf-smf
k8s registry dockerhub.cisco.com/smi-fuse-docker-internal
k8s single-node false
k8s use-volume-claims false
k8s ingress-host-name 1.1.1.2.nip.io
aaa authentication users user admin
uid      117
gid      117
password $1$fvlWGa/b$GW6OyeqG77lQ.Xu/qcbgu.
ssh_keydir /tmp/admin/.ssh
homedir   /tmp/admin
exit
aaa ios level 0
prompt "\h> "
exit
aaa ios level 15
prompt "\h# "
exit
aaa ios privilege exec
level 0
command action
exit
command autowizard
exit
command enable
exit
command exit
exit
command help
exit
command startup
exit
exit
level 15
command configure
exit
exit
exit
nacm write-default deny
nacm groups group LI
user-name [ liadmin ]
exit
nacm groups group admin
user-name [ admin ]
exit

```

```
nacm rule-list admin
group [ admin ]
rule li-deny-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           deny
exit
rule li-deny-clear
  module-name      tailf-mobile-smf
  path            /clear/lawful-intercept
  access-operations *
  action           deny
exit
rule any-access
  action permit
exit
exit
nacm rule-list confd-api-manager
group [ confd-api-manager ]
rule any-access
  action permit
exit
exit
nacm rule-list lawful-intercept
group [ LI ]
rule li-accept-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           permit
exit
rule li-accept-clear
  module-name      tailf-mobile-smf
  path            /clear/lawful-intercept
  access-operations *
  action           permit
exit
exit
nacm rule-list any-group
group [ * ]
rule li-deny-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           deny
exit
rule li-deny-clear
  module-name      tailf-mobile-smf
  path            /clear/lawful-intercept
  access-operations *
  action           deny
exit
exit
```

SMF Service Configuration

The SMF service requires the basic configuration to process PDU Session Management API calls.

Configuring SMF

The SMF configuration is provided using the Ops Center infrastructure.

The following is a sample SMF configuration:

```
smf-settings base-url-nrf http://10.81.71.223:8082/NRF
smf-settings base-url-amf http://10.81.71.223:8090
smf-settings base-url-udm http://10.81.71.224:8099
smf-settings upf-ip-addr 10.81.71.224
smf-settings n4-peer-addr 10.81.71.224
smf-settings n4-peer-port 8809
smf-settings datastore-endpoint datastore-ep-smf:8980
smf-settings redis-endpoint redis-primary:6379
smf-settings rest-ep no-of-replicas 1
smf-settings rest-ep external-ip [ 10.81.71.224 ]
smf-settings service no-of-replicas 1
smf-settings upgmt no-of-replicas 1
smf-settings protocol no-of-replicas 1
smf-settings protocol external-ip [ 10.81.71.228 ]
```

The following table describes the supported SMF commands:

Table 3: Supported SMF Commands

No.	Configuration	Description
1	smf-services <i>service_name</i>	Configures a new SMF service. Entering this command results in a sub command mode. <i>service_name</i> is the name of the SMF service.
2	smf-name <i>node_name</i>	Specifies the NF name that is sent to the NRF during the SMF registration. This is a command in the smf-services mode.
3	http-endpoint base-url <i>url</i>	Configures the base endpoint URL to be sent in the NRF registration of the SMF. This is a command in the smf-services mode.
4	dnn <i>dnn_name</i>	Specifies the SMF-served DNN name. This is sent to the NRF during the SMF registration. This is a command in the smf-services mode.
5	slices name <i>slice_name</i> sdt <i>sdt_value</i> sst <i>sst_value</i>	Specifies the slice information to which the SMF belongs. This includes the slice type (sst) and slice descriptor (sdt). This is sent to the NRF during the SMF registration. This is a command in the smf-services mode.

No.	Configuration	Description
6	smf-settings base-url-nrf <i>nrf_url</i> smf-settings base-url-amf <i>amf_url</i> smf-settings base-url-pcf <i>pcf_url</i> smf-settings base-url-udm <i>udm_url</i> smf-settings rest-ep no-of-replicas <i>num_replicas</i>	<p>Specifies the URL for the SBI interface towards the NRF, UDM, AMF, and PCF. These configurations are used when the nodes are not discovered through the NRF discovery procedure.</p> <p>Specifies the number of replicas for the different microservices of the SMF.</p>
7	smf-settings upf-ip-addr <i>upf_ip_address</i> smf-settings n4-peer-addr <i>upf_ip_address</i> smf-settings n4-peer-port <i>upf_port</i>	Specifies the peer UPF IP address and port configuration.
8	smf-settings n4-addr <i>pfcp_intf_address</i>	Specifies the N4 interface IP address of the SMF towards the peer UPF.
9	smf-settings datastore-endpoint <i>datastore_endpoint</i> smf-settings redis-endpoint <i>redis_store_endpoint</i>	Specifies the endpoints for the mongodb and redis data stores.
10	smf-settings rest-ep no-of-replicas <i>num_replicas</i> smf-settings service no-of-replicas <i>num_replicas</i> smf-settings upmgmt no-of-replicas <i>num_replicas</i> smf-settings protocol no-of-replicas <i>num_replicas</i>	Specifies the number of replicas for the different microservices of the SMF.
11	smf-settings rest-ep external-ip [<i>restep_external_ip</i>] smf-settings protocol external-ip [<i>smfprot_external_IP</i>]	Specifies the service IP to be exposed for the rest-ep and smf-protocol services.
12	ue-pool <i>ipv4_address</i>	Specifies the IP pool to assign the IPv4 address in the CIDR notation to the UE session.

Contact your Cisco Account representative for the corresponding yang and render.yaml files.

Loading Day 1 Configuration

To load the Day 1 configuration for SMF, run the following command:

```
ssh admin@ops_center_pod_ip -p 2024 < Day1config.cli
```



Note The [Day1config.cli](#) file contains the necessary parameters required for the Day 1 configuration.

Alternatively, you can copy the configuration and paste it in the SMF Ops Center CLI to load the Day 1 configuration.

configure

<Paste the Day 1 configuration here>

commit

exit

A sample *Day1config.cli* file, which contains the Day 1 configuration for SMF is shown below.

Day1config.cli

The following is a sample Day1config.cli file, which contains the Day 1 configuration for the SMF.

```
config
ipam
  source local
  address-pool ipv6
  vrf-name ISP
  tags
    dnn intershat
  exit
  ipv6
    prefix-ranges
      prefix-range 2001:4870:e00b:1500:: length 56
    exit
  exit
  address-pool poolv4
  vrf-name ISP
  tags
    dnn intershat
  exit
  ipv4
    split-size
      per-cache 1024
      per-dp 256
    exit
    address-range 0.0.0.1 0.0.0.254
  exit
  exit
  group nf-mgmt NFMGMT1
  nrf-mgmt-group MGMT
  locality LOC1
  exit
  group nrf discovery udmdiscovery
  service type nrf nnrf-disc
  endpoint-profile epprof
  capacity 10
  priority 1
  uri-scheme http
  version
  uri-version v1
  full-version 1.1.1.[1]
  exit
  exit
```



