

# Broadband Network Gateway Command Reference for Cisco ASR 9000 Series Routers

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# Preface

From Release 6.1.2 onwards, Cisco introduces support for the 64-bit Linux-based IOS XR operating system. Extensive feature parity is maintained between the 32-bit and 64-bit environments. Unless explicitly marked otherwise, the contents of this document are applicable for both the environments. For more details on Cisco IOS XR 64 bit, refer to the Release Notes for Cisco ASR 9000 Series Routers, Release 6.1.2 document.

The Preface contains these topics:


- Changes to This Document, on page xiii
- Communications, Services, and Additional Information, on page xiv


# Changes to This Document

This table lists the changes made to this document since it was first printed.

***Table 1: Changes to This Document***

| Date | Change Summary |
|---|---|
| March 2017 | Initial release of this document. |
| July 2017 | Republished for Release 6.2.2. |
| March 2018 | Republished for Release 6.3.2. |
| March 2018 | Republished for Release 6.4.1. |
| July 2018 | Republished for Release 6.5.1. |
| January 2019 | Republished for Release 6.5.2. |
| March 2019 | Republished for Release 6.5.3. |
| April 2019 | Republished for Release 6.6.2. |
| December 2019 | Republished for Release 6.6.3. |
| February 2021 | Republished for Release 7.3.1. |
| July 2021 | Republished for Release 6.8.1. |

| Date | Change Summary |
|---|---|
| July 2021 | Republished for Release 7.4.1. |

# Communications, Services, and Additional Information

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# ACL and ABF Commands

This module describes the Cisco IOS XR software commands used to configure the ACL and ABF commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- ipv4 access-group (BNG), on page 2
- ipv4 access-list(BNG), on page 5
- ipv6 access-group(BNG), on page 7
- ipv6 access-list(BNG), on page 9

# ipv4 access-group (BNG)

To control access to an interface, use the **ipv4 access-group** command in an appropriate configuration mode. To remove the specified access group, use the **no** form of this command.

**ipv4 access-group** *access-list-name* {**common** *acl-p* {[*acl1* **ingress** [**hardware-count**] [**interface-statistics**]] | **ingress**} | *acl1* {**ingress** | **egress**} [**hardware-count**] [**interface-statistics**]}

## Syntax Description

| | |
|---|---|
| *access-list-name* | The name of the ipv4 access list as specified by the ipv4 access-list command. |
| **common** | The name of the common ACL. Common ACL is only supported on the ingress direction. |
| **ingress** | Filters on inbound packets. |
| **egress** | Filters on outbound packets. |
| **hardware-count** | (Optional) Specifies to access a group's hardware counters. |
| **interface-statistics** | (Optional) Specifies per-interface statistics in the hardware. Not available for common ACL. |

## Command Default

The interface does not have an IPv4 access list applied to it.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.1.1 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

Use the **ipv4 access-group** command to control access to an interface. To remove the specified access group, use the **no** form of the command. Use the *access-list-name* argument to specify a particular IPv4 access list. Use the **ingress** keyword to filter on inbound packets or the egress keyword to filter on outbound packets. Use the *hardware-count* argument to enable hardware counters for the access group.

Permitted packets are counted only when hardware counters are enabled using the hardware-count argument. Denied packets are counted whether hardware counters are enabled or not.

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode(applicable only for BNG).

**Note** Under the dynamic template configuration mode, only the **egress** and **ingress** keywords are displayed.

**Note** For packet filtering applications using the ipv4/ipv6 access-group command, packet counters are maintained in hardware for each direction. If an access group is used on multiple interfaces in the same direction, then packets are counted for each interface that has the hardware-count argument enabled.

If the access list permits the addresses, the software continues to process the packet. If the access list denies the address, the software discards the packet and returns an Internet Control Message Protocol (ICMP) host unreachable message.

If the specified access list does not exist, all packets are passed.

By default, the unique or per-interface ACL statistics are disabled.

## Task ID

| Task ID | Operation |
|---|---|
| acl | read, write |
| network | read, write |
| config-services | read, write |

This is an example of the show access-lists command:

```
RP/0/RSP0/CPU0:router# show access-lists
ipv4 access-list acl-common
 10 permit ipv4 host 205.205.205.1 host 200.175.175.1 log-input
 15 deny ipv4 any host 200.175.175.1
 20 permit ipv4 host 205.205.205.1 host 201.175.175.1 log-input
 25 deny ipv4 any host 201.175.175.1
 30 permit ipv4 host 205.205.205.1 host 202.175.175.1 log-input
 35 deny ipv4 any host 202.175.175.1
ipv4 access-list acl-unique1
 10 permit ipv4 host 205.205.205.1 host 203.175.175.1 log-input
 15 deny ipv4 any host 203.175.175.1
 20 permit ipv4 any any
ipv4 access-list ssm-acl
 10 permit ipv4 232.0.0.0 0.255.255.255 any log
```

This is an example of a configured IPv4 ACL in the interface configuration mode:

```
RP/0/RSP0/CPU0:router(config-if)#ipv4 access-group common acl-common acl-unique1 ingress
```

This is an example of a configured IPv4 ACL in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv4 access-group a1 egress
```

# ipv4 access-list(BNG)

To define an IPv4 access list by name, use the **ipv4 access-list** command in Global Configuration mode. To remove all entries in an IPv4 access list, use the **no** form of this command.

**ipv4 access-list** *name*

## Syntax Description

| | |
|---|---|
| *name* | Name of the access list. Names cannot contain a space or quotation marks. |

## Command Default

No IPv4 access list is defined.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

Use the **ipv4 access-list** command to configure an IPv4 access list. This command places the router in access list configuration mode, in which the denied or permitted access conditions must be defined with the **deny** or **permit** command.

Use the **resequence access-list ipv4** command if you want to add a **permit** , **deny** , or **remark** statement between consecutive entries in an existing IPv4 access list. Specify the first entry number (the *base* ) and the increment by which to separate the entry numbers of the statements. The software renumbers the existing statements, thereby making room to add new statements with the unused entry numbers.

Use the **ipv4 access-group** command to apply the access list to an interface.

## Task ID

| Task ID | Operations |
|---|---|
| acl | read, write |

## Examples

The following example shows how to define a standard access list named Internetfilter:

```
Router(config)# ipv4 access-list Internetfilter
Router(config-if)# 10 permit 192.168.34.0 0.0.0.255
Router(config-if)# 20 permit 172.16.0.0 0.0.255.255
Router(config-if)# 30 permit 10.0.0.0 0.255.255.255
Router(config-if)# 39 remark Block BGP traffic from 172.16 net.
Router(config-if)# 40 deny tcp host 172.16.0.0 eq bgp host 192.168.202.203 range 1300 1400
```

## Related Commands

| Command | Description |
|---|---|
| ipv4 access-group (BNG), on page 2 | Filters incoming or outgoing IPv4 traffic on an interface. |

| Command | Description |
| --- | --- |
| show access-lists ipv4 | Displays the contents of all current IPv4 access lists. |

# ipv6 access-group(BNG)

To control access to an interface, use the **ipv6 access-group** command in interface configuration mode. To remove the specified access group, use the **no** form of this command.

**ipv6 access-group** *access-list-name* {**ingress** | **egress**} [**interface-statistics**]

## Syntax Description

| | |
|---|---|
| access-list-name | Name of an IPv6 access list as specified by an **ipv6 access-list** command. |
| ingress | Filters on inbound packets. |
| egress | Filters on outbound packets. |
| interface-statistics | (Optional) Specifies per-interface statistics in the hardware. |

## Command Default

The interface does not have an IPv6 access list applied to it.

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The **ipv6 access-group** command is similar to the **ipv4 access-group** command, except that it is IPv6-specific.

Use the **ipv6 access-group** command to control access to an interface. To remove the specified access group, use the **no** form of the command. Use the *access-list-name* to specify a particular IPv6 access list. Use the **ingress** keyword to filter on inbound packets or the **egress** keyword to filter on outbound packets.

**Note** For packet filtering applications using the **ipv6 access-group** command, packet counters are maintained in hardware for each direction. If an access group is used on multiple interfaces in the same direction, then packets are counted for each interface.

If the access list permits the addresses, the software continues to process the packet. If the access list denies the address, the software discards the packet and returns a rate-limited Internet Control Message Protocol (ICMP) host unreachable message.

If the specified access list does not exist, all packets are passed.

By default, the unique or per-interface ACL statistics are disabled.

## Task ID

| Task ID | Operations |
|---|---|
| acl | read, write |

| Task ID | Operations |
|---|---|
| ipv6 | read, write |

## Examples

The following example shows how to apply filters on packets inbound and outbound from GigabitEthernet interface 0/2/0/2:

```
RP/0/RSP0

/CPU0:router(config)# interface gigabitethernet 0/2/0/2
RP/0/RSP0

/CPU0:router(config-if)# ipv6 access-group p-in-filter ingress
RP/0/RSP0

/CPU0:router(config-if)# ipv6 access-group p-out-filter egress
```

The following example shows how to apply per-interface statistics in the hardware:

```
RP/0/RSP0

/CPU0:router(config)# interface gigabitethernet 0/2/0/2
RP/0/RSP0

/CPU0:router(config-if)# ipv6 access-group p-in-filter ingress interface-statistics
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 access-list(BNG) | Defines an IPv6 access list and enters IPv6 access list configuration mode. |
| show ipv6 interface | Displays the usability status of interfaces configured for IPv6. |

# ipv6 access-list(BNG)

To define an IPv6 access list and to place the router in IPv6 access list configuration mode, use the **ipv6 access-list** command in Global Configuration mode. To remove the access list, use the **no** form of this command.

**ipv6 access-list** *name*

## Syntax Description

| | |
|---|---|
| *name* | Name of the IPv6 access list. Names cannot contain a space or quotation mark, or begin with a numeric. |

## Command Default

No IPv6 access list is defined.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The **ipv6 access-list** command is similar to the **ipv4 access-list** command, except that it is IPv6-specific.

The IPv6 access lists are used for traffic filtering based on source and destination addresses, IPv6 option headers, and optional, upper-layer protocol type information for finer granularity of control. IPv6 access lists are defined by using the **ipv6 access-list** command in global configuration mode and their permit and deny conditions are set by using the **deny** and **permit** commands in IPv6 access list configuration mode. Configuring the **ipv6 access-list** command places the router in IPv6 access list configuration mode—the router prompt changes to router (config-ipv6-acl)#. From IPv6 access list configuration mode, permit and deny conditions can be set for the defined IPv6 access list.



**Note** No more than one IPv6 access list can be applied to an interface per direction.



**Note** Every IPv6 access list has an implicit **deny ipv6 any any** statement as its last match condition. An IPv6 access list must contain at least one entry for the implicit **deny ipv6 any any** statement to take effect.



**Note** IPv6 prefix lists, not access lists, should be used for filtering routing protocol prefixes.

Use the **ipv6 access-group** interface configuration command with the *access-list-name* argument to apply an IPv6 access list to an IPv6 interface.



**Note** Every IPv6 ACL has implicit **permit icmp any any nd-na** , **permit icmp any any nd-ns** , and **deny ipv6 any any** statements as its last match conditions. (The former two match conditions allow for ICMPv6 neighbor discovery.) An IPv6 ACL must contain at least one entry for the implicit **deny ipv6 any any** statement to take effect. **permit icmp any any nd-na permit icmp any any nd-ns deny ipv6 any any deny ipv6 any any**

The IPv6 neighbor discovery process makes use of the IPv6 network layer service; therefore, by default, IPv6 ACLs implicitly allow IPv6 neighbor discovery packets to be sent and received on an interface. In IPv4, the Address Resolution Protocol (ARP), which is equivalent to the IPv6 neighbor discovery process, makes use of a separate data link layer protocol; therefore, by default, IPv4 ACLs implicitly allow ARP packets to be sent and received on an interface.

## Task ID

| Task ID | Operations |
|---|---|
| acl | read, write |
| ipv6 | read, write |

## Examples

The following example shows how to configure the IPv6 access list named list2 and applies the ACL to outbound traffic on interface GigabitEthernet 0/2/0/2. Specifically, the first ACL entry keeps all packets from the network fec0:0:0:2::/64 (packets that have the site-local prefix fec0:0:0:2 as the first 64 bits of their source IPv6 address) from exiting out of interface GigabitEthernet 0/2/0/2. The second entry in the ACL permits all other traffic to exit out of interface GigabitEthernet 0/2/0/2. The second entry is necessary because an implicit deny all condition is at the end of each IPv6 ACL.

```
RP/0/RSP0

/CPU0:router(config)# ipv6 access-list list2
RP/0/RSP0

/CPU0:router(config-ipv6-acl)# 10 deny fec0:0:0:2::/64 any
RP/0/RSP0

/CPU0:router(config-ipv6-acl)# 20 permit any any

RP/0/RSP0

/CPU0:router# show ipv6 access-lists list2

ipv6 access-list list2
  10 deny ipv6 fec0:0:0:2::/64 any
  20 permit ipv6 any any

RP/0/RSP0

/CPU0:router(config)# interface gigabitethernet 0/2/0/2
RP/0/RSP0

/CPU0:router(config-if)# ipv6 access-group list2 out
```

**Note** IPv6 is automatically configured as the protocol type in **permit any any** and **deny any any** statements that are translated from global configuration mode to IPv6 access list configuration mode.

**Note** An IPv6 router does not forward to another network an IPv6 packet that has a link-local address as either its source or destination address (and the source interface for the packet is different from the destination interface for the packet).



# Address Pool Service Commands

This chapter describes the Cisco IOS XR software Address Pool Service commands for Broadband Network Gateway (BNG). For details regarding related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- address-range, on page 14
- exclude, on page 16
- network (BNG), on page 18
- pool ipv4, on page 20
- pool ipv6, on page 21
- pool onfly pppoe, on page 22
- pool vrf, on page 23
- prefix-length, on page 25
- prefix-range, on page 26
- utilization-mark, on page 27
- show pool ipv4 name, on page 29
- show pool ipv6 name, on page 33
- show pool vrf, on page 40

# address-range

To specify address range for allocation, use the **address-range** command in Pool IPv4 or IPv6 configuration submode. To remove the address range, use the **no** form of this command.

**address-range** *first_range last_range* [**block**]

## Syntax Description

| | |
|---|---|
| *first_range* | Specifies the first address in range from which the IP addresses can be assigned to clients. |
| *last_range* | Specifies the last address in range until which the IP addresses can be assigned to clients. |
| **block** | Dynamically blocks one of the networks in the address pool. |

## Command Default

None

## Command Modes

Pool IPv4 configuration

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |
| Release 6.2.1 | Modified the command to include **block** option. |

## Usage Guidelines

You should only specify the addresses that are assignable to clients in a particular subnet. The interface and broadcast addresses should not be included in the address-range configuration.

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

Multiple address-ranges are allowed within a pool.

Dynamic soft pool migration as well as static IP address subscriber management work only if the identity change feature is enabled using **subscriber featurette identity-change** command. DHCP validates the IP address with DAPS and accordingly rejects the RENEW request from the client, only if the **block** command is enabled. For more details, refer DHCP soft pool migration feature in *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **address-range** command for IPv4 in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv4 pool2
RP/0/RSP0/CPU0:router(config-pool-ipv4)# address-range 11.11.11.11 14.14.14.14
```

This is an example of configuring the **address-range** command for IPv6 in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# address-range 2001::1 2001::100
```

This example shows how to enable dynamic soft pool migration by blocking one of the networks in the address pool:

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router#pool vrf default ipv4 dhcp_192
RP/0/RSP0/CPU0:router#address-range 192.0.2.1 192.0.2.7 block
RP/0/RSP0/CPU0:router#address-range 192.0.2.11 192.0.2.20
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |
| subscriber featurette identity-change, on page 461 | Enables identity change for DHCP Remote-Id parameter, thereby allowing modification of the subscriber service |

# exclude

To specify a range of IPv4 or Pv6 addresses that distributed address pool service (DAPS) must not assign to clients, use the **exclude** command in Pool IPv4 or IPv6 configuration submode. To remove the excluded IP addresses, use the **no** form of this command.

**exclude** {*first_addresslast_address*}

## Syntax Description

| | |
|---|---|
| *first_address* | Specifies the first address in the range that needs to be excluded for IPv4 and specifies the first address or prefix in the range for IPv6. |
| *last_address* | Specifies the last address in the range that needs to be excluded and specifies the last address or prefix in the range for IPv6. |

## Command Default

None

## Command Modes

Pool IPv4 configuration

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |

## Usage Guidelines

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

The low IP address cannot overlap with the IP address of a reserved address command. Multiple exclude commands are allowed within a pool. To exclude a single address, <highIpAddress> can be omitted.

**Note** The **exclude** command can be configured along with the **network**, **address-range**, and the **prefix-range** commands.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example to configure the **exclude** command for IPv4:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv4 pool2
RP/0/RSP0/CPU0:router(config-pool-ipv4)# exclude 10.10.10.1 10.10.10.10
```

This is an example to configure the **exclude** command for IPv6:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# exclude 2001::1
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on IPv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| network (BNG), on page 18 | Specifies a set of addresses or prefixes inside a subnet. |

# network (BNG)

To specify a set of addresses or prefixes inside a subnet, use the **network** command in Pool IPv4 or IPv6 configuration submode. To remove the addresses or prefixes, use the **no** form of this command.

**network** {*IPv4_subnet/length* [**default-router** *default-router-address* ]*IPv6_subnet/length*}

## Syntax Description

| | |
|---|---|
| *IPv4_subnet* | Specifies the decimal representation of the IPv4 subnet mask. |
| *IPv6_subnet* | Specifies the hexadecimal value for the IPv6 subnet mask. |
| *length* | Specifies the length of the prefix.<br>**Note** The prefix length must be a maximum of 16 bit more than the subnet mask. |
| **default-router** | (Optional) Specifies the default-gateway address for the subnet. |
| *default-router-address* | IPv4 address of the default-gateway. |

## Command Default

None

## Command Modes

Pool IPv4 configuration

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |
| Release 5.1 | Support for IPv4 **default-router** was added. |

## Usage Guidelines

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

The **prefix-length** command must be configured whenever the **network** command is used. The **prefix-length** must be configured to 128 to signify singleton addresses and a smaller value to signify IPv6 prefixes. The number of addresses or prefixes that can be allocated by DAPS can become huge when this command is used. The prefix-length command should be configured to a number that limits the number of addresses or prefixes for each pool to 64K.

The prefix is written as the first address of a network, followed by a slash character (/) , and ends with the bit-length of the prefix. For example, 192.168.1.0/24 is the prefix of the IPv4 network starting at the given

address, having 24 bits allocated for the network prefix, and the remaining 8 bits reserved for host addressing. The IPv6 address specification 2001:db8::/32 is a large network with 2 $^{96}$ addresses, having a 32-bit routing prefix. In IPv4 the routing prefix is also specified in the form of the subnet mask, which is expressed in quad-dotted decimal representation like an address. For example, 255.255.255.0 is the network mask for the 192.168.1.0/24 prefix.

The **default-router** option is supported only for IPv4 pools. The configured default-gateway address is automatically excluded from allocation to clients, if the address is within the subnet range.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **network** command for IPv4:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv4 pool2
RP/0/RSP0/CPU0:router(config-pool-ipv4)# network 11.11.11.0/24 default-router 11.11.11.11
```

This is an example of configuring the **network** command for IPv6:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# network 10:1:1::/50
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| prefix-length, on page 25 | Specifies the length of the prefix that is assigned to the client. |

# pool ipv4

To enable distributed address pool service on IPv4 and to enter the pool IPv4 configuration submode, use the **pool ipv4** command in the Global Configuration mode. To disable this feature, use the **no** form of this command.

**pool ipv4** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of the IPv4 pool. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **pool ipv4** command to enter IPv4 pool configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **pool ipv4** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool ipv4 pool1
RP/0/RSP0/CPU0:router(config-pool-ipv4)# address-range 10.10.10.1 10.10.10.254
```

## Related Commands

| Command | Description |
|---|---|
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |
| address-range, on page 14 | Specifies a range of IP addresses. |

# pool ipv6

To enable distributed address pool service on IPv6 and to enter the IPv6 pool configuration submode, use the **pool ipv6** command in the Global Configuration mode. To disable this feature, use the **no** form of this command.

**pool ipv6** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the IPv6 pool name. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

Use the **pool ipv6** command to enter IPv6 pool configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **pool ipv6** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool ipv6 p6 prefix-length 45
RP/0/RSP0/CPU0:router(config-pool-ipv6)#
```

## Related Commands

| Command | Description |
|---|---|
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |

# pool onfly pppoe

To enable dynamic modification of DAPS pool for PPPoE sessions, use the **pool onfly pppoe** command in Global Configuration mode. To disable the feature, use the **no** form of this command.

**pool onfly pppoe**

## Syntax Description

This command has no keywords or arguments.

## Command Default

By default, dynamic modification of DAPS pool for PPPoE sessions is disabled.

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 7.4.1 | This command was introduced for Cisco IOS XR 64-bit platforms. |
| Release 6.8.1 | This command was introduced for Cisco IOS XR 32-bit platforms. |

## Usage Guidelines

For the subscriber session to be released after the configuration changes are done, you may have to wait for approximately 5 to 20 minutes, depending on the number of IP addresses allocated from an address pool.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This example shows how to enable dynamic modification of DAPS pool for PPPoE sessions:

```
Router#configure
Router(config)#pool onfly pppoe
Router(config)#commit
```

# pool vrf

To enable distributed address pool service on a vrf and to enter the corresponding configuration submode, use the **pool vrf** command in the Global Configuration mode. To disable this feature, use the **no** form of this command.

