Cloud Native BNG Control Plane Command Reference Guide, Release 2025.01.0

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About this Guide

Note The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. While any existing biased terms are being substituted, exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

This guide provides details about the CLI commands available for the Cloud Native Broadband Network Gateway (cnBNG) Control Plane (CP).

• Conventions Used, on page iii

Conventions Used

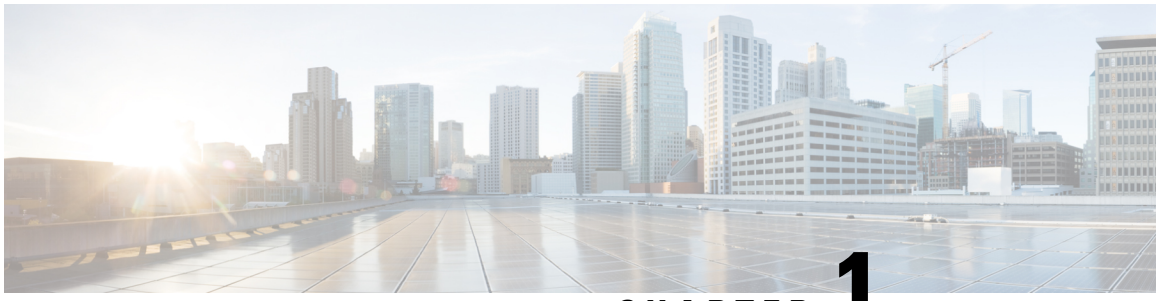
The following tables describe the conventions used throughout this documentation.

Notice Type	Description
Information Note	Provides information about important features or instructions.
Caution	Alerts you of potential damage to a program, device, or system.
Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical ha

Typeface Conventions	Description
Text represented as a `screen display`	This typeface represents displays that appear on your terminal screen, for examp `Login:`
Text represented as **commands**	This typeface represents commands that you enter, for example: **show ip access-list** This document always gives the full form of a command in lowercase letters. Co are not case sensitive.

About this Guide

Typeface Conventions	Description
Text represented as a **command** *variable*	This typeface represents a variable that is part of a command, for example: **show card** *slot_number* *slot_number* is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the **File** menu, then click **New**



CHAPTER 1

cnBNG CP Commands

This guide describes the CLI commands that are used to configure a control plane in cnBNG.

Some keywords and commands are common across multiple commands and configuration modes respectively. Use the information in the Command Modes section only as a reference to navigate to the command in the applicable configuration modes.

• user-plane port-id, on page 101

auto-test enable

Enables RADIUS automated testing.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > Server Configuration (config-server)

Syntax Description **auto-test enable**

Usage Guidelines Use this command to enable RADIUS automated testing. To disable the RADIUS Automated Testing feature, use the **no auto-test enable** command.

auto-test enable idle-timer

Enables RADIUS automated testing along with idle-timer functionality.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > Server Configuration (config-server)

Syntax Description **auto-test enable idle-timer** *value*

idle-timer *value*

Specify the value for idle-timer.

Must be a number in the range of 1 - 30.

Usage Guidelines Use this command to enable RADIUS automated testing along with idle-timer functionality. To disable the idle-timer functionality, use the **no auto-test idle-timer** command.

clear subscriber

Clears BNG subscriber data.

Command Modes Exec

Syntax Description **clear subscriber [force]** *type* **{ [ipv4-pool** *ipv4_pool_name* **] [ipv4-range** *ipv4_address_range* **] [ipv6-addr-pool** *ipv6_address_pool_name* **] [ipv6-addr-range** *ipv6_address_range* **] [ipv6-pfx-pool** *ipv6_prefix_pool_name* **] [ipv6-pfx-range** *ipv6_prefix_range* **] [mac** *mac_address* **] [port-id** *upf_port_id* **] [sublabel** *subscriber_label* **] [upf** *upf_name* **] }**

force

Specify to force session deletion, even if UP is down.

ipv4-pool ***ipv4_pool_name***

Specify the IPv4 address pool name.

Must be a string.

ipv4-range ***ipv4_address_range***

Specify the IPv4 address range in the format "*poolName*/*start-ip*".

Must be a string.

ipv6-addr-pool ***ipv6_address_pool_name***

Specify the IPv6 address pool name.

Must be a string.

ipv6-addr-range ***ipv6_address_range***

Specify the IPv6 address range in the format "*poolName*/*start-ip*".

Must be a string.

ipv6-pfx-pool ***ipv6_prefix_pool_name***

Specify the IPv6 prefix pool name.

Must be a string.

ipv6-pfx-range ***ipv6_prefix_range***

Specify the IPv6 prefix range in the format "*poolName*/*start-pfx*".

Must be a string.

mac ***mac_address***

Specify the MAC address in the format "aabb.ccdd.eeff".

Must be a string.

port-id ***upf_port_id***

Specify the user plane function port ID in the format "*upf*/*port-id*".

Must be a string.

sublabel ***subscriber_label***

Specify the subscriber label.

Must be a string.

upf ***upf_name***

Specify the user plane function name.

Must be a string.

type

Specify the type.

Must be one of the following:

- **dhcp**
- **pppoe**
- **sessmgr**

Usage Guidelines Use this command to clear BNG subscriber data.

endpoint ep

Configures endpoint parameters.

Command Modes Exec > Global Configuration

Syntax Description **endpoint** *endpoint_type* **{ replicas** *replicas_per_node* **| nodes** *node_replicas_for_resiliency* **| loopbackEth** *loopbackEth* **| loopbackPort** *loopbackPort* **}**

eptype *endpoint_type*

Specify the endpoint type.

loopbackEth *loopbackEth*

Specify the endpoint local interface name or host IP.

Must be a string.

loopbackPort *loopbackPort*

Specify the endpoint local port.

Must be an integer.

nodes *node_replicas_for_resiliency*

Specify the number of node replicas for resiliency.

Must be an integer.

Default Value: 1.

replicas *replicas_per_node*

Specify the number of replicas per node.

Must be an integer.

Default Value: 1.

In a GR setup for AIO CP cluster, the replica count must be 1 for BGP speaker pod, GR-replication pod, and UDP-proxy pod. For other pods, the replica count should be based on capacity planning.

Usage Guidelines Use this command to configure endpoint parameters.

endpoint ep interface

Configures the interface type.

Command Modes Exec > Global Configuration

Syntax Description **endpoint ep interface** *interface_type*

loopbackEth *loopback_eth*

Specify the loopback Eth.

Must be a string.

loopbackPort *loopback_port*

Specify the loopback port.

Must be an integer.

interface_type

Specify the interface type.

Usage Guidelines Use this command to configure the interface type.

endpoint ep interface sla

Configures SLA parameters.

Command Modes Exec > Global Configuration

Syntax Description **endpoint ep interface sla { response** *response_time* **| procedure** *procedure_time* **}**

procedure *procedure_time*

Specify the procedure time in milliseconds.

Must be an integer in the range of 1000-120000.

response *response_time*

Specify the response time in milliseconds.

Must be an integer in the range of 1000-180000.

Usage Guidelines Use this command to configure SLA parameters.

endpoint ep interface vip

Configures VIP IP parameters.

Command Modes Exec > Global Configuration

Syntax Description **endpoint ep interface vip { vip-ip** *vip_ip* **| vip-port** *vip_port* **| offline }**

offline

Specify to mark the vip-ip as offline.

vip-ip *vip_ip*

Specify the host IP address.

Must be a string.

vip-port *vip_port*

Specify the port number.

Must be an integer.

Usage Guidelines Use this command to configure VIP IP parameters.

endpoint ep vip

Configures VIP parameters.

Command Modes Exec > Global Configuration > Endpoint Confgiuration

Syntax Description **vip-ip** *vip_ip_address* **[[vip-port** *port_number* **] [offline]]**

offline

Specify the VIP-IP as offline.

vip-ip *vip_ip_address*

Specify the VIP IP address.

Must be a string.

vip-port *port_number*

Specify the port number.

Must be an integer.

Usage Guidelines Use this command to configure VIP parameters.

helm

Configures Helm configuration parameters.

Command Modes Exec > Global Configuration (config)

Syntax Description **helm default-repository** *default_repository_name*

default-repository *default_repository_name*

Specify the name of the default Helm repository.

Usage Guidelines Use this command to configure Helm configuration parameters.

helm charts

Displays Helm release details.

Command Modes Exec > Global Configuration (config)

Syntax Description **charts**

Usage Guidelines Use this command to view Helm release details.

helm repository

Configures Helm repository parameters.

Command Modes Exec > Global Configuration (config)

Syntax Description **helm repository** *helm_repo_name* **[[access-token** *access_token* **] [url** *helm_repo_url* **] [username** *helm_repo_username* **] [password** *helm_repo_password* **]]**

access-token *helm_repo_access_token*

Specify the access token for the Helm repository.

Must be a string.

password *helm_repo_password*

Specify the password for the Helm repository.

Must be an aes-cfb-128-encrypted string.

url *helm_repo_url*

Specify the URL for the Helm repository.

Must be a string.

username *helm_repo_username*

Specify the username for the Helm repostiory.

Must be a string.

helm_repo_name

Specify the name of the Helm repository.

Must be a string.

Usage Guidelines Use this command to configure the Helm repository parameters.

ipam-address-chunk

Configures pre-allocation of Gateway IP and address chunks.

Command Modes Exec mode

Syntax Description

```
ipam-address-chunk { allocate | release { [ pool-group-tag  value |
pool-name  pool_name ]}
{ address-type [ ipv6-addr | ipv6-prefix | ipv4 ] }
[ ipam-dp-key  dp_key ]
[ gr-instance gr_instance ]
[ srg-peer-id srg_peer_id ]
```

allocate

Enables pre-allocation of IP address chunk and the gateway IP.

release

Releases the data plane and its associated IP address chunks.

pool-group-tag / pool-name

Provide either the pool-name or the pool-group-tag, and this should match the pool information configured in the DHCP profile.

address-type

Specify one of the three possible address types:

- ipv6-addr
- ipv6-prefix
- ipv4

ipam-dp-key

Specifies the data plane key for IP management.

- **Routed SRG case**: Indicates the value of ipam-dp-key specified in the DHCP pool. Currently, circuit-id is supported. Essentially, use the value of circuit-id set on the access-side OLT.
- **Non-Routed SRG case**: The **ipam-dp-key** can either be the same as the srg-peer-id or it can be different.
- **Non-Routed Non SRG case**: This scenario is not supported currently.
- **Routed Non SRG case**: This scenario is not supported currently.

gr-instance

Specifies the GR instance information. If not provided, the local gr-instance is used as the default value.

srg-peer-id

The SRG group peer-id as specified in the configuration.

Usage Guidelines

Use this command to allocate and release IP address chunks.

The output of this action command provides information about the chunk and the first IP address that were reserved. For example,

```
bng# ipam-address-chunk allocate instance-id 1 pool-name dhcp-ipv6-iapd ipv6-prefix
ipam-dp-key
INGJRJKTMDHRTW6001ENBESR001 srg-peer-id Peer1
Sat Aug 24 06:27:29.200 UTC+00:00
result
Gateway Address: 2001:DB8::1/50
```

ipam address-pool

Configures IPAM address pools.

Command Modes

Exec > Global Configuration (config) > IPAM Configuration (config-ipam)

Syntax Description

address-pool *pool_name* **[static | offline | vrf-name** *vrf_name* **]**

address-quarantine-timer *address_quarantine_timer_interval*

Specify the address quarantine timer interval in seconds.

Must be an integer in the range of 4-60.

Default Value: 4.

default-gateway *ip_address*

Specify the default gateway IP address for static pool.

Must be an IPv4 address.

offline

Specify the pool as an offline pool.

prefix-length *prefix_length*

Specify the prefix length.

Must be an integer in the range of 1-64.

Default Value: 64.

vrf-name *vrf_name*

Specify the VRF name.

Must be a string.

pool_name

Specify the address pool's name.

Must be a string.

Usage Guidelines Use this command to configure IPAM address pools.

ipam address-pool ipv4 address-range

Configures IPv4 address ranges.

Command Modes Exec > Global Configuration (config) > IPAM Configuration (config-ipam) > Address Pool Configuration

Syntax Description **address-range** *start_ipv4_address end_ipv4_address* **[offline]**

default-gateway *ip_address*

Specify the default gateway IP address for static pool.

Must be an IPv4 address.

offline

Specify the IPv4 address range as offline.

end_ipv4_address

Specify the end address of the IPv4 address range.

Must be an IPv4 address.

start_ipv4_address

Specify the start address of the IPv4 address range.

Must be an IPv4 address.

Usage Guidelines Use this command to configure IPv4 address ranges.

ipam address-pool ipv4 split-size

Configures chunk split size.

Command Modes Exec > Global Configuration > IPAM Configuration

Syntax Description **split-size [per-cache** *number_of_addresses* **] [per-dp** *number_of_addresses* **]**

no-split

Specify not to split the address range into smaller chunks.

per-cache *number_of_addresses*

Specify the number of addresses per chunk for IPAM cache allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

per-dp *number_of_addresses*

Specify the number of addresses per chunk for data-plane allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

Usage Guidelines Use this command to configure chunk split sizes.

ipam address-pool ipv4 threshold

Configures pool thresholds.

Command Modes Exec > Global Configuration > IPAM Configuration

Syntax Description **threshold upper-threshold** *upper_threshold*

upper-threshold *upper_threshold*

Specify the upper threshold value in percentage.

Must be an integer in the range of 1-100.

Usage Guidelines Use this command to configure pool thresholds.

ipam address-pool ipv6 address-ranges address-range

Configures IPv6 address ranges.

Command Modes Exec > Global Configuration (config) > IPAM Configuration (config-ipam) > Address Pool Configuration > Address Ranges Configuration

Syntax Description **address-range** *start_ipv6_address end_ipv6_address* **[offline]**

default-gateway *ip_address*

Specify the default gateway IP address for static pool.

Must be an IPv4 address.

offline

Specify the IPv6 address range as offline.

end_ipv6_address

Specify the end address of the IPv6 address range.

Must be an IPv6 address.

start_ipv6_address

Specify the start address of the IPv6 address range.

Must be an IPv6 address.

Usage Guidelines Use this command to configure IPv6 address ranges.

ipam address-pool ipv6 address-ranges split-size

Configures chunk split size.

Command Modes Exec > Global Configuration > IPAM Configuration

Syntax Description **split-size [per-cache** *number_of_addresses* **] [per-dp** *number_of_addresses* **]**

no-split

Specify not to split the address range into smaller chunks.

per-cache *number_of_addresses*

Specify the number of addresses per chunk for IPAM cache allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

per-dp *number_of_addresses*

Specify the number of addresses per chunk for data-plane allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

Usage Guidelines Use this command to configure chunk split sizes.

ipam address-pool ipv6 address-ranges threshold

Configures pool thresholds.