```
    endpoint-name endpointName
    priority 1
    capacity 100
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 8082
  exit
exit
group nrf mgmt MGMT
  service type nrf nrf-nfm
  endpoint-profile mgmt-1
  priority 1
  uri-scheme http
  endpoint-name mgmt-1
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 8082
  secondary ip-address ipv4 3.3.3.3
  secondary ip-address port 8083
  tertiary ip-address ipv4 3.3.3.3
  tertiary ip-address port 8084
  exit
exit
exit
cdl node-type smf-cdl
cdl zookeeper replica 2
cdl kafka replica 2
etcd replicas 1
endpoint nodemgr
exit
endpoint gtp
  replicas 1
  vip-ip 4.4.4.4
exit
endpoint pfcp
  replicas 1
  nodes 2
exit
endpoint service
  replicas 1
  nodes 1
exit
endpoint protocol
  replicas 1
  nodes 2
  vip-ip 4.4.4.4
exit
endpoint sbi
  replicas 1
  nodes 2
  vip-ip 4.4.4.4
  interface nrf
    loopbackPort 7005
    vip-ip 20.20.20.5 vip-port 9005
  exit
  interface n7
    loopbackPort 7001
    vip-ip 20.20.20.1 vip-port 9001
  exit
  interface n10
    loopbackPort 7004
    vip-ip 20.20.20.4 vip-port 9004
  exit
```

```

interface n40
  loopbackPort 7003
  vip-ip 20.20.20.3 vip-port 9003
exit
exit
logging level application trace
logging level transaction trace
logging level tracing off
logging name infra.config.core level application debug
logging name infra.config.core level transaction warn
logging name infra.config.core level tracing warn
logging name infra.resource_monitor.core level application warn
logging name infra.resource_monitor.core level transaction warn
deployment
  app-name      SMF
  cluster-name  Local
  dc-name       DC
  model         small
exit
k8 label protocol-layer key smi.cisco.com/node-type value smf-proto
exit
k8 label service-layer key vm-type value smf-svc
exit
k8 label cdl-layer key smi.cisco.com/node-type value smf-cdl
exit
k8 label oam-layer key smi.cisco.com/node-type value oam
exit
helm default-repository smf
helm repository smf
  url
https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnaf-smf/smf-products/master/
exit
helm repository smf-stage
  url
https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnaf-smf/smf-products/dev-smf-stage/
exit
k8s namespace      smf
k8s registry        dockerhub.cisco.com/smi-fuse-docker-internal
k8s single-node     false
k8s use-volume-claims false
k8s ingress-host-name 1.1.1.1.nip.io
profile dnn intershat
  dns primary ipv4 11.11.1.1
  dns primary ipv6 66:66:1::aa
  dns secondary ipv4 22.22.2.2
  dns secondary ipv6 66:66:2::bb
  network-element-profiles chf chf1
  network-element-profiles amf amf1
  network-element-profiles pcf pcf1
  network-element-profiles udm udm1
  dnn starent.com network-function-list [ upf ]
  charging-profile chgprf1
  virtual-mac      b6:6d:47:47:47:47
  pcscf-profile    pcscf1
  ssc-mode 1
  session type IPV4 allowed [ IPV4V6 ]
  upf apn cisco.com
exit
profile dnn profDnn1
  dnn cisco.com network-function-list [ chf pcf udm upf ]
  charging-profile chgprf1
  ssc-mode 1
  session type IPV4
exit

```

```
profile dnn profDnn2
  dnn cisco.com network-function-list [ chf pcf rmgr udm upf ]
  charging-profile chgprfl
  ssc-mode 1
  session type IPV4
exit
profile charging chgprfl
  method [ offline ]
  limit volume 20
  limit duration 60
  tight-interworking-mode true
  reporting-level online rating-group
  reporting-level offline service-id
exit
profile pcscf pcscf1
  v4-list
  precedence 3
    primary 3.3.3.1
    secondary 3.3.3.2
  exit
  precedence 5
    primary 5.5.5.1
    secondary 5.5.5.2
  exit
  precedence 7
    primary 7.7.7.1
    secondary 7.7.7.2
  exit
  exit
  v6-list
  precedence 3
    primary 33:33::1
    secondary 33:33::2
  exit
  precedence 5
    primary 55:55::1
    secondary 55:55::2
  exit
  exit
  v4v6-list
  precedence 3
    primary ipv4 46.46.33.1
    primary ipv6 46:46:33::1
    secondary ipv4 46.46.33.2
    secondary ipv6 46:46:33::2
  exit
  precedence 5
    primary ipv4 46.46.55.1
    primary ipv6 46:46:55::1
    secondary ipv4 46.46.55.2
    secondary ipv6 46:46:55::2
  exit
  precedence 7
    primary ipv4 46.46.77.1
    primary ipv6 46:46:77::1
    secondary ipv4 46.46.77.2
    secondary ipv6 46:46:77::2
  exit
  exit
  exit
profile charging-characteristics 1
  charging-profile chgprfl
exit
profile icmpv6 icmpprfl
```