**pool vrf** {*vrf_name* | **all**} {**ipv4***pool_name* | **ipv6***pool_name*}

## Syntax Description

| | |
|---|---|
| *vrf_name* | Specifies the name of the vrf. |
| **ipv4** | Specifies IPv4 pool name. Each pool must have a unique name across all VRFs. |
| **ipv6** | Specifies IPv6 pool name. Each pool must have a unique name across all VRFs. |
| *pool_name* | Specifies the name of the pool for IPv4 or IPv6. |
| **all** | Specifies the global pool. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |

## Usage Guidelines

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

**Note** Each pool must have a unique name across all VRFs. For example, pool1 can not be created in both vrf1 and vrf2.

Some pools can be associated with all the VRFs and these pools are configured with the **all** keyword.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **pool vrf** command for IPv4 in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv4 pool2
RP/0/RSP0/CPU0:router(config-pool-ipv4)#
```

This is an example of configuring the **pool vrf** command for IPv6 in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)#
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on IPv4. |
| pool ipv6, on page 21 | Enables distributed address pool service on IPv6. |

# prefix-length

To specify the length of the prefix that is assigned to the client, use the **prefix-length** command in IPv6 configuration submode. To remove the length of the prefix, use the **no** form of this command.

**prefix-length** *prefix_length*

## Syntax Description

| | |
|---|---|
| *prefix_length* | Specifies the length of the prefix. |

## Command Default

None

## Command Modes

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

Use the **pool ipv6** command to enter ipv6 pool configuration submode.

The **prefix-length** command under the pool ensures all the prefixes (described in the **prefix-range** section) in the pool have the same length. The **prefix-length** command must be configured when the **network** and the **prefix-length** commands are used.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **prefix-length** command in the IPv6 configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# prefix-length 50
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| network (BNG), on page 18 | Specifies a set of addresses or prefixes inside a subnet. |

# prefix-range

To specify a range of IPv6 address prefixes, use the **prefix-range** command in IPv6 configuration submode. To remove the range of prefixes, use the **no** form of this command.

**prefix-range** {*first_ipv6_rangelast_ipv6_range*}

## Syntax Description

| | |
|---|---|
| *first_ipv6_range* | Specifies the first IPv6 in the prefix range. |
| *last_ipv6_range* | Specifies the last IPv6 in the prefix range. |

## Command Default

None

## Command Modes

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

Use the **pool ipv6** command to enter IPv6 pool configuration submode.

Multiple prefix-ranges are allowed within a pool. The length of the prefix in any pool is the same for all prefix's and this is imposed by the **prefix-length** command. The **prefix-length** has to be mandatorily configured whenever **prefix-range** is configured.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **prefix-range** command in IPv6 configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# prefix-range 1001:1:1:1:: 1001:1:1:10::
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| prefix-length, on page 25 | Specifies the length of the prefix that is assigned to the client. |

# utilization-mark

To specify a utilization threshold, use the **utilization-mark** command in Pool IPv4 or IPv6 configuration submode. To remove the utilization threshold, use the **no** form of this command.

**utilization-mark** {**high***high_value* | **low***low_value*}

## Syntax Description

| | |
|---|---|
| **high** | Specifies the high mark in the threshold value. |
| *high_value* | Specifies the numerical value as percentage, for the low mark in the threshold. |
| **low** | Specifies the low mark in the threshold value. |
| *low_value* | Specifies the numerical value as percentage, for the low mark in the threshold. |

## Command Default

None

## Command Modes

Pool IPv4 configuration

Pool IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |

## Usage Guidelines

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

When the utilization threshold is reached, a LOG_WARNING message is logged with syslog facility. The high and low values are entered as percentages between 0 and 100. The utilization is defined as the # allocated addresses or # total addresses.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **utilization-mark** command in Pool IPv4 configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv4 pool2
RP/0/RSP0/CPU0:router(config-pool-ipv4)# utilization-mark high 90 low 10
```

This is an example of configuring the **utilization-mark** command in Pool IPv6 configuration submode:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# pool vrf vrf1 ipv6 pool3
RP/0/RSP0/CPU0:router(config-pool-ipv6)# utilization-mark high 70 low 40
```

## Related Commands

| Command | Description |
|---|---|
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |

# show pool ipv4 name

To display the status of an IPv4 pool, use the **show pool ipv4 name** command in the EXEC mode.

**show pool ipv4 name** *pool_name* {**location** | **verbose** | }

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of the IPv4 pool. |
| **location** | Specifies the location of the IPv4 pool. |
| **verbose** | Displays all allocations for the pools. |
| \| | Specifies the output modifiers. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the**pool ipv4** command to enter Pool IPv4 configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is the sample output of the **show pool ipv4 name** command:

```
RP/0/RSP0/CPU0:router# show pool ipv4 name POOL1

              Pool POOL1 Allocations
-------------------------------------------------
VRF: default
Pool Id: 30
Pool Scope: VRF Specific Pool
Prefix Length: 32

Used:           100
Excl:             0
Free:          7900
Total:         8000
```

```
Utilization:    1%

Range List:
-----------
Range Start        :  12.0.0.2
Range End          :  12.0.31.65
Used Addresses     :  100
Excluded Addresses :  0
Free Addresses     :  7900

RP/0/RSP0/CPU0:router# show pool ipv4 name POOL1 verbose

              Pool POOL1 Allocations
--------------------------------------------------
VRF: default
Pool Id: 30
Pool Scope: VRF Specific Pool
Prefix Length: 32

Used:           100
Excl:             0
Free:          7900
Total:         8000

Utilization:    1%

Range List:
-----------
Range Start        :  12.0.0.2
Range End          :  12.0.31.65
Used Addresses     :  100
Excluded Addresses :  0
Free Addresses     :  7900

In-Use Address List:
   12.0.0.2  PPP
   12.0.0.3  PPP
   12.0.0.4  PPP
   12.0.0.5  PPP
   12.0.0.6  PPP
   12.0.0.7  PPP
   12.0.0.8  PPP
   12.0.0.9  PPP
   12.0.0.10  PPP
   12.0.0.11  PPP
   12.0.0.12  PPP
   12.0.0.13  PPP
   12.0.0.14  PPP
   12.0.0.15  PPP
   12.0.0.16  PPP
   12.0.0.17  PPP
   12.0.0.18  PPP
   12.0.0.19  PPP
   12.0.0.20  PPP
   12.0.0.21  PPP
   12.0.0.22  PPP
   12.0.0.23  PPP
   12.0.0.24  PPP
   12.0.0.25  PPP
   12.0.0.26  PPP
   12.0.0.27  PPP
   12.0.0.28  PPP
   12.0.0.29  PPP
   12.0.0.30  PPP
```

```
12.0.0.31  PPP
12.0.0.32  PPP
12.0.0.33  PPP
12.0.0.34  PPP
12.0.0.35  PPP
12.0.0.36  PPP
12.0.0.37  PPP
12.0.0.38  PPP
12.0.0.39  PPP
12.0.0.40  PPP
12.0.0.41  PPP
12.0.0.42  PPP
12.0.0.43  PPP
12.0.0.44  PPP
12.0.0.45  PPP
12.0.0.46  PPP
12.0.0.47  PPP
12.0.0.48  PPP
12.0.0.49  PPP
12.0.0.50  PPP
12.0.0.51  PPP
12.0.0.52  PPP
12.0.0.53  PPP
12.0.0.54  PPP
12.0.0.55  PPP
12.0.0.56  PPP
12.0.0.57  PPP
12.0.0.58  PPP
12.0.0.59  PPP
12.0.0.60  PPP
12.0.0.61  PPP
12.0.0.62  PPP
12.0.0.63  PPP
12.0.0.64  PPP
12.0.0.65  PPP
12.0.0.66  PPP
12.0.0.67  PPP
12.0.0.68  PPP
12.0.0.69  PPP
12.0.0.70  PPP
12.0.0.71  PPP
12.0.0.72  PPP
12.0.0.73  PPP
12.0.0.74  PPP
12.0.0.75  PPP
12.0.0.76  PPP
12.0.0.77  PPP
12.0.0.78  PPP
12.0.0.79  PPP
12.0.0.80  PPP
12.0.0.81  PPP
12.0.0.82  PPP
12.0.0.83  PPP
12.0.0.84  PPP
12.0.0.85  PPP
12.0.0.86  PPP
12.0.0.87  PPP
12.0.0.88  PPP
12.0.0.89  PPP
12.0.0.90  PPP
12.0.0.91  PPP
12.0.0.92  PPP
12.0.0.93  PPP
12.0.0.94  PPP
```

```
12.0.0.95  PPP
12.0.0.96  PPP
12.0.0.97  PPP
12.0.0.98  PPP
12.0.0.99  PPP
12.0.0.100  PPP
12.0.0.101  PPP
```

This table describes the significant fields shown in the display.

***Table 2: show pool ipv4 name Field Descriptions***

| Field | Description |
|---|---|
| VRF | Specifies the VRF the pool is associated with. |
| Pool ID | The unique pool ID of a specific pool. |
| Pool Scope | Pool scope belongs to the VRF specific pool. |
| Prefix Length | Length of the prefix specified. |

## Related Commands

| Command | Description |
|---|---|
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |
| address-range, on page 14 | Specifies a range of IP addresses. |

# show pool ipv6 name

To show the status of an IPv6 pool, use the **show pool ipv6 name** command in the EXEC mode.

**show pool ipv6 name** *pool_name* {**location** | **verbose** | }

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of the IPv6 pool. |
| **location** | Specifies the location of the IPv6 pool. |
| **verbose** | Displays all allocations for the pools. |
| \| | Specifies the output modifiers. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the**pool ipv6** command to enter Pool IPv6 configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is the sample output for the **show pool ipv6 name** command:

```
RP/0/RSP0/CPU0:router# show pool ipv4 name POOL_A6_i_1
               Pool POOL_A6_i_1 Allocations
--------------------------------------------------
VRF: vrf1
Pool Id: 1
Pool Scope: VRF Specific Pool
Prefix Length: 128

Used:         15797
Excl:             0
Free:           203
Total:        16000

Utilization:    98%

Range List:
-----------
```

```
Range Start        :  19::2
Range End          :  19::3e81
Used Addresses     :  15797
Excluded Addresses :  0
Free Addresses     :  203

RP/0/RSP0/CPU0:router# show pool ipv6 name POOL_A6_i_1 verbose

              Pool POOL_A6_i_1 Allocations
--------------------------------------------------
VRF: vrf1
Pool Id: 1
Pool Scope: VRF Specific Pool
Prefix Length: 128

Used:         15797
Excl:             0
Free:           203
Total:        16000

Utilization:    98%

Range List:
-----------
Range Start        :  19::2
Range End          :  19::3e81
Used Addresses     :  15797
Excluded Addresses :  0
Free Addresses     :  203

In-Use Address List:
   19::2  DHCPV6
   19::3  DHCPV6
   19::4  DHCPV6
   19::5  DHCPV6
   19::6  DHCPV6
   19::7  DHCPV6
   19::8  DHCPV6
   19::9  DHCPV6
   19::a  DHCPV6
   19::b  DHCPV6
   19::c  DHCPV6
   19::d  DHCPV6
   19::e  DHCPV6
   19::f  DHCPV6
   19::10  DHCPV6
   19::11  DHCPV6
   19::12  DHCPV6
   19::13  DHCPV6
   19::14  DHCPV6
   19::15  DHCPV6
   19::16  DHCPV6
   19::17  DHCPV6
   19::18  DHCPV6
   19::19  DHCPV6
   19::1a  DHCPV6
   19::1b  DHCPV6
   19::1c  DHCPV6
   19::1d  DHCPV6
   19::1e  DHCPV6
   19::1f  DHCPV6
   19::20  DHCPV6
   19::21  DHCPV6
   19::22  DHCPV6
```

```
19::23  DHCPV6
19::24  DHCPV6
19::25  DHCPV6
19::26  DHCPV6
19::27  DHCPV6
19::28  DHCPV6
19::29  DHCPV6
19::2a  DHCPV6
19::2b  DHCPV6
19::2c  DHCPV6
19::2d  DHCPV6
19::2e  DHCPV6
19::2f  DHCPV6
19::30  DHCPV6
19::31  DHCPV6
19::32  DHCPV6
19::33  DHCPV6
19::34  DHCPV6
19::35  DHCPV6
19::36  DHCPV6
19::37  DHCPV6
19::38  DHCPV6
19::39  DHCPV6
19::3a  DHCPV6
19::3b  DHCPV6
19::3c  DHCPV6
19::3d  DHCPV6
19::3e  DHCPV6
19::3f  DHCPV6
19::40  DHCPV6
19::41  DHCPV6
19::42  DHCPV6
19::43  DHCPV6
19::44  DHCPV6
19::45  DHCPV6
19::46  DHCPV6
19::47  DHCPV6
19::48  DHCPV6
19::49  DHCPV6
19::4a  DHCPV6
19::4b  DHCPV6
19::4c  DHCPV6
19::4d  DHCPV6
19::4e  DHCPV6
19::4f  DHCPV6
19::50  DHCPV6
19::51  DHCPV6
19::52  DHCPV6
19::53  DHCPV6
19::54  DHCPV6
19::55  DHCPV6
19::56  DHCPV6
19::57  DHCPV6
19::58  DHCPV6
19::59  DHCPV6
19::5a  DHCPV6
19::5b  DHCPV6
19::5c  DHCPV6
19::5d  DHCPV6
19::5e  DHCPV6
19::5f  DHCPV6
19::60  DHCPV6
19::61  DHCPV6
19::62  DHCPV6
```

```
19::63  DHCPV6
19::64  DHCPV6
19::65  DHCPV6
19::66  DHCPV6
19::67  DHCPV6
19::68  DHCPV6
19::69  DHCPV6
19::6a  DHCPV6
19::6b  DHCPV6
19::6c  DHCPV6
19::6d  DHCPV6
19::6e  DHCPV6
19::6f  DHCPV6
19::70  DHCPV6
19::71  DHCPV6
19::72  DHCPV6
19::73  DHCPV6
19::74  DHCPV6
19::75  DHCPV6
19::76  DHCPV6
19::77  DHCPV6
19::78  DHCPV6
19::79  DHCPV6
19::7a  DHCPV6
19::7b  DHCPV6
19::7c  DHCPV6
19::7d  DHCPV6
19::7e  DHCPV6
19::7f  DHCPV6
19::80  DHCPV6
19::81  DHCPV6
19::82  DHCPV6
19::83  DHCPV6
19::84  DHCPV6
19::85  DHCPV6
19::86  DHCPV6
19::87  DHCPV6
19::88  DHCPV6
19::89  DHCPV6
19::8a  DHCPV6
19::8b  DHCPV6
19::8c  DHCPV6
19::8d  DHCPV6
19::8e  DHCPV6
19::8f  DHCPV6
19::90  DHCPV6
19::91  DHCPV6
19::92  DHCPV6
19::93  DHCPV6
19::94  DHCPV6
19::95  DHCPV6
19::96  DHCPV6
19::97  DHCPV6
19::98  DHCPV6
19::99  DHCPV6
19::9a  DHCPV6
19::9b  DHCPV6
19::9c  DHCPV6
19::9d  DHCPV6
19::9e  DHCPV6
19::9f  DHCPV6
19::a0  DHCPV6
19::a1  DHCPV6
19::a2  DHCPV6
```

```
19::a3  DHCPV6
19::a4  DHCPV6
19::a5  DHCPV6
19::a6  DHCPV6
19::a7  DHCPV6
19::a8  DHCPV6
19::a9  DHCPV6
19::aa  DHCPV6
19::ab  DHCPV6
19::ac  DHCPV6
19::ad  DHCPV6
19::ae  DHCPV6
19::af  DHCPV6
19::b0  DHCPV6
19::b1  DHCPV6
19::b2  DHCPV6
19::b3  DHCPV6
19::b4  DHCPV6
19::b5  DHCPV6
19::b6  DHCPV6
19::b7  DHCPV6
19::b8  DHCPV6
19::b9  DHCPV6
19::ba  DHCPV6
19::bb  DHCPV6
19::bc  DHCPV6
19::bd  DHCPV6
19::be  DHCPV6
19::bf  DHCPV6
19::c0  DHCPV6
19::c1  DHCPV6
19::c2  DHCPV6
19::c3  DHCPV6
19::c4  DHCPV6
19::c5  DHCPV6
19::c6  DHCPV6
19::c7  DHCPV6
19::c8  DHCPV6
19::c9  DHCPV6
19::ca  DHCPV6
19::cb  DHCPV6
19::cc  DHCPV6
19::cd  DHCPV6
19::ce  DHCPV6
19::cf  DHCPV6
19::d0  DHCPV6
19::d1  DHCPV6
19::d2  DHCPV6
19::d3  DHCPV6
19::d4  DHCPV6
19::d5  DHCPV6
19::d6  DHCPV6
19::d7  DHCPV6
19::d8  DHCPV6
19::d9  DHCPV6
19::da  DHCPV6
19::db  DHCPV6
19::dc  DHCPV6
19::dd  DHCPV6
19::de  DHCPV6
19::df  DHCPV6
19::e0  DHCPV6
19::e1  DHCPV6
19::e2  DHCPV6
```

```
19::e3  DHCPV6
19::e4  DHCPV6
19::e5  DHCPV6
19::e6  DHCPV6
19::e7  DHCPV6
19::e8  DHCPV6
19::e9  DHCPV6
19::ea  DHCPV6
19::eb  DHCPV6
19::ec  DHCPV6
19::ed  DHCPV6
19::ee  DHCPV6
19::ef  DHCPV6
19::f0  DHCPV6
19::f1  DHCPV6
19::f2  DHCPV6
19::f3  DHCPV6
19::f4  DHCPV6
19::f5  DHCPV6
19::f6  DHCPV6
19::f7  DHCPV6
19::f8  DHCPV6
19::f9  DHCPV6
19::fa  DHCPV6
19::fb  DHCPV6
19::fc  DHCPV6
19::fd  DHCPV6
19::fe  DHCPV6
19::ff  DHCPV6
19::100  DHCPV6
19::101  DHCPV6
19::102  DHCPV6
19::103  DHCPV6
19::104  DHCPV6
19::105  DHCPV6
19::106  DHCPV6
19::107  DHCPV6
19::108  DHCPV6
19::109  DHCPV6
19::10a  DHCPV6
19::10b  DHCPV6
19::10c  DHCPV6
19::10d  DHCPV6
19::10e  DHCPV6
19::10f  DHCPV6
19::110  DHCPV6
19::111  DHCPV6
19::112  DHCPV6
19::113  DHCPV6
19::114  DHCPV6
19::115  DHCPV6
19::116  DHCPV6
19::117  DHCPV6
19::118  DHCPV6
19::119  DHCPV6
19::11a  DHCPV6
19::11b  DHCPV6
19::11c  DHCPV6
19::11d  DHCPV6
19::11e  DHCPV6
```

This table describes the significant fields shown in the display.

*Table 3: show pool ipv6 name Field Descriptions*

| Field | Description |
|---|---|
| VRF | Specifies the VRF the pool is associated with. |
| Pool ID | The unique pool ID of a specific pool. |
| Pool Scope | Pool scope belongs to the VRF specific pool. |
| Prefix Length | Length of the prefix specified. |

## Related Commands

| Command | Description |
|---|---|
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| pool ipv6, on page 21 | Enables distributed address pool service on ipv6. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |
| address-range, on page 14 | Specifies a range of IP addresses. |

# show pool vrf

To show the status of VRF pool, use the **show pool vrf** command in the EXEC mode.

**show pool vrf** *vrf_name* { **ipv4** | **ipv6** }

## Syntax Description

| | |
|---|---|
| *vrf_name* | Specifies the vrf name. |
| **all** | Displays all vrfs. |
| **ipv4** | Specifies the IPv4 pool. |
| **ipv6** | Specifies the IPv6 pool. |
| \| | Specifies the output modifiers. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support for **IPv6** was added. |

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **pool ipv4** command to enter IPv4 pool configuration submode and **pool ipv6** command to enter IPv6 pool configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is the sample output of the **show pool vrf** command for IPv4:

```
RP/0/RSP0/CPU0:router# show pool vrf vrf1 ipv4

                  Allocation Summary
-------------------------------------------------

Used: 0
Excl: 0
Free: 254
Total: 254
Utilization: 0%
```

```
 Pool Name    Pool ID      VRF      Used    Excl    Free   Total
-----------  ---------  ---------  ------  ------  ------ -------
     test1       4         vrf2          0       0    254    254
```

This is the sample output of the **show pool vrf** command for IPv6:

```
RP/0/RSP0/CPU0:router# show pool vrf vrf1 ipv6


                Allocation Summary
------------------------------------------------

Used: 2
Excl: 0
Free: 31999
Total: 32001
Utilization: 0%


 Pool Name    Pool ID      VRF      Used    Excl    Free   Total
-----------  ---------  ---------  ------  ------  ------ -------
POOL_A6_i_1      1         vrf1           1       0  15999  16000
POOL_P6_i_2      2         vrf1           1       0  15999  16000
      test       0         vrf1           0       0      1      1
```

This table describes the significant fields shown in the display.

***Table 4: show pool ipv4 name Field Descriptions***

| Field | Description |
|---|---|
| VRF | Specifies the VRF the pool is associated with. |
| Pool ID | The unique pool ID of a specific pool. |
| Pool Name | The name of the IPv6 pool. |

## Related Commands

| Command | Description |
|---|---|
| pool vrf, on page 23 | Enables distributed address pool service on vrf. |
| pool ipv4, on page 20 | Enables distributed address pool service on ipv4. |
| exclude, on page 16 | Specifies a range of IP addresses that distributed address pool service should not assign to clients. |
| address-range, on page 14 | Specifies a range of IP addresses. |



# Control Policy Commands

This module describes the Cisco IOS XR software commands used to configure the Control Policy commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- activate, on page 44
- authenticate (BNG), on page 46
- authorize, on page 47
- class-map type control subscriber, on page 49
- deactivate, on page 50
- decode, on page 52
- event, on page 53
- match (class-map), on page 56
- match option (DHCPv6), on page 58
- policy-map type control subscriber, on page 60
- policy-map type pbr, on page 61
- service-policy type control subscriber, on page 62
- show class-map, on page 63
- show policy-map, on page 65

# activate

To activate the dynamic template in the class map sub-configuration mode, use the **activate** command. To deactivate the dynamic template, use the **deactivate** command.

**activate dynamic-template** {*name* **aaa list** {*list_name* | **default**} | **service-from-line**}

## Syntax Description

| | |
|---|---|
| **dynamic-template** | Specifies the actions related to dynamic templates. |
| *name* | Specifies the name of the dynamic template. |
| **aaa** | Specifies the AAA parameters. |
| **list** | Specifies the AAA method list that identifies the radius server from which to acquire the service definition. |
| **default** | Specifies the default AAA method list. |
| *list_name* | (Optional) Specifies the name of the AAA method list. If provided, the template is downloaded from radius. If not provided, then the template is expected to be locally configured. |
| **service-from-line** | Activates the service encoded in the DHCP Remote-Id parameter. |

## Command Default

None

## Command Modes

Class map sub-configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 6.2.1 | Modified the command to include **service-from-line** option. |

## Usage Guidelines

You must configure **decode** command to decode (as per the defined AAA attribute format) the service encoded in the DHCP Remote-Id parameter. This particular service is the one referred as **service-from-line** in this context.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **activate** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
```

```
RP/0/RSP0/CPU0:router(config-pmap)# event session-activate match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 activate dynamic-template DL1 aaa list default
```

This is an example of activating the service that was encoded in the DHCP Remote-Id parameter:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2 do-until-failure
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 decode remote-id format my-format
RP/0/RSP0/CPU0:router(config-pmap-c)# 2 activate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)# 3 authorize aaa list default identifier remote-id
password blank
```

## Related Commands

| Command | Description |
|---|---|
| deactivate, on page 50 | Deactivates the dynamic template mode in the class map sub-configuration mode. |
| decode, on page 52 | Decodes DHCP parameter based on the defined AAA attribute format. |

# authenticate (BNG)

To authenticate and specify the AAA method list that authentication should be made with in the class map sub-configuration mode, use the **authenticate** command in the Global Configuration mode. To disable the AAA method list authentication, use the **no** form of this command.

**authenticate aaa list** {*list_name* | **default**}

## Syntax Description

| | |
|---|---|
| **aaa** | Specifies the AAA parameters. |
| **list** | Specifies AAA method list that authentication should be made with. |
| **default** | Specifies the default AAA method list. |
| *list_name* | Specifies the name of the AAA method list. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **authenticate** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 authenticate aaa list default
```

# authorize

To authenticate and specify the AAA method list that authorization should be made with in the class map sub-configuration mode, use the **authorize** command in the Global Configuration mode. To disable the AAA method list authorization, use the **no** form of this command.