Command Modes Exec > Global Configuration > IPAM Configuration

Syntax Description **threshold upper-threshold** *upper_threshold*

upper-threshold *upper_threshold*

Specify the upper threshold value in percentage.

Must be an integer in the range of 1-100.

Usage Guidelines Use this command to configure pool thresholds.

ipam address-pool ipv6 prefix-ranges prefix-range

Configures IPv6 prefix ranges.

Command Modes Exec > Global Configuration (config) > IPAM Configuration (config-ipam) > Address Pool Configuration > Prefix Ranges Configuration

Syntax Description **prefix-range** *prefix_value* **length** *prefix_length* **[offline]**

length *prefix_length*

Specify the prefix length.

Must be an integer in the range of 1-63.

offline

Specify the IPv6 prefix range as offline.

prefix-range *prefix_value*

Specify the IPv6 prefix range.

Must be an IPv6 address.

Usage Guidelines Use this command to configure IPv6 prefix ranges.

ipam address-pool ipv6 prefix-ranges split-size

Configures chunk split size.

Command Modes Exec > Global Configuration > IPAM Configuration

Syntax Description

split-size [per-cache *number_of_addresses* **] [per-dp** *number_of_addresses* **]**

no-split

Specify not to split the address range into smaller chunks.

per-cache *number_of_addresses*

Specify the number of addresses per chunk for IPAM cache allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

per-dp *number_of_addresses*

Specify the number of addresses per chunk for data-plane allocation. Specify in power of 2.

Must be an integer in the range of 2-262144.

Usage Guidelines

Use this command to configure chunk split sizes.

ipam address-pool ipv6 prefix-ranges threshold

Configures pool thresholds.

Command Modes

Exec > Global Configuration > IPAM Configuration

Syntax Description

threshold upper-threshold *upper_threshold*

upper-threshold *upper_threshold*

Specify the upper threshold value in percentage.

Must be an integer in the range of 1-100.

Usage Guidelines

Use this command to configure pool thresholds.

ipam address-pool static

Configures static pool parameters.

Command Modes

Exec > Global Configuration (config) > IPAM Configuration (config-ipam) > Address Pool Configuration

Syntax Description

static { enable | user-plane *user_plane* **}**

enable

Specify to set pool as static.

user-plane *user_plane*

Specify to associate user plane for this static pool.

Must be a string.

Usage Guidelines Use this command to configure static pool parameters.

ipam source

Configures pool-datastore source selection.

Command Modes Exec > Global Configuration (config)

Syntax Description **`ipam source local`**

local

Specify to use local address pool datastore.

Usage Guidelines Use this command to configure pool-datastore source selection. Enters the IPAM Configuration mode";

ipam threshold

Configures global thresholds.

Command Modes Exec > Global Configuration (config) > IPAM Configuration (config-ipam)

Syntax Description **`threshold [ [ ipv4-addr`** *`ipv4_address_threshold`* **`] | [ ipv6-addr`** *`ipv6_address_threshold`* **`] | [ ipv6-prefix`** *`ipv6_prefix_threshold`* **`] ]`**

ipv4-addr *ipv4_address_threshold*

Specify the IPv4 address threshold in percentage.

Must be an integer in the range of 1-100.

ipv6-addr *ipv6_address_threshold*

Specify the IPv6 address threshold in percentage.

Must be an integer in the range of 1-100.

ipv6-prefix *ipv6_prefix_threshold*

Specify the IPv6 prefix threshold in percentage.

Must be an integer in the range of 1-100.

Usage Guidelines Use this command to configure global thresholds.

k8 bng

Configures k8 BNG parameters.

Command Modes Exec > Global Configuration

Syntax Description **bng etcd-endpoint** *etcd_endpoint* **datastore-endpoint** *datastore_endpoint* **coverage-build { false | true }**

etcd-endpoint *etcd_endpoint*

Specify the Etcd endpoint configuration. For example, *hostname*:*port*

Default Value: "etcd:2379".

datastore-endpoint *datastore_endpoint*

Specify the Datastore endpoint configuration. For example, *hostname*:*port*

etcd-endpoint *etcd_endpoint*

Specify the Etcd endpoint configuration. For example, *hostname*:*port*

Default Value: "datastore-ep-session:8882".

coverage-build { false | true }

Specify to enable or disable coverage build.

Must be one of the following:

- **false**
- **true**

Default Value: false.

datastore-endpoint *datastore_endpoint*

Specify the Datastore endpoint configuration. For example, *hostname*:*port*

etcd-endpoint *etcd_endpoint*

Specify the Etcd endpoint configuration. For example, *hostname*:*port*

Usage Guidelines Use this command to configure k8 BNG parameters.

k8 label pod-group-config

Configures K8 node affinity label pod group configuration.

Command Modes Exec > Global Configuration

Syntax Description

k8 label pod-group-config pod-group *pod_group* **key** *label_key* **value** *label_value*

key *label_key*

Specify the key for the label.

Must be a string.

pod-group *pod_group*

Specify the pod group for the VMs.

Must be one of the following:

- **cdl-layer**
- **oam-layer**
- **protocol-layer**
- **service-layer**

value *label_value*

Specify the value for the label.

Must be a string.

Usage Guidelines

Use this command to configure K8 node affinity label pod group configuration.

kubernetes

Configures Kubernetes parameters.

Command Modes

Exec > Global Configuration (config)

Syntax Description

k8s name *k8s_cluster_name* **[[image-pull-secrets** *image_pull_secrets* **] [ingress-host-name** *ingress_host_name* **] [namespace** *k8s_namespace* **] [nf-name** *nf_name* **] [registry** *image_registry* **] [single-node { false | true }] [use-volume-claims { false | true }]]**

image-pull-secrets *image_pull_secrets*

Specify the image pull secrets stored within K8s.

Must be a string.

ingress-host-name *ingress_host_name*

Specify the generic ingress host name.

Must be a string.

name *k8s_cluster_name*

Specify the K8s cluster name.

Must be a string.

namespace *k8s_namespace*

Specify the K8s namespace for the network function.

Must be a string.

nf-name *nf_name*

Specify the NF deployed in this k8s namespace.

Must be a string.

registry *image_registry*

This keyword is deprecated.

Must be a string.

single-node { false | true }

Specify to enable or disable single node deployment.

Must be one of the following:

- **false**
- **true**

Default Value: false.

use-volume-claims { false | true }

Specify to enable or disable using volume claims when deploying.

Must be one of the following:

- **false**
- **true**

Default Value: false.

Usage Guidelines Use this command to configure Kubernetes parameters.

kubernetes nodes

Configures list of k8s nodes.

Command Modes Exec > Global Configuration (config)

Syntax Description **k8s nodes** *k8s_node_name* **[[node-type** *node_type* **] [worker-type** *worker_type* **]]**

node-type *node_type*

Specify the K8s node type.

Must be a string.

worker-type *worker_type*

Specify the k8s worker type.

Must be a string.

k8s_node_name

Specify the K8s node name.

Must be a string.

Usage Guidelines Use this command to configure the list of k8s nodes.

logging level

Configures the logging level.

Command Modes Exec > Global Configuration

Syntax Description **level** *log_level*

application *application_log_level*

Specify the application logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

monitor-subscriber *monitor_subscriber_log_level*

Specify the monitor subscriber logging level.

Must be one of the following:

- **debug**

- **error**
- **info**
- **off**
- **trace**
- **warn**

tracing *tracing_log_level*

Specify the tracing logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

transaction *transaction_log_level*

Specify the transaction logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

Usage Guidelines Use this command to configure the logging level.

logging logger

Configures the log name.

Command Modes Exec > Global Configuration

Syntax Description `logger log_name`

log_name

Specify the log name in "module.component.interface" format.

Must be a string.

Usage Guidelines Use this command to configure the log name.

logging logger level

Configures the logging level.

Command Modes Exec > Global Configuration

Syntax Description **logger level** *log_type_options*

application *application_log_level*

Specify the application logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

monitor-subscriber *monitor_subscriber_log_level*

Specify the monitor subscriber logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

tracing *tracing_log_level*

Specify the tracing logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

transaction *transaction_log_level*

Specify the transaction logging level.

Must be one of the following:

- **debug**
- **error**
- **info**
- **off**
- **trace**
- **warn**

Usage Guidelines Use this command to configure the logging level.

logging transaction

Configures the transaction logging parameters.

Command Modes Exec > Global Configuration

Syntax Description **`transaction`** *`transaction_log_parameters`*

duplicate

Specify to enable duplicate in transaction logging.

Must be one of the following:

- **disable**
- **enable**

Default Value: disable.

message

Specify to enable messages in transaction logging.

Must be one of the following:

- **disable**
- **enable**

Default Value: disable.

Usage Guidelines Use this command to configure the transaction logging parameters.

prepend as-path true

Enables the cnBNG to prepend the AS-path attribute to BGP Virtual IP (VIP) routes when advertising to neighboring routers.

Command Modes Exec > Global Configuration (config) > Router BGP Configuration (config-bgp)

Syntax Description **`prepend as-path true`**

Usage Guidelines Use this command to enable prepending of AS-path attribute to BGP VIP routes.

profile aaa

Configures AAA profiles.

Command Modes Exec > Global Configuration (config)

Syntax Description **`profile aaa`** *`aaa_profile_name`*

aaa_profile_name

Specify the AAA profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure AAA profiles. Enters the AAA Profile Configuration mode.

profile aaa accounting

Configures accounting configuration parameters.

Command Modes Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*)

Syntax Description **`accounting method-order`** *`method_list_order`*

method-order *method_list_order*

Specify the method list order.

Must be one of the following:

- **radius**

Usage Guidelines

Use this command to configure accounting parameters.

You can configure a maximum of three elements with this command.

profile aaa accounting service

Configures asynchronous mode for service accounting.

Command Modes

Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*) >Accounting configuration (config-accounting)

Syntax Description

service { acct-interim-async *true/false* **| acct-start-async** *true/false* **| acct-stop-async** *true/false* **}**

acct-interim-async *true/false*

Specifies the option to enable or disable the asynchronous mode when interim updates are sent.

Must be one of the following:

- **true**
- **false**

acct-start-async *true/false*

Specifies the option to enable or disable the asynchronous mode when an Accounting-Start request is sent to AAA.

Must be one of the following:

- **true**
- **false**

acct-stop-async *true/false*

Specifies the option to enable or disable the asynchronous mode when an Accounting-Stop request is sent.

Must be one of the following:

- **true**
- **false**

Usage Guidelines

Use this command to configure asynchronous mode for service accounting.

If asynchronous RADIUS accounting is configured, message retransmission functionality will be unavailable. Lost messages due to network issues or server errors will not be retried by the Control Plane.

profile aaa accounting session

Configures asynchronous mode for session accounting.

Command Modes Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*) >Accounting configuration (config-accounting)

Syntax Description **session { acct-interim-async** *true/false* **| acct-start-async** *true/false* **| acct-stop-async** *true/false* **}**

acct-interim-async *true/false*

Specifies the option to enable or disable the asynchronous mode when interim updates are sent.

Must be one of the following:

- **true**
- **false**

acct-start-async *true/false*

Specifies the option to enable or disable the asynchronous mode when an Accounting-Start request is sent to AAA.

Must be one of the following:

- **true**
- **false**

acct-stop-async *true/false*

Specifies the option to enable or disable the asynchronous mode when an Accounting-Stop request is sent.

Must be one of the following:

- **true**
- **false**

Usage Guidelines Use this command to configure asynchronous mode for session accounting.

If asynchronous RADIUS accounting is configured, message retransmission functionality will be unavailable. Lost messages due to network issues or server errors will not be retried by the Control Plane.

profile aaa authentication

Configures authentication parameters.

Command Modes Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*)

Syntax Description

authentication [method-order *method_list_order* **]**

method-order *method_list_order*

Specify the method list order.

Must be one of the following:

- **radius**

Usage Guidelines

Use this command to configure authentication parameters.

You can configure a maximum of three elements with this command.

profile aaa authorization

Configures authorization parameters.

Command Modes

Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*)

Syntax Description

authorization [password *default_password* **]**

password *default_password*

Specify the default password.

Must be a string.

Usage Guidelines

Use this command to configure authorization parameters. Enters the Authorization Configuration mode.

profile aaa authorization type subscriber

Configures authorization type subscriber.

Command Modes

Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*) > Authorization Configuration (config-authorization)

Syntax Description

type subscriber method-order *method_list_order*

method-order *method_list_order*

Specify the method list order.

Must be one of the following:

- **radius**

Usage Guidelines

Use this command to configure authorization type subscriber.

You can configure a maximum of three elements with this command.

profile aaa authorization username

Configures the default user name.

Command Modes Exec > Global Configuration (config) > AAA Profile Configuration (config-aaa-*aaa_profile_name*) > Authorization Configuration (config-authorization)

Syntax Description **username { format** *attribute_format* **| identifier** *identifier_type* **| value** *user_name* **}**

format *attribute_format*

Specify the attribute format.

identifier *identifier_type*

Specify the identifier type.

value *user_name*

Specify the user name.

Must be a string.

Usage Guidelines Use this command to configure the default user name.

profile attribute-format

Configures AAA attribute templates.

Command Modes Exec > Global Configuration (config)

Syntax Description **profile attribute-format** *profile_name* **[format-order** *attributes_list* **]**

format-order *attributes_list*

Specify the ordered list of attributes.

profile_name

Specify the profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Must be a string.

Usage Guidelines Use this command to configure AAA attribute templates. Enters the Attribute Format Profile Configuration mode.

You can configure a maximum of 32 elements with this command.

profile coa

Configures RADIUS Dynamic-author/COA parameters.

Command Modes Exec > Global Configuration

Syntax Description **profile coa server-key** *server_shared_secret_key*

server-key *server_shared_secret_key*

Specify the COA server shared secret key.

Must be an aes-cfb-128-encrypted string.

Usage Guidelines Use this command to configure RADIUS Dynamic-author/COA parameters.

profile coa client

Configures RADIUS COA client parameters.

Command Modes Exec > Global Configuration

Syntax Description **client ip** *client_ip_address* **server-key** *client_shared_secret_key*

ip *client_ip_address*

Specify the client IP address.

Must be an IP address.

server-key *client_shared_secret_key*

Specify the client shared secret key.

Must be an aes-cfb-128-encrypted string.

Usage Guidelines Use this command to configure RADIUS COA client parameters.

profile dhcp

Configures DHCP profiles.

Command Modes Exec > Global Configuration (config)

Syntax Description **dhcp** *dhcp_profile_name*

dhcp_profile_name

Specify the DHCP profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure DHCP profiles. Enters the DHCP Profile Configuration mode.

profile dhcp ipv4

Configures DHCP IPv4 parameters.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*)

Syntax Description **ipv4 [mode** *dhcp_mode* **]**

mode *dhcp_mode*

Specify the DHCP server or proxy mode.

Default Value: server.