```

options virtual-mac b6:6d:57:45:45:45
exit
profile smf smf1
  locality      LOC1
  bind-address  ipv4 4.4.4.4
  bind-port     8090
  fqdn          5.5.5.5
  allowed-nssai [ slice1 slice2 ]
  plmn-id mcc 123
  plmn-id mnc 456
  service name nsmf-pdu
    type          pdu-session
    schema        http
    version       1.Rn.0.0
    http-endpoint base-url http://smf-service
    icmpv6-profile icmpprf1
    compliance-profile dec18
    access-profile access1
    policy subscriber polSub
  exit
exit
profile compliance dec18
  service nsmf-pdusession
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service namf-comm
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service n1
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service n2
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service nudm-sdm
    version uri v1
    version full 1.0.0
    version spec 15.2.1
  exit
  service nudm-uecm
    version uri v1
    version full 1.0.0
    version spec 15.2.1
  exit
  service n NRF-disc
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service n NRF-nfm
    version uri v1
    version full 1.0.0
    version spec 15.2.0
  exit
  service n PCF-smpolicycontrol
    version uri v1

```

```

    version full 1.0.0
    version spec 15.2.0
  exit
  service nchf-convergedcharging
    version uri v2
    version full 1.0.0
    version spec 15.2.1
  exit
exit
profile network-element amf amf1
  nf-client-profile      amfP1
  failure-handling-profile FH3
  query-params [ dnn ]
exit
profile network-element pcf pcf1
  nf-client-profile      pcfP1
  failure-handling-profile FH1
  rulebase-prefix       cbn#
  predefined-rule-prefix crn#
exit
profile network-element udm udm1
  nf-client-profile      udmP1
  failure-handling-profile FH1
exit
profile network-element upf upf1
  n4-peer-address ipv4 6.6.6.6
  n4-peer-port 8805
  keepalive 60
  dnn-list [ dnn1 intershat starent ]
exit
profile network-element chf chf1
  nf-client-profile      chfP1
  failure-handling-profile FH2
  nf-client-profile-offline CP2
  failure-handling-profile-offline FH2
exit
profile qos abc
  ambr ul "250 Kbps"
  ambr dl "500 Kbps"
  qi5 7
  arp priority-level 14
  arp preempt-cap NOT_PREEMPT
  arp preempt-vuln PREEMPTABLE
  priority 120
  max data-burst 2000
  dscp-map qi5 2 arp-priority-level 3 uplink user-datagram dscp-marking 0x1c
  dscp-map qi5 2 arp-priority-level 3 downlink user-datagram dscp-marking 0x1a encsp-header
  dscp-marking 0x1b
  dscp-map qi5 3 arp-priority-level 3 uplink user-datagram dscp-marking 0x4
  dscp-map qi5 3 arp-priority-level 3 downlink user-datagram dscp-marking 0x3 encsp-header
  copy-inner
exit
profile access access1
  eps-fallback cbr delay 500 max-retry 10 timeout 3
  n26 idft enable timeout 15
  n2 idft enable timeout 15
exit
profile nf-client nf-type udm
  udm-profile udmP1
  locality LOC1
  priority 30
  service name type nudm-sdm
  endpoint-profile EP1
  capacity 30

```