**authorize aaa list** {*list_name* | **default**} {**format** *format_name* } | **identifier** {**circuit-id** | **remote-id** | **source-address-ipv4** | **source-address-mac** | **username**} {**password** | {**use-from-line***password*}}

## Syntax Description

| | |
|---|---|
| **aaa** | Specifies the AAA parameters. |
| **list** | Specifies AAA method list that authorization should be made with. |
| **default** | Specifies the default AAA method list. |
| *list_name* | Specifies the name of the AAA method list. |
| **format** | Specifies an authorize format name. |
| *format_name* | Specifies to use format_name, which was defined using CLI 'aaa attribute format'. The result of format is used as user name in authorization request. |
| **password** | Specifies a password to be used for AAA request. |
| **use-from-line** | Specifies the line from which the password needs to be used. |
| *password* | Specifies a clear text password. |
| **identifier** | Specifies an authorize identifier. |
| **circuit-id** | Specifies to use circuit-id as the username in authorize request. |
| **remote-id** | Specifies to use remote-id as the username in authorize request. . |
| **source-address-ipv4** | Specifies to use source-address-ipv4 as the username in authorize request. |
| **source-address-mac** | Specifies to use source-address-mac as the username in authorize request. |
| **username** | Specifies an authorize username. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **authorize** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 authorize aaa list default password DdjkkWE
```

# class-map type control subscriber

To determine the list of actions to be executed for the class and to enter the class-map configuration mode, use the **class-map type control subscriber** command in Global Configuration mode. To disable the class map type control subscriber and exit the class-map configuration mode, use the **no** form of this command.

**class-map type control subscriber** { **match-all** | **match-any** } *class-map name*

## Syntax Description

| | |
|---|---|
| *class-map name* | Specifies the class map name. |
| **match-all** | Configures the match all criteria for this class. |
| **match-any** | Configures the match any criteria for this class. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **class-map type control subscriber** command to enter class-map configuration mode.

From Cisco IOS XR Software Release 5.2.2 and later, you can edit the class associated with the subscriber policy even while the sessions are active. Prior to this, new class map actions were not editable if the sessions were up, and any such dynamic policy-map changes resulted in clearing off the subscriber sessions.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **class-map type control subscriber** command in Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# class-map type control subscriber match-any class1
RP/0/RSP0/CPU0:router(config-cmap)# match protocol ppp
RP/0/RSP0/CPU0:router(config-cmap)# end-class-map
```

## Related Commands

| Command | Description |
|---|---|
| policy-map type control subscriber, on page 60 | Enables the policy-map. |
| event, on page 53 | Enables the event in a policy-map. |

# deactivate

To deactivate the dynamic template mode, use the **deactivate** command in the class map sub-configuration mode. To disable this feature, use the **no** form of this command.

**deactivate dynamic-template** {*name* **aaa list** {*list_name* | **default**} | **service-from-line**}

## Syntax Description

| | |
|---|---|
| **dynamic-template** | Specifies the actions related to dynamic templates. |
| *name* | Specifies the name of the dynamic template. |
| **aaa** | Specifies the AAA parameters. |
| **list** | Specifies AAA method list that authentication should be made with. |
| **default** | Specifies the default AAA method list. |
| *list_name* | Specifies the name of the AAA method list. |
| **service-from-line** | Deactivates the service encoded in the DHCP Remote-Id parameter. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 6.2.1 | Modified the command to include **service-from-line** option. |

## Usage Guidelines

You must configure **decode** command to decode (as per the defined AAA attribute format) the service encoded in the DHCP Remote-Id parameter. This particular service is the one referred as **service-from-line** in this context.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **deactivate** command in the class map sub-configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 deactivate dynamic-template DL1 aaa list default
```

This is an example of deactivating an old service and activating the new service that was encoded in the DHCP Remote-id parameter:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-identity-change match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2 do-until-failure
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 decode remote-id format my-format
RP/0/RSP0/CPU0:router(config-pmap-c)# 2 deactivate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)# 3 activate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)# 4 authorize aaa list default identifier remote-id
password blank
```

## Related Commands

| Command | Description |
|---|---|
| activate, on page 44 | Activates the dynamic template mode in the class map sub-configuration mode. |
| decode, on page 52 | Decodes DHCP Remote-Id parameter based on the defined AAA attribute format. |

# decode

To decode the DHCP parameter based on the defined AAA attribute format, use the **decode** command in policy-map event class configuration mode. To disable this feature, use the **no** form of this command.

**decode** *identity* **format** *format-name*

## Syntax Description

| | |
|---|---|
| *identity* | Specifies the DHCP parameter to be decoded.<br>**Note** Currently, only Remote-Id or Circuit-Id parameter is supported for decoding. |
| **format** *format-name* | Specifies the AAA attribute format based on the which the DHCP parameter is to be decoded. |

## Command Default

None

## Command Modes

Policy-map event class configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This example shows how to decode the DHCP Remote-Id parameter based on the defined AAA attribute format:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#aaa attribute format my-format format-string length 253
"%[^|]|%[^|]|" username service-name
RP/0/RSP0/CPU0:router(config)#policy-map type control subscriber S1
RP/0/RSP0/CPU0:router(config-pmap)#event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)#class type control subscriber CL1 do-until-failure
RP/0/RSP0/CPU0:router(config-pmap-c)#1 decode remote-id format my-format
RP/0/RSP0/CPU0:router(config-pmap-c)#2 activate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)#3 authorize aaa list default identifier remote-id
password blank
```

# event

To configure a policy event, use the **event** command in policy-map configuration mode. To disable an event and exit the policy-map configuration mode, use the **no** form of this command.

**event** { **account-logoff** | **account-logon** | **authenticate-dhcp-renew** | **authentication-failure** | **authentication-no-response** | **authorization-failure** | **authorization-no-response** | **exception** [**match-all** | **match-first**] | **idle-timeout** | **service-start** | **service-stop** | **session-activate** | **session-identity-change** | **session-start** | **session-stop** | **timer-expiry** }

## Syntax Description

| | |
|---|---|
| **account-logoff** | Specifies an account logoff event. |
| **account-logon** | Specifies an account logon event. |
| **authenticate-dhcp-renew** | Specifies the session renewal event. |
| **authentication-failure** | Specifies an authentication failure event. |
| **authentication-no-response** | Specifies an authentication no response event. |
| **authorization-failure** | Specifies an authorization failure event. |
| **authorization-no-response** | Specifies an authorization no response event. |
| **exception** | Specifies a service rollback failure event due to a multi-action CoA (MA - CoA) request failure. |
| **idle-timeout** | Specifies an idle timeout event. |
| **service-start** | Specifies a service start event. |
| **service-stop** | Specifies a service stop event. |
| **session-activate** | Specifies session activate event. |
| **session-identity-change** | Specifies an identity change event. |
| **session-start** | Specifies session start event. |
| **session-stop** | Specifies session start event. |
| **timer-expiry** | Specifies the timer expiry event. |

## Command Default

None

## Command Modes

Policy-map configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

| Release | Modification |
|---|---|
| Release 5.1 | The **idle-timeout** event was added. |
| Release 5.2.0 | The **exception** event was added for service rollback failure due to multi-action CoA request failure. |
| Release 6.2.1 | The command was modified to include **session-identity-change** event, for controlling subscriber plans using protocol options. |
| Release 6.4.1 | The command was modified to include **authenticate-dhcp-renew** event, that enables AAA authorization feature at the time of session lease renewal. |

## Usage Guidelines

Use the **policy-map type control subscriber** command to enter policy-map configuration mode.

For **idle-timeout** event, you can configure the policy action as **monitor** under the idle timeout event for a subscriber policy, to prevent the termination of the session.

The **exception** event with the action as **disconnect**, specifies that the subscriber sessions be removed when a service rollback fails due to a multi-action Coa (MA-CoA) request failure. The default action is to retain the session.

For more details on **authenticate-dhcp-renew** event, see the *Establishing Subscriber Sessions* chapter in the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This example shows how to configure the **event** command in policy configuration mode:

```
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber pol1
RP/0/RSP0/CPU0:router(config-pmap)# event session-start match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber ip_dhcp do-until-failure
RP/0/RSP0/CPU0:router(config-cmap-c)# 1 activate dynamic-template ip_temp
RP/0/RSP0/CPU0:router(config-cmap-c)# 10 authorize aaa list default identifier format
dhcp_id_format password xya
RP/0/RSP0/CPU0:router(config-cmap-c)# end-policy-map
```

This example shows how to configure the **idle-timeout** event in policy configuration mode, with the action as **monitor** for the subscriber policy:

```
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber pol1
RP/0/RSP0/CPU0:router(config-pmap)# event idle-timeout
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber ip_dhcp
RP/0/RSP0/CPU0:router(config-cmap-c)# 1 monitor
```

This example shows how to configure the **exception** event in policy configuration mode, with the action as **disconnect**:

```
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
```

```
RP/0/RSP0/CPU0:router(config-pmap)# event exception match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber coa-rollback-failure
do-all
RP/0/RSP0/CPU0:router(config-cmap-c)# 10 disconnect
```

This example shows how to handle identity change of DHCP Remote-id parameter, to enable modification of subscriber service. For more details, refer the section on controlling subscriber plans using protocol options, in *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber PL1
RP/0/RSP0/CPU0:router(config-pmap)# event session-identity-change match-first
RP/0/RSP0/CPU0:router(config-pmap-e)# class type control subscriber CL2 do-until-failure
RP/0/RSP0/CPU0:router(config-pmap-c)# 1 decode remote-id format my-format
RP/0/RSP0/CPU0:router(config-pmap-c)# 2 deactivate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)# 3 activate dynamic-template service-from-line
RP/0/RSP0/CPU0:router(config-pmap-c)# 4 authorize aaa list default identifier remote-id
password blank
```

This example shows how to enable AAA authorization on DHCP RENEW or REBIND:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber dhcpv4_policy
RP/0/RSP0/CPU0:router(config-pmap)# event authenticate-dhcp-renew match-all
RP/0/RSP0/CPU0:router(config-pmap-e)# 1 authorize aaa list default format username password
 example
RP/0/RSP0/CPU0:router(config-pmap-e)# commit

RP/0/RSP0/CPU0:router(config-)# subscriber featurette dhcp-renew-author
RP/0/RSP0/CPU0:router(config-pmap-c)# commit
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Enables the class-map. |
| policy-map type control subscriber, on page 60 | Enables the policy-map. |

# match (class-map)

To configure match criteria for the corresponding class, use the **match** command in class-map configuration mode. To disable the match feature and exit the policy-map configuration mode, use the **no** form of this command.

**match** {**authen-status** {**authenticated** | **unathenticated**} | **domain** {*domain_name* | **regexp** *string*} **format** *format_name* | **not** | **protocol** {**dhcpv4** | **dhcpv6**} | **service-name** {*service-name* | **regexp** *string*} | **source-address** {**ipv4** | **mac**} | **timer** {*string* | **regexp** *string*} | **username** {*string* | **regexp** *string*}}

## Syntax Description

| | |
|---|---|
| **authen-status** | Specified the authentication status. |
| **authenticated** | Specified the authenticated status. |
| **unauthenticated** | Specified the unauthenticated status. |
| **domain** | Specifies the domain type. |
| *domain_name* | Specifies the name of the domain. |
| **format** | Specifies the format type. |
| *format_name* | Specifies the name of the format. |
| **regexp** | Specifies the regular expression. |
| *string* | Specifies the regular expression of a string. |
| **not** | Negates the match criteria. |
| **protocol** | Specifies the protocol type. |
| **service-name** | Specifies the service name. |
| *service-name* | Service name as a string. |
| **source-address** | Specifies the source address. |
| **timer** | Specifies the timer. |
| **username** | Specifies the name of the user. |

## Command Default

None

## Command Modes

Class-map configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

| Release | Modification |
|---|---|
| Release 5.2.2 | The command was modified to add new keyword, **service-name**. |

## Usage Guidelines

Use the **class-map type control subscriber** command to enter class-map configuration mode.

These are the usage guidelines for **match service-name**:

- It works only for service activations through CoA. For services defined in dynamic-template and activated by **action** in policy-maps, the service-activate event is not enabled, and a class map with **match service-name** is not useful in that case.
- It does not work in multi-action CoA (MA-CoA) where multiple services are enabled by a single CoA request.
- The order of configuration must be such that, the **match service-name** is configured in a class-map and then the class-map is linked in the policy-map. The class-map must ideally be placed to match during a service-start or service-stop event, where the service being started or stopped matches to the service names configured in the class-map. With other events, the class-map with match service-name is irrelevant.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **class-map type control subscriber** command in the class-map configuration mode:

```
RP/0/RSP0/CPU0:router(config)# class-map type control subscriber CL1
RP/0/RSP0/CPU0:router(config-pmap)# match authen-status authenticated
RP/0/RSP0/CPU0:router(config-pmap-e)# match domain d1 format f1
RP/0/RSP0/CPU0:router(config-cmap-c)# match protocol ppp
RP/0/RSP0/CPU0:router(config-cmap-c)# match source-address ipv4 1.3.4.5 12.334.55.2
RP/0/RSP0/CPU0:router(config-cmap-c)# match timer time1
```

This is an example of configuring the **service-name** matching in the class-map (type subscriber) configuration mode:

```
RP/0/RSP0/CPU0:router(config)# class-map type control subscriber match-any match-svc
RP/0/RSP0/CPU0:router(config-cmap)# match service-name idle-to
RP/0/RSP0/CPU0:router(config-cmap)# match service-name regexp id*
RP/0/RSP0/CPU0:router(config-cmap)# match service-name regexp .*
```

# match option (DHCPv6)

To enable DHCP option 16 filtering feature in BNG, use the **match option enterprise-id** or **match option vendor-class** or both commands in DHCP IPv6 server profile configuration mode. To disable this feature, use the **no** form of this command.

**match option enterprise-id** {**default** | **hex** *hex-string*} **action** {**allow** | **drop**}

**match option enterprise-id** {**default** | **string** *string-value*} **action** {**allow** | **drop**}

## Syntax Description

| | |
|---|---|
| **default** | Defines a default behavior for incoming DHCP SOLICIT packets. |
| **hex** *hex-string* | Specifies the hexadecimal pattern of enterprise-ID in the DHCP option 16 to be matched. |
| **string** *string-value* | Specifies the string value of vendor-class data in the DHCP option 16 to be matched. |
| **action** | Specifies the action to be performed on DHCP SOLICIT packets. |
| **allow** | Allows the DHCP SOLICIT packets based on the DHCP option 16 information. |
| **drop** | Drops the DHCP SOLICIT packets based on the DHCP option 16 information. |

## Command Default

None

## Command Modes

DHCP IPv6 server profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was introduced. |

## Usage Guidelines

These configurations are invalid and are not supported:

- 
```
match vendor-class-data default action drop
match enterprise-ID default action allow
```

- 
```
match vendor-class-data default action allow
match enterprise-ID default action drop
```

- 
```
match vendor-class-data default action drop
```

- `match enterprise-ID default action drop`

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to enable DHCPv6 option 16 filtering feature in BNG. In this example, the BNG router drops all the DHCP SOLICIT packets by default, except the ones that are explicitly configured to be allowed.

```
RP/0/RSP0/CPU0:router(configure)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile server_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# match vendor-class-data string "ABC*"
 action allow
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# match enterprise-ID hex FFF action
allow
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# match vendor-class-data default action
 drop
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# match enterprise-ID default  action
drop
```

## Related Commands

| Command | Description |
|---|---|
| duid allowed-type, on page 89 | Specifies the permitted DUID type for the incoming DHCP SOLICIT packets, as part of enabling DHCP option 16 filtering feature in BNG. |

# policy-map type control subscriber

To determine the list of events that are applicable to the subscriber lifecycle and to enter the policy-map configuration mode, use the **policy-map type control subscriber** command in Global Configuration mode. To disable the policy map type control subscriber and exit the policy-map configuration mode, use the **no** form of this command.

**policy-map type control subscriber** *policy-map name*

## Syntax Description

| | |
|---|---|
| *policy-map name* | Represents the policy map name. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

From Cisco IOS XR Software Release 5.2.2 and later, you can edit the class associated with the subscriber policy even while the sessions are active. Prior to this, new class map actions were not editable if the sessions were up, and any such dynamic policy-map changes resulted in clearing off the subscriber sessions.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **policy-map type control subscriber** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber pol1
RP/0/RSP0/CPU0:router(config-cmap-c)# end-policy-map
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Enables the class-map. |
| event, on page 53 | Enables the event in the policy-map. |

# policy-map type pbr

To create or modify a policy map of type policy based routing that can be attached to one or more interfaces, use the **policy-map type pbr** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**policy-map type pbr** *name*

## Syntax Description

| | |
|---|---|
| *policy-map name* | Represents the policy map name. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **policy-map type pbr** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# policy-map type pbr pbr_policy
RP/0/RSP0/CPU0:router(config-pmap)# end-policy-map
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Enables the class-map. |
| event, on page 53 | Enables the event in the policy-map. |

# service-policy type control subscriber

To associate a subscriber control service policy to the interface, use the **service-policy type control subscriber** command in interface configuration mode. To disable the service-policy type control subscriber, use the **no** form of this command.

**service-policy type control subscriber** *name*

## Syntax Description

| | |
|---|---|
| *name* | Represents the policy map name. |

## Command Default

None

## Command Modes

Interface configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **service-policy type control subscriber** command in interface configuration mode:

```
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 344
RP/0/RSP0/CPU0:router(config-if)# service-policy type control subscriber sub1
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Enables the class-map. |
| event, on page 53 | Enables the event in the policy-map. |

# show class-map

To show the class-map related information, use the **show class-map** command in the EXEC mode.

**show class-map type control subscriber** *name*

## Syntax Description

| | |
|---|---|
| **type** | Displays the type of classmap. |
| **control** | Displays all the control class maps. |
| **subscriber** | Displays all the subscriber control class maps. |
| *name* | Displays the class map name. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read |

This is a sample output of the **show class-map** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show class-map type control subscriber PTA_CLASS
```

The show class-map output is as follows:

```
Wed Jan 23 08:55:15.027 GMT
1) ClassMap: PTA_CLASS    Type: subscriber_control
    Referenced by 1 Policymaps
```

This table describes the significant fields shown in the display.

***Table 5: show class-map Field Descriptions***

| Field | Description |
|---|---|
| ClassMap | Specifies the class map name. |
| Type | Specifies the type of the class map. |

**Related Commands**

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Determines the list of actions to be executed for the class and enters the class-map configuration mode. |

# show policy-map

To show the policy-map related information, use the **show policy-map** command in the EXEC mode.

**show policy-map type control subscriber pmap-name** *name*

**Syntax Description**

| | |
|---|---|
| **type** | Displays the type of policy-map. |
| **control** | Displays the control type policy-map. |
| **subscriber** | Displays the subscriber control type policy-map. |
| **pmap_name** | Specifies the policy-map name. |
| *name* | Displays the policy map name. |

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| qos | read |

This is a sample output of the **show policy-map** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show policy-map control subscriber pmap-name POLICY1
```

The show policy-map output is as follows:

```
Wed Jan 23 08:56:13.794 GMT
policy-map type control subscriber POLICY1
 event session-start match-all
  class type control subscriber PTA_CLASS do-all
   1 activate dynamic-template PPP_PTA_TEMPLATE
  !
 !
 end-policy-map
!
```

This table describes the significant fields shown in the display.

*Table 6: show policy-map Field Descriptions*

| Field | Description |
|---|---|
| policy-map | Specifies the policy map name. |
| Type | Specifies the type of the class type control subscriber. |

## Related Commands

| Command | Description |
|---|---|
| policy-map type control subscriber, on page 60 | Determines the list of events that are applicable to the subscriber lifecycle and to enter the policy-map configuration mode. |



# BNG DHCP Commands

This module describes the Cisco IOS XR software commands used to configure the DHCP commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- aaa dhcp-option force-insert, on page 69
- address-pool, on page 70
- aftr-name, on page 71
- authentication username, on page 72
- broadcast-flag policy check (BNG), on page 74
- class, on page 76
- delayed authentication, on page 78
- dhcp ipv4 (BNG), on page 79
- dhcp ipv6 (BNG), on page 80
- dhcp-to-aaa option list, on page 81
- dhcpv6-to-aaa option list, on page 82
- dhcpv6 address-pool, on page 83
- dhcpv6 delegated-prefix-pool, on page 84
- dns-server (BNG), on page 85
- domain-name (DHCP IPv6 pool-BNG), on page 87
- duid allowed-type, on page 89
- duplicate-mac-allowed, on page 90
- enable-vlan-intf-session-limit, on page 92
- framed-prefix-pool, on page 94
- giaddr policy keep, on page 95
- helper-address (BNG), on page 96
- inner-cos, on page 98
- interface (DHCP-BNG), on page 100
- interface subscriber-pppoe profile, on page 102
- lease, on page 103
- lease proxy client-lease-time, on page 105

- linkaddress-from-ra-enable, on page 106
- limit lease per-circuit-id, on page 108
- limit lease per-interface, on page 109
- limit lease per-remote-id, on page 110
- match-default, on page 111
- match mode-class, on page 113
- match option, on page 115
- match option 60, on page 117
- match vrf, on page 119
- option 17, on page 120
- outer-cos, on page 121
- prefix-pool, on page 122
- profile (BNG), on page 123
- rapid commit, on page 125
- relay information authenticate (BNG), on page 126
- relay information check (BNG), on page 128
- relay information option (BNG), on page 130
- relay information option allow-untrusted (BNG), on page 132
- relay information policy (BNG), on page 134
- relay option interface-id, on page 136
- relay option link-layer-addr, on page 138
- relay option remote-id, on page 139
- relay option subscriber-id, on page 141
- show dhcp ipv4 proxy binding, on page 142
- show dhcp ipv4 proxy interface (BNG), on page 146
- show dhcp ipv4 proxy profile, on page 148
- show dhcp ipv4 proxy statistics, on page 149
- show dhcp ipv4/6 server cdm, on page 150
- show dhcp ipv6 proxy binding (BNG), on page 152
- show dhcp ipv6 proxy interface (BNG), on page 154
- show dhcp ipv6 proxy profile, on page 156
- show dhcp ipv6 proxy statistics, on page 157
- show dhcp ipv6 server binding, on page 159
- show dhcp ipv6 server interface, on page 162
- show dhcp ipv6 server profile, on page 164
- show dhcp ipv6 server statistics, on page 165

# aaa dhcp-option force-insert

To enable the insertion of DHCP options while replying to the DHCP client, regardless of the request from the DHCP host, use the **aaa dhcp-option force-insert** command in DHCP IPv4 or IPv6 server profile configuration mode. To disable this functionality, use the **no** form of this command.

**aaa dhcp-option force-insert**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv4 server profile

DHCP IPv6 server profile

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | The command was extended for DHCP IPv6 server profile configuration mode. |
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

If DHCP server profile is configured on BNG, the per-subscriber-based DHCP options get preference over that.

You can configure a maximum of 8 DHCPv6 options for a single user profile. The AAA server can send a maximum of 120 hexadecimal bytes and 240 ASCII characters (approximately) to the BNG router.

For more information on Rich DHCP Option on RADIUS VSA feature, see the *Establishing Subscriber Sessions* chapter in the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to enable rich DHCP option feature on BNG:

```
RP/0/RSP0/CPU0:router(config-dhcpv4-server-profile)#aaa dhcp-option force-insert
```

# address-pool

To specify the name of an address pool by integrating the DHCPv6 sever with distributed address pool service (DAPS), use the **address-pool** command in the DHCP IPv6 server profile class configuration mode. To remove the address pool name, use the **no** form of this command.

**address-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of a address pool. |

## Command Default

None

## Command Modes

DHCP IPv6 server profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To enter the DHCP IPv6 server profile configuration, enter **profile** *profile_name* **server** command in the DHCPv6 configuration mode.

To enter the DHCP IPv6 server profile class configuration, enter **class** *class_name* command in the DHCPv6 server profile configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of creating a address-pool name using the **address-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# class class_dhcp
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-class)# address-pool pool_addr
```

# aftr-name

To set the Address Family Transition Router's (AFTR) name for Dual-stack Lite support, use the **aftr-name** command in DHCPv6 server profile configuration mode. To disable the AFTR-name, use the **no** form of this command.

