GTP-U Service Configuration Mode Commands

The GTP-U Service Configuration Mode is used to manage parameters applied to incoming GTP-U packets.

**Command Modes**

Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

`configure > context context_name > gtpu-service service_name`

Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-gtpu-service)#
```

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

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bind

Configures the IP address to use for GTP-U data packets.

Product
- ePDG
- GGSN
- P-GW
- SAEGW
- SaMOG
- SGSN
- S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

configure > context context_name > gtpu-service service_name

Entering the above command sequence results in the following prompt:

{context_name}@host_name(config-gtpu-service)#

Syntax Description

```bash
[ no ] bind { ipv4-address ipv4_address [ crypto-template crypto_template ] [ ike-bind-address { ipv4_address } ] [ ipv6-address ipv6_address [ crypto-template crypto_template ] [ ike-bind-address { ipv6_address } ] ] [ ipv4-address ipv4_address [ bearer-type { non-ims-media | ims-media | all } ] | ipv6-address ipv6_address [ crypto-template crypto_template ] [ ike-bind-address { ipv6_address } ] [ ipv4-address ipv4_address [ bearer-type { non-ims-media | ims-media | all } ] ] [ crypto-template crypto_template ] [ ike-bind-address { ipv6_address } ] ]
```

- **no** removes a configured IP address from this service.

- **ipv4-address ipv4_address**
  
  Binds this service to the IPv4 address of a configured interface.
  
  `ipv4_address` must be entered using IPv4 dotted-decimal notation.
bearer-type non-ims-media | ims-media | all

Specifies the type of bearer to be associated with the bind address. Default behavior is for that the address will be used for all bearer types.

non-ims-media Configures bind address for non-ims media only.
ims-media Configures bind address for ims-media traffic only.
all configures bind address to handle all types of bearer traffic. This is the default setting.

ipv6-address ipv6_address

Binds this service to the IPv6 address of a configured interface.
ipv6_address must be entered using IPv6 colon-separated-hexadecimal notation.

crypto-template crypto_template

Configures crypto template for IPSec, which enables IPSec tunneling for this GTP-U address. Must be followed by the name of an existing crypto template.
crypto_template must be an alphanumeric string of 1 through 127 characters.

ike-bind-address ip_address

Configures an IKE bind address. Must be followed by IPv4 or IPv6 address; IP address type must be the same as the GTP-U address type.
ipv4_address must be entered using IPv4 dotted-decimal notation.
ipv6_address must be entered using IPv6 colon-separated-hexadecimal notation.

Usage Guidelines

Use this command to bind the service to an interface for sending/receiving GTP-U packets.

Important

A GTP-U service can support a maximum of 12 GTP-U endpoints/interfaces.

Example

The following command configures the IPv4 address for this GTP-U service as 10.2.3.4:
bind ipv4-address 10.2.3.4
**echo-interval**

Configures the rate at which GPRS Tunneling Protocol (GTP) v1-U echo packets are sent.

**Product**
- ePDG
- GGSN
- P-GW
- SAEGW
- SaMOG
- SGSN
- S-GW

**Privilege**
- Administrator

**Command Modes**

`Exec > Global Configuration > Context Configuration > GTP-U Service Configuration`

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-gtpu-service)#
```

**Syntax Description**

```
echo-interval seconds [ dynamic [ smooth-factor multiplier ] ]
{ default | no } echo-interval
```

- **default**
  - Disables the configured echo-interval setting.

- **no**
  - Removes the configured echo-interval setting.

- **seconds**
  - Specifies the number of seconds between the sending of a GTP-Uv1 echo packet. `seconds` must be an integer from 60 through 3600. Default: 60

```
dynamic [ smooth-factor multiplier ]
```

- Enables the dynamic echo timer for the GTP-U service.
**smooth-factor multiplier**: Introduces a multiplier into the dynamic echo timer as an integer from 1 through 5. Default: 2

**Usage Guidelines**
Use this command to configure the rate at which GTP-Uv1 echo packets are sent.

**Example**
The following command sets the rate between the sending of echo packets at 120 seconds:

```
echo-interval 120
```

### echo-retransmission-timeout

Configures the timeout for GTP-U echo message retransmissions for this service.

**Product**
ePDG
GGSN
P-GW
SAEGW
SGSN
S-GW

**Privilege**
Administrator

**Command Modes**
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-gtpu-service)#
```

**Syntax Description**
```
echo-retransmission-timeout seconds
```

**default**
Returns the command to its default setting of 5.