```

    uri-scheme http
    endpoint-name EP1
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 9007
    exit
  exit
exit
service name type nudm-uecm
endpoint-profile EP1
  capacity 30
  uri-scheme http
  endpoint-name EP1
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 9001
  exit
  exit
  exit
exit
exit
profile nf-client nf-type pcf
pcf-profile pcfP1
  locality LOC1
  priority 30
  service name type npcfc-am-policy-control
  endpoint-profile EP1
  capacity 30
  uri-scheme http
  endpoint-name EP1
  priority 50
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 9003
  exit
  exit
  exit
  service name type npcfc-smpolicycontrol
  endpoint-profile EP1
  capacity 30
  uri-scheme http
  endpoint-name EP1
  priority 5
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 9003
  exit
  endpoint-name realPCF
  priority 10
  primary ip-address ipv4 7.7.7.7
  primary ip-address port 9082
  exit
  exit
  exit
  exit
  exit
profile nf-client nf-type amf
amf-profile amfP1
  locality LOC1
  priority 10
  service name type namf-comm
  endpoint-profile EP1
  capacity 20
  uri-scheme http
  endpoint-name EP1
  priority 30

```

```
        primary ip-address ipv4 3.3.3.3
        primary ip-address port 9002
    exit
    exit
    exit
    exit
    exit
    exit
    profile nf-client nf-type chf
    chf-profile CP2
    locality LOC1
    priority 31
    service name type nchf-convergedcharging
    endpoint-profile EP1
    capacity 30
    uri-scheme http
    version
    uri-version v2
    exit
    exit
    endpoint-name EP1
    priority 56
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 9906
    exit
    exit
    exit
    exit
    chf-profile chfP1
    locality LOC1
    priority 10
    service name type nchf-convergedcharging
    endpoint-profile EP1
    capacity 30
    uri-scheme http
    version
    uri-version v2
    exit
    exit
    endpoint-name EP1
    priority 50
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 9904
    exit
    endpoint-name EP2
    priority 80
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 9905
    exit
    exit
    exit
    exit
    profile nf-pair nf-type UDM
    locality client LOC1
    locality geo-server GEO
    exit
    profile nf-pair nf-type AMF
    locality client LOC1
    locality geo-server GEO
    exit
    profile nf-pair nf-type PCF
```

```

    locality client LOC1
    locality geo-server GEO
  exit
profile nf-pair nf-type UPF
  nrf-discovery-group udmdiscovery
  locality client LOC1
  locality preferred-server LOC1
  locality geo-server GEO
  exit
profile nf-pair nf-type CHF
  locality client LOC1
  locality preferred-server LOC1
  locality geo-server GEO
  exit
profile nf-client-failure nf-type chf
profile failure-handling FH2
  service name type nchf-convergedcharging
  message type ChfConvergedchargingCreate
  status-code httpv2 0
  action continue
  exit
  exit
  message type ChfConvergedchargingUpdate
  status-code httpv2 0
  action continue
  exit
  exit
  exit
  exit
  exit
  exit
  exit
policy subscriber polSub
  precedence 1
  sst 01
  sdt ABcd01
  serving-plmn mcc 123
  serving-plmn mnc 456
  supi-start-range 100000000000001
  supi-stop-range 999999999999999
  gpsi-start-range 1000000000
  gpsi-stop-range 9999999999
  operator-policy opPol1
  exit
  exit
policy operator opPol1
  policy dnn opPolDnn1
  exit
policy dnn dnnPol1
  profile default
  dnn starent profile abc.com
  exit
policy dnn opPolDnn1
  dnn intershat profile intershat
  dnn intershat1 profile profDnn1
  exit
policy dnn polDnn
  profile default
  dnn intershat profile intershat
  dnn intershat1 profile profDnn1
  dnn intershat2 profile profDnn2
  exit
nssai name slice1
  sst 01
  sdt ABcd01
  dnn [ intershat ]

```