**aftr-name** *aftr-name*

## Syntax Description

| | |
|---|---|
| *aftr-name* | Specifies the AFTR fully qualified domain name for the server profile. |

## Command Default

Dual-stack support is not enabled.

## Command Modes

DHCPv6 server profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to configure the AFTR Fully Qualified Domain Name (FQDN) for a server profile:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# aftr-name aftr-server.example.com
```

# authentication username

To specify the username format of IPv4 or IPv6 subscriber for authentication with the AAA server (as part of enabling DHCP L3 snoop feature in BNG), use the **authentication username** command in DHCP IPv4 (or IPv6) proxy profile configuration mode. To remove this configuration, use the **no** form of this command.

For IPv4:

**authentication username** {**giaddr** | **mac**}

For IPv6:

**authentication username DUID**

## Syntax Description

| | |
|---|---|
| **giaddr** | Specifies gateway address as the username for IPv4 subscriber.<br>A combination of gateway address and MAC address is used as the authorization username to enable DHCP L3 snooping in BNG. |
| **mac** | Specifies MAC address as the username for IPv4 subscriber. |
| **DUID** | Specifies DUID as the username for IPv6 subscriber. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile

DHCP IPv6 proxy profile

## Command History

| Release | Modification |
|---|---|
| Release 6.3.2 | This command was introduced. |

## Usage Guidelines

This is supported only on Cisco IOS XR 64-bit operating system.

The **DUID** option is applicable only for IPv6 subscribers, and is available only in DHCP IPv6 proxy profile configuration mode. Similarly, the **giaddr** and **mac**options are applicable only for IPv4 subscribers, and are available only in DHCP IPv4 proxy profile configuration mode.

The **DUID** option is mainly useful in routed DHCPv6-initiated sessions in case the MAC information is not available to BNG through DHCP Option 79.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to specify the MAC address-gateway address combination as the authorization username of IPv4 subscriber, to enable DHCP L3 snoop feature in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile example-profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# authentication username mac giaddr
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# commit
```

## Related Commands

| Command | Description |
|---|---|
| delayed authentication, on page 78 | Delays the client authorization until DHCP REQUEST message is received from the client. |

# broadcast-flag policy check (BNG)

To configure Dynamic Host Configuration Protocol (DHCP) IPv4 Relay to broadcast only BOOTREPLY packets if the DHCP IPv4 broadacst flag is set in the DHCP IPv4 header, use the **broadcast-flag policy check** command in DHCP IPv4 relay profile configuration submode or DHCP IPv4 server profile configuration submode. By default, the DHCP IPv4 Relay always broadcasts BOOTREPLY packets. To restore the default, use the **no** form of this command.

**broadcast-flag policy** { **check** | **unicast-always** }

## Syntax Description

| | |
|---|---|
| **check** | Checks the broadcast flag in packets. |
| **unicast-always** | Sets the broadcast-flag policy to unicast-always. |

## Command Default

Relay agent always broadcasts DHCP IPv4 packets to a client.

## Command Modes

DHCP IPv4 relay profile configuration

DHCP IPv4 server profile

## Command History

| Release | Modification |
|---|---|
| Release 3.7.0 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |
| Release 5.1 | The **unicast-always** keyword was added. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This an example of the **broadcast-flag policy check** command:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# broadcast-flag policy check
```

This an example of the **broadcast-flag policy** command:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile TEST server
```

```
RP/0/RSP0/CPU0:router(config-dhcpv4-server-profile)# broadcast-flag policy unicast-always
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode. |
| helper-address | Configures the DHCP relay agent to relay packets to a specific DHCP server. |
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |
| relay information policy (BNG), on page 134 | Configures how a relay agent processes BOOTREQUEST messages that already contain a relay information option. |

# class

To create a proxy profile class and to enter the proxy profile class sub configuration mode, use the **class** command in an appropriate configuration mode. To disable this feature and exit the profile mode, use the **no** form of this command.

**class** *class_name* {**helper-address** | **match**} {**address-pool** | **dns-server** | **domain-name** | **prefix-pool**}

## Syntax Description

| | |
|---|---|
| *class_name* | Specifies the class name. |
| **helper-address** | Specifies the server address to relay packets. |
| **match** | Inserts a match keyword. |
| **address-pool** | Specifies the name of the address pool |
| **dns-server** | Specifies the name of a dns server. |
| **domain-name** | Specifies the name of a domain. |
| **prefix-pool** | Specifies the name of the prefix pool. |

## Command Default

No class is specified.

## Command Modes

DHCP IPv4 proxy profile configuration

DHCP IPv6 proxy profile configuration

DHCP IPv6 server profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | The support for IPv6 was added. |

## Usage Guidelines

The class submode is present in both DHCP IPv6 proxy profile configuration and DHCP IPv6 server profile configuration submodes. A class is associated with a match criterion, which is used to determine if the class is applied to a subscriber or not. The class name needs to be unique for the system.



**Note** The address-pool, dns-server, domain-name, and prefix-pool keywords appear only in the DHCP IPv6 server profile configuration mode. However, the helper-address keywords appears in both DHCP IPv4 proxy profile configuration and DHCP IPv6 proxy profile configuration modes.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to create a class in the DHCP IPv4 proxy profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile dhcp_profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# class blue
```

This example shows how to create a class in the DHCP IPv6 proxy profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile dhcp_profile1 proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# class blue
```

This example shows how to create a class in the DHCP IPv6 server profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile dhcp_profile2 server
RP/0/RSP0/CPU0:router(config-dhcpv4-server-profile)# class red
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | This topic describes the class-map type control subscriber command. |

# delayed authentication

To delay the client authorization until DHCP REQUEST message is received from the client, use the **delayed authentication** command in DHCP IPv4 proxy profile configuration mode. This is used while enabling DHCP L3 snooping feature in BNG. To disable this configuration, use the **no** form of this command.

**delayed authentication**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile

## Command History

| Release | Modification |
|---|---|
| Release 6.3.2 | This command was introduced. |

## Usage Guidelines

This command is supported only for DHCPv4; not for DHCPv6. Also, it is supported only on Cisco IOS XR 64-bit operating system.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to delay the client authorization while enabling DHCP L3 snooping in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile example-profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# delayed authentication
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# commit
```

## Related Commands

| Command | Description |
|---|---|
| authentication username, on page 72 | Specifies the username format of IPv4 or IPv6 subscriber for authentication with the AAA server, as part of enabling DHCP L3 snoop feature in BNG. |

# dhcp ipv4 (BNG)

To enable Dynamic Host Configuration Protocol (DHCP) for IPv4 and to enter DHCP IPv4 configuration mode, use the **dhcp ipv4** command in Global Configuration mode. To disable DHCP for IPv4 and exit the DHCP IPv4 configuration mode, use the **no** form of this command.

**dhcp ipv4**

## Syntax Description

This command has no keywords or arguments.

## Command Modes

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |

## Usage Guidelines

Use the **dhcp ipv4** command to enter DHCP IPv4 configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to enable DHCP for IPv4:

```
RP/0/RSP0/CPU0:router# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)#
```

# dhcp ipv6 (BNG)

To enable Dynamic Host Configuration Protocol (DHCP) for IPv6 and to enter DHCP IPv6 configuration mode, use the **dhcp ipv6** command in Global Configuration mode. To disable the DHCP for IPv6, use the **no** form of this command.

**dhcp ipv6**

## Syntax Description

This command has no keywords or arguments.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.1.0 | This command was introduced. |
| Release 4.3.0 | This command was supported for BNG. |

## Usage Guidelines

Use the **dhcp ipv6** command to enter DHCP IPv6 configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to enable DHCP for IPv6:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#
```

# dhcp-to-aaa option list

To enable control over the subscriber DHCP options to be sent to the AAA server by the BNG router, use the **dhcp-to-aaa option list** command in DHCP IPv4 server profile or proxy profile configuration mode. To disable this feature, use the **no** form of this command.

**dhcp-to-aaa option list** {**all***option-value*}

## Syntax Description

| | |
|---|---|
| **all** | Enables the functionality to send all DHCPv4 options from the subscriber to the AAA server. |
| *option-value* | Specifies the particular DHCPv4 options from the subscriber to be sent to the AAA server. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile

DHCP IPv4 server profile

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was introduced. |

## Usage Guidelines

The BNG router sends all or the specified DHCPv4 options to the AAA server, if this command is configured. You can send a maximum of 13 options (12 DHCP options and a DHCP header) to the AAA server. The header portion of the DHCP control packet is encoded as option type 0. The first 108 bytes of the header are sent to the AAA server.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to enable control over the subscriber DHCP options to be sent to the AAA server:

```
Router# configure
Router(config)# dhcp ipv4
Router(config-dhcpv4)# profile server-profile server
Router(config-dhcpv4-server-profile)# dhcp-to-aaa option list 90 50
Router(config-dhcpv4-server-profile)# commit
```

## Related Commands

| Command | Description |
|---|---|
| aaa dhcp-option force-insert, on page 69 | Enables the insertion of DHCP options while replying to the DHCP client, regardless of the request from the DHCP host. |

# dhcpv6-to-aaa option list

To enable control over the subscriber DHCPv6 options to be sent to the AAA server by the BNG router, use the **dhcpv6-to-aaa option list all** command in DHCP IPv6 server profile or proxy profile configuration mode. To disable this feature, use the **no** form of this command.

**dhcpv6-to-aaa option list** {**all** | *option-value*}

## Syntax Description

| | |
|---|---|
| **all** | Enables the functionality to send all DHCPv6 options from the subscriber to the AAA server. |
| *option-value* | Specifies the particular DHCPv6 options from the subscriber to be sent to the AAA server. |

## Command Default

None

## Command Modes

DHCP IPv6 proxy profile

DHCP IPv6 server profile

## Command History

| Release | Modification |
|---|---|
| Release 6.6.2 | This command was introduced. |

## Usage Guidelines

The BNG router sends all or specified DHCPv6 options to the AAA server, if this command is configured. You can send a maximum of 13 options (12 DHCP options and a DHCP header) to the AAA server. The header portion of the DHCP control packet is encoded as option type 0. The first 108 bytes of the header are sent to the AAA server.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to enable control over the subscriber DHCP options to be sent to the AAA server:

```
Router# configure
Router(config)# dhcp ipv6
Router(config-dhcpv6)# profile server-profile server
Router(config-dhcpv6-server-profile)# dhcpv6-to-aaa option list 90 50
Router(config-dhcpv6-server-profile)# commit
```

# dhcpv6 address-pool

To specify addresses for DHCPv6 when Radius does not provide IPv6 address, use the **dhcpv6 address-pool** command in the dynamic template configuration mode. To remove the IPv6 address pool name for DHCPv6, use the **no** form of this command.

**dhcpv6 address-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of a IPv6 address pool name for DHCPv6. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To enter the dynamic template configuration mode, enter **dynamic-template** command in the Global Configuration mode.

The IPv6 address pool is used for both PPPoE and IPoE subscribers.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This is an example of creating an IPv6 address pool for PPPoE subscribers using the **dhcpv6 address-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ppp my-ipv6-pppoe-tempate
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# dhcpv6 address-pool my-pppoe-addr-pool
```

This is an example of creating an IPv6 address pool for IPoE subscribers using the **dhcpv6 address-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ppp my-ipv6-tempate
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# dhcpv6 address-pool my-ipsub-addr-pool
```

# dhcpv6 delegated-prefix-pool

To specify the default pool name for (IA-PD) prefix delegation when no pool name or prefix is provided by the Radius, use the **dhcpv6 delegated-prefix-pool** command in the dynamic template configuration mode. To remove the delegated prefix pool name, use the **no** form of this command.

**dhcpv6 delegated-prefix-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of a delegated prefix pool for DHCPv6. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To enter the dynamic template configuration mode, enter **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This is an example of creating a delegated prefix-pool name using the **dhcpv6 delegated-prefix-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ipsubscriber ipsub1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# dhcpv6 delegated-prefix-pool myPool
```

# dns-server (BNG)

To specify the Domain Name System (DNS) IPv6 servers available to a Dynamic Host Configuration Protocol (DHCP) for IPv6 client, use the **dns-server** command in an appropriate configuration mode. To remove the DNS server list, use the **no** form of this command.

**dns-server** *ipv6-address*

## Syntax Description

| | |
|---|---|
| *ipv6-address* | IPv6 address of a DNS server.<br>This argument must be in the form documented in RFC 2373, where the address is specified in hexadecimal using 16-bit values between colons. |

## Command Default

When a DHCP for IPv6 pool is first created, no DNS IPv6 servers are configured.

## Command Modes

DHCP IPv6 server profile configuration

DHCP IPv6 server profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was supported in DHCP IPv6 server profile and class configuration mode in BNG. |

## Usage Guidelines

Multiple Domain Name System (DNS) server addresses can be configured by issuing this command multiple times. New addresses do not overwrite old addresses.

To enter the DHCP IPv6 server profile configuration, enter **profile** *profile_name* **server** command in the DHCPv6 configuration mode.

To enter the DHCP IPv6 server profile class configuration, enter **class** *class_name* command in the DHCPv6 server profile configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of setting the DNS server name using the **dns-server** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6 pool pool1
RP/0/RSP0/CPU0:router(config-dhcpv6-pool)# dns-server 10:10::10
```

This is an example of setting the DNS address - 2001:db8:1203::1 and 2001:db8:1204::1 - using the **dns-server** command in the DHCP IPv6 server profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
```

```
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# dns-server 2001:db8:1203::1 and
2001:db8:1204::1
```

This is an example of setting the DNS address - 2001:db8:1203::1 and 2001:db8:1204::1 - using the **dns-server** command in the DHCP IPv6 server profile class configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# class proxy-red
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-class)# dns-server 2001:db8:1203::1 and
 2001:db8:1204::1
```

# domain-name (DHCP IPv6 pool-BNG)

To configure a domain name for a Dynamic Host Configuration Protocol (DHCP) for IPv6 client, use the **domain-name** command in an appropriate configuration mode. To remove the domain name, use the **no** form of this command.

**domain-name** *domain*

## Syntax Description

| | |
|---|---|
| *domain* | Specifies the domain name string to be used by the client. |

## Command Default

When a DHCP for IPv6 pool is first created, no domain name for clients is configured.

## Command Modes

DHCP IPv6 server profile configuration

DHCP IPv6 server profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was supported in DHCP IPv6 server profile and class configuration mode in BNG. |

## Usage Guidelines

Multiple Domain Name System (DNS) domain names can be configured by issuing the **domain-name** command multiple times. The new domain name does not overwrite existing domain names.

To enter the DHCP IPv6 server profile configuration, enter **profile** *profile_name* **server** command in the DHCPv6 configuration mode.

To enter the DHCP IPv6 server profile class configuration, enter **class** *class_name* command in the DHCPv6 server profile configuration mode.

The domain name is defined in DHCP IPv6 server profile and DHCP IPv6 server profile class configuration. If the same parameters are defined in the class scope, then the values defined in the class scope takes precedence.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of setting the domain name using the **domain-name** command in the DHCP IPv6 server profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# domain-name my.domain.com
```

This is an example of setting the domain name using the **domain-name** command in the DHCP IPv6 server profile class configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# class proxy-red
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-class)# domain-name my.domain.com
```

# duid allowed-type

To specify the permitted DUID type for the incoming DHCP SOLICIT packets in BNG, use the **duid allowed-type** command in DHCP IPv6 server profile configuration mode. To disable this feature, use the **no** form of this command.

**duid allowed-type** *type*

## Syntax Description

| | |
|---|---|
| *type* | Specifies the permitted DUID type of the DHCP solicit packet. |

## Command Default

None

## Command Modes

DHCP IPv6 server profile

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to specify the permitted DUID type for the incoming DHCP SOLICIT packets, as part of enabling DHCP option 16 filtering feature in BNG :

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile server-profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# duid allowed-type 1
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# commit
```

## Related Commands

| Command | Description |
|---|---|
| match option (DHCPv6), on page 58 | Enables DHCP option 16 filtering feature in BNG. |

# duplicate-mac-allowed

To allow duplicate client MAC addresses across different VLANs and interfaces, use the **duplicate-mac-allowed** command in the DHCP IPv4 configuration mode. To disallow duplicate client MAC addresses, use the **no** form of this command.

**duplicate-mac-allowed** [**exclude-vlan** | **include-giaddr**]

## Syntax Description

| | |
|---|---|
| **exclude-vlan** | Excludes VLANs from the client key; only MAC address and interface form the client key. |
| **include-giaddr** | Enables support for duplicate sessions having the same MAC address but different *gi-address* values, mainly in the case of routed sessions. |

## Command Default

By default, duplicate MAC address support is disabled.

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.3.2 | Modified the command to include **include-giaddr** option as part of DHCP L3 snooping feature in BNG. |
| Release 6.1.2 | This command was introduced in BNG, with an addition of **exclude-vlan** option to exclude VLANs from the client key. |
| Release 4.3.2 | This command was introduced. |

## Usage Guidelines

You can enable duplicate MAC addresses on relay, proxy, server, and snoop DHCP modes.

Do not enable the **duplicate-mac-allowed** command for mobile subscribers.

With **exclude-vlan** option enabled, both inner and outer VLANs get excluded. You cannot exclude just one of them.

The **include-giaddr** option is used for DHCP L3 snooping feature in BNG. It is supported only on Cisco IOS XR 64-bit operating system.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

### Example

This examples shows how to allow duplicate client MAC addresses across different VLANs and interfaces, using the **duplicate-mac-allowed** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# duplicate-mac-allowed exclude-vlan
```

This examples shows how to enable support for duplicate sessions having the same MAC address but different *gi-address* values, for DHCP L3 snooping in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# duplicate-mac-allowed include-giaddr
```

### Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables Dynamic Host Configuration Protocol (DHCP) for IPv4 and enters DHCP IPv4 configuration mode. |

# enable-vlan-intf-session-limit

To enable VLAN or interface session-limit, use the **enable-vlan-intf-session-limit** command.

**enable-vlan-intf-session-limit**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv4 server profile configuration

DHCP IPv6 server profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 7.3.1 | This command is introduced. |

## Usage Guidelines

None

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

For DHCP IPv4 server sessions, use the **enable-vlan-intf-session-limit** command, as shown in this configuration snippet:

```
Router#configure
Router(config)#dhcp ipv4
Router(config-dhcpv4)#profile s1 server
Router(config-dhcpv4-server-profile)#enable-vlan-intf-session-limit
Router(config-dhcpv4-server-profile)#lease 1 0 0
Router(config-dhcpv4-server-profile)#exit
Router(config-dhcpv4)#interface bundle-ether 10.100 server profile s1
Router(config-dhcpv4)#commit
```

For DHCP IPv6 server sessions, use the **enable-vlan-intf-session-limit** command, as shown in this configuration snippet:

```
Router#configure
Router(config)#dhcp ipv6
Router(config-dhcpv6)#profile s1 server
Router(config-dhcpv6-server-profile)#enable-vlan-intf-session-limit
Router(config-dhcpv6-server-profile)#lease 1 0 0
Router(config-dhcpv6-server-profile)#exit
Router(config-dhcpv6)#interface bundle-ether 10.100 server profile s1
Router(config-dhcpv6)#commit
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | To enable Dynamic Host Configuration Protocol (DHCP) for IPv4 and to enter DHCP IPv4 configuration mode |
| dhcp ipv6 (BNG), on page 80 | To enable Dynamic Host Configuration Protocol (DHCP) for IPv6 and to enter DHCP IPv6 configuration mode |
| profile (BNG), on page 123 | To specify a DHCP profile for the Dynamic Host Configuration Protocol (DHCP) IPv4 and IPv6 component and to enter the appropriate profile mode. |

# framed-prefix-pool

To specify the default pool name for ipv6 prefixes for assignment only from SLAAC (Stateless Address Auto-Configuration), use the **framed-prefix-pool** command in the dynamic template configuration mode. To remove the framed prefix pool name, use the **no** form of this command.

**framed-prefix-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of a prefix pool. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To enter the dynamic template configuration mode, enter **dynamic-template** command in the Global Configuration mode.

The dynamic template configuration is used when Radius does not return pool name or prefix for the SLAAC.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This is an example of creating a framed prefix pool name using the **framed-prefix-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ipv6
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# framed-prefix-pool my-slaac-pool
```

# giaddr policy keep

While in proxy mode, to retain the gateway address in the DHCP control packets received at BNG from the relay agent, use the **giaddr policy keep** command in DHCP IPv4 proxy profile configuration mode. This is used while enabling DHCP L3 snooping feature in BNG. To disable this configuration, use the **no** form of this command.