Usage Guidelines Use this command to configure DHCP IPv4 parameters. Enters the DHCP IPv4 Configuration mode.

profile dhcp ipv4 class

Configures DHCP IPv4 class configuration parameters.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4)

Syntax Description **class** *dhcp_class_name*

dhcp_class_name

Specify the DHCP class name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure DHCP IPv4 class configuration parameters. Enters the DHCP Class Configuration mode.

profile dhcp ipv4 class matches

Configures the list of match values.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*)

Syntax Description **matches [match-type { all | any }]**

match-type *match_type*

Specify the match type.

Usage Guidelines Use this command to configure the list of match values. Enters the Matches Configuration mode.

profile dhcp ipv4 class matches match

Configures match key and value.

Command Modes Exec > Global Configuration (config) > DHCP Configuration (config-dhcp-*dhcp_profile_name*) > DHCP Class Configuration (config-class-*dhcp_class_name*) > Matches Configuration (config-matches)

Syntax Description **match** *match_key* **{ ascii** *ascii_string* **| hex** *hex_string* **}**

match_key

Specify the match key.

ascii *ascii_string*

Specify the ASCII strings.

Must be a string.

hex *hex_string*

Specify the hexadecimal strings.

Must be a string in the pattern ([0-9a-fA-F]{2}([0-9a-fA-F]{2})*)?.

match_key

Specify the match key.

You can configure a maximum of "8" elements with this command.

Usage Guidelines Use this command to configure match key and value.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv4 class server

Configures DHCP server mode.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*)

Syntax Description

server [boot-filename *boot_file_name* **| dns-servers** *ip_address* **| domain-name** *domain_name* **| netbios-name-server** *ip_address* **| next-server** *ip_address* **| ntp-servers** *ntp_servers* **| pool-name** *pool_name* **]**

boot-filename *boot_file_name*

Specify the boot file name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

dns-servers *ip_address*

Specify the DNS server IP addresses.

Must be an IPv4 address.

domain-name *domain_name*

Specify the domain name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

netbios-name-server *ip_address*

Specify the NetBIOS name server IP addresses.

Must be an IPv4 address.

next-server *ip_address*

Specify the TFTP server IP address to be used by the client.

Must be an IPv4 address.

ntp-servers *ntp_servers*

Specify the NTP servers.

Must be an IPv4 address.

pool-name *pool_name*

Specify the pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines

Use this command to configure the DHCP server mode. Enters the DHCP Server Configuration mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv4 class server lease

Configures DHCP Server Lease parameters.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **`lease { [ days`** *`days`* **`] [ hours`** *`hours`* **`] [ minutes`** *`minutes`* **`] }`**

days *days*

Specify the number of days.

Must be an integer in the range of 0-365.

hours *hours*

Specify the hours.

Must be an integer in the range of 0-23.

minutes *minutes*

Specify the minutes.

Must be an integer in the range of 0-59.

Usage Guidelines Use this command to configure the DHCP Server Lease parameters.

profile dhcp ipv4 class server netbios-node-type

Configures NetBIOS node type.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **`netbios-node-type { broadcast-node | hexadecimal`** *`hex_number`* **`| hybrid-node | mixed-node | peer-to-peer-node }`**

broadcast-node

Specify broadcast node.

hexadecimal *hex_number*

Specify the hexadecimal number.

Must be a string in the pattern ([0-9a-fA-F]{2}(:[0-9a-fA-F]{2})*)?.

hybrid-node

Specify hybrid node.

mixed-node

Specify mixed node.

peer-to-peer-node

Specify peer-to-peer node.

Usage Guidelines Use this command to configure the NetBIOS node type.

profile dhcp ipv4 class server option-codes

Configures the OptionCode table.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description `option-codes`

Usage Guidelines Use this command to configure the OptionCode table. Enters the Option Codes Configuration mode.

profile dhcp ipv4 class server option-codes option-code

Configures a DHCP option code.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server) > Option Codes Configuration (config-option-codes)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server) > Option Codes Configuration (config-option-codes)

Syntax Description `option-code` *dhcp_option_code* `[ ascii-string` *ascii_string* `| force-insert { false | true } | hex-string` *hex_string* `| ip-address` *ip_address* `]`

ascii-string *ascii_string*

Specify the ASCII string.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

force-insert { false | true }

Specify whether to force insert this option.

Must be one of the following:

- **false**
- **true**

hex-string *hex_string*

Specify the hexadecimal string.

Must be a string in the pattern ([0-9a-fA-F]{2}([0-9a-fA-F]{2})*)?.

ip-address *ip_address*

Specify the server's IP addresses.

Must be an IPv4 address.

option-code *dhcp_option_code*

Specify the DHCP option code.

Must be an integer in the range of 0-255.

Usage Guidelines

Use this command to configure a DHCP option code. Enters the Option Code Configuration mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv4 server

Configures DHCP server mode.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4)

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*)

Syntax Description

server [boot-filename *boot_file_name* **| dns-servers** *ip_address* **| domain-name** *domain_name* **| netbios-name-server** *ip_address* **| next-server** *ip_address* **| ntp-servers** *ntp_servers* **| pool-name** *pool_name* **]**

boot-filename *boot_file_name*

Specify the boot file name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

dns-servers *ip_address*

Specify the DNS server IP addresses.

Must be an IPv4 address.

domain-name *domain_name*

Specify the domain name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

netbios-name-server *ip_address*

Specify the NetBIOS name server IP addresses.

Must be an IPv4 address.

next-server *ip_address*

Specify the TFTP server IP address to be used by the client.

Must be an IPv4 address.

ntp-servers *ntp_servers*

Specify the NTP servers.

Must be an IPv4 address.

pool-name *pool_name*

Specify the pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines

Use this command to configure the DHCP server mode. Enters the DHCP Server Configuration mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv4 server lease

Configures DHCP Server Lease parameters.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description

`lease { [ days` *`days`* `] [ hours` *`hours`* `] [ minutes` *`minutes`* `] }`

days *days*

Specify the number of days.

Must be an integer in the range of 0-365.

hours *hours*

Specify the hours.

Must be an integer in the range of 0-23.

minutes *minutes*

Specify the minutes.

Must be an integer in the range of 0-59.

Usage Guidelines Use this command to configure the DHCP Server Lease parameters.

profile dhcp ipv4 server netbios-node-type

Configures NetBIOS node type.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **`netbios-node-type { broadcast-node | hexadecimal`** *`hex_number`* **`| hybrid-node | mixed-node | peer-to-peer-node }`**

broadcast-node

Specify broadcast node.

hexadecimal *hex_number*

Specify the hexadecimal number.

Must be a string in the pattern ([0-9a-fA-F]{2}(:[0-9a-fA-F]{2})*)?.

hybrid-node

Specify hybrid node.

mixed-node

Specify mixed node.

peer-to-peer-node

Specify peer-to-peer node.

Usage Guidelines Use this command to configure the NetBIOS node type.

profile dhcp ipv4 server option-codes

Configures the OptionCode table.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **`option-codes`**

Usage Guidelines Use this command to configure the OptionCode table. Enters the Option Codes Configuration mode.

profile dhcp ipv4 server option-codes option-code

Configures a DHCP option code.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Server Configuration Mode (config-server) > Option Codes Configuration (config-option-codes)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv4 Configuration (config-ipv4) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server) > Option Codes Configuration (config-option-codes)

Syntax Description **`option-code`** *`dhcp_option_code`* **`[ ascii-string`** *`ascii_string`* **`| force-insert { false | true } | hex-string`** *`hex_string`* **`| ip-address`** *`ip_address`* **`]`**

ascii-string *ascii_string*

Specify the ASCII string.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

force-insert { false | true }

Specify whether to force insert this option.

Must be one of the following:

- **false**
- **true**

hex-string *hex_string*

Specify the hexadecimal string.

Must be a string in the pattern ([0-9a-fA-F]{2}([0-9a-fA-F]{2})*)?.

ip-address *ip_address*

Specify the server's IP addresses.

Must be an IPv4 address.

option-code *dhcp_option_code*

Specify the DHCP option code.

Must be an integer in the range of 0-255.

Usage Guidelines Use this command to configure a DHCP option code. Enters the Option Code Configuration mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv6

Configures DHCP IPv6 parameters.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*)

Syntax Description **ipv6 [mode** *dhcp_mode* **]**

mode *dhcp_mode*

Specify the DCHP mode server or proxy.

Default Value: server.

Usage Guidelines Use this command to configure DHCP IPv6 parameters. Enters the DHCP IPv6 Configuration mode.

profile dhcp ipv6 class

Configures DHCP IPv6 class configuration parameters.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6)

Syntax Description **class** *dhcp_class_name*

dhcp_class_name

Specify the DHCP class name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure DHCP IPv6 class configuration parameters.

profile dhcp ipv6 class server

Configures DHCP server mode.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6)

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Class Configuration (config-class-*dhcp_class_name*)

Syntax Description

server { aftr-name *aftr_name* **| dns-servers** *ip_address* **| domain-name** *domain_name* **| iana-pool-name** *iana_pool_name* **| iapd-pool-name** *iapd_pool_name* **| preference** *server_preference* **| rapid-commit }**

aftr-name *aftr_name*

Specify the Address Family Transition Router (AFTR) name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

dns-servers *ip_address*

Specify the DNS server IP addresses.

Must be an IPv6 address.

domain-name *domain_name*

Specify the domain name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

iana-pool-name *iana_pool_name*

Specify the IANA pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

iapd-pool-name *iapd_pool_name*

Specify the IAPD pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

preference *server_preference*

Specify the DHCP server preference.

Must be an integer in the range of 1-255.

rapid-commit

Specify to allow rapid commit.

Usage Guidelines Use this command to configure the DHCP server mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv6 class server lease

Configures the lease parameters.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **`lease { [ days`** *`days`* **`] [ hours`** *`hours`* **`] [ minutes`** *`minutes`* **`] }`**

days *days*

Specify the number of days.

Must be an integer in the range of 0-365.

hours *hours*

Specify the hours.

Must be an integer in the range of 0-23.

minutes *minutes*

Specify the minutes.

Must be an integer in the range of 1-59.

Usage Guidelines Use this command to configure lease parameters.

profile dhcp ipv6 mode server option-codes option-code

Configures a DHCP option code.

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Server Configuration Mode (config-server) > Option Codes Configuration (config-option-codes)

Syntax Description **`option-code`** *`dhcp_option_code`* **`[ ascii-string`** *`ascii_string`* **`| force-insert { false | true } | hex-string`** *`hex_string`* **`| ip-address`** *`ip_address`* **`]`**

option-code *dhcp_option_code*

Specify the DHCP option code [up to 255].

ascii-string *ascii_string*

Specify the ASCII string.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

force-insert { false | true }

Specify whether to force insert this option.

Must be one of the following:

- **false**
- **true**

If set to true, force insert the option regardless of the DHCPv6 Option Request Option (ORO) value. If set to false, honor the ORO option.

hex-string *hex_string*

Specify the hexadecimal string.

Must be a string in the pattern ([0-9a-fA-F]{2}([0-9a-fA-F]{2})*)?.

ip-address *ipv6_address*

Specify the server's IP addresses.

Must be an IPv6 address.

profile dhcp ipv6 server

Configures DHCP server mode.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6)

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Class Configuration (config-class-*dhcp_class_name*)

Syntax Description

server { aftr-name *aftr_name* **| dns-servers** *ip_address* **| domain-name** *domain_name* **| iana-pool-name** *iana_pool_name* **| iapd-pool-name** *iapd_pool_name* **| ipam-dp-key circuit-id delimiter** *value* **substring** *value* **| preference** *server_preference* **| rapid-commit }**

aftr-name *aftr_name*

Specify the Address Family Transition Router (AFTR) name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

dns-servers *ip_address*

Specify the DNS server IP addresses.

Must be an IPv6 address.

domain-name *domain_name*

Specify the domain name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

iana-pool-name *iana_pool_name*

Specify the IANA pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

iapd-pool-name *iapd_pool_name*

Specify the IAPD pool name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ipam-dp-key circuit-id delimiter *value* substring *value*

Specify the data plane key for IP management.

- **circuit-id** *value*: The DHCPv6 interface-id found in the hop zero relay header will be used as the key for IPAM in the data plane.
- **delimiter** *value*: The delimiter value must be a single character and can be one of the following: [!@#$%^&*()_+].
- **substring** *value*: This option can only be set to 0 or 1. It allows the string to be split into two substrings based on the first occurrence of the specified delimiter.

preference *server_preference*

Specify the DHCP server preference.

Must be an integer in the range of 1-255.

rapid-commit

Specify to allow rapid commit.

Usage Guidelines

Use this command to configure the DHCP server mode.

You can configure a maximum of "8" elements with this command.

profile dhcp ipv6 server lease

Configures the lease parameters.

Command Modes

Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Server Configuration Mode (config-server)

Command Modes Exec > Global Configuration (config) > DHCP Profile Configuration (config-dhcp-*dhcp_profile_name*) > DHCP IPv6 Configuration (config-ipv6) > DHCP Class Configuration (config-class-*dhcp_class_name*) > DHCP Server Configuration Mode (config-server)

Syntax Description **lease { [days** *days* **] [hours** *hours* **] [minutes** *minutes* **] }**

days *days*

Specify the number of days.

Must be an integer in the range of 0-365.

hours *hours*

Specify the hours.

Must be an integer in the range of 0-23.

minutes *minutes*

Specify the minutes.

Must be an integer in the range of 1-59.

Usage Guidelines Use this command to configure lease parameters.

profile feature-template

Configures feature templates.

Command Modes Exec > Global Configuration (config)

Syntax Description **feature-template** *feature_template_name* **[[vrf-name** *vrf_name* **] [httpr-policy** *httpr_policy_name* **]]**

httpr-policy *httpr_policy_name*

Specify the PBR HTTPR policy name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

vrf-name *vrf_name*

Specify the VRF name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

feature_template_name

Specify the feature template name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure feature templates. Enters the Feature Template Configuration mode.

profile feature-template ipv4

Configures IPv4 features.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **ipv4 [[mtu** *maximum_transmission_unit* **] [ingress-acl** *ingress_ipv4_acl_name* **] [egress-acl** *egress_ipv4_acl_name* **] [disable-unreachables]]**

disable-unreachables

Specify to disable sending ICMP Unreachable messages.

egress-acl *egress_ipv4_acl_name*

Specify the egress IPV4 ACL name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ingress-acl *ingress_ipv4_acl_name*

Specify the ingress IPV4 ACL name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

mtu *maximum_transmission_unit*

Specify the Maximum Transmission Unit in bytes.

Must be an integer in the range of 68-65535.

Usage Guidelines Use this command to configure IPv4 features. Enters the IPv4 Configuration mode.

profile feature-template ipv4 verify-unicast-source

Enables per-packet validation for unicast.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > IPv4 Configuration (config-ipv4)

Syntax Description **verify-unicast-source reachable-via-rx**

reachable-via-rx

Specify the source is reachable via interface on which packet was received.

