

Sx Service Configuration Mode Commands

The Sx Service Configuration Mode is used to associate with the SAEGW service at the Control Plane, and User-Plane service at the User Plane. There is one-to-one mapping of the Sx service with the Control-Plane and User Plane.

Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

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

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bind

Use this command to bind the specified Sx service to an IP address.

Product

CUPS

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > **context** *context_name* > **sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

`[ no ] bind { ipv4-address` *`ipv4_address`* **`| ipv6-address`** *`ipv6_address`* **`}`**

no

Disables the command.

ipv4-address

Designates an IPv4 address of the Sx service.

ipv6-address

Designates an IPv6 address of the Sx service.

Usage Guidelines

Use this command to bind the specified Sx service to an IPv4 or IPv6 address.

instance-type

Configures the instance type for which the Sx service with Sx Demux is used under Sx Service Configuration Mode.

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > **context** *context_name* > **sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

`[ no ] instance-type { controlplane | userplane }`

no

Disables the command.

controlplane

Configures Sx service with Demux on the Control-Plane instance.

userplane

Configures Sx service with Demux on the User-Plane instance.

Usage Guidelines Use this command to configure the instance type for which the Sx service with Sx Demux is used under Sx Service Configuration Mode. Only one instance type can be configured at a given time.

sx-protocol association release-timeout

Configures association release-timeout for Sx interface.

Product UPF

Privilege Administrator

Command Modes Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > **context** *context_name* > **sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description **`sx-protocol association release-timeout`** *`seconds`*

release-timeout *seconds*

Configures the association release interval (in seconds) for Sx Service. *seconds* must be an integer in the range of 1 to 30.

Usage Guidelines Use this command to configure association release-timeout for Sx interface.

Example

The following command sets the association release-timeout to *20* seconds:

```
sx-protocol association release-timeout 20
```

sx-protocol heartbeat

Configures heartbeat parameters for Sx interface.

Product CUPS

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Command Modes Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > **context** *context_name* > **sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description **`[ default ] sx-protocol heartbeat { interval`** *`seconds`* **`| max-retransmissions`** *`mx_value`* **`| path-failure detection-policy { control-recovery-timestamp-change`**

```
 | heartbeat-retry-failure | heartbeat-recovery-timestamp-change } |
retransmission-timeout seconds }
no sx-protocol heartbeat { interval | path-failure detection-policy {
control-recovery-timestamp-change | heartbeat-retry-failure |
heartbeat-recovery-timestamp-change }
```

default

Sets/restores default value assigned for specified parameter.

no

Disables the followed option.

heartbeat

Configures Sx heartbeat parameters.

interval *seconds*

Configures heartbeat interval (in seconds) for Sx Service. *seconds* must be an integer in the range of 1 to 3600.

max-retransmissions *mx_value*

Configures maximum retries for Sx heartbeat request. Must be followed by integer, ranging from 0 to 15. Default is 4.

retransmission-timeout *seconds*

Configures the heartbeat retransmission timeout for Sx Service, in seconds, ranging from 1 to 20. Default is 5.

path-failure

Specifies policy to be used when path failure happens via heartbeat request timeout.

detection-policy

Specifies the policy to be used. Default action is to do cleanup upon heartbeat request timeout.

control-recovery-time-stamp-change

Path failure is detected when the recovery timestamp in control request/response message changes.

heartbeat-retry-failure

Path failure is detected when the retries of heartbeat messages times out.

heartbeat-recovery-timestamp-change

Path failure is detected when the recovery timestamp in heartbeat request/response message changes.

Usage Guidelines

Use this command to configure heartbeat parameters for Sx interface.

Example

The following command sets the heartbeat interval to *60* seconds:

```
sx-protocol heartbeat interval 60
```

sx-protocol pdi-optimization

Enables Packet Detection Information (PDI) Optimization feature. This feature allows the optimization of PFCP signaling through Sx Establishment and Sx Modification messages between the Control Plane and the User Plane function.

Product

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

[no] sx-protocol pdi-optimization

no

Disables PDI optimization. By default, the CLI command is disabled.

Usage Guidelines

Use this command to enable the PDI Optimization feature.

- PDI Optimization is enabled or disabled at PDN level. PDI Optimization is enabled for each PDN based on the configuration in sx-service. The PDN is PDI Optimization-enabled if the configuration is enabled while processing Sx Establishment Request on the Control Plane.
- Configuration changes will not have any effect on the PDN. The configuration that is applied while processing Sx Establishment Request will be maintained throughout the lifetime of the PDN. In a multi-PDN call, each PDN has the configuration applied while PDN is set up.
- On the User Plane, there is no separate configuration to determine whether the PDN has PDI Optimization-enabled. When Create Traffic Endpoint IE is received in Sx Establishment Request for a Sx session, then the Sx session is considered to have PDI Optimization-enabled throughout the lifetime of the session. This will not change dynamically midway, and validations are done accordingly. In case of any validation failures, Error Response is sent back to the Control Plane.
- When there are multiple Create Traffic Endpoint IEs with the same Traffic Endpoint ID, the first Create Traffic Endpoint IE is processed, and rest are ignored. The same behavior is applicable for Created Traffic Endpoint IE, Update Traffic Endpoint IE, and Remove Traffic Endpoint IE.

sx-protocol supported-features

Configures various features for Sx interface.