**giaddr policy keep**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile

## Command History

| Release | Modification |
|---|---|
| Release 6.3.2 | This command was introduced. |

## Usage Guidelines

This is supported only on Cisco IOS XR 64-bit operating system.

Without this configuration, the *gi-address* value received at BNG while in proxy mode, is modified and a new value is set based on the router configuration.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to retain the gateway address in the DHCP control packets received at BNG from the relay agent:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile example-profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# giaddr policy keep
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# commit
```

## Related Commands

| Command | Description |
|---|---|
| initiator dhcp-snoop, on page 256 | Configures DHCP to pass the control packets from BNG to the DHCP server to enable DHCP L3 snooping for an IP subscriber. |

# helper-address (BNG)

To configure the Dynamic Host Configuration Protocol (DHCP) IPv4 or IPv6 relay agent to relay DHCP packets to a specific DHCP server, use the **helper-address** command in an appropriate configuration mode. Use the **no** form of this command to clear the address.

**helper-address** [**vrf** *vrf-name* ] [*address*] [**giaddr** *gateway-address*]

## Syntax Description

| | |
|---|---|
| *vrf-name* | (Optional) Specifies the name of a particular VRF. |
| *address* | IPv4 and Pv6 address in four part, dotted decimal format. |
| **giaddr** *gateway-address* | (Optional) Specifies the gateway address to use in packets relayed to server. This keyword is applicable for IPv4 helper address. |

## Command Default

Helper address is not configured.

## Command Modes

DHCP IPv6 proxy profile class configuration

DHCP IPv6 profile relay configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |
| Release 4.3.0 | The support for IPv6 was added in BNG. |
| Release 5.2.2 | This command is supported in DHCPv6 profile relay configuration submode. |

## Usage Guidelines

A maximum of upto eight helper addresses can be configured.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to set the helper-address for a VRF using the **helper-address** command in DHCP IPv6 proxy profile class configuration mode:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile myprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# class myclass
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile-class)#  helper-address vrf my-server-vrf
 1:1:1::1
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables Dynamic Host Configuration Protocol (DHCP) for IPv4 and enters DHCP IPv4 configuration mode. |
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |
| relay information policy (BNG), on page 134 | Configures how a relay agent processes BOOTREQUEST messages that already contain a relay information option. |

# inner-cos

To reset the default inner-cos value for DHCPv4 control packets sent on BNG subscriber interfaces, use the **inner-cos** command in DHCP IPv4 configuration mode. To set the inner-cos value back to the default value, use the **no** form of this command.

**inner-cos** *value*

## Syntax Description

| | |
|---|---|
| *value* | Value of inner-cos for DHCPv4 control packets.<br>The range is from 0 to 7. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.2 | This command was introduced. |
| Release 5.3.1 | This command was modified. |

## Usage Guidelines

The inner and outer Class of Service (CoS) values can be configured for DHCPv4 control packets. For broadcast packets, both the **inner-cos** and **outer-cos** commands can be used to configure CoS values. For unicast packets, the **inner-cos** command cannot be directly used. The outer CoS value configured using the **outer-cos** command is also set as the inner CoS value.

In the following example, for all broadcast DHCP control packets, the inner CoS value will be set as 5 and the outer CoS value will be set as 7. However, for unicast DHCP control packets, both inner and outer CoS values will be set as 7 (the **inner-cos 5** command does not affect the unicast packets).

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)#inner-cos 5
RP/0/RSP0/CPU0:router(config-dhcpv4)#outer-cos 7
RP/0/RSP0/CPU0:router(config-dhcpv4)#
```

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

### Example

This example shows how to reset the default inner-cos value for DHCPv4 control packets sent on BNG subscriber interfaces:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# inner-cos 0
```

## Related Commands

| Command | Description |
|---|---|
| outer-cos, on page 121 | Resets the default outer-cos value for DHCPv4 control packets sent on BNG subscriber interfaces. |

# interface (DHCP-BNG)

To enable Dynamic Host Configuration Protocol (DHCP) for IPv4 or IPv6 on an interface, use the **interface** command in the appropriate configuration mode. To disable DHCPv4 or DHCPv6 on an interface, use the **no** form of the command.

**interface** *type interface-path-id* { **base** | **proxy** | **relay** | **server** | **snoop** }
**profile** *profile-name*

## Syntax Description

| | |
|---|---|
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **server** | Attaches a server profile for the specified interface. |
| **relay** | Attaches a relay profile for the specified interface. |
| **snoop** | Attaches a snoop profile for the specified interface. |
| **proxy** | Attaches the proxy profile to an interface. |
| **base** | Attaches a base profile for the specified interface. |
| **profile** *profile-name* | Specifies the profile name. |

## Command Default

None

## Command Modes

DHCP IPv6 configuration

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.1.0 | This command was introduced. |
| Release 4.3.0 | The support for IPv6 was added in BNG. |
| Release 5.1 | Support for **server** profile was added. |

| Release | Modification |
|---|---|
| Release 5.2.2 | Support for DHCP IPv6 relay was added.<br>The keyword **base** was added as part of DHCPv4 Service Based Mode Selection feature. |
| Release 6.2.1 | Support for DHCP IPv6 base profile was added. |

## Usage Guidelines

The support for **base** profile option for DHCP IPv6 is available in BNG from Release 6.2.1 and later. For more details, refer *PPP Class-based DHCPv6 Mode Selection* feature in *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of attaching a base profile to an interface:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface gigabitEthernet 0/0/0/0 base profile
BASE_PROFILE
```

This is an example of enabling the DHCP interface mode on a Packet over Sonet/SDH (POS) interface using the **interface** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface POS 0/5/0/0 relay
```

This is an example of enabling the DHCP interface mode on a Packet over Sonet/SDH (POS) interface using the **interface** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface POS 0/5/0/0 server profile TEST
```

This example shows how to attach a base profile to an interface, in DHCPv6 mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface Bundle-Ether302.2501 base profile base_TEST
```

# interface subscriber-pppoe profile

To enable the PPPoE subscribers to use a profile for all the PPPoE subscribers, use the **interface subscriber-pppoe profile** command in the DHCP IPv6 configuration mode. To disable this feature, use the **no** form of this command.

**interface subscriber-pppoe profile** *profile_name*

## Syntax Description

| | |
|---|---|
| *profile_name* | Specifies the name of the profile. |

## Command Default

VRF is disabled.

## Command Modes

DHCP IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example for enabling PPPoE subscribers to use the "my-def-pppoe-green" profile for all the PPPoE subscribers using the **interface subscriber-pppoe profile** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#  interface subscriber-pppoe profile my-def-pppoe-green
```

# lease

To set a client lease time at a global server profile level or class profile level, use the **lease** command in DHCPv6 server profile or class profile configuration mode. To disable the client lease time, use the **no** form of this command.

**lease** {*days* [*hours* *minutes*] | **infinite**}

## Syntax Description

| | |
|---|---|
| *days* | Specifies the number of days for the lease time. The value ranges from 1 to 365. |
| *hours* | Specifies the number of hours for the lease time. The value ranges from 0 to 23. |
| *minutes* | Specifies the number of minutes for the lease time. The value ranges from 0 to 59. |
| **infinite** | Specifies an infinite amount of lease. |

## Command Default

By default, the lease is 86400 seconds (one day).

## Command Modes

DHCPv6 server profile configuration

DHCPv6 server class profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | The command was extended for lease timer support for class profile as well. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

The lease time is applied only to the class and not to the whole profile. When both profile and class lease time configurations are present, then the class lease time takes precedence. The default lease time is 1 day, if lease time is not configured.

The lease time is specified in seconds or date format.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to configure lease time for 1 day and 6 hours:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# lease 1 6 0
```

This example shows how to configure infinite amount of lease time:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
```

```
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# lease infinite
```

This example shows how to configure lease time for class profile:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile server-profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# class class1
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-c)# lease 0 0 20
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-c)# address-pool poolv6
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-c)# dns-server 2001:DB8::1
```

# lease proxy client-lease-time

To specify the lease limit each circuit id each interface, use the **lease proxy client-lease-time** command in the DHCP IPv4 sub configuration mode. To disable the lease proxy client-lease-time, use the **no** form of this command.

**lease proxy client-lease-time** *value*

## Syntax Description

| | |
|---|---|
| *value* | Specifies the time in seconds for the lease proxy client. The minimum value of lease proxy client-time is 600 seconds. |

## Command Default

If you set the default (no), then the lease proxy gets disabled.

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.1 | This command was introduced. |

## Usage Guidelines

When the binding is created, the client-lease-time is cached on a per-binding basis, thus, the changes to the profile client-lease-time does not cause any impact to any existing bindings. However, changes are effective only for subsequently created bindings.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **lease proxy client-lease-time** command in the DHCP IPv4 sub configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile myproxyprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4)# lease proxy client-lease-time 600
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |

# linkaddress-from-ra-enable

To enable DHCP IPv6 proxy mode Point to Point Protocol on Ethernet (PPPoE) session to send the link local address for SOLICIT message or renew request message, use the **linkaddress-from-ra-enable** command.

**linkaddress-from-ra-enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv6 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.3.1 | This command was introduced. |

## Usage Guidelines

By default this feature is disabled. You can use **show profile** *profile_name* **proxy** command to see if this feature is enabled or not.

**Note** The link address configured in proxy profile or class level will take precedence over the link address while using the **linkaddress-from-ra-enable** command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile dhcp_v6 proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)# helper-address vrf default 4000::7:2c:2
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)# linkaddress-from-ra-enable
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv6 (BNG), on page 80 | To enable Dynamic Host Configuration Protocol (DHCP) for IPv6 and to enter DHCP IPv6 configuration mode |

| Command | Description |
| --- | --- |
| helper-address (BNG), on page 96 | To configure the Dynamic Host Configuration Protocol (DHCP) IPv4 or IPv6 relay agent to relay DHCP packets to a specific DHCP server |

# limit lease per-circuit-id

To specify the lease limit each circuit id each interface, use the **limit lease per-circuit-id** command in the DHCP IPv4 sub configuration mode. To disable the lease per-circuit-id, use the **no** form of this command.

**limit lease per-circuit-id** *value*

## Syntax Description

| | |
|---|---|
| *value* | Specifies the limit up to which the lease value can be extended. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.1 | This command was introduced. |

## Usage Guidelines

Use the **dhcp ipv4** command to enter DHCP IPv4 configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **limit lease per-circuit-id** command in the DHCP IPv4 sub configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile myproxyprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4)# limit lease per-circuit-id 1000
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |

# limit lease per-interface

To specify the lease limit each interface, use the **limit lease per-interface** command in the DHCP IPv4 sub configuration mode. To disable the limit lease per-interface, use the **no** form of this command.

**limit lease per-interface** *value*

## Syntax Description

| | |
|---|---|
| *value* | Specifies the limit up to which the lease value can be extended. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.1 | This command was introduced. |

## Usage Guidelines

Use the **dhcp ipv4** command to enter DHCP IPv4 configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **limit lease per-interface** command in the DHCP IPv4 sub configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile myproxyprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4)# limit lease per-interface 1000
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |

# limit lease per-remote-id

To specify the lease limit per remote id each interface, use the **limit lease per-remote-id** command in the DHCP IPv4 sub configuration mode. To disable the lease per-remote-id, use the **no** form of this command.

**limit lease per-remote-id** *value*

## Syntax Description

| | |
|---|---|
| *value* | Specifies the limit up to which the lease value can be extended. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.1 | This command was introduced. |

## Usage Guidelines

Use the **dhcp ipv4** command to enter DHCP IPv4 configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **limit lease per-remote-id** command in the DHCP IPv4 sub configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile myproxyprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4)# limit lease per-remote-id 1000
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |

# match-default

To specify the default profile to match the subscriber's PPPoE/IPoE class information for IPv4/IPv6 prefix allocation to the end user, use the **match-default** command in the DHCP IPv4/IPv6 base profile configuration mode. To disable the match option, use the **no** form of the command.

**match-default profile** *profile-name* **server**

## Syntax Description

| | |
|---|---|
| *class-name* | Specifies the name of the class. |
| **profile** | Specifies the profile to select for a particular class. |
| *profile-name* | Specifies the name of the profile. |
| **server** | Specifies the server mode. |

## Command Default

None

## Command Modes

DHCP IPv4/IPv6 base profile configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced for DHCPv6. |
| Release 6.6.2 | This command was introduced for DHCPv4. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of using the **match-default** command in the DHCP IPv4 base profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile BASE_PROFILE base
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match mode-class SERVER_CLASS profile
SERVER_PROFILE  server
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match mode-class  PROXY_CLASS profile
PROXY_PROFILE proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match-default profile DEFAULT_SERVER
server
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# dhcp-to-aaa option list 12 55 60 61 124
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# exit
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface bundle-ether1.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface pw-ether25000.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv4)# commit
```

This is an example of using the **match-default** command in the DHCP IPv6 base profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile BASE_PROFILE base
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match mode-class SERVER_CLASS profile
SERVER_PROFILE  server
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match mode-class  PROXY_CLASS profile
PROXY_PROFILE proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match-default profile DEFAULT_SERVER
server
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# dhcpv6-to-aaa option list all
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# exit
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface bundle-ether1.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface pw-ether25000.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv6)# commit
```

## Related Commands

| Command | Description |
|---|---|
| match mode-class, on page 113 | Matches the subscriber's PPPoE/IPoE class information for IPv4/IPv6 prefix allocation. |
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |
| dhcp ipv6 (BNG), on page 80 | |
| interface (DHCP-BNG), on page 100 | |

# match mode-class

To match the subscriber's PPPoE/IPoE class information in order to select the corresponding profile to perform the server or proxy functionality for IPv4/IPv6 prefix allocation to the end user, use the **match mode-class** command in the DHCP IPv4/IPv6 base profile configuration mode. To disable the match option, use the **no** form of the command.

**match mode-class** *class-name* **profile** *profile-name* {**server** | | **proxy**}

## Syntax Description

| | |
|---|---|
| *class-name* | Specifies the name of the class. |
| **profile** | Specifies the profile to select for a particular class. |
| *profile-name* | Specifies the name of the profile. |
| **server** | Specifies the server mode. |
| **proxy** | Specifies the proxy mode. |

## Command Default

None

## Command Modes

DHCP IPv4/IPv6 base profile configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced for DHCPv6. |
| Release 6.6.2 | This command was introduced for DHCPv4. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of using the **match mode-class** command in the DHCP IPv4 base profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile BASE_PROFILE base
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match mode-class SERVER_CLASS profile
SERVER_PROFILE  server
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match mode-class  PROXY_CLASS profile
PROXY_PROFILE proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# match-default profile DEFAULT_SERVER
server
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# dhcp-to-aaa option list 12 55 60 61 124
RP/0/RSP0/CPU0:router(config-dhcpv4-base-profile)# exit
```

```
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface bundle-ether1.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv4)# interface pw-ether25000.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv4)# commit
```

This is an example of using the **match mode-class** command in the DHCP IPv6 base profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile BASE_PROFILE base
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match mode-class SERVER_CLASS profile
SERVER_PROFILE  server
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match mode-class  PROXY_CLASS profile
PROXY_PROFILE proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# match-default profile DEFAULT_SERVER
server
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# dhcpv6-to-aaa option list all
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)# exit
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface bundle-ether1.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv6)# interface pw-ether25000.10 base profile BASE_PROFILE
RP/0/RSP0/CPU0:router(config-dhcpv6)# commit
```

## Related Commands

| Command | Description |
|---|---|
| match-default, on page 111 | Specifies the default profile to match the subscriber's PPPoE/IPoE class information for IPv4/IPv6 prefix allocation. |
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |
| dhcp ipv6 (BNG), on page 80 | |
| interface (DHCP-BNG), on page 100 | |

# match option

To match the proxy with the configured pattern, use the **match option** command in the DHCP IPv4 proxy profile class configuration mode. To disable the match option, use the **no** form of the command.

**match option** {**124** | **125** | | **60** | **77**} **hex** *hex_string* **mask** *bit_mask_string*

## Syntax Description

| | |
|---|---|
| **124** | Inserts option 124 vendor-identifying vendor class. |
| **125** | Inserts option 125 vendor-identifying vendor-specific info. |
| **60** | Inserts option 60 vendor class ID. |
| **77** | Inserts option 124 user class. |
| **hex** | Inserts a hex pattern. |
| *hex_string* | Specifies the hex pattern string. |
| **mask** | Inserts bit mask pattern. |
| *bit_mask_string* | Specifies the bit mask pattern string. The string pattern is between 0 and 4294967295. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **match option** command in the DHCP IPv4 proxy profile class configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile dhcp_profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# class blue
```

```
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile-class)# match option 124 hex hex_name
mask 3445
```

## Related Commands

| Command | Description |
|---|---|
| class, on page 76 | Creates a proxy profile class and enters the proxy profile class sub configuration mode. |

# match option 60

To enable option 60-based DISCOVER packet filter in DHCPv4, use the **match option 60** command in DHCP IPv4 profile (server, proxy, base or dynamic) configuration mode. To disable this feature, use the **no** form of this command.

For server or proxy profile mode:

**match option 60** {**default** | **hex** *hex-string*} **action** {**allow** | **drop**}

For base or dynamic profile mode:

**match option 60** {**default** *hex-string*} **action** {**allow** | **drop**}

## Syntax Description

| | |
|---|---|
| **default** | Defines a default behavior in case any Vendor-Id specific option 60 filter is not configured. |
| **hex** *hex-string* | Specifies the hexadecimal pattern in DHCP option 60 to be matched. |
| **action** | Specifies the action to be performed on DISCOVER packets. |
| **allow** | Allows the DISCOVER packets based on DHCP option 60 information. |
| **drop** | Drops the DISCOVER packets based on DHCP option 60 information. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile configuration

DHCP IPv4 server profile configuration

DHCP IPv4 base profile configuration

DHCP IPv4 dynamic profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

The DHCP option 60 filtering feature kicks in only for DISCOVER packets that have option 60 field available.

In case of dynamic mode, the preference is given to the base profile filter list over proxy or server mode filter list, if available.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to allow DHCP client packets with option 60 hex string "1234" and "1256", and drop all others.

```
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 hex 1234 action allow
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 hex 1256 action allow
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 default action drop
```

This example shows how to drop DHCP client packets with option 60 hex string "1234" and "1256", and allow all others.

```
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 hex 1234 action drop
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 hex 1256 action drop
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# match option 60 default action allow
```

# match vrf

To match class based on VRF name, use the **match vrf** command in the DHCP IPv4 proxy profile class configuration mode. To disable the match vrf, use the **no** form of the command.

**match vrf** *vrf_name*

## Syntax Description

| | |
|---|---|
| *vrf_name* | Specifies the VRF name. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This is an example of configuring the **match vrf** command

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile dhcp_profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# class blue
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile-class)# match vrf vrf1
```

## Related Commands

| Command | Description |
|---|---|
| match option, on page 115 | Matches the proxy with the configured pattern. |

# option 17

To deliver the URL for self-configuration from the BNG to CPEs through DHCPv6 Option 17, use the **option 17** command in the DHCP IPv6 server profile configuration mode. To remove the configuration, use the **no** form of this command.

**option 17 hex** *hex-string*

## Syntax Description

| | |
|---|---|
| **hex** *hex_string* | Specifies URL in hexadecimal format, with a maximum length of 1000 hex nibbles or 500 characters. |

## Command Default

None

## Command Modes

DHCP IPv6 server profile

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

This example shows how to send the URL for self-configuration from BNG to CPEs through DHCPv6 Option 17:

```
RP/0/RSP0/CPU0:router(config)#dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#profile dhcp_server1 server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)#option 17 hex
0000168b000100206874747073a2f2f6f70657261746f722e636f6d2f6465766963652f61636d70
```

The value used as encoded string in this example represents these:

- 0x00000de9—enterprise number=3561—The Broadband Forum
- 0x0001—opt-code=1
- 0x0020—option-len=32
- 0x68747470733a2f2f6f70657261746f722e636f6d2f6465766963652f61636d70—option-data=

  https://operator.com/device/acmp

# outer-cos

To reset the default outer-cos value for DHCPv4 control packets sent on BNG subscriber interfaces, use the **outer-cos** command in DHCP IPv4 configuration mode. To set the outer-cos value back to the default value, use the **no** form of this command.

**outer-cos** *value*

## Syntax Description

| | |
|---|---|
| *value* | Value of outer-cos for DHCPv4 control packets.<br>The range is from 0 to 7. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.2 | This command was introduced. |
| Release 5.3.1 | This command was modified. |

## Usage Guidelines

The inner and outer Class of Service (CoS) values can be configured for DHCPv4 control packets. For broadcast packets, both the **inner-cos** and **outer-cos** commands can be used to configure CoS values. For unicast packets, the **inner-cos** command cannot be directly used. The outer CoS value configured using the **outer-cos** command is also set as the inner CoS value.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read, write |

### Example

This example shows how to reset the default outer-cos value for DHCPv4 control packets sent on BNG subscriber interfaces:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# outer-cos 0
```

## Related Commands

| Command | Description |
|---|---|
| inner-cos, on page 98 | Resets the default inner-cos value for DHCPv4 control packets sent on BNG subscriber interfaces. |

# prefix-pool

To specify the name of prefix pool by integrating the DHCPv6 sever with distributed address pool service (DAPS), use the **prefix-pool** command in the DHCP IPv6 server profile class configuration mode. To remove the prefix pool name, use the **no** form of this command.

**prefix-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the name of a prefix pool. |

## Command Default

When a DHCP for IPv6 pool is first created, no DNS IPv6 servers are configured.

## Command Modes

DHCP IPv6 server profile class configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

To enter the DHCP IPv6 server profile configuration, enter **profile** *profile_name* **server** command in the DHCPv6 configuration mode.