Usage Guidelines Use this command to enable per-packet validation for unicast.

profile feature-template ipv6

Configures IPv6 features.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **ipv6 [[mtu** *maximum_transmission_unit* **] [ingress-acl** *ingress_ipv6_acl_name* **] [egress-acl** *egress_ipv6_acl_name* **]]**

disable-unreachables

Specify to disable sending ICMP Unreachable messages.

egress-acl *egress_ipv6_acl_name*

Specify the egress IPV6 ACL name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ingress-acl *ingress_ipv6_acl_name*

Specify the ingress IPV6 ACL name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

mtu *maximum_transmission_unit*

Specify the Maximum Transmission Unit in bytes.

Must be an integer in the range of 1280-65535.

Usage Guidelines Use this command to configure IPv6 features. Enters the IPv6 Configuration mode.

profile feature-template ipv6 verify-unicast-source

Configures per packet validation for unicast.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > IPv6 Configuration (config-ipv6)

Syntax Description **verify-unicast-source reachable-via-rx**

reachable-via-rx

Specify source is reachable via interface on which packet was received.

Usage Guidelines Use this command to configure per packet validation for unicast.

profile feature-template ppp

Configures PPP feature.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **ppp [[authentication** *authentication_method* **] [max-bad-auth** *max_auth_failures* **] [max-configure** *max_configure* **] [max-failure** *max_conf_naks* **]]**

authentication *authentication_method*

Specify the authentication method.

Must be one of the following:

- **chap**
- **pap**

max-bad-auth *max_auth_failures*

Specify the maximum authentication failures to allow.

Must be an integer in the range of 0-10.

max-configure *max_configure*

Specify the maximum conf-reqs to send without response.

Must be an integer in the range of 1-10.

max-failure *max_conf_naks*

Specify the maximum conf-naks to receive.

Must be an integer in the range of 1-5.

Usage Guidelines Use this command to configure the PPP feature. Enters the PPP Configuration mode.

You can configure a maximum of "2" elements with this command.

profile feature-template ppp chap

Configures Challenge Handshake Authentication Protocol (CHAP) parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **chap hostname** *chap_host_name* **[password** *chap_password* **]**

hostname *chap_host_name*

Specify the CHAP host name.

hostname *chap_host_name*

Specify the CHAP host name.

password *chap_password*

Specify the CHAP password.

Must be an aes-cfb-128-encrypted string.

Usage Guidelines Use this command to configure CHAP parameters.

profile feature-template ppp ipcp

Configures PPP IPCP negotiation parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **ipcp peer-address-pool** *peer_address_pool_name*

peer-address-pool *peer_address_pool_name*

Specify the peer-address pool name.

Usage Guidelines Use this command to configure PPP IPCP negotiation parameters.

profile feature-template ppp ipcp dns

Configures DNS address to be used for peer.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **ipcp dns primary-address** *primary_address* **secondary-address** *secondary_address*

primary-address *primary_address*

Specify the primary address. The first address is considered as Primary and second address as Secondary.

Must be an IPv4 address.

secondary-address *secondary_address*

Specify the secondary address.

Must be an IPv4 address.

Usage Guidelines Use this command to configure DNS address to be used for peer.

profile feature-template ppp ipcp renegotiation

Configures renegotiation parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`ipcp renegotiation ignore`**

ignore

Specify to ignore attempts by the peer to renegotiate LCP.

Usage Guidelines Use this command to configure renegotiation parameters.

profile feature-template ppp ipcp wins

Configures WINS address to be used for peer.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`ipcp wins primary-address`** *`primary_ip_address`* **`secondary-address`** *`secondary_ip_address`*

primary-address *primary_ip_address*

Specify the primary address.

Must be an IPv4 address.

secondary-address *secondary_ip_address*

Specify the secondary address.

Must be an IPv4 address.

Usage Guidelines Use this command to configure WINS address to be used for peer.

profile feature-template ppp ipv6cp renegotiation

Configures IPv6CP renegotiation parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`ipv6cp renegotiation ignore`**

ignore

Specify to ignore attempts by the peer to renegotiate LCP.

Usage Guidelines Use this command to configure IPv6CP renegotiation parameters.

profile feature-template ppp keepalive

Configures PPP Keepalive parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **keepalive { disable | interval** *keepalive_interval* **| retry** *keepalive_retries* **}**

disable

Specify to disable PPP keepalive.

interval *keepalive_interval*

Specify the keepalive interval in minutes.

Must be an integer in the range of 10-120.

retry *keepalive_retries*

Specify the number of keepalive retries.

Must be an integer in the range of 1-255.

Usage Guidelines Use this command to configure PPP Keepalive parameters.

profile feature-template ppp lcp delay

Configures the time to delay before starting active LCP negotiations.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **lcp delay seconds** *delay_value* **milliseconds** *delay_value*

milliseconds *delay_value*

Specify the delay value in milliseconds.

Must be an integer in the range of 0-70000000.

seconds *delay_value*

Specify the delay value in seconds.

Must be an integer in the range of 0-255.

Usage Guidelines Use this command to configure the time to delay before starting active LCP negotiations.

profile feature-template ppp lcp renegotiation

Configures LCP renegotiation feature.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`lcp renegotiation ignore`**

ignore

Specify to ignore attempts by the peer to renegotiate LCP.

Usage Guidelines Use this command to configure LCP renegotiation feature.

profile feature-template ppp pap

Configures PAP parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`pap accept-null-password`**

accept-null-password

Specify to accept null-password option.

Usage Guidelines Use this command to configure PAP parameters.

profile feature-template ppp timeout

Configures PPP timeout parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **`timeout { [ authentication`** *`total_auth_complete_time`* **`] [ retry`** *`max_response_time`* **`] }`**

Command Modes Exec > Global Configuration (config) > Endpoint N4 Protocol Configuration (config-endpoint-n4-protocol)

Syntax Description **`retransmission timeout`** *`total_auth_complete_time`* **`[ retry`** *`max_response_time`* **`]`**

authentication *total_auth_complete_time*

Specify the total time to allow for authentication to complete.

Must be an integer in the range of 3-30.

retry *max_response_time*

Specify the maximum time to wait for a response to a Conf-Req in seconds.

Must be an integer in the range of 1-10.

Usage Guidelines Use this command to configure PPP timeout parameters.

profile feature-template ppp timeout absolute

Configures the absolute timeout period for a PPP session.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*) > PPP Configuration (config-ppp)

Syntax Description **timeout absolute minutes** *timeout_minutes* **seconds** *timeout_seconds*

minutes *timeout_minutes*

Specify the timeout period in minutes.

Must be an integer in the range of 0-70000000.

Usage Guidelines Use this command to configure the absolute timeout period for a PPP session.

profile feature-template qos

Configures QoS input policy parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **qos [in-policy** *in_policy_name* **| out-policy** *out_policy_name* **| merge-level** *merge_level* **]**

in-policy *in_policy_name*

Specify the QOS input policy name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

merge-level *merge_level*

Specify the merge level. 0 = merge disabled, 0 = merge enabled + level.

Must be an integer.

out-policy *out_policy_name*

Specify the QOS output policy name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure QoS input policy parameters.

profile feature-template service-accounting

Configures service accounting parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **service-accounting [[enable] [aaa-profile** *aaa_profile_name* **] [periodic-interval** *interim_interval* **]]**

aaa-profile *aaa_profile_name*

Specify the AAA profile to use for service accounting.

enable

Specify to enable service accounting.

periodic-interval *interim_interval*

Specify the interim interval in seconds.

Must be an integer in the range of 60-4320000.

Usage Guidelines Use this command to configure service accounting parameters.

profile feature-template session-accounting

Configures session accounting parameters.

Command Modes Exec > Global Configuration (config) > Feature Template Profile Configuration (config-feature-template-*feature_template_name*)

Syntax Description **session-accounting enable { aaa-profile** *aaa_profile_name* **| periodic-interval** *interim_interval* **| dual-stack-delay** *dual_stack_delay_wait* **}**

aaa-profile *aaa_profile_name*

Specify the AAA profile to use for session accounting.

dual-stack-delay *dual_stack_delay_wait*

Specify the dual stack set delay wait in seconds.

Must be an integer in the range of 1-30.

enable

Specify to enable session accounting.

periodic-interval *interim_interval*

Specify the interim interval in seconds.

Must be an integer in the range of 60-4320000.

Usage Guidelines Use this command to configure session accounting parameters.

profile pppoe

Configures PPPOE Subscriber profiles.

Command Modes Exec > Global Configuration (config)

Syntax Description

```
profile pppoe pppoe_profile_name [ [ ac-cookie ac_cookie ] [ ac-name ac_name ] [
 ctrl-pkt-priority priority ] [ service-name pppoe_service_names ] [
service-selection-disable { false | true } ] [ timeout-completion
session_completion_timeout ] ]
```

ctrl-pkt-priority *priority*

Specify the CoS bits to use in PADx packets.

Must be an integer in the range of 0-7.

Default Value: 0.

mtu *pppoe_mtu*

Specify the PPPOE MTU for LCP negotiation.

Must be an integer in the range of 500-2000.

Default Value: 1492.

service-name *pppoe_service_names*

Specify the supported PPPoE service names. You can simultaneously configure multiple service names.

service-selection-disable { false | true }

Specify to disable or enable the advertising of extra service names in PADO packets.

Must be one of the following:

- **false**
- **true**

Default Value: false.

pppoe_profile_name

Specify the PPPOE profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ac-name *ac_name*

Specify the the AC-Name to use in PADO packets.

ctrl-pkt-priority *priority*

Specify the CoS bits to use in PADx packets.

Must be an integer in the range of 0-7.

Default Value: 0.

mtu *pppoe_mtu*

Specify the PPPOE MTU for LCP negotiation.

Must be an integer in the range of 500-2000.

Default Value: 1492.

service-name *pppoe_service_names*

Specify the supported PPPoE service names. You can simultaneously configure multiple service names.

service-selection-disable { false | true }

Specify to disable or enable the advertising of extra service names in PADO packets.

Must be one of the following:

- **false**
- **true**

Default Value: false.

pppoe_profile_name

Specify the PPPOE profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ac-cookie *ac_cookie*

Specify the AC-Cookie to use in PADO packets.

ac-name *ac_name*

Specify the the AC-Name to use in PADO packets.

ctrl-pkt-priority *priority*

Specify the CoS bits to use in PADx packets.

Must be an integer in the range of 0-7.

Default Value: 0.

mtu *pppoe_mtu*

Specify the PPPOE MTU for LCP negotiation.

Must be an integer in the range of 500-2000.

Default Value: 1492.

service-name *pppoe_service_names*

Specify the supported PPPoE service names. You can simultaneously configure multiple service names.

service-selection-disable { false | true }

Specify to disable or enable the advertising of extra service names in PADO packets.

Must be one of the following:

- **false**
- **true**

Default Value: false.

pppoe_profile_name

Specify the PPPOE profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

ac-cookie *ac_cookie*

Specify the AC-Cookie to use in PADO packets.

ac-name *ac_name*

Specify the the AC-Name to use in PADO packets.

ctrl-pkt-priority *priority*

Specify the CoS bits to use in PADx packets.

Must be an integer in the range of 0-7.

Default Value: 0.

mtu *pppoe_mtu*

Specify the PPPOE MTU for LCP negotiation.

Must be an integer in the range of 500-2000.

Default Value: 1492.

service-name *pppoe_service_names*

Specify the supported PPPoE service names. You can simultaneously configure multiple service names.

service-selection-disable { false | true }

Specify to disable or enable the advertising of extra service names in PADO packets.

Must be one of the following:

- **false**
- **true**

Default Value: false.

timeout-completion *session_completion_timeout*

Specify the maximum wait time for session to be completed.

Must be an integer in the range of 3-600.

Default Value: 180.

pppoe_profile_name

Specify the PPPOE profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure PPPOE Subscriber profiles. Enters the PPPOE Profile Configuration mode.

profile pppoe max-payload

Configures a range for the ppp-max payload tag value.

Command Modes Exec > Global Configuration (config) > PPPOE Profile Configuration (config-pppoe-*pppoe_profile_name*)

Syntax Description **max-payload { deny | minimum** *minimum_payload_value* **| maximum** *maximum_payload_value* **}**

deny

Specify to deny the PPP-max payload value.

maximum *maximum_payload_value*

Specify the maximum payload value.

Must be an integer in the range of 1-40000.

Default Value: "1500".

minimum *minimum_payload_value*

Specify the minimum value for the payload.

Must be an integer in the range of 1-40000.

Default Value: "1492".

Usage Guidelines Use this command to configure a range for the ppp-max payload tag value.

profile pppoe session-limit circuit-id

Configures the maximum number of sessions allowed per Circuit-ID.

Command Modes Exec > Global Configuration (config) > PPPOE Profile Configuration (config-pppoe-*pppoe_profile_name*)

Syntax Description **session-limit circuit-id** *value* **[threshold** *threshold_count* **]**

threshold *threshold_count*

Specify the threshold count.

Must be an integer in the range of 1-65535.

value *attribute_value*

Specify the attribute value.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure the maximum number of sessions allowed per Circuit-ID.

profile pppoe session-limit mac

Configures the maximum number of sessions allowed per peer MAC address.

Command Modes Exec > Global Configuration (config) > PPPOE Profile Configuration (config-pppoe-*pppoe_profile_name*)

Syntax Description **session-limit mac** *value* **[threshold** *threshold_count* **]**

threshold *threshold_count*

Specify the threshold count.

Must be an integer in the range of 1-65535.

value *attribute_value*

Specify the attribute value.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure the maximum number of sessions allowed per peer MAC address.

profile pppoe session-limit max

Configures the maximum number of sessions allowed under the PPPoE profile.

Command Modes Exec > Global Configuration (config) > PPPOE Profile Configuration (config-pppoe-*pppoe_profile_name*)

Syntax Description **session-limit max** *value* **[threshold** *threshold_count* **]**

threshold *threshold_count*

Specify the threshold count.

Must be an integer in the range of 1-65535.

value *attribute_value*

Specify the attribute value.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure the maximum number of sessions allowed under the PPPoE profile.

profile pppoe session-limit outer-vlan

Configures the maximum number of sessions allowed per outer-vlan, per access interface.

Command Modes Exec > Global Configuration (config) > PPPOE Profile Configuration (config-pppoe-*pppoe_profile_name*)

Syntax Description **session-limit outer-vlan** *value* **[threshold** *threshold_count* **]**

threshold *threshold_count*

Specify the threshold count.

Must be an integer in the range of 1-65535.

value *attribute_value*

Specify the attribute value.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure the maximum number of sessions allowed per outer-vlan, per access interface.

profile radius

Configures RADIUS client profile parameters.

Command Modes Exec > Global Configuration (config)

Syntax Description

profile radius [algorithm *radius_server_selection_algorithm* **| deadtime** *dead_time* **| max-retry** *max_retry* **| timeout** *retransmit_timeout_duration* **]**

algorithm *radius_server_selection_algorithm*

Specify the algorithm for selecting RADIUS server.