```
exit
nssai name slice2
  sst 02
  sdt 000003
  dnn [ cisco.com ]
exit
active-charging service acs1
  packet-filter pkt1
    ip local-port range 2 to 23
    ip protocol = 23
    ip remote-address = 10.10.10.0/24
    ip remote-port range 12 to 34
    ip tos-traffic-class = 23 mask = 23
    priority 23
  exit
  packet-filter pkt2
    direction uplink
    ip local-port = 100
    ip protocol = 100
    ip remote-address = 1.1.1.1/32
    ip remote-port = 140
    priority 100
  exit
  packet-filter pkt3
    direction downlink
    ip local-port = 111
    ip protocol = 111
    ip remote-address = 2.2.2.2/31
    ip remote-port = 111
    priority 111
  exit
  charging-action cal
    allocation-retention-priority 12 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
    flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
    violate-action discard committedDataRate 2000000 committed-burst-size 100 exceed-action
    discard
    flow limit-for-bandwidth direction downlink peak-data-rate 2000000 peak-burst-size 100
    violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
    discard
    qos-class-identifier 3
    tft-notify-ue
    tos af11
    tft packet-filter pkt1
  exit
  charging-action cal0
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100
    violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
    violate-action discard
    tos af11
  exit
  charging-action cal1
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100
    violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
    violate-action discard
  exit
  charging-action cal2
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
    violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 3000000 peak-burst-size 100
    violate-action discard
  exit
  charging-action cal3
```

```

    flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 3000000 peak-burst-size 100
violate-action discard
exit
charging-action ca2
    allocation-retention-priority 13 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100
violate-action discard committedDataRate 3000000000 committed-burst-size 100 exceed-action
discard
    flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
violate-action discard committedDataRate 4000000000 committed-burst-size 100 exceed-action
discard
    qos-class-identifier 2
    tft-notify-ue
    tos af11
    tft packet-filter pkt2
exit
charging-action ca20
    flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca21
    flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca22
    flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca23
    flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
    flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca3
    allocation-retention-priority 14 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 1000000 committed-burst-size 100 exceed-action
discard
    flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
    qos-class-identifier 1
    tft-notify-ue
    tos af11
    tft packet-filter pkt3
exit
charging-action ca4
    allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
    flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
    flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
    qos-class-identifier 4

```

```
tft-notify-ue
tos af11
tft packet-filter pkt1
exit
charging-action ca5
allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
qos-class-identifier 4
tft-notify-ue
tos af11
tft packet-filter pkt2
exit
charging-action ca6
allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
qos-class-identifier 4
tft-notify-ue
tos af11
tft packet-filter pkt3
exit
charging-action ca7
allocation-retention-priority 1 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard
flow limit-for-bandwidth direction downlink peak-data-rate 400000 peak-burst-size 100
violate-action discard
qos-class-identifier 7
tft-notify-ue
tos af11
exit
charging-action caGyGz
billing-action egcdr
cca charging credit rating-group 102
content-id 102
service-identifier 202
exit
charging-action caOffline
billing-action egcdr
content-id 100
service-identifier 200
exit
charging-action caOffline1
billing-action egcdr
content-id 11
service-identifier 21
exit
charging-action caOffline2
billing-action egcdr
content-id 12
service-identifier 22
exit
charging-action caOffline3
billing-action egcdr
content-id 13
```