To enter the DHCP IPv6 server profile class configuration, enter **class** *class_name* command in the DHCPv6 server profile configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of creating a prefix-pool name using the **prefix-pool** command:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# class class_dhcp
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile-class)# prefix-pool pool1
```

# profile (BNG)

To specify a DHCP profile for the Dynamic Host Configuration Protocol (DHCP) IPv4 and IPv6 component and to enter the profile mode, use the **profile** command in DHCP IPv4 or DHCP IPv6 configuration submode. To disable a profile and exit the profile mode, use the **no** form of this command.

**profile** *profile_name* { **base** | **proxy** | **server** }

## Syntax Description

| | |
|---|---|
| *profile_name* | Specifies the name of the profile that uniquely identifies the proxy or server. |
| **base** | Creates a DHCP base profile. |
| **proxy** | Creates a DHCP proxy profile. |
| **server** | Creates a DHCP server profile. |

## Command Default

None

## Command Modes

DHCP IPv4 configuration

DHCP IPv6 configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support was added for IPv6. |
| Release 6.2.1 | Support for base profile was added for DHCP IPv6 in BNG. |

## Usage Guidelines

The *profile-name* and the *class-name* should be unique per base profile.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to enable the dhcpv4 configuration mode and how to create a profile called dhcp_profile in the dhcpv4 configuration submode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile dhcp_profile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)#
```

This example shows how to enable the dhcpv6 configuration mode and how to create a profile called dhcp_v6 in the dhcpv6 configuration submode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile dhcp_v6 proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)#
```

This example shows how to create a DHCPv6 base profile:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile dhcp_profile base
RP/0/RSP0/CPU0:router(config-dhcpv6-base-profile)#
```

# rapid commit

This command aids to enable or disable the rapid commit option of the DHCP server. Enabling it renders the DHCPv6 server to use the two message exchange feature to address/prefix an assignment. Including the **rapid commit** option in the **SOLICIT** message and enabling the same in the server profile, enables the server to respond with the **REPLY** message. Else, it follows the normal four message exchange procedure to assign address/prefix an assignment.

**rapid-commit**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv6 server profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This is an example of enabling rapid-commit in the DHCP IPv6 server profile configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile my_profile server
RP/0/RSP0/CPU0:router(config-dhcpv6-server-profile)# rapid-commit
```

# relay information authenticate (BNG)

To specify relay agent information option to the policy plane for authentication purposes, use the **relay information authenticate** command in the DHCP IPv4 proxy profile configuration mode. To disable the relay option, use the **no** form of this command.

**relay information authenticate** {**received** | **inserted**}

## Syntax Description

| | |
|---|---|
| **received** | Authenticate using received relay agent information option. |
| **inserted** | Authenticate using inserted relay agent information option. |

## Command Default

None

## Command Modes

DHCP IPv4 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to specify the received relay agent information option for authentication using the **relay information authenticate** command in DHCP IPv4 proxy profile configuration mode:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile myprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)# relay information authenticate received
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables Dynamic Host Configuration Protocol (DHCP) for IPv4 and enters DHCP IPv4 configuration mode. |

| Command | Description |
|---|---|
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |
| relay information policy (BNG), on page 134 | Configures how a relay agent processes BOOTREQUEST messages that already contain a relay information option. |

# relay information check (BNG)

To configure a Dynamic Host Configuration Protocol (DHCP) IPv4 Relay to validate the relay agent information option in forwarded BOOTREPLY messages, use the **relay information check** command in DHCP IPv4 relay profile configuration submode. To disable this feature, use the **no** form of this command.

**relay information check**

## Syntax Description

This command has no keywords or arguments.

## Command Default

DHCP validates the relay agent information option.

## Command Modes

DHCP IPv4 relay profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |
| basic-services | read, write |

This example shows how to use the **relay information check** command:

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# relay information check
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode. |
| helper-address | Configures the DHCP relay agent to relay packets to a specific DHCP Server. |
| **profile (BNG)** | Configures a relay profile for the DHCP IPv4 component. |

| Command | Description |
|---|---|
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |

# relay information option (BNG)

To configure Dynamic Host Configuration Protocol (DHCP) IPv4 relay or DHCP snooping Relay to insert relay agent information option in forwarded BOOTREQUEST messages to a DHCP server, use the **relay information option** command in DHCP IPv4 relay profile relay configuration or DHCP IPv4 profile snoop submode. To disable inserting relay information into forwarded BOOTREQUEST messages, use the **no** form of this command.

**relay information option**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

DHCP IPv4
relay
profile
relay
configuration

DHCP IPv4 profile snoop configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |

## Usage Guidelines

The **relay information option** command automatically adds the circuit identifier suboption and the remote ID suboption to the DHCP relay agent information option.

The **relay information option** command enables a DHCP server to identify the user (for example, cable access router) sending the request and initiate appropriate action based on this information. By default, DHCP does not insert relay information.

If the **information option** command is enabled, DHCP snooping mode does not set the giaddr field in the DHCP packet.

The upstream DHCP server or DHCP relay interface must be configured to accept this type of packet using the **relay information option allow-untrusted** configuration. This configuration prevents the server or relay from dropping the DHCP message.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |
| basic-services | read, write |

This example shows how to use the **relay information option** command:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# relay information option
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode. |
| helper-address | Configures the DHCP relay agent to relay packets to a specific DHCP Server. |
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |

# relay information option allow-untrusted (BNG)

To configure the Dynamic Host Configuration Protocol (DHCP) IPv4 relay or DHCP snooping Relay not to drop discard BOOTREQUEST packets that have the relay information option set and the giaddr set to zero, use the **relay information option allow-untrusted** command in DHCP IPv4 relay profile configuration submode or DHCP IPv4 profile snoop configuration submode. To restore the default behavior, which is to discard the BOOTREQUEST packets that have the relay information option and set the giaddr set to zero, use the **no** form of this command.

**relay information option allow-untrusted**

## Syntax Description

This command has no keywords or arguments.

## Command Default

The packet is dropped if the relay information is set and the giaddr is set to zero.

## Command Modes

DHCP IPv4
relay
profile
relay
configuration

DHCP IPv4 profile snoop configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |

## Usage Guidelines

According to RFC 3046, relay agents (and servers) receiving a DHCP packet from an untrusted circuit with giaddr set to zero but with a relay agent information option already present in the packet shall discard the packet and increment an error count. This configuration prevents the server or relay from dropping the DHCP message.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |
| basic-services | read, write |

## Examples

This example shows how to use the **relay information option allow-untrusted** command:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
```

```
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# relay information option allow-untrusted
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode. |
| helper-address | Configures the DHCP relay agent to relay packets to a specific DHCP Server. |
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |

# relay information policy (BNG)

To configure how the Dynamic Host Configuration Protocol (DHCP) IPv4 relay processes BOOTREQUEST packets that already contain a relay information option, use the **relay information policy** command in DHCP IPv4 relay profile configuration submode. To restore the default relay information policy, use the **no** form of this command.

**relay information policy** {**drop** | **keep** | **encapsulate**}

## Syntax Description

| | |
|---|---|
| drop | Directs the DHCP IPv4 Relay to discard BOOTREQUEST packets with the existing relay information option. |
| keep | Directs the DHCP IPv4 Relay not to discard a BOOTREQUEST packet that is received with an existing relay information option and to keep the existing relay information option value. |
| encapsulate | Encapsulates the DHCP relay agent information option received from a prior relay agent in forwarded BOOTREQUEST messages. |

## Command Default

The DHCP IPv4 Relay does not discard a BOOTREQUEST packet that has an existing relay information option. The option and the existing relay information option value is replaced.

## Command Modes

DHCP IPv4 relay profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.7.2 | This command was introduced. |
| Release 4.2.0 | This command was supported for BNG. |
| Release 4.3.1 | The **encapsulate** keyword was added. |

## Usage Guidelines

The **encapsulate** keyword allows the second relay agent to encapsulate option 82 information in a message received from the first relay agent, if it is also configured to add its own option 82 information. This configuration allows the DHCP server to use option 82 information from both relay agents.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |
| basic-services | read, write |

## Examples

This is sample output from executing the **relay information policy** command:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
```

```
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# relay information policy keep
```

This example shows how to encapsulate the DHCP relay agent information option:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)# profile client relay
RP/0/RSP0/CPU0:router(config-dhcpv4-relay-profile)# relay information policy encapsulate
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode. |
| helper-address | Configures the DHCP relay agent to relay packets to a specific DHCP Server. |
| relay information check (BNG), on page 128 | Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages. |
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay information option allow-untrusted (BNG), on page 132 | Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero. |

# relay option interface-id

To insert Interface-Id DHCPv6 option (option 18) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server, use the **relay option interface-id** command in the DHCP IPv6 proxy profile configuration mode. To disable this, use the **no** form of this command.

**relay option interface-id insert** {**local** | **pppoe** | **received**}

## Syntax Description

| | |
|---|---|
| **insert** | Inserts Interface-Id DHCPv6 option (option 18) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |
| **local** | Inserts locally generated or configured Interface-Id value. |
| **pppoe** | Inserts the Interface-Id value received from the SADB. |
| **received** | Inserts the received Interface-Id value. |

## Command Default

None

## Command Modes

DHCP IPv6 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

This command is valid only for PPPoE subscriber sessions.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to insert DHCPv6 option (Interface-Id) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)#dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#profile P1 proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)#relay option
  interface-id insert pppoe
```

## Related Commands

| Command | Description |
|---|---|
| relay option link-layer-addr, on page 138 | Sets MAC address as the Link-layer address in the Relay-forward message sent from BNG DHCPv6 to the external DHCPv6 server. |
| relay option remote-id, on page 139 | Identifies the remote host end of the circuit in the DHCPv6 relay agents. |

| Command | Description |
| --- | --- |
| relay option subscriber-id, on page 141 | Sets the Relay-Agent-Subscriber-Id option (DHCPv6 option 38) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |

# relay option link-layer-addr

To set the MAC address as the Link-layer address DHCPv6 option in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server, use the **relay option link-layer-addr** command in the DHCP IPv6 proxy profile configuration mode. To disable this feature, use the **no** form of this command.

**relay option remote-id set**

## Syntax Description

| | |
|---|---|
| **set** | Sets the MAC address as the Link-layer address in the Relay-forward message sent from BNG DHCPv6 to the external DHCPv6 server. |

## Command Default

None

## Command Modes

DHCP IPv6 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

This command is valid for both IPoE and PPPoE subscriber sessions.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to set DHCPv6 option 79 (Link-layer address) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server:

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)#dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#profile P1 proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)#relay option
  link-layer-addr
```

## Related Commands

| Command | Description |
|---|---|
| relay option interface-id, on page 136 | Inserts Interface-Id DHCPv6 option (option 18) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |
| relay option remote-id, on page 139 | Identifies the remote host end of the circuit in the DHCPv6 relay agents. |
| relay option subscriber-id, on page 141 | Sets the Relay-Agent-Subscriber-Id option (DHCPv6 option 38) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |

# relay option remote-id

To identify the remote host end of the circuit in the DHCPv6 relay agents, use the **relay option remote-id** command in the DHCP IPv6 proxy profile configuration mode. To disable the relay option, use the **no** form of this command.

**relay option remote-id** {*remote-id-string* | **pppoe**}

## Syntax Description

| | |
|---|---|
| *remote-id-string* | Specifies the string value for the Remote-Id. |
| **pppoe** | Specifies Remote-Id attribute in PPPoE session. |

## Command Default

If the remote-id is not provided during configuration, then the default value is used.

## Command Modes

DHCP IPv6 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | Modified the command to include**pppoe** option. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

The **relay option remote-id** *remote-id* option is from the relay agent/proxy to the server. The option provides additional information to the DHCPv6 server. The server may use the information in the option to select parameters specific to particular users, hosts, or subscriber modems. The remote-id field is opaque to server and the server does not parse the value.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to set the remote-id value as "my-remote-id-12345" using the **relay option remote-id** command in DHCP IPv6 proxy profile configuration mode:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)# profile myprofile proxy
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)# relay option remote-id my-remote-id-12345
```

This example shows how to facilitate identification of subscriber based on the Remote-Id attribute in PPPoE session:

```
RP/0/RSP0/CPU0:router(config-dhcpv6-proxy-profile)# relay option remote-id pppoe
```

## Related Commands

| Command | Description |
|---|---|
| relay information option (BNG), on page 130 | Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server. |
| relay option interface-id, on page 136 | Inserts Interface-Id DHCPv6 option (option 18) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |
| relay option link-layer-addr, on page 138 | Sets MAC address as the Link-layer address in the Relay-forward message sent from BNG DHCPv6 to the external DHCPv6 server. |
| relay option subscriber-id, on page 141 | Sets the Relay-Agent-Subscriber-Id option (DHCPv6 option 38) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |

# relay option subscriber-id

To set the Relay-Agent-Subscriber-Id option (DHCPv6 option 38) in the Relay-forward message sent from BNG DHCPv6 proxy to the DHCPv6 server, use the **relay option subscriber-id** command in the DHCP IPv6 proxy profile configuration mode. To disable this feature, use the **no** form of this command.

**relay option subscriber-id pppoe**

## Syntax Description

| | |
|---|---|
| **pppoe** | Specifies Relay-Agent-Subscriber-Id for PPPoE subscribers. |

## Command Default

None

## Command Modes

DHCP IPv6 proxy profile configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

This command is valid only for PPPoE subscribers.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read, write |

## Examples

This example shows how to set DHCPv6 option 38 in the Relay-forward message sent from BNG DHCPv6 proxy to the DHCPv6 server:

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)#dhcp ipv6
RP/0/RSP0/CPU0:router(config-dhcpv6)#profile P1 proxy
RP/0/RSP0/CPU0:router(config-dhcpv4-proxy-profile)#relay option subscriber-id pppoe
```

## Related Commands

| Command | Description |
|---|---|
| relay option interface-id, on page 136 | Inserts Interface-Id DHCPv6 option (option 18) in the Relay-forward message sent from BNG DHCPv6 proxy to the external DHCPv6 server. |
| relay option link-layer-addr, on page 138 | Sets MAC address as the Link-layer address in the Relay-forward message sent from BNG DHCPv6 to the external DHCPv6 server. |
| relay option remote-id, on page 139 | Identifies the remote host end of the circuit in the DHCPv6 relay agents. |

# show dhcp ipv4 proxy binding

To show information concerning DHCP client bindings for proxy, use the **show dhcp ipv4 proxy binding** command in the EXEC mode.

**show dhcp ipv4 proxy binding** [**circuit-id** *circuit_id_name* | **detail** | **interface***ipspecifier* | **location***locationspecifier* | **mac-address** | **remote-id** | **summary**] {**location** | **vrf***vrf_name*}

## Syntax Description

| | |
|---|---|
| **circuit-id** | Displays the DHCP IPv4 proxy client binding based on circuit ID. |
| *circuit_id_name* | Displays the name of the circuit ID. |
| **detail** | Displays detailed binding information for DHCP proxy. |
| **interface** | Specifies the interface based on which the DHCP bindings are filtered. |
| *ipspecifier* | Displays the name of the interface. |
| **location** | Specifies the node location of the DHCP proxy. |
| *locationspecifier* | Displays the name of the location. |
| **mac-address** | Displays detailed client binding information based on mac-address. |
| **remote-id** | Displays the DHCP IPv4 proxy client binding based on remote ID. |
| **summary** | Displays the summary binding information for proxy. |
| **vrf** | Displays the VRF information. |
| *vrf_name* | Displays the name of the VRF. |
| \| | Displays the output modifiers. |

## Command Default

Displays brief information about all DHCP proxy client bindings.

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read |

## Examples

This is the sample output of the **show dhcp ipv4 proxy binding** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding
The show dhcp ipv4 proxy binding output is as follows:
                                                                        Lease

 MAC Address      IP Address      State    Remaining      Interface            VRF
Sublabel
--------------          --------------    ---------   ---------       --------------------
  ---------  ----------
0000.6602.0102    1.1.1.1             BOUND    3495         Gi0/1/0/0            default
  0x0


RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding mac-address  0000.6602.0102
MAC Address:      0000.6602.0102
IP Address:       1.1.1.1
Profile:          foo
State:            BOUND
Proxy Lease:                    86400 secs (1d00h)
Proxy Lease Remaining:  85942 secs (23:52:22)
Client Lease:                    600 secs (00:10:00)
Client Lease Remaining: 442 secs (00:07:22)
Client ID:        00-00-66-02-01-02
Interface:        GigabitEthernet0/1/0/0.200
VLAN Id:      200
VRF:              default
Subscriber Label: 0x0

RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding circuit-id CCCCCCCCCC
MAC Address:      0000.6602.0102
IP Address:       1.1.1.1
circuit-id:  CCCCCCCCCC
remote-id: RRRRRRRRRR
Profile:          foo
State:            BOUND
Proxy Lease:                    86400 secs (1d00h)
Proxy Lease Remaining:  85942 secs (23:52:22)
Client Lease:                    600 secs (00:10:00)
Client Lease Remaining: 442 secs (00:07:22)
Client ID:        00-00-66-02-01-02
Interface:        GigabitEthernet0/1/0/0.200
VLAN Id:      outer 200, inner 300
VRF:              default
Subscriber Label: 0x0

RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding remote-id RRRRRRRRRR
MAC Address:      0000.6602.0102
IP Address:       1.1.1.1
Profile:          foo
circuit-id:  CCCCCCCCCC
remote-id: RRRRRRRRRR
State:            BOUND
Proxy Lease:                    86400 secs (1d00h)
Proxy Lease Remaining:  85942 secs (23:52:22)
Client Lease:                    600 secs (00:10:00)
Client Lease Remaining: 442 secs (00:07:22)
Client ID:        00-00-66-02-01-02
Interface:        GigabitEthernet0/1/0/0
VRF:              default
Subscriber Label: 0x0

RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding detail
MAC Address:        ca01.3fcd.0000
VRF:                default
```

```
IP Address:         10.10.10.6
Gateway IP Address: 0.0.0.0
Server IP Address:  11.11.11.3
ReceivedCircuit ID: -
InsertedCircuit ID: -
ReceivedRemote ID:  -
InsertedRemote ID:  -
Profile:            proxyProfile
State:              BOUND
Proxy Lease:                    86400 secs (1d00h)
Proxy Lease Remaining:  85942 secs (23:52:22)
Client Lease:                    600 secs (00:10:00)
Client Lease Remaining: 442 secs (00:07:22)
Client ID:          0x00-0x76-0x6C-0x61-0x6E-0x31-0x30-0x30
Interface:          GigabitEthernet0/1/0/0.100
VLAN:               None
Subscriber Label:   0x0

RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding interface Gi0/1/0/0
                                                                    Lease

 MAC Address      IP Address      State    Remaining      Interface            VRF
Sublabel
--------------          --------------     ---------   ---------       --------------------
  ---------  ----------
0000.6602.0102    1.1.1.1             BOUND    3495         Gi0/1/0/0            default
  0x0
```

This is the sample output of the **show dhcp ipv4 proxy binding detail** command, that displays the detailed information of the IPoEv4 clients created as part of the dual-stack subscriber session. The IP-address, MAC-address, VRF-name, the interface on which the client is created and so on, are displayed as part of this command output.

```
RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy binding detail
Tue Jan 29   12:49:49.498 UTC

MAC   Address:                 0000.6401.0102

VRF:                          default


Server VRF:                 default

IP Address:                 10.10.10.10

Giaddr from   client:         0.0.0.0

Giaddr to   server:           10.10.10.1

Server IP   Address:           20.20.20.2

Server IP   Address to client: 10.10.10.1

ReceivedCircuit   ID:         -

InsertedCircuit   ID:         -

ReceivedRemote   ID:           -

InsertedRemote   ID:           -

ReceivedVSISO:               -
```

```
InsertedVSISO:              -

Auth. on   received relay info:FALSE

Profile:                    IPoEv4

State:                      BOUND

Proxy   lease:                3600 secs   (01:00:00)

Proxy lease   remaining:      3403 secs (00:56:43)

Client ID:                    0x00-0x00-0x64-0x01-0x01-0x02

Access   Interface:          Bundle-Ether1.10

Access VRF:                 default

VLAN Id:                    10

Subscriber   Label:          0x55

Subscriber   Interface:      Bundle-Ether1.10.ip22
```

## Related Commands

| Command | Description |
|---|---|
| dhcp ipv4 (BNG), on page 79 | Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4. |
| show dhcp ipv6 proxy binding (BNG), on page 152 | Shows the client bindings for Dynamic Host Configuration Protocol (DHCP) proxy. |

# show dhcp ipv4 proxy interface (BNG)

To display the proxy interface information for Dynamic Host Configuration Protocol (DHCP) IPv4, use the **show dhcp ipv4 proxy interface** command in EXEC mode.

**show dhcp ipv4 proxy interface** [*interface-type interface-name*] [**detail**]

## Syntax Description

| | |
|---|---|
| *interface-type* | Type of the proxy interface. |
| *interface-name* | Name of the proxy interface. |
| **detail** | Displays the detailed information of proxy interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was supported for BNG. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv4 proxy interface** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy interface bundle-Ether 70.16 detail
Sat Jan  5 14:25:53.484 UTC

Interface:          Bundle-Ether70.16
VRF:                default
Mode:               Proxy
Profile Name:       proxy1
Lease Limit:        per circuit id from AAA 2

Lease Count Details:
Circuit id from AAA                                             Count
c2                                                              1
```

This table describes the significant fields shown in the display.

***Table 7: show dhcp ipv4 proxy interface Command Field Descriptions***

| Field | Description |
|---|---|
| Lease Limit | Specifies the lease limit value sent from AAA server. |

| Field | Description |
|---|---|
| Count | Specifies the number of sessions on the router having the specific Circuit-ID received from the AAA server. |

# show dhcp ipv4 proxy profile

To display Dynamic Host Configuration Protocol (DHCP) proxy profile information, use the **show dhcp ipv4 proxy profile** command in the EXEC mode.

**show dhcp ipv4 proxy profile** {**name***profile_name* | }

## Syntax Description

| | |
|---|---|
| **name** | Displays the detailed proxy profile information. |
| *profile_name* | Specifies the profile name. |
| \| | Displays the output modifiers. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

This command displays the proxy profiles created for DHCP IPv4.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read |

## Examples

This is the sample output of the **show dhcp ipv4 proxy profile** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy profile
```

The show dhcp ipv4 proxy profile output is as follows:

```
Wed Jan 23 17:05:49.760 IST

DHCP IPv4 Proxy Profiles
--------------------------
DHCP_PROF_IPSUB
```

This table describes the significant fields shown in the display.

***Table 8: show dhcp ipv4 proxy profile Field Descriptions***

| Field | Description |
|---|---|
| DHCP IPv4 Proxy Profiles | Specifies all the DHCP IPv4 proxy profiles. |

# show dhcp ipv4 proxy statistics

To display statistics for a specific bridge domain, use the **show dhcp ipv4 proxy statistics** command in the EXEC mode.

**show dhcp ipv4 proxy statistics location** |]

## Syntax Description

| | |
|---|---|
| **location** | Specifies the node information for dhcp ipv4 proxy. |
| **\|** | Displays the output modifiers. |

## Command Default

Displays a table of DHCP proxy statistics.

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| ip-services | read |

## Examples

This is the sample output of the **show dhcp ipv4 proxy statistics** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv4 proxy statistics
```

The show dhcp ipv4 proxy statistics output is as follows:

```
Wed Jan 23 17:07:12.386 IST

                  VRF                     |       RX       |       TX       |       DR
|
-------------------------------------------------------------------------------------------
default                                   |            0   |            0   |            0   |
**nVSatellite                             |            0   |            0   |            0   |
```

This table describes the significant fields shown in the display.