Must be one of the following:

- **first-server**: Highest priority first.
- **round-robin**: Round-robin.
- **least-outstanding**: Least number of outstanding transactions.

deadtime *dead_time*

Specify the time to elapse, in minutes, between RADIUS server marked unreachable and when connection can be re-attempted.

Must be an integer in the range of 0-65535.

max-retry *max_retry*

Specify the maximum number of times the system must attempt retry with the RADIUS server.

Must be an integer in the range of 0-65535.

timeout *retransmit_timeout_duration*

Specify the time duration to wait for response from the RADIUS server before retransmitting.

Must be an integer in the range of 1-65535.

Usage Guidelines

Use this command to configure RADIUS client parameters. Enters the RADIUS Client Profile Configuration mode.

profile radius accounting

Configures RADIUS accounting parameters.

Command Modes

Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Syntax Description

```
profile radius accounting
   algorithm { first-server | round-robin }
   attribute { nas-identifier value | nas-ip { ipv4_address | user-plane-ip
} |
   nas-port { nas_port } | { format-e format_e
             { nas-port-type nas_port_type } }
   deadtime value
   detect-dead-server response-timeout value
   max-retry value
```

```
timeout value
commit
```

algorithm { first-server | round-robin }

Specify the algorithm for selecting RADIUS server.

Must be one of the following:

- **first-server**: Highest priority first.
- **round-robin**: Round-robin.

attribute { nas-identifier *value* | nas-ip { *ipv4_address* | user-plane-ip } | nas-port { format-e *format_e_value* | nas-port-type *nas_port_type* } }

Configures the RADIUS identification parameters.

- **nas-identifier** *value*: Specifies the attribute name by which the system will be identified in Accounting-Request messages. *value* must be an alphanumeric string.
- **nas-ip** *ipv4_address*: Specifies the NAS IPv4 address. *ipv4_address* must be an IPv4 address in dotted decimal notation.
- **nas-ip user-plane-ip**: Enables the `user-plane-ip-address` AVPair to use the configured User-Plane IP address in Accounting-Request messages.
- **nas-port {** *nas_port* **} | { format-e** *format_e* **{ nas-port-type** *nas_port_type* **} }**: Specifies the nas-port attributes.
  - *nas_port* configures the NAS port value. The NAS port value ranges from 1 to 4294967295.

Note If none of the NAS port configurations are present, the existing default nas-port logic is applied. That is, setting a fixed-number per radius-pod.

- **format-e** *format_e_value* : Specifies the custom attribute formation support for nas-port. The nas-port is a 32 bit integer format. The configuration takes a 32 length of characters, each presenting a particular attribute mapping. The *format_e_value* pattern is: 01FSAPRiLUVQ]*):
- 0 – Set bit to 0

  1 – Set bit to 1

  F - PHY_SHELF

  S – PHY_SLOT

  A – PHY_ADAPTER

  P - PHY_PORT

  R - PHY_CHASSIS

  i - PHY_SUBSLOT

  L - PHY_CHANNEL

  V - OUTER_VLAN_ID

Q - INNER_VLAN_ID

U - PPPOE_SESSION_ID

nas-port-type *nas_port_type*: Specifies the NAS port type. The supported values range from 0 to 44.

Note

- The nas-port-type configuration is not in scope of the Control Plane. It is derived from the interface-type.
- The supported NAS port types are 36 , 37, 43, and 44.
- The NAS port type value takes precedence over the common NAS port format-e.

deadtime *dead_time*

Sets the time to elapse, in minutes, between RADIUS server marked unreachable and when connection can be re-attempted.

Must be an integer in the range of 0-65535. Default: 10 minutes.

detect-dead-server response-timeout *value*

Sets the timeout value that marks a server as "dead" when a packet is not received for the specified number of seconds.

value must be an integer from 1 through 65535. Default: 10 seconds.

max-retry *max_retry*

Sets the maximum number of times the system must attempt retry with the RADIUS server.

Must be an integer in the range of 0-65535. Default: 2

timeout *retransmit_timeout_duration*

Sets the time duration to wait for response from the RADIUS server before retransmitting.

Must be an integer in the range of 1-65535. Default: 2 seconds.

Usage Guidelines Use this command to configure RADIUS accounting parameters. Enters the RADIUS Accounting Configuration mode.

profile radius accounting attribute called-station-id

Configures the AAA called-station-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute called-station-id** *value*

value

Specify the value of the AAA called-station-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA called-station-id attribute.

profile radius accounting attribute calling-station-id

Configures the AAA calling-station-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute calling-station-id** *value*

value

Specify the value of the AAA calling-station-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA calling-station-id attribute.

profile radius accounting attribute nas-identifier-format

Configures the AAA nas-identifier-format attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute nas-identifier-format** *value*

Usage Guidelines Use this command to configure the AAA nas-identifier-format attribute.

profile radius accounting attribute nas-port-id

Configures the AAA nas-port-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute nas-port-id** *value*

value

Specify value of the AAA nas-port-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA nas-port-id attribute.

profile radius accounting detect-dead-server

Configures parameters to detect a dead RADIUS server.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **detect-dead-server response-timeout** *response_timeout_duration*

response-timeout *response_timeout_duration*

Specify the time duration, in seconds, for a response from the RADIUS server to mark it as unreachable.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure parameters to detect a dead RADIUS server.

profile radius attribute called-station-id

Configures the AAA called-station-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute called-station-id** *value*

format-name *format_name*

Specify the attribute format name.

Must be a string.

value

Specify the value of the AAA called-station-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA called-station-id attribute.

profile radius attribute called-station-id format

Configures node parameters.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute** *attribute_name* **format nas-port-type** *nas_port_type* **format-name** *format_name*

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

format-name *format_name*

Specify the attribute format name.

Must be a string.

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

Usage Guidelines Use this command to configure node parameters for nas-port-id, calling-station-id, called-station-id, nas-identifier-format.

profile radius attribute calling-station-id

Configures the AAA calling-station-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute calling-station-id** *value*

format-name *format_name*

Specify the attribute format name.

Must be a string.

value

Specify the value of the AAA calling-station-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA calling-station-id attribute.

profile radius attribute calling-station-id format

Configures node parameters.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute** *attribute_name* **format nas-port-type** *nas_port_type* **format-name** *format_name*

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

format-name *format_name*

Specify the attribute format name.

Must be a string.

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

Usage Guidelines Use this command to configure node parameters for nas-port-id, calling-station-id, called-station-id, nas-identifier-format.

profile radius attribute nas-identifier-format

Configures the AAA nas-identifier-format attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute nas-identifier-format** *value*

format-name *format_name*

Specify the attribute format name.

Must be a string.

Usage Guidelines Use this command to configure the AAA nas-identifier-format attribute.

profile radius attribute nas-identifier-format format

Configures node parameters.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute** *attribute_name* **format nas-port-type** *nas_port_type* **format-name** *format_name*

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

format-name *format_name*

Specify the attribute format name.

Must be a string.

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

Usage Guidelines Use this command to configure node parameters for nas-port-id, calling-station-id, called-station-id, nas-identifier-format.

profile radius attribute nas-ip

Configures the NAS IPv4 or User-Plane IP address.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Attribute Configuration (config-attribute)

Syntax Description **attribute nas-ip {** *ipv4_address* **| user-plane-ip }**

nas-ip *ipv4_address*

Specifies the AAA NAS IPv4 address.

nas-ip user-plane-ip

Enables the `user-plane-ip-address` AVPair to use the configured User-Plane IP address in Access-Request or Accounting-Request messages.

Usage Guidelines Use this command to configure the AAA NAS-IP attribute.

profile radius attribute nas-port-id

Configures the AAA nas-port-id attribute.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute nas-port-id** *value*

format-name *format_name*

Specify the attribute format name.

Must be a string.

value

Specify value of the AAA nas-port-id attribute.

Must be a string.

Usage Guidelines Use this command to configure the AAA nas-port-id attribute.

profile radius attribute nas-port-id format

Configures node parameters.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **attribute** *attribute_name* **format nas-port-type** *nas_port_type* **format-name** *format_name*

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

format-name *format_name*

Specify the attribute format name.

Must be a string.

nas-port-type *nas_port_type*

Specify the Nas-Port-Type value to apply format name on.

Must be an integer.

Usage Guidelines Use this command to configure node parameters for nas-port-id, calling-station-id, called-station-id, nas-identifier-format.

profile radius detect-dead-server

Configures parameters to detect a dead RADIUS server.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Accounting Configuration (config-accounting)

Syntax Description **detect-dead-server response-timeout** *response_timeout_duration*

response-timeout *response_timeout_duration*

Specify the time duration, in seconds, for a response from the RADIUS server to mark it as unreachable.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure parameters to detect a dead RADIUS server.

profile radius radius-server attribute

Configures RADIUS server attributes list.

Command Modes Exec > Global Configuration (config)

Syntax Description **profile radius radius-server attribute attr-list** *list_name* **{ ietf-attributes** *ietf_attributes* **| vendor-attribute { vendor-id** *vendor_id* **vendor-type** *vendor_type_value* **[name]**

attribute attr-list *list_name*

Specify the RADIUS server attributes list.

ietf-attributes *ietf_attributes*

Configures the list of Internet Engineering Task Force (IETF) attributes. For example, ietf-attributes [88 8 30 2] indicates that IETF attributes such as Framed-IP-Pool (88), Framed-IP-Address (8), Called-Station-Id(30), User-Password(2) are configured.

vendor-attribute vendor-id *vendor_id* vendor-type *vendor_type_value*

Configures the list of Internet Engineering Task Force (IETF) attributes. For example, ietf-attributes [88 8 30 2] indicates that IETF attributes such as Framed-IP-Pool (88), Framed-IP-Address (8), Called-Station-Id(30), User-Password(2) are configured.

name

[Optional] Specifies the attribute name for a Cisco generic Vendor Specific Attribute (VSA).

The name option is only available for vendor-id 9 and vendor-type 1.

Note For vendor-type 1, if names are not configured, the accept or reject action applies to all vendor-type attributes of the configured vendor ID.

profile radius server

Configures RADIUS external server configuration.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Syntax Description **server** *radius_server_ip_address radius_server_port_number* **[priority** *radius_server_priority* **| secret** *radius_server_secret* **| type** *server_type* **]**

priority *radius_server_priority*

Specify the priority of the RADIUS server.

Must be an integer in the range of 1-100.

secret *radius_server_secret*

Specify the secret of the RADIUS server.

Must be an aes-cfb-128-encrypted string.

type *server_type*

Specify the server type.

Must be one of the following:

- **acct**
- **auth**

Default Value: auth.

radius_server_ip_address

Specify the IP address of the RADIUS server.

Must be an IP address.

radius_server_port_number

Specify the port number of the RADIUS server.

Must be an integer in the range of 1-65535.

Usage Guidelines Use this command to configure RADIUS external server configuration.

profile radius server-group

Configures association of RADIUS servers to groups.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius)

Syntax Description **server-group** *server_group_name* **{ accounting { request accept** *list_name* **reply accept** *list_name* **} | authentication { request accept** *list_name* **reply accept** *list_name* **}**

server_group_name

Specify the server group name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

accounting { request accept | request reject *list_name* reply accept | reply reject *list_name* }

Enters the accounting sub-mode.

- **request accept** *list_name*: Configures the accept attributes list for request messages in RADIUS accounting.
- **reply accept** *list_name*: Configures the accept attributes list for reply messages in RADIUS accounting.
- **request reject** *list_name*: Configures the reject attributes list for request messages in RADIUS accounting.
- **reply reject** *list_name*: Configures the reject attributes list for reply messages in RADIUS accounting.

authentication { request accept | request reject *list_name* reply accept | reply reject *list_name* }

Enters the authentication sub-mode.

- **request accept** *list_name*: Configures the accept attributes list for request messages in RADIUS authentication.

- **reply accept** *list_name*: Configures the accept attributes list for reply messages in RADIUS authentication.
- **request reject** *list_name*: Configures the reject attributes list for request messages in RADIUS authentication.
- **reply reject** *list_name*: Configures the reject attributes list for reply messages in RADIUS authentication.

Usage Guidelines Use this command to configure association of RADIUS servers to groups. Enters the Server Group Configuration mode.

profile radius server-group server

Configures RADIUS server information.

Command Modes Exec > Global Configuration (config) > RADIUS Profile Configuration (config-radius) > RADIUS Server Group Configuration (config-server-group-*server_group_name*)

Syntax Description **server** *radius_server_type* **ip** *radius_server_ip_address* **port** *radius_port_number*

ip *radius_server_ip_address*

Specify IP address of the RADIUS server.

port *radius_port_number*

Specify the port number of the RADIUS server.

radius_server_type

Specify the server type.

Must be one of the following:

- **acct**: Server used for accounting requests.
- **auth**: Server is used for authentication/authorization requests.

Usage Guidelines Use this command to configure RADIUS server information.

profile server-group

Configures AAA custom server groups.

Command Modes Exec > Global Configuration (config)

Syntax Description **server-group** *server_group_name* **radius-group** *radius_server_group_name*

radius-group *radius_server_group_name*

Specify the RADIUS server group name.

aaa_server_group_name

Specify the AAA server group name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure AAA custom server groups.

profile slaac

Configures Stateless Address Autoconfiguration (SLAAC) profile parameters.

Command Modes Exec > Global Configuration (config)

Syntax Description **profile slaac** *slaac_profile_name* **{ [managed-config-flag enable] [other-config-flag enable] [prefix-pool** *slaac_prefix_pool_name* **]**

managed-config-flag enable

Enables M-bit for IPv6 RA packets.

other-config-flag enable

Enables O-bit for IPv6 RA packets.

prefix-pool *slaac_prefix_pool_name*

Specifies the /64 IPv6 PD prefix pool to allocate SLAAC prefix to subscribers.

Usage Guidelines Use this command to configure SLAAC profiles. Enters the SLAAC Profile Configuration mode.

profile subscriber

Configures subscriber profiles.

Command Modes Exec > Global Configuration (config)

Syntax Description **profile subscriber** *subscriber_profile_name* **[[activate-feature-templates** *template_names* **] [apply-all-class] [dhcp-profile** *dhcp_profile_name* **] [pppoe-profile** *pppoe_profile_name* **] [session-type** *session_type* **]]**

activate-feature-templates *template_names*

Specify the list of feature templates to activate.

apply-all-class

Specify to apply all classes if enabled.

dhcp-profile *dhcp_profile_name*

Specify the DHCP-FSOL profile name.

pppoe-profile *pppoe_profile_name*

Specify the PPPOE-FSOL profile name.

session-type *session_type*

Specify the allowed session type.