```

    service-identifier 23
  exit
  charging-action caOffline4
    billing-action egcdr
    content-id 40
  exit
  charging-action caOfflineOnline
    billing-action egcdr
    cca charging credit
    content-id 30
    service-identifier 60
  exit
  charging-action caOfflineOnline1
    billing-action egcdr
    cca charging credit
    content-id 31
    service-identifier 61
  exit
  charging-action caOnline
    cca charging credit rating-group 100
    content-id 100
    service-identifier 200
  exit
  charging-action caOnline1
    cca charging credit rating-group 101
    content-id 101
    service-identifier 201
  exit
  charging-action caOnline2
    cca charging credit
    content-id 102
    service-identifier 202
  exit
  charging-action caOnline3
    cca charging credit
    content-id 103
    service-identifier 203
  exit
  charging-action caOnline4
    cca charging credit
    content-id 110
  exit
  charging-action nocharging
  exit
  rulebase cbn#spp-tmobile
    action priority 1 ruledef crn#test_1 charging-action ca1
    action priority 2 ruledef crn#test_2 charging-action ca2
  exit
  rulebase rba1
    action priority 1 dynamic-only ruledef rda1 charging-action ca1 description myrule1
    action priority 2 dynamic-only ruledef rda2 charging-action ca2 description myrule2
    action priority 3 dynamic-only ruledef rda3 charging-action ca3 description myrule3
  exit
  rulebase rba2
    action priority 10 ruledef rda10 charging-action ca10 description myrule10
    action priority 11 ruledef rda11 charging-action ca11 description myrule11
    action priority 12 dynamic-only ruledef rda12 charging-action ca12 description myrule12
    action priority 13 dynamic-only ruledef rda13 charging-action ca13 description myrule13
  exit
  rulebase rba3
    action priority 20 ruledef rda20 charging-action ca20 description myrule20
    action priority 21 ruledef rda21 charging-action ca21 description myrule21
    action priority 22 dynamic-only ruledef rda22 charging-action ca22 description myrule22
    action priority 23 dynamic-only ruledef rda23 charging-action ca23 description myrule23

```

```

exit
rulebase rba4
  action priority 30 ruledef rda3 charging-action ca3 description myrule3
  action priority 31 dynamic-only ruledef rda3 charging-action ca3 description myrule3
exit
rulebase rba5
  action priority 50 dynamic-only ruledef rda50 charging-action ca4 description myrule50
  action priority 51 dynamic-only ruledef rda51 charging-action ca5 description myrule51
  action priority 52 dynamic-only ruledef rda52 charging-action ca6 description myrule52
exit
rulebase rba6
  action priority 60 dynamic-only ruledef rda60 charging-action ca1 description myrule60
  action priority 61 dynamic-only ruledef rda61 charging-action ca1 description myrule61
  action priority 62 dynamic-only ruledef rda62 charging-action ca1 description myrule62
exit
rulebase rba7
  action priority 50 ruledef rda50 charging-action ca4 description myrule50
  action priority 51 ruledef rda51 charging-action ca5 description myrule51
  action priority 52 ruledef rda52 charging-action ca6 description myrule52
exit
rulebase rba8
  action priority 60 ruledef rda60 charging-action ca1 description myrule60
  action priority 61 ruledef rda61 charging-action ca1 description myrule61
  action priority 62 ruledef rda62 charging-action ca1 description myrule62
exit
rulebase rbaStatic
  action priority 10 ruledef rda20 charging-action caOffline
exit
rulebase rbaStatic-Online
  action priority 20 ruledef rdaStatic charging-action caOnline
exit
rulebase rbaStatic1
  action priority 10 ruledef rda20 charging-action caOffline
exit
rulebase rba_GyGz
  egcdr threshold volume downlink 100000 uplink 100000
  action priority 20 dynamic-only ruledef rdaPredefined charging-action caGyGz
  action priority 30 ruledef rda20 charging-action caGyGz
exit
rulebase rba_charging_StaticDynamic_Offline_Online_mix
  cca diameter requested-service-unit sub-avp volume cc-input-octets 11000 cc-output-octets
12000 cc-total-octets 23000
  credit-control-group onlineoffline
  egcdr threshold interval 100
  egcdr threshold volume downlink 150000 uplink 150000 total 300000
  action priority 20 dynamic-only ruledef rdaPredefined charging-action caOffline1
  action priority 21 dynamic-only ruledef rdaPredefined1 charging-action caOnline1
  action priority 31 ruledef rdaStatic charging-action caOfflineOnline
exit
rulebase rba_charging_StaticDynamic_offline
  egcdr threshold volume downlink 100000 uplink 100000
  action priority 20 dynamic-only ruledef rdaPredefined charging-action caOffline1
  action priority 30 ruledef rda20 charging-action caOffline
exit
rulebase rba_charging_StaticDynamic_online
  action priority 20 ruledef rda20 charging-action caOnline
  action priority 30 dynamic-only ruledef rdaPredefined charging-action caOnline1
exit
rulebase rbs1
  action priority 1 ruledef rds1 charging-action ca1 description myrules1
  action priority 2 ruledef rds2 charging-action ca2 description myrules2
exit
urr-list urr_smf
  rating-group 10 service-identifier 20 urr-id 1

```