***Table 9: show dhcp ipv4 proxy statistics Field Descriptions***

| Field | Description |
|---|---|
| VRF | Specifies the VRF in the DHCP proxy. The default is nVSatellite. |

# show dhcp ipv4/6 server cdm

To display the entries from the CDM memory for Dynamic Host Configuration Protocol (DHCP), use the **show dhcp ipv4 server cdm** or **show dhcp ipv6 server cdm** command in EXEC mode.

**show dhcp** { **ipv4** | | **ipv6** } **server** **cdm** [ **detail** ]

## Syntax Description

| | |
|---|---|
| **cdm** | Displays entries from CDM server. |
| **detail** | Displays detailed CDM entries for server. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 7.3.1 | This command is introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This snippet is a sample output from the **show dhcp ipv4 server cdm** command:

```
Router#show dhcp ipv4 server cdm

  Interface-Vlan                          Session-count        Session-limit
-------------------------------------------------------------------------------
  Bundle-Ether10100.9996:6.6              2000                 2000
  Bundle-Ether10100.9993:3.3              2000                 2000
  Bundle-Ether10100.9995:5.5              2000                 2000
  Bundle-Ether10100.9997:7.7              2000                 2000
  Bundle-Ether10100.9991:1.1              2000                 2000
  Bundle-Ether10100.9998:8.8              2000                 2000
  Bundle-Ether10100.9992:2.2              2000                 2000
  Bundle-Ether10100.9994:4.4              2000                 2000
```

This snippet is a sample output from the **show dhcp ipv6 server cdm** command:

```
Router#show dhcp ipv6 server cdm

  Interface-Vlan                          Session-count        Session-limit
-------------------------------------------------------------------------------
  Bundle-Ether10100.9996:6.6              2000                 2000
  Bundle-Ether10100.9993:3.3              2000                 2000
```

```
Bundle-Ether10100.9995:5.5              2000                2000
Bundle-Ether10100.9997:7.7              2000                2000
Bundle-Ether10100.9991:1.1              2000                2000
Bundle-Ether10100.9998:8.8              2000                2000
Bundle-Ether10100.9992:2.2              2000                2000
Bundle-Ether10100.9994:4.4              2000                2000
```

# show dhcp ipv6 proxy binding (BNG)

To display the client bindings for Dynamic Host Configuration Protocol (DHCP) proxy, use the **show dhcp ipv6 proxy binding** command in EXEC mode.

**show dhcp ipv6 proxy binding** {**detail** | **duid** | **interface** | **interface-id** | **location** | **mac-address** | **remote-id** | **summary** | **vrf**}

## Syntax Description

| | |
|---|---|
| **detail** | Displays detailed bindings for proxy. |
| **duid** | Displays client bindings for DUID. |
| **interface** | Displays client bindings by Interface. |
| **interface-id** | Displays client bindings by Interface ID. |
| **location** | Specifies the node location. |
| **mac-address** | Displays detailed client binding information. |
| **remote-id** | Displays client binding by Remote ID. |
| **summary** | Displays summary bindings for proxy. |
| **vrf** | Displays client bindings by VRF name. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.1.1 | This command was introduced. |
| Release 4.3.0 | This command was supported for BNG. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 proxy binding** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 proxy binding

Summary:
  Total number of Proxy bindings = 1
```

```
Prefix: 2001::/60 (Gi0/0/0/1)
  DUID: 00030001ca004a2d0000
  IAID: 00020001
  lifetime: 2592000
  expiration: Nov 25 2010 16:47

RP/0/RSP0/CPU0:router# show dhcp ipv6 proxy binding summary

Total number of clients: 2

     STATE              |             COUNT            |
                        |     IA-NA     |    IA-PD     |
-------------------------------------------------------
  INIT                  |            0  |           0  |
  SUB VALIDATING        |            0  |           0  |
  ADDR/PREFIX ALLOCATING|            0  |           0  |
  REQUESTING            |            0  |           0  |
  SESSION RESP PENDING  |            2  |           0  |
  ROUTE UPDATING        |            0  |           0  |
  BOUND                 |            0  |           0  |
```

# show dhcp ipv6 proxy interface (BNG)

To display the proxy interface information for Dynamic Host Configuration Protocol (DHCP), use the **show dhcp ipv6 proxy interface** command in EXEC mode.

**show dhcp ipv6 proxy interface** {*typeinterface-path-id*} {**location***location*}

## Syntax Description

| | |
|---|---|
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark ( **?** ) online help function. |
| **location** | Displays the node location by Interface. |
| *location* | Displays the fully qualified location specification of an interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 proxy interface** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 proxy interface

Tue Sep  4 19:14:54.056 UTC
Codes: Amb - Ambiguous VLAN, B - Base, R - Relay, P - Proxy,
       SR - Server, S - Snoop, C - Client, INV - Invalid
       CID - Circuit Id, RID - Remote Id, INTF - Interface

Interface              Mode Profile Name                          Amb Lease Limit
-------------------------------------------------------------------------------
BE1.100                P    pxy1                                  No  None
BE1.200                P    pxy1                                  No  None
BE1.250                P    pxy1                                  Yes None
```

```
BE1.400                P    pxy1                                  Yes None
```

# show dhcp ipv6 proxy profile

To display the proxy profile information for Dynamic Host Configuration Protocol (DHCP) proxy, use the **show dhcp ipv6 proxy profile** command in EXEC mode.

**show dhcp ipv6 proxy profile name** *profile_name* {**location***location*}

## Syntax Description

| | |
|---|---|
| **name** | Displays the detailed proxy profile information for the profile. |
| *profile_name* | Specifies the name of the profile. |
| **location** | Displays the node location by Interface. |
| *location* | Displays the fully qualified location specification of an interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 proxy profile** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 proxy profile

Tue Sep  4 05:00:57.938 UTC

DHCP IPv6 Proxy Profiles
-------------------------
pxy1
pxy_pppoe1
pxy_pppoe2
```

# show dhcp ipv6 proxy statistics

To display the statistics for Dynamic Host Configuration Protocol (DHCP) proxy, use the **show dhcp ipv6 proxy statistics** command in EXEC mode.

**show dhcp ipv6 proxy statistics** {**debug** | **location** | **vrf**}

## Syntax Description

| | |
|---|---|
| **debug** | Displays the debug statistics for the proxy. |
| **location** | Displays the node location for the proxy. |
| **vrf** | Displays the proxy statistics by VRF. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 proxy statistics** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 proxy statistics

Wed Sep  5 01:10:35.650 UTC

                  VRF                     |       RX        |       TX        |        DR
|
-------------------------------------------------------------------------------------------

 default                                  |            23   |            28   |             0
|
 red                                      |             0   |             0   |             0
|
 blue                                     |             0   |             0   |             0
|
 green                                    |             6   |             0   |             0
|
 orange                                   |             0   |             0   |             0
|
 test_vrf                                 |             0   |             0   |             0
|
 dhcpclient                               |             0   |             0   |             0
|
```

```
 dhcpserver                                |             0  |             0  |             0
|
```

# show dhcp ipv6 server binding

To display the client bindings for Dynamic Host Configuration Protocol (DHCP) server, use the **show dhcp ipv6 server binding** command in EXEC mode.

**show dhcp ipv6 server binding** {**detail** | **duid** | **interface** | **interface-id** | **location** | **mac-address** | **remote-id** | **summary** | **vrf**}

## Syntax Description

| | |
|---|---|
| **detail** | Displays detailed bindings for proxy. |
| **duid** | Displays client bindings for DUID. |
| **interface** | Displays client bindings by Interface. |
| **interface-id** | Displays client bindings by Interface ID. |
| **location** | Specifies the node location. |
| **mac-address** | Displays detailed client binding information. |
| **remote-id** | Displays client binding by Remote ID. |
| **summary** | Displays summary bindings for proxy. |
| **vrf** | Displays client bindings by VRF name. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 server binding** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 server binding location 0/RSP0/CPU0
Summary:
Total number of clients: 3
  DUID  : 000300010000641e0103
  MAC Address: 0000.641e.0103
  Client Link Local: fe80::200:64ff:fe1e:103
  Sublabel: 0x82f
```

```
    IA ID: 0xb100
      STATE: BOUND
      IPv6 Prefix:  2004:4:4:6::/64 (Bundle-Ether2.3)
        lifetime  : 600 secs (00:10:00)
        expiration: 327 secs (00:05:27)
  DUID  : 000300010000641e0104
  MAC Address: 0000.641e.0104
  Client Link Local: fe80::200:64ff:fe1e:104
  Sublabel: 0x870
    IA ID: 0xb101
      STATE: BOUND
      IPv6 Prefix:  2004:4:4:a::/64 (Bundle-Ether2.3)
        lifetime  : 600 secs (00:10:00)
        expiration: 327 secs (00:05:27)
  DUID  : 000300010000641e0105
  MAC Address: 0000.641e.0105
  Client Link Local: fe80::200:64ff:fe1e:105
  Sublabel: 0x8b5
    IA ID: 0xb102
      STATE: BOUND
      IPv6 Prefix:  2004:4:4:b::/64 (Bundle-Ether2.3)
        lifetime  : 600 secs (00:10:00)
        expiration: 397 secs (00:06:37)

RP/0/RSP0/CPU0:router# show dhcp ipv6 server binding summary
Tue Sep  4 04:58:19.580 UTC

Total number of clients: 3

     STATE               |              COUNT             |
                         |     IA-NA     |    IA-PD       |
-------------------------------------------------------------
  INIT                   |            0  |           0    |
  SUB VALIDATING         |            0  |           0    |
  ADDR/PREFIX ALLOCATING |            0  |           0    |
  REQUESTING             |            0  |           0    |
  SESSION RESP PENDING   |            0  |           0    |
  ROUTE UPDATING         |            0  |           0    |
  BOUND                  |            0  |           3    |


RP/0/RSP0/CPU0:router#show dhcp ipv6 server binding detail
Tue Sep  4 04:59:41.765 UTC

Client Link Local:      fe80::200:64ff:fe1e:103
MAC Address:            0000.641e.0103
Profile:                test
Client DUID:            000300010000641e0103
Client Flag:            0x80080811
Subscriber VRF:         abc
Class Name:             -
Access Interface:       Bundle-Ether2.3
Access VRF:             abc
Subscriber Label:       0x82f
VLAN Id:                3
ReceivedRemote ID:      -
ReceivedInterface ID:   -
Prefix Pool Name:       p2
Address Pool Name:      -
  IA ID:                0xb100
    STATE:              BOUND
      IPv6 Prefix:      2004:4:4:6::/64 (Bundle-Ether2.3)
        lifetime:       600 secs (00:10:00)
        expiration:     515 secs (00:08:35)
```

```
Client Link Local:      fe80::200:64ff:fe1e:104
MAC Address:            0000.641e.0104
Profile:                test
Client DUID:            000300010000641e0104
Client Flag:            0x80080811
Subscriber VRF:         abc
Class Name:             -
Access Interface:       Bundle-Ether2.3
Access VRF:             abc
Subscriber Label:       0x870
VLAN Id:                3
ReceivedRemote ID:      -
ReceivedInterface ID:   -
Prefix Pool Name:       p2
Address Pool Name:      -
  IA ID:                0xb101
    STATE:              BOUND
      IPv6 Prefix:      2004:4:4:a::/64 (Bundle-Ether2.3)
        lifetime:       600 secs (00:10:00)
        expiration:     515 secs (00:08:35)

Client Link Local:      fe80::200:64ff:fe1e:105
MAC Address:            0000.641e.0105
Profile:                test
Client DUID:            000300010000641e0105
Client Flag:            0x80080811
Subscriber VRF:         abc
Class Name:             -
Access Interface:       Bundle-Ether2.3
Access VRF:             abc
Subscriber Label:       0x8b5
VLAN Id:                3
ReceivedRemote ID:      -
ReceivedInterface ID:   -
Prefix Pool Name:       p2
Address Pool Name:      -
  IA ID:                0xb102
    STATE:              BOUND
      IPv6 Prefix:      2004:4:4:b::/64 (Bundle-Ether2.3)
        lifetime:       600 secs (00:10:00)
        expiration:     585 secs (00:09:45)
```

# show dhcp ipv6 server interface

To display the server interface information for Dynamic Host Configuration Protocol (DHCP), use the **show dhcp ipv6 server interface** command in EXEC mode.

**show dhcp ipv6 server interface** {*typeinterface-path-id*} {**location***location*}

## Syntax Description

| | |
|---|---|
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Either a physical interface instance or a virtual interface instance as follows:<br>• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.<br>  • *rack*: Chassis number of the rack.<br>  • *slot*: Physical slot number of the modular services card or line card.<br>  • *module*: Module number. A physical layer interface module (PLIM) is always 0.<br>  • *port*: Physical port number of the interface.<br>**Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.<br>• Virtual interface instance. Number range varies depending on interface type.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **location** | Displays the node location by Interface. |
| *location* | Displays the fully qualified location specification of an interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 server interface** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 server interface bundle-Ether 2.3


Tue Sep  4 05:02:03.861 UTC

Interface:          Bundle-Ether2.3
VRF:                abc
Mode:               Server
Profile Name:       test
Lease Limit:        None
```

# show dhcp ipv6 server profile

To display the server profile information for Dynamic Host Configuration Protocol (DHCP) server, use the **show dhcp ipv6 server profile** command in EXEC mode.

**show dhcp ipv6 server profile name** *profile_name* {**location***location*}

## Syntax Description

| | |
|---|---|
| **name** | Displays the detailed proxy profile information for the profile. |
| *profile_name* | Specifies the name of the profile. |
| **location** | Displays the node location by Interface. |
| *location* | Displays the fully qualified location specification of an interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 server profile** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 server profile name test

Tue Sep  4 05:00:57.938 UTC

Profile: test
DNS Addresses:None
Client Lease Time: 0 secs (00:00:00)
Framed Address Pool: p1
Delegated Prefix Pool: p2
Interface References:
Bundle-Ether2.3
```

# show dhcp ipv6 server statistics

To display the statistics for Dynamic Host Configuration Protocol (DHCP) server, use the **show dhcp ipv6 server statistics** command in EXEC mode.

**show dhcp ipv6 server statistics** {**debug** | **location** | **vrf**}

## Syntax Description

| | |
|---|---|
| **debug** | Displays the debug statistics for the proxy. |
| **location** | Displays the node location for the proxy. |
| **vrf** | Displays the proxy statistics by VRF. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ip-services | read |

This is a sample output from the **show dhcp ipv6 server statistics** command:

```
RP/0/RSP0/CPU0:router# show dhcp ipv6 server statistics

  Tue Sep  4 19:13:47.472 UTC

                  VRF                       |       RX        |       TX        |        DR
|
-------------------------------------------------------------------------------------------

 default                                    |         10003   |         11651   |             3
|
 red                                        |             0   |             0   |             0
|
 blue                                       |             0   |             0   |             0
|
 green                                      |             0   |             0   |             0
|
 orange                                     |             0   |             0   |             0
|
 test_vrf                                   |             0   |             0   |             0
|
 dhcpclient                                 |             0   |             0   |             0
|
```

```
 dhcpserver                                |             0  |             0  |             0
|
```



# BNG Interface Commands

This module describes the Cisco IOS XR software commands used to configure and verify the interfaces for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- encapsulation ambiguous dot1ad, on page 168
- encapsulation ambiguous dot1q, on page 170
- show ethernet tags, on page 172

# encapsulation ambiguous dot1ad

To configure encapsulated ambiguous VLANs with IEEE 802.1ad Provider Bridging (PB) encapsulation type on an access-interface, use the **encapsulation ambiguous dot1ad** command in the interface configuration mode. To remove the encapsulated ambiguous VLANs, use the **no** form of this command.

**encapsulation ambiguous dot1ad** {**any** *vlan-id vlan-range*} [**dot1q** {**any** *vlan-range*}]

## Syntax Description

| | |
|---|---|
| **any** | Specifies the matching criteria as **any** VLAN tag in the range 1 to 4094. |
| *vlan-id* | VLAN-ID for the outer VLAN. |
| *vlan-range* | VLAN range for the outer and inner VLANs.<br>The range is given in comma-separated, or hyphen-separated format, or a combination of both. |
| **dot1q** | Indicates that the IEEE 802.1q standard encapsulation type is used for the inner tag. |

## Command Default

None

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.2.0 | The support for outer VLAN range was added in BNG. |

## Usage Guidelines

The valid combinations of ambiguous VLAN configurations in BNG, with IEEE 802.1ad Provider Bridging (PB) encapsulation type are:

- **encapsulation ambiguous dot1ad** {**any** | *vlan-range* }
- **encapsulation ambiguous dot1ad** *vlan-id* **dot1q** { **any** | *vlan-range* }
- **encapsulation ambiguous dot1ad** *vlan-range* **dot1q any**



**Note** Although **encapsulation ambiguous dot1ad** is supported, it is not commonly used in BNG deployments.

## Task ID

| Task ID | Operation |
|---|---|
| interface | read, write |

These examples show how to configure ambiguous VLANs with IEEE 802.1ad Provider Bridging (PB) encapsulation type on an access-interface.

Single-tagged ambiguous VLAN configuration where the matching criteria for the outer VLAN is specified as **any**:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#interface Bundle-Ether100.10
RP/0/RSP0/CPU0:router(config-subif)#encapsulation ambiguous dot1ad any
```

Ambiguous VLAN configuration where the match criteria for outer VLAN is specified as VLAN-Id and that for inner VLAN is specified as a range:

```
RP/0/RSP0/CPU0:router(config-subif)#encapsulation ambiguous dot1ad 14 dot1q 100,200,300-400
```

Ambiguous VLAN configuration with outer VLAN range:

```
(config-subif)#encapsulation ambiguous dot1ad 1-1000 dot1q any
```

## Related Commands

| Command | Description |
|---|---|
| encapsulation ambiguous dot1q, on page 170 | Configures encapsulated ambiguous VLANs with IEEE 802.1q encapsulation type, on an access-interface in BNG. |

# encapsulation ambiguous dot1q

To configure encapsulated ambiguous VLANs with IEEE 802.1q encapsulation type on an access-interface, use the **encapsulation ambiguous dot1q** command in the interface configuration mode. To remove the encapsulated ambiguous VLANs, use the **no** form of this command.

**encapsulation ambiguous dot1q** {**any** *vlan-id vlan-range*} [**second-dot1q** {**any** *vlan-id vlan-range*}]

## Syntax Description

| | |
|---|---|
| **any** | Specifies the matching criteria as **any** VLAN tag in the range 1 to 4094. |
| *vlan-id* | VLAN-ID for the outer and inner VLANs.<br>The range is from 0 to 4094. |
| *vlan-range* | VLAN range for the outer and inner VLANs.<br>The range is given in comma-separated, or hyphen-separated format, or a combination of both. |

## Command Default

None

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.1 | The support for **encapsulation ambiguous dot1q any second-dot1q** { **any** \| *vlan-id*} was added. |
| Release 5.2.0 | The support for outer VLAN range was added in BNG. |

## Usage Guidelines

The valid combinations of ambiguous VLAN configurations in BNG, with IEEE 802.1q encapsulation type are:

- **encapsulation ambiguous dot1q** {**any** | *vlan-range* }
- **encapsulation ambiguous dot1q** *vlan-id* **second-dot1q** { **any** | *vlan-range* }
- **encapsulation ambiguous dot1q any second-dot1q** { **any** | *vlan-id* }
- **encapsulation ambiguous dot1q** *vlan-range* **second-dot1q any**

For ambiguous VLAN dot1q configuration where the match criteria is explicitly configured for inner and outer VLAN tags or where a range is specified or where **any** is used for outer VLAN tag, the MTU is calculated by adding 8 bytes (2xdot1q tags) to the default MTU. That is, if default is 1514, the MTU is set to 1522 bytes in such scenarios. Whereas, for configurations where the match criteria for inner VLAN is specified as **any**, the MTU on the sub-interface is calculated by adding 4 (and not 8) bytes to the main interface MTU. That is, 1514 + 4 = 1518 bytes. This behavior is applicable for both physical interfaces and bundle sub-interfaces.

## Task ID

| Task ID | Operation |
|---|---|
| interface | read, write |

These examples show how to configure ambiguous VLANs with IEEE 802.1q encapsulation type on an access-interface.