Must be one of the following:

- **ipv4**
- **ipv4v6**
- **ipv6**

Default Value: ipv4v6.

subscriber_profile_name

Specify the subscriber profile name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure subscriber profiles. Enters the Subscriber Profile Configuration mode.

You can configure a maximum of "8" elements with this command.

profile subscriber aaa

Configures AAA operations.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*)

Syntax Description **aaa** *aaa_option aaa_profile_name*

aaa_option

Specify the AAA option.

Must be one of the following:

- **authenticate**
- **authorize**

aaa_profile_name

Specify the AAA profile name.

Usage Guidelines Use this command to configure AAA operations.

profile subscriber accounting send-stop setup-failure

Enables the sending of accounting stop records upon session bring-up failures.

Command Modes Exec > Global Configuration (config)

Syntax Description **profile subscriber** *subs_profile* **accounting send-stop setup-failure aaa-profile** *aaa_profile_name*

If the AAA_Profile_Name is	then
use-author-profile	the AAA profile configured for authorization is used for sending the accounting stop record in case of session bringup failure. This configuration is used for IPoE sessions.
use-authen-profile	the AAA profile configured for authentication is used for sending the accounting stop record in case of session bringup failure. This configuration is used for PPPoE, LAC or LNS sessions.

profile subscriber class

Configures subscriber classification parameters.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*)

Syntax Description **class** *class_name* **[activate-feature-templates** *feature_template_names* **]**

activate-feature-templates *feature_template_names*

Specify the list of feature template names to activate.

class_name

Specify the class name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure subscriber classification parameters. Enters the Subscriber Class Configuration mode.

You can configure a maximum of "8" elements with this command.

profile subscriber class aaa

Configures AAA operations.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Subscriber Class Configuration (config-class-*class_name*)

Syntax Description **aaa** *aaa_option profile_name*

aaa_option

Specify the AAA option.

Must be one of the following:

- **authenticate**
- **authorize**

profile_name

Specify the AAA profile name.

Usage Guidelines Use this command to configure AAA operations.

profile subscriber class matches

Configures the list of match values.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*)

Syntax Description **matches [match-type { all | any }]**

match-type *match_type*

Specify the match type.

Usage Guidelines Use this command to configure the list of match values. Enters the Matches Configuration mode.

profile subscriber class matches match

Configures match key and value.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*) > Matches Configuration (config-matches)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*) > Matches Configuration (config-matches)

Syntax Description **match** *match_key* **{** *match_protocol* **| ascii** *ascii_string* **| regex** *regex_string* **}**

match_key

Specify the match key.

ascii *ascii_string*

Specify the ASCII string.

Must be a string.

regex *regex_string*

Specify the regular expression string.

Must be a string.

match_key

Specify the match key.

match_protocol

Specify the match protocol.

Must be one of the following:

- **dhcp**
- **ppp**

You can configure a maximum of "2" elements with this command.

You can configure a maximum of "8" elements with this command.

Usage Guidelines

Use this command to configure match key and value.

You can configure a maximum of "8" elements with this command.

profile subscriber event

Configures subscriber events.

Command Modes

Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*)

Syntax Description

event *event_name* **[activate-feature-templates** *template_names* **| apply-all-class | deactivate-feature-templates** *template_names* **]**

event *event_name*

Specify the event name.

activate-feature-templates *template_names*

Specify the list of feature templates to activate.

apply-all-class

Specify to apply all classes if enabled.

deactivate-feature-templates *template_names*

Specify the list of feature templates to deactivate.

event *event_name*

Specify the event name.

You can configure a maximum of "8" elements with this command.

Usage Guidelines

Use this command to configure subscriber events.

You can configure a maximum of "8" elements with this command.

profile subscriber event aaa

Configures AAA operations.

Command Modes

Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*)

Command Modes

Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*)

Syntax Description **aaa** *aaa_option aaa_profile_name*

aaa_option

Specify the AAA option.

Must be one of the following:

- **authenticate**
- **authorize**

aaa_profile_name

Specify the AAA profile name.

Usage Guidelines Use this command to configure AAA operations.

profile subscriber event class

Configures subscriber classification.

Command Modes Exec > Global Configuration

Syntax Description **class { class-name** *class_name* **| deactivate-feature-templates** *template_names* **| activate-feature-templates** *template_names* **}**

activate-feature-templates *template_names*

Specify the list of feature template names to activate.

class-name *class_name*

Specify the class name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

deactivate-feature-templates *template_names*

Specify the list of feature template names to deactivate.

You can configure a maximum of "8" elements with this command.

Usage Guidelines Use this command to configure subscriber classification.

You can configure a maximum of "8" elements with this command.

profile subscriber event class aaa

Configures AAA operations.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Subscriber Class Configuration (config-class-*class_name*)

Syntax Description **aaa** *aaa_option profile_name*

aaa_option

Specify the AAA option.

Must be one of the following:

- **authenticate**
- **authorize**

profile_name

Specify the AAA profile name.

Usage Guidelines Use this command to configure AAA operations.

profile subscriber event class matches

Configures the list of match values.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*)

Syntax Description **matches [match-type { all | any }]**

match-type *match_type*

Specify the match type.

Usage Guidelines Use this command to configure the list of match values. Enters the Matches Configuration mode.

profile subscriber event class matches match

Configures match key and value.

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Class Configuration (config-class-*class_name*) > Matches Configuration (config-matches)

Command Modes Exec > Global Configuration (config) > Subscriber Profile Configuration (config-subscriber-*subscriber_profile_name*) > Event Configuration (config-event-*event_name*) > Class Configuration (config-class-*class_name*) > Matches Configuration (config-matches)

Syntax Description **match** *match_key* **{** *match_protocol* **| ascii** *ascii_string* **| regex** *regex_string* **}**

match_key

Specify the match key.

ascii ***ascii_string***

Specify the ASCII string.

Must be a string.

regex ***regex_string***

Specify the regular expression string.

Must be a string.

match_key

Specify the match key.

match_protocol

Specify the match protocol.

Must be one of the following:

- **dhcp**
- **ppp**

Usage Guidelines Use this command to configure match key and value.

You can configure a maximum of "8" elements with this command.

show sessions

Displays pending session commits in the database.

Command Modes Exec

Syntax Description **show sessions**

Usage Guidelines Use this command to view pending session commits in the database.

show sessions affinity

Displays instance-wise affinity count.

Command Modes Exec

Syntax Description `show sessions affinity`

Usage Guidelines Use this command to view the instance-wise affinity count.

show sessions commit-pending

Displays all pending session commits.

Command Modes Exec

Syntax Description `show sessions commit-pending`

Usage Guidelines Use this command to view all pending session commits.

show diagnostics

Displays diagnostics information.

Command Modes Exec

Syntax Description `show diagnostics`

Usage Guidelines Use this command to view diagnostics information.

show diagnostics info

Displays diagnostics information.

Command Modes Exec

Syntax Description `show diagnostics info`

Usage Guidelines Use this command to view diagnostics information.

show endpoint all

Displays endpoint status.

Command Modes Exec

Syntax Description `show endpoint all`

Usage Guidelines Use this command to view endpoint status for all endpoints.

show endpoint info

Displays endpoint information.

Command Modes Exec

Syntax Description `show endpoint info`

Usage Guidelines Use this command to view endpoint information.

show ipam dp

Displays IPAM data-plane allocations.

Command Modes Exec

Syntax Description `show ipam dp`

Usage Guidelines Use this command to view IPAM data-plane allocations.

show ipam pool

Displays pool allocation information.

Command Modes Exec

Syntax Description `show ipam pool`

Usage Guidelines Use this command to view pool allocation information.

show peers

Displays peer information.

Command Modes Exec

Syntax Description `show peers`

Usage Guidelines Use this command to view peer information.

show peers all

Displays information for all peers.

Command Modes Exec

Syntax Description `show peers all`

Usage Guidelines Use this command to view information for all peers.

show resources

Displays resources information.

Command Modes Exec

Syntax Description `show resources`

Usage Guidelines Use this command to view resources information.

show resources info

Displays resources information.

Command Modes Exec

Syntax Description `show resources info`

Usage Guidelines Use this command to view resources information.

show rpc

Displays RPC information.

Command Modes Exec

Syntax Description `show rpc`

Usage Guidelines Use this command view RPC information.

show rpc all

Displays information for all RPCs.

Command Modes Exec

Syntax Description `show rpc all`

Usage Guidelines Use this command to view information for all RPCs.

show running-status

Displays system running status information.

Command Modes Exec

Syntax Description `show running-status`

Usage Guidelines Use this command to view system running status information.

show running-status info

Displays system running status information.

Command Modes Exec

Syntax Description `show running-status info`

Usage Guidelines Use this command to view system running status information.

show subscriber

Displays BNG subscriber data.

Command Modes Exec

Syntax Description `show subscriber` *type* `[ count | detail | sublabel` *subscriber_label* `]`

acct-sess-id ***accounting_session_id***

Specify the accounting session ID.

Must be a string.

count

Specify to display the number of sessions.

debug

Specify debug information.

detail

Specify to display detailed information.

sublabel *subscriber_label*

Specify the subscriber label.

Must be a string.

sync *sync_info*

Specify synchronization information.

Must be one of the following:

- **synchronize**

upf *upf_info*

Specify UPF information.

Must be a string.

upmgr

Specify SMUP information.

type

Specify the type.

Must be one of the following:

- **charging**
- **dhcp**
- **pppoe**
- **session**

Usage Guidelines Use this command to view BNG subscriber data.

show subscriber

Displays subscriber information.

Command Modes Exec

Syntax Description **show subscriber { all | supi** *supi_id* **}**

all

Specify all SUPI.

supi *supi_id*

Specify the SUPI.

Must be a string.

Usage Guidelines Use this command to view summary and detailed subscriber information for all subscribers or specific subscribers based on SUPI.

show subscriber filter

Configures additional filters.

Command Modes Exec

Syntax Description **show subscriber** *type* **filter [afi** *address_family* **| iana-state-bound** *iana_bound_state* **| iapd-state-bound** *iapd_bound_state* **| ipv4-addr** *ipv4_address* **| ipv4-pool** *ipv4_pool_name* **| ipv4-range** *ipv4_address_range* **| ipv4-state-bound** *ipv4_bound_state* **| ipv6-addr** *ipv6_address* **| ipv6-addr-pool** *ipv6_address_pool_name* **| ipv6-addr-range** *ipv6_address_range* **| ipv6-pfx** *ipv6_prefix* **| ipv6-pfx-pool** *ipv6_prefix_pool* **| ipv6-pfx-range** *ipv6_prefix_range* **| mac** *mac_address* **| port-id** *upf_port_id* **| state** *session_state* **| up-subs-id** *up_subscriber_id* **| upf** *upf_name* **| upmgr** *sm_up_info* **| username** *session_user_name* **| vrf** *vrf_name* **]**

afi *address_family*

Specify the address family.

Must be one of the following:

- **dual**
- **ipv4**
- **ipv6**
- **pending**

iana-state-bound *iana_bound_state*

Specify the IANA bound state.

Must be one of the following:

- **iana-state-bound**

iapd-state-bound *iapd_bound_state*

Specify the IAPD bound state.

Must be one of the following:

- **iapd-state-bound**

ipv4-addr *ipv4_address*

Specify the IPv4 address in the format "*pool-name*/*ipv4-addr*".

Must be a string.

ipv4-pool *ipv4_pool_name*

Specify the IPv4 pool name.

Must be a string.

ipv4-range *ipv4_address_range*

Specify the IPv4 address range in the format "*poolName*/*start-ip*".

Must be a string.

ipv4-state-bound *ipv4_bound_state*

Specify the IPv4 bound state.

Must be one of the following:

- **ipv4-state-bound**

ipv6-addr-pool *ipv6_address_pool_name*

Specify the IPv6 address pool name.

Must be a string.

ipv6-addr-range *ipv6_address_range*

Specify the IPv6 address range in the format "*poolName*/*start-ip*".

Must be a string.

ipv6-addr *ipv6_address*

Specify the IPv6 address in the format "*pool-name*/*ipv6-addr*".

Must be a string.

ipv6-pfx-pool *ipv6_prefix_pool*

Specify the IPv6 prefix pool name.

Must be a string.

ipv6-pfx-range *ipv6_prefix_range*

Specify the IPv6 prefix range in the format "*poolName*/*start-pfx*".

Must be a string.

ipv6-pfx *ipv6_prefix*

Specify the IPv6 prefix in the format "*pool-name*/*ipv6-pfx*".

Must be a string.

mac *mac_address*

Specify the MAC address in the format "aabb.ccdd.eeff".

Must be a string.

port-id *upf_port_id*

Specify the user plane function port ID in the format "*upf*/*portid*".

Must be a string.

smstate *sm_session_state*

Specify the state of the SM session.

Must be one of the following:

- **created**
- **deleted**
- **established**

smupstate *smup_session_state*

Specify the state of the SMUP session.

Must be one of the following:

- **smUpSessionCreated**
- **smUpSessionDeleted**
- **smUpSessionWait4SmCreate**

state *session_state*

Specify the session state.

Must be one of the following:

- **complete**
- **incomplete**

up-subs-id *up_subscriber_id*

Specify the UP subscriber ID.

Must be a string.

upf *upf_name*

Specify the user plane function name.

Must be a string.

upmgr *upmgr*

Specify the UPMgr.

Must be one of the following:

- **upmgr**

username *session_user_name*

Specify the user name of the session.

Must be a string.

Usage Guidelines Use this command to configure additional filters.

show subscriber redundancy

Displays the key values of SRG groups

Command Modes Exec

Syntax Description **show subscriber redundancy [count | debug | detail | gr-instance** *gr_instance_id* **| srg-peer-id** *srg_peer_id* **| upf** *upf_name* **]**

count

Specify the count of SRG groups

debug

Specify debug information

detail

Specify to display detailed information.

gr-instance *gr_instance_id*

Specify the geo redundancy instance identity.

srg-peer-id *srg_peer_id*

Specify the identity of peer user plane for the group.

upf *upf_name*

Specify the name of user plane function.

Usage Guidelines Use this command to view the key values of SRG groups.

show subscriber redundancy-sync

Displays the subscriber reconciliation details.

Command Modes Exec

Syntax Description **show subscriber redundancy-sync [gr-instance** *gr_instance_id* **| srg-peer-id** *srg_peer_id* **| upf** *upf_name* **]**

gr-instance *gr_instance_id*

Specify the geo redundancy instance identity.

srg-peer-id *srg_peer_id*

Specify the identity of peer user plane for the SRG.

upf *upf_name*

Specify the name of user plane function.

Usage Guidelines Use this command to view the subscriber reconciliation details.

show subscriber session

Displays the session manager CDL record keys per session.

Command Modes Exec

Syntax Description **show subscriber session [detail | filter { smupstate {** *upf_name*/**smUpSessionCreated } | { mac** *mac_id* **[detail] } | sesstype ipoerouted | ipam-dp-key }**

detail

Display the session details from SM CDL record.

filter { smupstate { *upf_name*/smUpSessionCreated } }

Display whether the session is created in the respective UPF for the SRG sessions.

filter { mac *mac_id* [detail] }

Display subscriber sessions based on the MAC ID.