```
seconds
```

Default: 5
Configures the echo retransmission timeout, in seconds, for the GTP-U service as an integer ranging from 1 to 20.

Usage Guidelines
Use this command to configure the amount of time, in seconds, before the GTP-U service transmits another echo request message. The value set in this command is used, as is, for the default echo. If dynamic echo is enabled (echo-interval dynamic) the value set in this command serves as the dynamic minimum (if the RTT multiplied by the smooth factor is less than the value set in this command, the service uses this value).

Example
The following command sets the retransmission timeout for echo messages to 2 seconds:

```
  echo-retransmission-timeout 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.

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.

extension-header

Configures the addition of an extension header in the GTP-U packet header, allowing for error indication messages.

Product
- GGSN
- P-GW
- SAEGW
- SGSN
- S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-gtpu-service)#
```

Syntax Description

```
[ default | no ] extension-header source-udp-port
```

- **default**
  Returns the command to its default setting of disabled.

- **no**
  Disables the feature.

- **source-udp-port**
  Configures extension header type UDP Port support in GTP-U header for GTP-U Error Indication messages.

Usage Guidelines
Use this command to configure the addition of an extension header in the GTP-U packet to allow for error indication messages.
Example
The following command enables the inclusion of an extension header to allow for error indication messages:

```
extension-header source-udp-port
```

## ip qos-dscp

Configures the quality of service (QoS) differentiated service code point (DSCP) per-hop behavior (PHB) to be marked on the outer header of signalling packets originating from the LTE component.

### Product
- ePDG
- P-GW
- SAEGW
- S-GW

### Privilege
Administrator

### Command Modes
```
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
```
```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:
```
[context_name]host_name(config-gtpu-service)#
```

### Syntax Description
```
ip qos-dscp { af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | be | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef }
| default | no | ip qos-dscp
```

- **default**
  Sets/restores default value.

- **no**
  Disables DSCP marking.

```
af11 | af12 | af13 | af21 | af22 | af23 | af31 | af32 | af33 | af41 | af42 | af43 | be | cs1 | cs2 | cs3 | cs4 | cs5 | cs6 | cs7 | ef
```

Specifies the IP QoS DSCP PHB to be marked on the outer header of signalling packets originating from the LTE component. This is a standards-based feature (RFC 2597 and RFC 2474).
Note that CS (class selector) mode options below are provided to support backward compatibility with the IP precedence field used by some network devices. CS maps one-to-one to IP precedence, where CS1 is IP precedence value 1. If a packet is received from a non-DSCP aware router that used IP precedence markings, then the DSCP router can still understand the encoding as a Class Selector code point.

The following forwarding types are supported:

- **af11**: Designates the use of Assured Forwarding 11 PHB. This is the default setting.
- **af12**: Designates the use of Assured Forwarding 12 PHB.
- **af13**: Designates the use of Assured Forwarding 13 PHB.
- **af21**: Designates the use of Assured Forwarding 21 PHB.
- **af22**: Designates the use of Assured Forwarding 22 PHB.
- **af23**: Designates the use of Assured Forwarding 23 PHB.
- **af31**: Designates the use of Assured Forwarding 31 PHB.
- **af32**: Designates the use of Assured Forwarding 32 PHB.
- **af33**: Designates the use of Assured Forwarding 33 PHB.
- **af41**: Designates the use of Assured Forwarding 41 PHB.
- **af42**: Designates the use of Assured Forwarding 42 PHB.
- **af43**: Designates the use of Assured Forwarding 43 PHB.
- **be**: Designates the use of Best Effort forwarding PHB.
- **cs1**: Designates the use of Class Selector code point "CS1".
- **cs2**: Designates the use of Class Selector code point "CS2".
- **cs3**: Designates the use of Class Selector code point "CS3".
- **cs4**: Designates the use of Class Selector code point "CS4".
- **cs5**: Designates the use of Class Selector code point "CS5".
- **cs6**: Designates the use of Class Selector code point "CS6".
- **cs7**: Designates the use of Class Selector code point "CS7".
- **ef**: Designates the use of Expedited Forwarding PHB typically dedicated to low-loss, low-latency traffic.

The assured forwarding behavior groups are listed in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Drop</td>
<td>AF11</td>
<td>AF21</td>
<td>AF31</td>
<td>AF41</td>
</tr>
<tr>
<td>Medium Drop</td>
<td>AF12</td>
<td>AF22</td>
<td>AF32</td>
<td>AF42</td>
</tr>
<tr>
<td>High Drop</td>
<td>AF13</td>
<td>AF23</td>
<td>AF33</td>
<td>AF43</td>
</tr>
</tbody>
</table>
Traffic marked with a higher class is given priority during congestion periods. If congestion occurs to traffic with the same class, the packets with the higher AF value are dropped first.

**Usage Guidelines**

Use this command to implement DSCP marking only for GTP-U ECHO Request and Response messages.