Product

UPF

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

`[ no ] sx-protocol supported-features { dbdm | ddnd | epfar | load-control | overload-control | udbc }`

no

Disables the supported features.

epfar

Configures the Enhanced PFCP Association Release (epfar) feature.

dbdm

Configures the DBDM feature for Reduced Capability functionality.

ddnd

Configures the DDND feature for Reduced Capability functionality.

udbc

Configures the UDBC feature for Reduced Capability functionality.

load-control

Configures the load control feature.

overload-control

Configures the overload control feature.

Usage Guidelines

Use this command to configure the Enhanced PFCP Association Release (epfar) feature for Sx interface.

Example

The following command enables the EPFAR feature:

```
sx-protocol supported-features epfar
```

sx-service exclude-user-plane

Configures the rejection parameters to exclude a specific User Plane when it crosses a threshold.

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > **context** *context_name* > **sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

[no] exclude-user-plane minimum-call-failures *min_callfail_range* **failure-threshold-percentage** *fail_threshold_percentage* **failure-rejection-interval** *fail_reject_int*

exclude-user-plane

Excludes a User Plane when it crosses the threshold.

minimum-call-failures *min_callfail*

Configures the minimum number of call failures within failure-rejection-interval to exclude a specific UP. The value for minimum-call-failures ranges between 1 to 5000. The suggested value is 200.

failure-threshold-percentage *fail_threshold_percentage*

Configures the failure threshold percentage to exclude a specific UP. The value for failure-threshold-percentage ranges between 80 to 100. The suggested value is >=90%

failure-rejection-interval *fail_reject_int*

Configures the failure rejection interval to exclude a specific UP. The value for failure-rejection-interval ranges between 10 to 600. The suggested value is 120 seconds.

[no]

This is an optional command. It disables the exclusion of the UP.

Usage Guidelines

Use this command to configure the rejection parameters to exclude a specific User Plane post crossing a threshold.

Example

```
exclude-user-plane minimum-call-failures 200 failure-threshold-percentage
 90 failure-rejection-interval 120
```

sxa

Configures Sxa parameters for the Sx control packets on the S-GW.

Product

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

sxa { max-retransmissions *mx_value* **| retransmissions-timeout-ms** *rt_value* **}**

By default, this command is disabled.

max-retransmissions *mx_value*

Configures the maximum retries for Sx control packets on the S-GW. Enter an integer. The valid value range from 0 to 15. The default value is 4.

retransmissions-timeout-ms *rt_value*

Configures the retransmission timeout for Sx control packets (on the S-GW), in milliseconds. Enter a value in multiples of 100. The valid values range from 1000 to 20000. The default value is 5000.

Usage Guidelines

Use this command to modify the Sxa parameters for the S-GW under Sx Service Configuration Mode.

Example

The following sets the maximum retries for Sx control packets to 5:

```
sxa max-retransmissions 5
```

sxab

Configures Sxab parameters for the Sx control packets on the S-GW and P-GW.

Product

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Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

sxab { max-retransmissions *mx_value* **| retransmissions-timeout-ms** *rt_value* **}**

By default, this command is disabled.

max-retransmissions *mx_value*

Configures the maximum retries for Sx control packets on the S-GW and P-GW. Enter an integer. The valid value range from 0 to 15. The default value is 4.

retransmissions-timeout-ms *rt_value*

Configures the retransmission timeout for Sx control packets (on the S-GW and P-GW), in milliseconds. Enter a value in multiples of 100. The valid values range from 1000 to 20000. The default value is 5000.

Usage Guidelines

Use this command to modify the Sxab parameters for the S-GW and P-GW under Sx Service Configuration Mode.

Example

The following sets the maximum retries for Sx control packets to 5:

```
sxab max-retransmissions 5
```

sxb

Configures Sxb parameters for the Sx control packets on the P-GW.

Product

CUPS

Privilege

Administrator

Command Modes

Exec > Global Configuration > Context Configuration > Sx Service Configuration

configure > context *context_name* **> sx-service** *service_name*

Entering the above command sequence results in the following prompt:

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

Syntax Description

sxb { max-retransmissions *mx_value* **| retransmissions-timeout-ms** *rt_value* **}**

By default, this command is disabled.

max-retransmissions *mx_value*

Configures the maximum retries for Sx control packets on the P-GW. Enter an integer. The valid value range from 0 to 15. The default value is 4.

retransmissions-timeout-ms *rt_value*

Configures the retransmission timeout for Sx control packets (on the P-GW), in milliseconds. Enter a value in multiples of 100. The valid values range from 1000 to 20000. The default value is 5000.

Usage Guidelines

Use this command to modify the Sxb parameters for the P-GW under Sx Service Configuration Mode.

Example

The following sets the maximum retries for Sx control packets to 5:

```
sxb max-retransmissions 5
```