For example,

```
bng# show subscriber session filter { mac aa11.0000.0001 } detail
Thu Jul 11 16:37:30.579 UTC+00:00
subscriber-details
{
"subResponses": [
```

```
{
"subLabel": "16777228",
"srgPeerId": "Peer1",
"srgId": "Group1",
"mac": "aa11.0000.0001",
"acct-sess-id": "Local_DC_16777228",
"sesstype": "ipoeRouted",
"state": "established",
"subCreateTime": "Thu, 11 Jul 2024 15:59:49 UTC",
"dhcpAuditId": 2,
"transId": "1",
<snip
```

filter { sesstype ipoerouted }

Display the IPOE routed subscriber sessions.

filter ipam-dp-key

Display sessions based on the ipam-dp-key.

Usage Guidelines Use this command to view the session manager CDL record keys per session.

show subscriber synchronize

Synchronize information.

Command Modes Exec

Syntax Description **show subscriber synchronize [srg-peer-id** *peer_id* **| upf** *upf_info* **]**

Syntax Description **show subscriber synchronize-cp upf** *upf_info*

synchronise-cp

Specify to synchronise CP information.

Must be one of the following:

- **synchronize-cp**

synchronize

Specify to synchronise UP information.

Must be one of the following:

- **synchronize**

srg-peer-id *peer_id*

Specify the identity of peer user plane for the group.

upf *upf_info*

Specify UPF information.

Must be a string of 1-64 characters.

Usage Guidelines Use this command to synchronise information.

split-prefix-iana-first

Enables allocation of both IANA and IAPD from the same IP pool.

Command Modes IPAM configuration mode

Syntax Description **`split-prefix-iana-first`**

subscriber featurette dhcp-lease-reservation enable

Enables/disables DHCP IP Lease Reservation.

Command Modes Exec > Global Configuration (config)

Syntax Description **`[ no ] subscriber featurette dhcp-lease-reservation enable`**

subscriber featurette dhcp-lease-reservation enable

Enables DHCP IP Lease Reservation

no subscriber featurette dhcp-lease-reservation enable

Disables DHCP IP Lease Reservation

Usage Guidelines Use this command to enable or disable DHCP IP Lease Reservation.

subscriber-redundancy group

Configures subscriber geographical redundancy group.

Command Modes Exec > Global Configuration > Userplane Configuration (config-user-plane-userplane_name)

Syntax Description **`subscriber-redundancy group`** *`group_name`* **`{ disable | domain-identifier`** *`domain-name`* **`| peer-identifier`** *`peer-id`* **`| port-id-map port-name`** *`port-id name port-id`*`|` **`[ preferred-role-active ] [ revertive-timer`** *`sec`* **`] }`**

subscriber-redundancy group *group_name*

Specifies the name of the subscriber redundancy group that is unique to a user plane.

disable

Disables an SRG group without deleting the entire configuration of the group. The behaviour is same as removing an SRG group.

domain-identifier *domain_name*

Specifies the domain name to identify all groups common between two userplanes.

peer-identifier *peer_id*

Identifies the peer user-plane for the group. This identifier must be unique across all groups in the control plane. The same peer-identifier must be configured in the peer user-plane.

port-id-map port-name *port_name port_id*

Specifies the mapping of access interfaces between user planes. At least one port-id-map must be configured.

preferred-role-active

This is an optional configuration.

Sets the preferred role active for user plane. If preferred-role-active is not configured, none of the UPs under the SRG group will be active. Default value: false.

state-control-route *route_name* afi *ipv6 aggregate_route* vrf *vrf_name*

Programs the route to the UP for a specific routed SRG group based on the active or standby state of the UP.

revertive-timer *sec*

This is an optional configuration.

Specifies the revertive timer in seconds. revertive_timer_value must be an integer in the range of 60 to 3600. This command is available only when **preferred-role-active** is configured.

Usage Guidelines Use this command to configure the subscriber redundancy group (SRG) configuration.

subscriber redundancy session-synchronize add

Synchronizes the sessions with the standby UP.

Command Modes Exec

Syntax Description

```
subscriber-redundancy session-synchronize add { domain [ domain_ID ] |
duration timeout_value | peer-id [ peer_id ] | target-upf upf_id | tps value |
 upf [ upf_id ] }
```

domain [*domain_id*]

Specifies the list of SRG domains.

duration *timeout_value*

Specifies the maximum timeout value in minutes.

peer-id [*peer_id*]

Specifies the list of SRG peer identities.

target-upf *upf_id*

Specifies the identity of target UP.

tps *value*

Specifies the maximum number of allowed transactions per second (TPS).

upf [*upf_id*]

Specifies the list of UPs.

subscriber redundancy session-synchronize delete

Deletes SRG sessions.

Command Modes

Exec

Syntax Description

subscriber-redundancy session-synchronize delete { domain [*domain_ID* **] | duration** *timeout_value* **| peer-id [** *peer_id* **] | target-upf** *upf_id* **| tps** *value* **| upf [** *upf_id* **] }**

domain [*domain_id*]

Specifies the list of SRG domains.

duration *timeout_value*

Specifies the maximum timeout value in minutes.

peer-id [*peer_id*]

Specifies the list of SRG peer identities.

target-upf *upf_id*

Specifies the identity of target UP.

tps *value*

Specifies the maximum number of allowed transactions per second (TPS).

upf [*upf_id*]

Specifies the list of UPs.

subscriber reset-token

Configure to reset the in-use token for the specified protocol.

Command Modes Exec

Syntax Description **subscriber reset-token { dhcp | pppoe }**

subscriber reset-token { dhcp | pppoe }

Reset the in-use token to zero for DHCP or PPPoE.

Usage Guidelines Use this command to reset the in-use token to zero.

subscriber route-synchronize

Synchronizes routes to UPF.

Command Modes Exec

Syntax Description **subscriber route-synchronize upf** *user_plane_name*

upf *user_plane_name*

Specify the user plane name.

Must be a string.

Usage Guidelines Use this command to synchronize routes to UPF.

subscriber session-synchronize

Synchronizes sessions to UPF.

Command Modes Exec

Syntax Description **subscriber session-synchronize upf** *user_plane_name* **[abort | timeout** *sla_timeout* **]**

abort

Specify to abort synchronization.

timeout *sla_timeout*

Specify the SLA timeout duration in seconds.

Must be an integer in the range of 10-1800.

upf *user_plane_name*

Specify the user plane name.

Must be a string.

Usage Guidelines Use this command to synchronize sessions to UPF.

subscriber session-synchronize-cp

Synchronizes sessions on CP.

Command Modes Exec

Syntax Description **subscriber session-synchronize-cp upf** *user_plane_name* **[abort | timeout** *timeout_value* **| tps** *tps* **]**

abort

Specify to abort synchronization.

timeout *timeout_value*

Specify the timeout duration in minutes.

Must be an integer in the range of 2-100.

tps *tps*

Specify the TPS.

Must be an integer in the range of 40-4000.

upf *user_plane_name*

Specify name of the user plane function.

Must be a string of 1-64 characters.

Usage Guidelines Use this command to synchronize sessions on CP.

subscriber token

Configures FSOL token mechanism.

Command Modes Exec > Global Configuration (config)

Syntax Description **subscriber token { dhcp | pppoe }** *token_count*

subscriber token { dhcp | pppoe } *token_count*

Set the maximum token available for FSOL pod.

token_count is cumulative across instances. For example, if there are 4 DHCP pods and DHCP token is set as 2000, then 500 tokens will be assigned for each pod

- **dhcp**: Set the DHCP pod token count.
- **pppoe**: Set the PPPoE pod token count.

Usage Guidelines Use this command to configure FSOL token mechanism.

user-plane

Configures the userplane configuration.

Command Modes Exec > Global Configuration (config)

Syntax Description **user-plane** *userplane_name* **[offline | subscriber-profile** *subscriber_profile* **]**

offline

Specify as offline.

subscriber-profile *subscriber_profile_name*

Specify the Subscriber Profile to associate at current level.

userplane_name

Specify the userplane name.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure the userplane configuration. Enters the Userplane Configuration mode.

user-plane flowctrl-group

Configures the associated flow control group in user plane.

Command Modes Exec > Global Configuration > Userplane Configuration (config-user-plane-*userplane_name*)

Syntax Description **flowctrl-group** group_name

flowctrl-group group_name

Specify the flow control group to be associated.

Usage Guidelines Use this command to associate the flow control group in user plane.

user-plane peer-address

Configures the userplane IP address.

Command Modes Exec > Global Configuration (config) > User Plane Configuration (config-user-plane-*userplane_name*)

Syntax Description **peer-address ipv4** *ipv4_address*

ipv4 *ipv4_address*

Specify the IPv4 address.

Must be an IPv4 address.

Usage Guidelines Use this command to configure the userplane IP address.

user-plane port-id

Configures Port Identifier parameters.

Command Modes Exec > Global Configuration (config) > User Plane Configuration (config-user-plane-*userplane_name*)

Syntax Description **port-id** *port_number* **[subscriber-profile** *subscriber_profile_name* **]**

subscriber-profile *subscriber_profile_name*

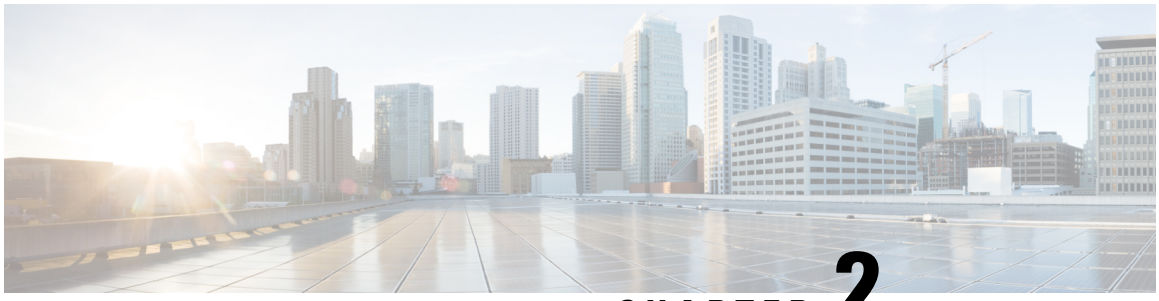
Specify the Subscriber Profile to associate to the Port Identifier level.

port_number

Specify the port identifier.

Must be a string in the pattern ([a-zA-Z1-9_][^(\\s,\\t,\",')]*).

Usage Guidelines Use this command to configure Port Identifier parameters.



CHAPTER 2

Input Pattern Types

arg-type

```
Pattern:
'[^\*].*|..+'; // must not be single '*'

Pattern:
'\*'
```

This statement can be used to hide a node from some, or all, northbound interfaces. All nodes with the same value are considered a hide group and are treated the same with regards to being visible or not in a northbound interface.

A node with an hidden property is not shown in the northbound user interfaces (CLI and Web UI) unless an 'unhide' operation is performed in the user interface.

The hidden value 'full' indicates that the node must be hidden from all northbound interfaces, including programmatical interfaces such as NETCONF. The value '*' is not valid. A hide group can be unhidden only if this is explicitly allowed in the confd.conf(5) daemon configuration.

Multiple hide groups can be specified by giving this statement multiple times. The node is shown if any of the specified hide groups is given in the 'unhide' operation. If a mandatory node is hidden, a hook callback function (or similar) might be needed in order to set the element

crypt-hash

```
Pattern:
'$0$.*'
  '|$1$[a-zA-Z0-9./]{1,8}$[a-zA-Z0-9./]{22}'
  '|$5$(rounds=\d+$)?[a-zA-Z0-9./]{1,16}$[a-zA-Z0-9./]{43}'
  '|$6$(rounds=\d+$)?[a-zA-Z0-9./]{1,16}$[a-zA-Z0-9./]{86}'
```

The **crypt-hash** type is used to store passwords using a hash function. The algorithms for applying the hash function and encoding the result are implemented in various UNIX systems as the function crypt(3).

A value of this type matches one of the forms:

- 0<clear text password>
- $<id>$<salt>$<password hash>
- $<id>$<parameter>$<salt>$<password hash>

The '0' prefix signals that the value is clear text. When such a value is received by the server, a hash value is calculated, and the string '$<id>$<salt>$' or $<id>$<parameter>$<salt>$ is prepended to the result. This value is stored in the configuration data store.

If a value starting with '$<id>$', where <id> is not '0', is received, the server knows that the value already represents a hashed value, and stores it as is in the data store.

When a server needs to verify a password given by a user, it finds the stored password hash string for that user, extracts the salt, and calculates the hash with the salt and given password as input. If the calculated hash value is the same as the stored value, the password given by the client is accepted.

This type defines the following hash functions:

Id	Hash Function	Feature
1	MD5	crypt-hash-md5
5	SHA-256	crypt-hash-sha-256
6	SHA-512	crypt-hash-sha-512

The server indicates support for the different hash functions by advertising the corresponding feature.

Reference:

- IEEE Std 1003.1-2008 - crypt() function
- RFC 1321: The MD5 Message-Digest Algorithm
- FIPS.180-3.2008: Secure Hash Standard

date-and-time

```
Pattern:
'\d{4}-\d{2}-\d{2}T\d{2}:\d{2}:\d{2}(\.\d+)?'
 '(Z|[\+\-]\d{2}:\d{2})'
```

The date-and-time type is a profile of the ISO 8601 standard for representation of dates and times using the Gregorian calendar. The profile is defined by the date-time production in Section 5.6 of RFC 3339. The date-and-time type is compatible with the dateTime XML schema type with the following notable exceptions:

1. The date-and-time type does not allow negative years.
2. The date-and-time time-offset -00:00 indicates an unknown time zone (see RFC 3339) while -00:00 and +00:00 and Z all represent the same time zone in dateTime.
3. The canonical format (see below) of data-and-time values differs from the canonical format used by the dateTime XML schema type, which requires all times to be in UTC using the time-offset 'Z'.

This type is not equivalent to the DateAndTime textual convention of the SMIv2 since RFC 3339 uses a different separator between full-date and full-time and provides higher resolution of time-secfrac. The canonical format for date-and-time values with a known time zone uses a numeric time zone offset that is calculated using the device's configured known offset to UTC time.

A change of the device's offset to UTC time will cause date-and-time values to change accordingly. Such changes might happen periodically in case a server follows automatically daylight saving time (DST) time zone offset changes. The canonical format for date-and-time values with an unknown time zone (usually referring to the notion of local time) uses the time-offset -00:00.