```
rating-group 11 service-identifier 21 urr-id 2
rating-group 12 service-identifier 22 urr-id 3
rating-group 13 service-identifier 23 urr-id 4
rating-group 30 service-identifier 60 urr-id 20
rating-group 31 service-identifier 61 urr-id 21
rating-group 100 service-identifier 200 urr-id 5
rating-group 101 service-identifier 201 urr-id 6
rating-group 102 service-identifier 202 urr-id 7
rating-group 103 service-identifier 203 urr-id 8
exit
ruledef rda1
  ip server-ip-address = 10.10.10.10
exit
ruledef rda10
  ip any-match = TRUE
exit
ruledef rda11
  ip any-match = TRUE
exit
ruledef rda12
  ip any-match = TRUE
exit
ruledef rda13
  ip any-match = TRUE
exit
ruledef rda2
  ip server-ip-address = 10.165.161.77/32
exit
ruledef rda20
  ip any-match = TRUE
exit
ruledef rda21
  ip any-match = TRUE
exit
ruledef rda22
  ip any-match = TRUE
exit
ruledef rda23
  ip any-match = TRUE
exit
ruledef rda3
  ip server-ip-address = 8.8.8.8/28
exit
ruledef rda40
  ip any-match = TRUE
exit
ruledef rda50
  ip server-ip-address = 50.50.50.50
exit
ruledef rda51
  ip server-ip-address = 51.51.51.51
exit
ruledef rda52
  ip server-ip-address = 52.52.52.52
exit
ruledef rda60
  ip dst-address = 60.60.60.60
exit
ruledef rda61
  ip dst-address = 61.61.61.61
exit
ruledef rda62
  ip dst-address = 62.62.62.62
exit
```

```

ruledef rdaPredefined
  ip any-match = TRUE
exit
ruledef rdaStatic
  ip any-match = TRUE
exit
ruledef rdaStatic1
  ip any-match = TRUE
exit
ruledef rdaStatic2
  ip any-match = TRUE
exit
ruledef rds1
  ip any-match = TRUE
exit
ruledef rds2
  ip any-match = TRUE
exit
credit-control group onlineoffline
  diameter ignore-service-id true
exit
exit
apn intershat
  gtpd group group1
  active-charging rulebase rba1
exit
gtpd group group1
  gtpd egcdr service-data-flow threshold interval 60
  gtpd egcdr service-data-flow threshold volume downlink 100000 uplink 100000 total 200000
apn intershat
gtpd group group1
exit
smiuser add-user username liadmin password Cisco@123
smiuser change-password username liadmin current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI
smiuser assign-user-group username liadmin group LI
smiuser add-user username liadmin2 password Cisco@123
smiuser change-password username liadmin2 current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI2
smiuser assign-user-group username liadmin2 group LI2
smiuser add-user username liadmin3 password Cisco@123
smiuser change-password username liadmin3 current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI3
smiuser assign-user-group username liadmin3 group LI3
nacm groups group LI2
user-name [ liadmin2 ]
exit
nacm groups group LI3
user-name [ liadmin3 ]
exit
nacm rule-list lawful-intercept
group [ LI LI2 LI3 ]
commit
end
config
system mode running
commit
end
exit

```