**Example**

Use the following command to set the use of Best Effort forwarding PHB:

```
ip qos-dscp be
```

**ipsec-allow-error-ind-in-clear**

Configures whether error-indication is dropped or sent without IPSec tunnel.

**Product**

- S-GW
- SAEGW
- SGSN

**Privilege**

Administrator

**Command Modes**

- Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
  - `configure > context context_name > gtpu-service service_name`
  
  Entering the above command sequence results in the following prompt:

  `context_name host_name (config-gtpu-service)`

**Syntax Description**

```
[ default | no ] ipsec-allow-error-ind-in-clear
```

- `default`
  
  Error-indication is dropped if no IPSec tunnel is present for that peer.

- `no`
  
  Disables the feature.

**Usage Guidelines**

Use this command to determine whether error-indication is dropped or sent without an IPSec tunnel.
On receiving data packets for a session that does not exist, error-indication needs to be sent back to the peer. If there is no IPSec tunnel present with that peer, error-indication may be either dropped or sent without any IPSec tunnel.

**Example**

The following command allows error-indication to be sent without any IPSec tunnel:

```
ipsec-allow-error-ind-in-clear
```

## ipsec-tunnel-idle-timeout

Configures the IPSec tunnel idle timeout after which IPSec tunnel deletion is triggered.

### Product

- S-GW
- SAEGW
- SGSN

### Privilege

Administrator

### Command Modes

```
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
```

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-gtpu-service)#
```

### Syntax Description

```
ipsec-tunnel-idle-timeout seconds
default ipsec-tunnel-idle-timeout
```

- **seconds**
  
  Default: 60

  Specifies the number of seconds an IPSec tunnel is idle before tunnel deletion is triggered. *seconds* must be an integer from 10 through 600.

- **default**

  Returns the command to its default setting of 60.

### Usage Guidelines

When there are no bearers on a particular IPSec tunnel, GTPUMGR initiates the delete for that tunnel. This timer helps to avoid unnecessary IPSec tunnel deletions for an idle tunnel.
Example

The following command sets the IPsec tunnel idle timeout to 100 seconds:

```bash
ipsec-tunnel-idle-timeout 100
```

max-retransmissions

Configures the maximum retry limit for GTP-U echo retransmissions.

**Product**
- ePDG
- GGSN
- P-GW
- SAEGW
- SGSN
- S-GW

**Privilege**
- Administrator

**Command Modes**

```
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
```

**Syntax Description**

```
max-retransmissions num
no max-retransmissions
```

**num**

Default: 4

Specifies the number of GTP-U echo message retransmissions allowed before triggering a path failure error condition. `num` must be an integer from 0 through 15.

**no**

Disables the feature.

**Usage Guidelines**

Use this command to set the maximum number of GTP-U echo message retransmissions in order to define a limit that triggers a path failure error.
Example
The following command sets the maximum GTP-U echo message retransmissions for this service to 10:

```
max-retransmissions 10
```

### path-failure clear-trap

Configures a trigger for clearing the path failure trap.

#### Product
- ePDG
- GGSN
- P-GW
- SAEGW
- SGSN
- S-GW

#### Privilege
Administrator

#### Command Modes

```
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
```

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name] host_name (config-gtpu-service) #
```

#### Syntax Description

```
path-failure clear-trap gtp echo
[ default | no ] path-failure clear-trap
```

- **gtp echo**
  
  Sets the clearing trigger/trap to detect a failure upon reaching the maximum number of GTP-U echo message retransmissions.

- **default**
  
  Resets the command to its default setting of enabled.

- **no**
  
  Disables the feature.
Usage Guidelines

Use this command to set the detection policy for path failures. By default, path failure trap is cleared on receiving first control plane message for that GTP-U peer allocation.

Example

The following command sets the clearing trigger to detect failures upon reaching the maximum number of GTP-U echo message retries:

```
path-failure clear-trap gtp echo
```

path-failure detection-policy

Configures a path failure detection policy on GTP-U echo messages that have been retransmitted the maximum number of retry times.

Product

ePDG
GGSN
P-GW
SAEGW
SGSN
S-GW

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]@host_name(config-gtpu-service)#
```

Syntax Description

```
path-failure detection-policy gtp echo
[ default | no ] path-failure detection-policy
```

**gtp echo**

Sets the detection policy to detect a failure upon reaching the maximum number of GTP-U echo message retransmissions.
default
Resets the command to its default setting of enabled.

no
Disables the feature.

Usage Guidelines
Use this command to set the detection policy for path failures.

Example
The following command sets the path failure detection policy to detect failures upon reaching the maximum number of GTP-U echo message retries:

```
path-failure detection-policy gtp echo
```

retransmission-timeout

Configures retransmission timeout for GTPU echo message retransmissions for this service.

Important
In release 14.0 and later versions, this command is replaced by the `echo-retransmission-timeout` command.

Product
ePDG
GGSN
P-GW
SAEGW
S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

```
configure > context context_name > gtpu-service service_name
```

Entering the above command sequence results in the following prompt:

```
[context_name]host_name(config-gtpu-service)#
```

Syntax Description
```
retransmission-timeout seconds
default retransmission-timeout
```
default
Returns the command to its default setting of 5.

seconds
Default: 5
Specifies the number of seconds between the re-sending of GTP-U echo messages. seconds must be an integer from 1 through 20.

Usage Guidelines
Use this command to set the number of seconds between the retransmission of GTP-U echo messages.

Example
The following command sets the number of seconds between the sending of GTP-U echo messages to 7:
retransmission-timeout 7

sequence-number
Enables addition of the sequence number to every GTP-U packet. Default is disabled.

Product
GGSN
HSGW
P-GW
SAEGW
SGSN
S-GW

Privilege
Administrator

Command Modes
Exec > Global Configuration > Context Configuration > GTP-U Service Configuration
configure > context context_name > gtpu-service service_name
Entering the above command sequence results in the following prompt:
(context_name)host_name(config-gtpu-service)#

Syntax Description
| no | sequence-number
no

Disables addition of the sequence number to every GTP-U packet.

Usage Guidelines

Use this command to enable/disable addition of the sequence number to every GTP-U packet coming from Gi interface and going towards Gn/Gp interface. If GTP-U packets are received out of sequence, sequence numbers would allow the packets to be reordered.

Example

The following command enables addition of the sequence number to every GTP-U packet:

sequence-number

source-port

Configures GTP-U data packet source port related parameters.

Product

GGSN
P-GW
SAEGW
S-GW

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration > GTP-U Service Configuration

configure > context context_name > gtpu-service service_name

Entering the above command sequence results in the following prompt:

{context_name}@host_name(config-gtpu-service)#

Syntax Description

source-port { non-standard | standard }

default source-port

default

Configures GTP-U service to use standard port 2152 as source port for all GTP-U data packets.

By default, standard port 2152 will be configured as GTP-U data packet source port (same as existing behavior).
non-standard
Configures GTP-U service to use multiple non-standard ports defined by system as a source port for GTP-U data packets. Starting port is 25500. Non-standard port number is unique per session manager instance.

standard
Configures GTP-U service to use standard port 2152 as source port for all GTP-U data packets.

Usage Guidelines
Currently, for forwarding GTP-U data packets, standard UDP port (2152) as source and destination port are used for outgoing GTP-U packet. This creates hardship to balance traffic properly over the LAG interfaces between the different L2/L3 elements in the network. Some routers use source UDP port to do load balancing of packets towards destination.

This command allows the source port outgoing GTP-U packet to be different for each SESSMGR. The destination port should remain as 2152, as per protocol.

Example
The following command configures GTP-U service to use standard port 2152 as source port for all GTP-U data packets.:

```
source-port standard
```

udp-checksum
Inserts UDP-checksum in the UDP header of GTP-U packet.

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.

<table>
<thead>
<tr>
<th>Product</th>
<th>GGSN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HNB-GW</td>
</tr>
<tr>
<td></td>
<td>P-GW</td>
</tr>
<tr>
<td></td>
<td>SGSN</td>
</tr>
<tr>
<td></td>
<td>S-GW</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; Context Configuration &gt; GTP-U Service Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>configure</td>
<td>context context_name &gt; gtpu-service service_name</td>
</tr>
</tbody>
</table>
Entering the above command sequence results in the following prompt:

```
[context_name] host_name(config-gtpu-service)#
```

**Syntax Description**

`udp-checksum { no-optimize | optimize } [ default | no ] udp-checksum`

- **default**
  
  Through releases 14.0: Enables the UDP checksum, but no optimization is attempted. Releases 15.0 and later: Enables the UDP checksum, and attempts optimization of the UDP checksum in UDP header of GTP-U packet using the inner payload transport checksum.

- **no**
  
  Outer UDP checksum is marked as ‘ZERO,’ effectively disabling UDP checksum. Applicable only for IPv4 data.

- **no-optimize**
  
  No optimization attempt over UDP checksum in UDP header of GTP-U packet.

- **optimize**
  
  Attempts optimization of UDP checksum in UDP header of GTP-U packet using inner payload transport checksum.

**Usage Guidelines**

This command is used for enabling optimization of UDP checksum in UDP header of the GTP-U packet. An option to completely disable the UDP checksum of GTP-U packet is also introduced.

**Example**

The following command enables the optimization of UDP checksum in UDP header of the GTP-U packet:

```
udp-checksum optimize
```