Reference:

- RFC 3339: Date and Time on the Internet: Timestamps
- RFC 2579: Textual Conventions for SMIv2
- XSD-TYPES: XML Schema Part 2: Datatypes Second Edition

domain-name

```
Pattern:
'((([a-zA-Z0-9_]([a-zA-Z0-9\-_]){0,61})?[a-zA-Z0-9]\.)*'
 '([a-zA-Z0-9_]([a-zA-Z0-9\-_]){0,61})?[a-zA-Z0-9]\.?)'
 '|\.'
```

The domain-name type represents a DNS domain name. The name must fully qualified whenever possible. Internet domain names are only loosely specified. Section 3.5 of RFC 1034 recommends a syntax (modified in Section 2.1 of RFC 1123). The Pattern above is intended to allow for current practice in domain name use, and some possible future expansion. It is designed to hold various types of domain names, including names used for A or AAAA records (host names) and other records, such as SRV records.

The Internet host names have a stricter syntax (described in RFC 952) than the DNS recommendations in RFCs 1034 and 1123, and that systems that want to store host names in schema nodes using the domain-name type are recommended to adhere to this stricter standard to ensure interoperability.

The encoding of DNS names in the DNS protocol is limited to 255 characters. Since the encoding consists of labels prefixed by a length bytes and there is a trailing NULL byte, only 253 characters can appear in the textual dotted notation.

The description clause of schema nodes using the domain-name type must describe when and how these names are resolved to IP addresses. The resolution of a domain-name value may require to query multiple DNS records. For example, A for IPv4 and AAAA for IPv6. The order of the resolution process and which DNS record takes precedence can either be defined explicitly or may depend on the configuration of the resolver.

Domain-name values use the US-ASCII encoding. Their canonical format uses lowercase US-ASCII characters. Internationalized domain names MUST be A-labels as per RFC 5890.

Reference:

- RFC 952: DoD Internet Host Table Specification
- RFC 1034: Domain Names - Concepts and Facilities
- RFC 1123: Requirements for Internet Hosts -- Application and Support
- RFC 2782: A DNS RR for specifying the location of services (DNS SRV)
- RFC 5890: Internationalized Domain Names in Applications (IDNA): Definitions and Document Framework

dotted-quad

Pattern:

```
'(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}'
 '([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])'
```

An unsigned 32-bit number expressed in the dotted-quad notation, that is, four octets written as decimal numbers and separated with the '.' (full stop) character.

hex-list

Pattern:

```
'(([0-9a-fA-F]){2}(:([0-9a-fA-F]){2})*)?'
```

DEPRECATED: Use yang:hex-string instead. There are no plans to remove tailf:hex-list. A list of colon-separated hexa-decimal octets, for example '4F:4C:41:71'.

The statement tailf:value-length can be used to restrict the number of octets. Using the 'length' restriction limits the number of characters in the lexical representation

hex-string

Pattern:
```
'([0-9a-fA-F]{2}(:[0-9a-fA-F]{2})*)?'
```

A hexadecimal string with octets represented as hex digits separated by colons. The canonical representation uses lowercase characters.

ipv4-address

Pattern:
```
'(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}'
 '([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])'
 '(%[\p{N}\p{L}]+)?'
```

The ipv4-address type represents an IPv4 address in dotted-quad notation. The IPv4 address may include a zone index, separated by a % sign. The zone index is used to disambiguate identical address values. For link-local addresses, the zone index will typically be the interface index number or the name of an interface. If the zone index is not present, the default zone of the device will be used. The canonical format for the zone index is the numerical format.

ipv4-address-and-prefix-length

Pattern:
```
'(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}'
 '([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])'
 '/(([0-9])|([1-2][0-9])|(3[0-2]))'
```

The ipv4-address-and-prefix-length type represents a combination of an IPv4 address and a prefix length. The prefix length is given by the number following the slash character and must be less than or equal to 32.

ipv4-address-no-zone

Pattern:
```
'[0-9\.]*'
```

An IPv4 address is without a zone index and derived from ipv4-address that is used in situations where the zone is known from the context and hence no zone index is needed.

ipv4-prefix

Pattern:
```
'(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}'
 '([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])'
 '/(([0-9])|([1-2][0-9])|(3[0-2]))'
```

The ipv4-prefix type represents an IPv4 address prefix. The prefix length is given by the number following the slash character and must be less than or equal to 32.

A prefix length value of 'n' corresponds to an IP address mask that has n contiguous 1-bits from the most significant bit (MSB) and all other bits set to 0.

The canonical format of an IPv4 prefix has all bits of the IPv4 address set to zero that are not part of the IPv4 prefix.

ipv6-address

```
Pattern:
'((:|[0-9a-fA-F]{0,4}):)([0-9a-fA-F]{0,4}:){0,5}'
  '((([0-9a-fA-F]{0,4}:)?(:|[0-9a-fA-F]{0,4}))|'
  '(((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}'Pattern:
  '(25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])))'
  '(%[\p{N}\p{L}]+)?'
```

```
Pattern:
'(([^:]+:){6}(([^:]+:[^:]+)|(.*\..*))|'
 '((([^:]+:)*[^:]+)?::(([^:]+:)*[^:]+)?)'
 '(%.+)?'
```

The ipv6-address type represents an IPv6 address in full, mixed, shortened, and shortened-mixed notation. The IPv6 address may include a zone index, separated by a % sign.

The zone index is used to disambiguate identical address values. For link-local addresses, the zone index will typically be the interface index number or the name of an interface. If the zone index is not present, the default zone of the device will be used.

The canonical format of IPv6 addresses uses the textual representation defined in Section 4 of RFC 5952. The canonical format for the zone index is the numerical format as described in Section 11.2 of RFC 4007.

Reference:

- RFC 4291: IP Version 6 Addressing Architecture
- RFC 4007: IPv6 Scoped Address Architecture
- RFC 5952: A Recommendation for IPv6 Address Text Representation

ipv6-address-and-prefix-length

```
Pattern:
'((:|[0-9a-fA-F]{0,4}):)([0-9a-fA-F]{0,4}:){0,5}'
 '((([0-9a-fA-F]{0,4}:)?(:|[0-9a-fA-F]{0,4}))|'
 '(((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}'
 '(25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])))'
 '(/(([0-9])|([0-9]{2})|(1[0-1][0-9])|(12[0-8])))'
```

```
Pattern:
'(([^:]+:){6}(([^:]+:[^:]+)|(.*\..*))|'
```

```
'((([^:]+:)*[^:]+)?::(([^:]+:)*[^:]+)?)'
'(/.+)'
```

The ipv6-address-and-prefix-length type represents a combination of an IPv6 address and a prefix length. The prefix length is given by the number following the slash character and must be less than or equal to 128.

ipv6-address-no-zone

Pattern:

```
'[0-9a-fA-F:\.]*'
```

An IPv6 address without a zone index. This type, derived from ipv6-address, may be used in situations where the zone is known from the context and hence no zone index is needed.

Reference:

- RFC 4291: IP Version 6 Addressing Architecture
- RFC 4007: IPv6 Scoped Address Architecture
- RFC 5952: A Recommendation for IPv6 Address Text Representation

ipv6-prefix

Pattern:

```
'((:|[0-9a-fA-F]{0,4}):)([0-9a-fA-F]{0,4}:){0,5}'
 '((([0-9a-fA-F]{0,4}:)?(:|[0-9a-fA-F]{0,4}))|'
 '(((25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])\.){3}'Pattern:
 '(25[0-5]|2[0-4][0-9]|[01]?[0-9]?[0-9])))'
 '(/(([0-9])|([0-9]{2})|(1[0-1][0-9])|(12[0-8])))';
```

Pattern:

```
'(([^:]+:){6}(([^:]+:[^:]+)|(.*\..*))|'
 '((([^:]+:)*[^:]+)?::(([^:]+:)*[^:]+)?)'
 '(/.+)'
```

The ipv6-prefix type represents an IPv6 address prefix. The prefix length is given by the number following the slash character and must be less than or equal to 128.

A prefix length value of n corresponds to an IP address mask that has n contiguous 1-bits from the most significant bit (MSB) and all other bits set to 0.

The IPv6 address should have all bits that do not belong to the prefix set to zero. The canonical format of an IPv6 prefix has all bits of the IPv6 address set to zero that are not part of the IPv6 prefix. Furthermore, the IPv6 address is represented as defined in Section 4 of RFC 5952

Reference:

- RFC 5952: A Recommendation for IPv6 Address Text Representation

mac-address

Pattern:
```
'[0-9a-fA-F]{2}(:[0-9a-fA-F]{2}){5}'
```

The mac-address type represents an IEEE 802 MAC address. The canonical representation uses lowercase characters. In the value set and its semantics, this type is equivalent to the MacAddress textual convention of the SMIv2.

Reference:

- IEEE 802: IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture
- RFC 2579: Textual Conventions for SMIv2

object-identifier

Pattern:
```
'(([0-1](\.[1-3]?[0-9]))|(2\.(0|([1-9]\d*))))'
 '(\.(0|([1-9]\d*)))*'
```

The object-identifier type represents administratively assigned names in a registration-hierarchical-name tree. The values of this type are denoted as a sequence of numerical non-negative sub-identifier values. Each sub-identifier value MUST NOT exceed 2^32-1 (4294967295). The Sub-identifiers are separated by single dots and without any intermediate whitespace.

The ASN.1 standard restricts the value space of the first sub-identifier to 0, 1, or 2. Furthermore, the value space of the second sub-identifier is restricted to the range 0 to 39 if the first sub-identifier is 0 or 1. Finally, the ASN.1 standard requires that an object identifier has always at least two sub-identifiers. The pattern captures these restrictions.

Although the number of sub-identifiers is not limited, module designers should realize that there may be implementations that stick with the SMIv2 limit of 128 sub-identifiers.

This type is a superset of the SMIv2 OBJECT IDENTIFIER type since it is not restricted to 128 sub-identifiers. Hence, this type SHOULD NOT be used to represent the SMIv2 OBJECT IDENTIFIER type; the object-identifier-128 type SHOULD be used instead.

Reference:

- ISO9834-1: Information technology - Open Systems
- Interconnection - Procedures for the operation of OSI
- Registration Authorities: General procedures and top arcs of the ASN.1 Object Identifier tree

object-identifier-128

Pattern:
```
'\d*(\.\d*){1,127}'
```

This type represents object-identifiers restricted to 128 sub-identifiers. In the value set and its semantics, this type is equivalent to the OBJECT IDENTIFIER type of the SMIv2.

Reference:

- RFC 2578: Structure of Management Information Version 2 (SMIv2)

octet-list

Pattern:
'(\d*(.\d*)*)?'

A list of dot-separated octets, for example '192.168.255.1.0'. The statement tailf:value-length can be used to restrict the number of octets. Using the 'length' restriction limits the number of characters in the lexical representation.

phys-address

Pattern:
'([0-9a-fA-F]{2}(:[0-9a-fA-F]{2})*)?'

Represents media- or physical-level addresses represented as a sequence octets, each octet represented by two hexadecimal numbers. Octets are separated by colons. The canonical representation uses lowercase characters. In the value set and its semantics, this type is equivalent to the PhysAddress textual convention of the SMIv2.

Reference:

- RFC 2579: Textual Conventions for SMIv2

sha-256-digest-string

Pattern:
'0.*'
'|5(rounds=\d+$)?[a-zA-Z0-9./]{1,16}$[a-zA-Z0-9./]{43}'

The sha-256-digest-string type automatically computes a SHA-256 digest for a value adhering to this type. A value of this type matches one of the forms:

- 0<clear text password>
- 5<salt>$<password hash>
- 5rounds=<number>$<salt>$<password hash>

The '0' prefix signals that this is plain text. When a plain text value is received by the server, a SHA-256 digest is calculated, and the string '5<salt>$' is prepended to the

result, where <salt> is a random 16 character salt used to generate the digest. This value is stored in the configuration data store. The algorithm can be tuned through the /confdConfig/cryptHash/rounds parameter, which if set to a number other than the default will cause '5rounds=<number>$<salt>$' to be prepended instead of only '5<salt>$'.

If a value starting with '5' is received, the server knows that the value already represents a SHA-256 digest, and stores it as is in the data store.

If a default value is specified, it must have a '5' prefix.

The digest algorithm used is the same as the SHA-256 crypt function used for encrypting passwords for various UNIX systems.

Reference:

- IEEE Std 1003.1-2008 - crypt() function FIPS.180-3.2008: Secure Hash Standard

sha-512-digest-string

```
Pattern:
'$0$.*'
 '|$6$(rounds=\d+$)?[a-zA-Z0-9./]{1,16}$[a-zA-Z0-9./]{86}'
```

The sha-512-digest-string type automatically computes a SHA-512 digest for a value adhering to this type. A value of this type matches one of the forms

- 0<clear text password>
- 6<salt>$<password hash>
- 6rounds=<number>$<salt>$<password hash>

The '0' prefix signals that this is plain text. When a plain text value is received by the server, a SHA-512 digest is calculated, and the string '6<salt>$' is prepended to the

result, where <salt> is a random 16 character salt used to generate the digest. This value is stored in the configuration data store. The algorithm can be tuned through the

/confdConfig/cryptHash/rounds parameter, which if set to a number other than the default will cause '6rounds=<number>$<salt>$' to be prepended instead of only '6<salt>$'.

If a value starting with '6' is received, the server knows that the value already represents a SHA-512 digest, and stores it as is in the data store.

If a default value is specified, it must have a '6' prefix. The digest algorithm used is the same as the SHA-512 crypt function used for encrypting passwords for various UNIX systems.

Reference:

- IEEE Std 1003.1-2008 - crypt() function FIPS.180-3.2008: Secure Hash Standard

size

```
Pattern:
'S(\d+G)?(\d+M)?(\d+K)?(\d+B)?'
```

A value that represents a number of bytes. An example could be S1G8M7K956B; meaning 1GB + 8MB + 7KB + 956B = 1082138556 bytes.

The value must start with an S. Any byte magnifier can be left out, for example, S1K1B equals 1025 bytes. The order is significant though, that is S1B56G is not a valid byte size.

In ConfD, a 'size' value is represented as an uint64.

uuid

Pattern:
```
'[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-'
 '[0-9a-fA-F]{4}-[0-9a-fA-F]{12}'
```

A Universally Unique IDentifier in the string representation defined in RFC 4122. The canonical representation uses lowercase characters. The following is an example of a UUID in string representation: f81d4fae-7dec-11d0-a765-00a0c91e6bf6.

Reference:

- RFC 4122: A Universally Unique IDentifier (UUID) URN Namespace

yang-identifier

Pattern:
```
'[a-zA-Z_][a-zA-Z0-9\-_.]*'
```

Pattern:
```
'.|..|[^xX].*|.[^mM].*|..[^lL].*'
```

A YANG identifier string as defined by the 'identifier' rule in Section 12 of RFC 6020. An identifier must start with an alphabetic character or an underscore followed by an arbitrary sequence of alphabetic or numeric characters, underscores, hyphens, or dots. A YANG identifier MUST NOT start with any possible combination of the lowercase or uppercase character sequence 'xml'.

Reference:

- RFC 6020: YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)