Single-tagged ambiguous VLAN configuration where the match criteria for outer VLAN is specified as **any**:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether100.10
RP/0/RSP0/CPU0:router(config-subif)# encapsulation ambiguous dot1q any
```

Ambiguous VLAN configuration where the match criteria for outer VLAN is specified as VLAN-ID and that for inner VLAN is specified as a range:

```
RP/0/RSP0/CPU0:router(config-subif)# encapsulation ambiguous dot1q 14 second-dot1q 100-200
```

Ambiguous VLAN configuration where the match criteria for outer VLAN and inner VLAN is specified as **any**:

```
(config-subif)# encapsulation ambiguous dot1q any second-dot1q any
```

Ambiguous VLAN configuration with a single outer VLAN range and inner VLAN specified as **any**:

```
(config-subif)# encapsulation ambiguous dot1q 1-1000 dot1q any
```

Ambiguous VLAN configuration with 9 outer VLAN ranges and inner VLAN specified as **any**:

```
(config-subif)# encapsulation ambiguous dot1q 9-18, 19-25, 26, 27-30, 32, 33-40, 42, 43-50,
 52 second-dot1q any
```

## Related Commands

| Command | Description |
|---|---|
| encapsulation ambiguous dot1ad, on page 168 | Configures encapsulated ambiguous VLANs with IEEE 802.1ad Provider Bridging (PB) encapsulation type, on an access-interface in BNG. |

# show ethernet tags

To display the ethernet tag match information, use the **show ethernet tags** command in EXEC mode.

**show ethernet tags** [*interface-type interface-path-id*] [**detail**] [**location** *node-id*] [**match-order**]

## Syntax Description

| | |
|---|---|
| *interface-type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **match-order** | Displays the high priority matches first. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

For ambiguous VLAN dot1q configuration where the match criteria is explicitly configured for inner and outer VLAN tags or where a range is specified or where **any** is used for outer VLAN tag, the MTU is calculated by adding 8 bytes (2xdot1q tags) to the default MTU. That is, if default is 1514, the MTU is set to 1522 bytes in such scenarios. Whereas, for configurations where the match criteria for inner VLAN is specified as **any**, the MTU on the sub-interface is calculated by adding 4 (and not 8) bytes to the main interface MTU. That is, 1514 + 4 = 1518 bytes. This behavior is applicable for both physical interfaces and bundle sub-interfaces.

## Task ID

| Task ID | Operation |
|---|---|
| ethernet-services | read |

This is a sample output of the **show ethernet tags** command:

```
RP/0/RSP0/CPU0:router#show ethernet tags tengigE 0/0/0/0.1
St:    AD - Administratively Down, Dn - Down, Up - Up
Ly:    L2 - Switched layer 2 service, L3 = Terminated layer 3 service,
Xtra   C - Match on Cos, E  - Match on Ethertype, M - Match on source MAC
-,+:   Ingress rewrite operation; number of tags to pop and push respectively

Interface              St  MTU  Ly Outer           Inner            Xtra -,+
Te0/0/0/0.1            Up  1522 L3 .1Q:10          .1Q:100-200      -    0 0
```

This is a sample output of the **show ethernet tags detail** command for BNG outer VLAN range feature:

```
RP/0/RSP0/CPU0:router#show ethernet tags tengigE 0/1/0/10.12 detail
GigabitEthernet0/1/0/10.12 is up, service is L3
    Interface MTU is 1518
   Outer Match: Dot1Q VLAN 11-20,21-30,31-60,61-100,101-140,141-180,181-220,221-260,261-300

    Inner Match: Dot1Q VLAN any
    Local traffic encap: -
    Pop 0 tags, push none
```



# DIAMETER Commands

This module describes the Cisco IOS XR software commands used to configure DIAMETER interface for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- address (DIAMETER), on page 177
- clear diameter peer, on page 178
- clear diameter statistics, on page 179
- destination host, on page 180
- destination realm, on page 181
- diameter attribute list, on page 182
- diameter gx, on page 184
- diameter gx retransmit, on page 185
- diameter gx tx-timer, on page 186
- diameter gy, on page 187
- diameter gy retransmit, on page 188
- diameter gy tx-timer, on page 189
- diameter origin host, on page 190
- diameter origin realm, on page 191
- diameter peer, on page 192
- diameter tls trustpoint, on page 193
- diameter vendor supported, on page 194
- ip vrf forwarding, on page 195
- peer-type, on page 196
- prepaid-config, on page 197
- server (DIAMETER), on page 198
- source-interface (DIAMETER), on page 199
- test aaa group diameter, on page 200
- timer (DIAMETER), on page 202
- transport (DIAMETER), on page 204
- transport security-type, on page 205

- show diameter, on page 206
- show diameter gx, on page 207
- show diameter gy, on page 209
- show diameter nas, on page 211
- show diameter peer, on page 214
- show checkpoint dynamic process (DIAMETER), on page 216

# address (DIAMETER)

To configure IPv4 or IPv6 address of DIAMETER peer, use the **address** command in DIAMETER peer configuration mode. To remove the IPv4 or IPv6 address of DIAMETER peer, use the **no** form of this command.

**address** {**ipv4** | **ipv6**} *ipaddress*

## Syntax Description

| | |
|---|---|
| *ipaddress* | Specifies the IPv4 or IPv6 address of DIAMETER peer. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure an IPv4 address for DIAMETER peer in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# address ipv4 2.2.2.2
```

# clear diameter peer

To reset DIAMETER peer connection in BNG, use the **clear diameter peer** command in EXEC mode.

**clear diameter peer** *peer-name*

## Syntax Description

| | |
|---|---|
| *peer-name* | The DIAMETER peer name. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

This command resets the peer connection. The connection to the peer is re-established after the connection timeout.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | write |

This example shows how to reset DIAMETER peer connection in BNG:

```
RP/0/RSP0/CPU0:router# clear diameter peer peer1
```

## Related Commands

| Command | Description |
|---|---|
| clear diameter statistics, on page 179 | Clears DIAMETER peer statistics in BNG |

# clear diameter statistics

To clear DIAMETER peer statistics in BNG, use the **clear diameter statistics** command in EXEC mode.

**clear diameter statistics** [**gx** | **gy** | **nas**]

## Syntax Description

| | |
|---|---|
| **gx** | (Optional) Clears the statistics of Gx application. |
| **gy** | (Optional) Clears the statistics of Gy application. |
| **nas** | (Optional) Clears the statistics of NAS application. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

Executing the **clear diameter statistics** command without any arguments, clears all the DIAMETER peer statistics.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | write |

This example shows how to clear NAS statistics:

```
RP/0/RSP0/CPU0:router# clear diameter statistics nas
```

## Related Commands

| Command | Description |
|---|---|
| clear diameter peer, on page 178 | Resets DIAMETER peer connection in BNG |

# destination host

To configure the hostname of the DIAMETER peer in BNG, use the **destination host** command in DIAMETER peer configuration mode. To remove the hostname of the DIAMETER peer, use the **no** form of this command.

**destination host** *host-name*

## Syntax Description

| | |
|---|---|
| *host-name* | Specifies the hostname of the DIAMETER peer in Fully Qualified Domain Name(FQDN) format.<br>This value is sent in various messages, so that intermediate proxies can route the packets properly. |

## Command Default

None

## Command Modes

DIAMETER peer configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the hostname of the DIAMETER peer in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# destination host dcca1.cisco.com
```

## Related Commands

| Command | Description |
|---|---|
| destination realm, on page 181 | Configures the realm to which the DIAMETER peer belongs to. |

# destination realm

To configure the realm to which the DIAMETER peer belongs to, use the **destination realm** command in DIAMETER peer configuration mode. To remove the realm configuration, use the **no** form of this command.

**destination relam** *realm-string*

## Syntax Description

| | |
|---|---|
| *realm-string* | Specifies the hostname of the DIAMETER peer in Fully Qualified Domain Name(FQDN) format.<br>This value is sent in various messages, so that intermediate proxies can route the packets properly. |

## Command Default

None

## Command Modes

DIAMETER peer configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

The destination realm is added by the AAA clients while sending a request to AAA server, using AAA_AT_DESTINATION_REALM attribute. If this attribute is not present, then the realm information is retrieved using the **User name** field. If the clients do not add the attribute, then the value configured in the peer mode is used while sending messages to the destination peer.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the realm to which the DIAMETER peer belongs to:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# destination realm GX_REALM
```

## Related Commands

| Command | Description |
|---|---|
| destination host, on page 180 | Configures the hostname of the DIAMETER peer in BNG. |

# diameter attribute list

To configure attribute list parameters for DIAMETER test command in BNG, use the **diameter attribute list** command in Global Configuration mode. To remove this configuration, use the **no** form of this command.

**diameter attribute list** *list-num* [**attribute** {*attr-id* | **vendor-id** *vendor-id*} *attr-format* *attr-value* [**mandatory**]]

## Syntax Description

| | |
|---|---|
| *list-num* | DIAMETER attribute list number.<br>The range is from 0 to 99. |
| **attribute** | Specifies an attribute definition. |
| *attr-id* | Attribute ID value.<br>The range is from 1 to 65535. |
| **vendor-id** | Specifies the vendor ID. |
| *vendor-id* | Vendor ID value.<br>The range is from 0 to 4294967295. |
| *attr-format* | Specifies the attribute format. The options are:<br>• address<br>• binary<br>• boolean<br>• diameter-identity<br>• enum<br>• grouped<br>• string<br>• ulong |
| *attr-value* | Attribute value as per the attribute format.<br>For boolean, enum and ulong formats, the range is from 0 to 4294967295.<br>For grouped formats, the range is from 0 to 99. |

## Command Default

None

**Command Modes**

Global Configuration mode

**Command History**

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

**Usage Guidelines**

This command is used along with the **test aaa group diameter** command, to define the attribute list. Based on the attribute list number, the attributes are sent as part of the test command.

**Task ID**

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure attribute list parameters for DIAMETER test command in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter attribute list 1
RP/0/RSP0/CPU0:router(config-dia-attr-list)# attribute vendor-id 0 8 address 5.6.7.8 mandatory
RP/0/RSP0/CPU0:router(config-dia-attr-list)# attribute vendor-id 0 416 enum 1 mandatory
RP/0/RSP0/CPU0:router(config-dia-attr-list)#  attribute vendor-id 9 14000 string
abcd:abcd:abcd
```

**Related Commands**

| Command | Description |
|---|---|
| test aaa group diameter, on page 200 | Tests various DIAMETER application behaviors in BNG. |

# diameter gx

To enable Gx application in BNG under the DIAMETER process, use the **diameter gx** command in Global Configuration mode. To disable Gx application in BNG, use the **no** form of this command, followed by a DIAMETER process restart.

**diameter gx**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

**Note** The **no** form of this command does not have any impact until followed by a DIAMETER process restart.

The **no diameter gx** command must not be executed when there are active subscriber sessions on the router.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to enable Gx application in BNG under the DIAMETER process:

```
RP/0/RSP0/CPU0:router(config)# diameter gx
```

## Related Commands

| Command | Description |
|---|---|
| diameter gy, on page 187 | Enables Gy application in BNG under the DIAMETER process. |

# diameter gx retransmit

To configure the retransmit count for Gx application, use the **diameter gx retransmit** command inGlobal Configuration mode. To remove this configuration, use the **no** form of this command.

**diameter gx retransmit** *count*

## Syntax Description

| | |
|---|---|
| *count* | Specifies the value of the retransmit count, in seconds. The range is from 1 to 10; the default is 1. |

## Command Default

If the retransmit count is not configured, it is 1 second, by default.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to set the retransmit count value to 8 seconds, for Gx application:

```
RP/0/RSP0/CPU0:router(config)# diameter gx retransmit 8
```

## Related Commands

| Command | Description |
|---|---|
| diameter gy retransmit, on page 188 | Configures the retransmit count for Gy application. |

# diameter gx tx-timer

To configure the transaction timer for Gx application, use the **diameter gx tx-timer** command inGlobal Configuration mode. To remove this configuration, use the **no** form of this command.

**diameter gx tx-timer** *timer-value*

## Syntax Description

| | |
|---|---|
| *timer-value* | Specifies the value of the transaction timer in seconds. The range is from 6 to 1000; the default is 15. |

## Command Default

If the timer value is not configured, it is 15 seconds, by default.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to set the transaction timer value to 7 seconds for Gx application:

```
RP/0/RSP0/CPU0:router(config)# diameter gx tx-timer 7
```

## Related Commands

| Command | Description |
|---|---|
| diameter gy tx-timer, on page 189 | Configures the transaction timer for Gy application. |

# diameter gy

To enable Gy application in BNG under the DIAMETER process, use the **diameter gy** command in Global Configuration mode. To disable Gy application in BNG under the DIAMETER process, use the **no** form of this command, followed by a DIAMETER process restart.

**diameter gy**

## Syntax Description



**Note** The **no** form of this command does not have any impact until followed by a process restart of DIAMETER process.

The **no diameter gy** command must not be executed when there are active subscriber sessions on the router.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command is introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to enable Gy application in BNG under the DIAMETER process:

```
RP/0/RSP0/CPU0:router(config)# diameter gy
```

## Related Commands

| Command | Description |
|---|---|
| diameter gx, on page 184 | Enables Gx application in BNG under the DIAMETER process. |

# diameter gy retransmit

To configure the retransmit count for Gy application, use the **diameter gy retransmit** command inGlobal Configuration mode. To remove this configuration, use the **no** form of this command.

**diameter gy retransmit** *count*

## Syntax Description

| | |
|---|---|
| *count* | Specifies the value of the retransmit count, in seconds. The range is from 1 to 10; the default is 1. |

## Command Default

If the retransmit count is not configured, it is 1 second, by default.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to set the retransmit count to 8 seconds, for Gy application:

```
RP/0/RSP0/CPU0:router(config)# diameter gy retransmit 8
```

## Related Commands

| Command | Description |
|---|---|
| diameter gx retransmit, on page 185 | Configures the retransmit count for Gx application. |

# diameter gy tx-timer

To configure the transaction timer for Gy application, use the **diameter gy tx-timer** command inGlobal Configuration mode. To remove this configuration, enter the **no** form of this command.

**diameter gy tx-timer** *timer-value*

## Syntax Description

| | |
|---|---|
| *timer-value* | Specifies the value of the transaction timer in seconds. The range is from 6 to 1000; the default is 15. |

## Command Default

If the timer value is not configured, it is 15 seconds, by default.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to set the transaction timer value to 7 seconds for Gy application.

```
RP/0/RSP0/CPU0:router(config)# diameter gy tx-timer 7
```

## Related Commands

| Command | Description |
|---|---|
| diameter gx tx-timer, on page 186 | Configures the transaction timer for Gx application. |

# diameter origin host

To configure the origin host information of DIAMETER server in BNG, use the **diameter origin host** command in Global Configuration mode. To remove this origin host information of DIAMETER server, use the **no** form of this command.

**diameter origin host** *host-name*

## Syntax Description

| | |
|---|---|
| *host-name* | Specifies the DIAMETER server's origin host either as a fully qualified domain name (FQDN) or as an IPv4 or IPv6 address. |

## Command Default

The origin host is set as a null string.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

If you do not specify the origin host, a null string is assumed as the origin host name. Therefore, this is a mandatory configuration.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to configure the DIAMETER origin host information in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter origin host BNG-1.cisco.com
```

## Related Commands

| Command | Description |
|---|---|
| diameter origin realm, on page 191 | Configures the origin realm information of DIAMETER server in BNG. |

# diameter origin realm

To configure the origin realm information of DIAMETER server in BNG, use the **diameter origin realm** command in Global Configuration mode. To remove this origin realm information of DIAMETER server, use the **no** form of this command.

**diameter origin realm** *realm-string*

## Syntax Description

| | |
|---|---|
| *realm-string* | Specifies the DIAMETER origin realm string either as a fully qualified domain name (FQDN) or as an IPv4 or IPv6 address. |

## Command Default

The default realm name string is a null string.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command is introduced. |

## Usage Guidelines

If you do not specify the origin realm, a null string is assumed as the origin realm name. Therefore, this is a mandatory configuration.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to configure the origin realm information of DIAMETER server in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter origin realm cisco.com
```

## Related Commands

| Command | Description |
|---|---|
| diameter origin host, on page 190 | Configures the origin host information of DIAMETER server in BNG. |

# diameter peer

To configure a DIAMETER peer and to enter the DIAMETER peer sub-configuration mode in BNG, use the **diameter peer** command in Global Configuration mode. To remove the diameter peer configuration, use the **no** form of this command.

**diameter peer** *peer-name*

## Syntax Description

| | |
|---|---|
| *peer-name* | Specifies the name of the diameter peer. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to configure a DIAMETER peer in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)#
```

# diameter tls trustpoint

To configure the trustpoint name to be used in the certificate to be used for DIAMETER TLS exchange, use the **diameter tls trustpoint** command in Global Configuration mode. To remove the DIAMETER trustpoint configuration, use the **no** form of this command.

**diameter tls trustpoint** *label*

## Syntax Description

| | |
|---|---|
| *label* | Specifies the trustpoint label name to be used for DIAMETER TLS exchange. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

If no trustpoint is provided, then the default trustpoint is used.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the trustpoint label name to be used for DIAMETER TLS exchange:

```
RP/0/RSP0/CPU0:router(config)# diameter tls trustpoint trustpoint1
```

# diameter vendor supported

To specify the vendor attribute-value pairs (AVPs) that the DIAMETER node can recognize, use the **diameter vendor supported** command in Global Configuration mode. This information is passed to the peer in capability exchange messages. To remove this configuration, use the **no** form of this command.

**diameter vendor supported** {*cisco etsi 3gpp vodafone*}

## Syntax Description

| | |
|---|---|
| *cisco* | Specifies that Cisco AVPs are recognized by the DIAMETER node. |
| *etsi* | Specifies that ETSI AVPs are recognized by the DIAMETER node. |
| *3gpp* | Specifies that 3GPP AVPs are recognized by the DIAMETER node. |
| *vodafone* | Specifies that Vodafone AVPs are recognized by the DIAMETER node. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command is introduced. |

## Usage Guidelines

You can have multiple vendors' AVPs supported. So, you can run this command multiple times with a different vendor ID on each instance.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

### Example

This example shows how to specify that the DIAMETER node recognizes Cisco AVPs:

```
RP/0/RSP0/CPU0:router(config)# diameter vendor supported cisco
```

# ip vrf forwarding

To configure the VRF associated with the DIAMETER peer, to establish connections with the peers immediately after configuring them, use the **ip vrf forwarding** command in DIAMETER peer configuration mode. To remove the VRF associated with the peer, use the **no** form of this command.

**ip vrf forwarding** *vrf_table_name*

## Syntax Description

| | |
|---|---|
| *vrf_table_name* | Name of the VRF table. |

## Command Default

None

## Command Modes

DIAMETER peer configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

If this command is not configured, then the global routing table is used for establishing the connection with the peer.

If the VRF associated with the name is not configured, then an error message mentioning so is displayed, and this command does not have any effect.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the VRF associated with the DIAMETER peer:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# ip vrf forwarding VRF1
```

# peer-type

To configure the DIAMETER peer type in BNG, use the **peer-type** command in DIAMETER peer configuration mode . To remove the DIAMETER peer type configuration, use the **no** form of this command.

**peer-type server**

## Syntax Description

| | |
|---|---|
| **server** | Specifies that the DIAMETER peer is a server. |

## Command Default

None

## Command Modes

DIAMETER peer configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

By default, the **peer-type** is server.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the DIAMETER peer type in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# peer-type server
```

# prepaid-config

To configure prepaid feature in BNG, use the **prepaid-config** command in dynamic template type service configuration mode. To remove this prepaid feature configuration, use the **no** form of this command.

**prepaid-config** *feature-name*

## Syntax Description

| | |
|---|---|
| *feature-name* | Pre-configured prepaid feature name. |

## Command Default

None

## Command Modes

Dynamic template type service

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

You must use already defined subscriber prepaid feature to program the feature name in dynamic template.

Service accounting configuration (using **accounting aaa list default type service** command) is mandatory for the functioning of prepaid services.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure prepaid feature in BNG:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type service service1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# prepaid-config feature1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# accounting aaa list default type service
```

# server (DIAMETER)

To attach the globally configured DIAMETER server (having the same name) to the server group, use the **server** command in DIAMETER server group configuration mode . To detach the globally configured DIAMETER server from the server group, use the **no** form of this command.

**server** *peer-name*

## Syntax Description

| | |
|---|---|
| *peer-name* | Specifies the name of DIAMETER peer. |

## Command Default

None

## Command Modes

DIAMETER server group configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

If a server is not configured globally with the same *peer_name*, then an error message saying so is displayed.

To configure the DIAMETER server globally, use **diameter peer** *peer_name* command in global configuration mode.

Unlike for RADIUS, DIAMETER does not have private servers. DIAMETER considers a server that does not have a VRF name configured, as a global server, and it uses global routing table for that particular server.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to attach the globally configured DIAMETER server (having the same name) to the server group in BNG:

```
RP/0/RSP0/CPU0:router(config)# aaa group server diameter GX_SG
RP/0/RSP0/CPU0:router(config-sg-diameter)# server GX_SERVER
```

# source-interface (DIAMETER)

To configure the source-interface to be used for the DIAMETER connection in BNG, use the **source-interface** command in DIAMETER peer configuration mode. To remove the source-interface used for the DIAMETER connection, use the **no** form of this command.

**source-interface** *interface-type interface-instance*

## Syntax Description

| | |
|---|---|
| *interface-type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-instance* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |

## Command Default

None

## Command Modes

DIAMETER peer configuration

Global Configuration mode (when used with **diameter** keyword)

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

The DIAMETER client uses this source address and port to initiate the TCP connection to the peer.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the source-interface (in DIAMETER peer configuration mode) to be used for the DIAMETER connection in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# source-interface bundle-ether 1.1
```

This example shows how to configure the source-interface (in global configuration mode) to be used for the DIAMETER connection in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter source-interface bundle-ether 1.1
```

# test aaa group diameter

To test various DIAMETER application behaviors in BNG, use the **test aaa group diameter** command in EXEC mode.

**test aaa group diameter** {**dcca** | **policy-if**} *list-num* *server-group* **timeout** *timeout-val*

## Syntax Description

| | |
|---|---|
| **dcca** | Tests DIAMETER DCCA application messages. |
| **policy-if** | Tests DIAMETER policy interface application messages. |
| *list-num* | DIAMETER attribute list number. |
| *server-group* | Specifies the configured server group to be used for testing. |
| **timeout** | Specifies the duration that the test process need to wait for the response. |
| *timeout-val* | Timeout value, in seconds.<br>The range is from 1 to 99. The value must be greater than or equal to 5. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

You must use **diameter attribute list** command, to define the attribute list required for this test command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to execute the **test aaa group diameter** command in BNG:

```
RP/0/RSP0/CPU0:router# test aaa group diameter policy-if 1 default timeout 5
```

## Related Commands

| Command | Description |
|---|---|
| diameter attribute list, on page 182 | Configures attribute list parameters for DIAMETER test command in BNG. |

# timer (DIAMETER)

To configure various DIAMETER base protocol timers, use the **timer** command in DIAMETER peer configuration mode or in Global Configuration mode (along with **diameter** keyword). To remove the DIAMETER base protocol timers, use the **no** form of this command.

**timer** {**connection** | **transaction** | **watchdog**} *timer-value*

## Syntax Description

| | |
|---|---|
| **connection** | Specifies the DIAMETER base protocol timer used for setting the frequency of transport connection attempts with the peer when there is no active connection to the peer.<br>This timer is used to delay the connection establishment or re-establishment of client with the DIAMETER server. |
| **transaction** | Specifies the timer used for setting the frequency of transaction attempts. That is, the duration for which the client waits for any response message from the peer. |
| **watchdog** | Specifies the timer used to periodically send the Device-Watch-Dog to the DIAMETER server to test the link status. |
| *timer-value* | Specifies the value for various DIAMETER base protocol timers.<br>The range, in seconds, for **transaction** timer is from 1 to 1000; the default is 5.<br>The range, in seconds, for **connection** timer and **watchdog** timer is from 6 to 1000; the default is 30. |

## Command Default

None

## Command Modes

DIAMETER peer configuration.

Global Configuration mode (when used with **diameter** keyword).

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

A **connection** timer value of zero (0) does not trigger any retry for the connection establishment. When the**no** form of **connection** timer command is issued, a default timer of 30 seconds is started. The connection retry does not trigger immediately.

The algorithm used for sending the **watchdog** messages, is based on RFC3539.

The DIAMETER base protocol timers can be configured globally and at the peer level. By default, the peers inherit the globally configured timer values. But, if the timer values are configured at peer level as well, then the peer level timer values take precedence over the globally configured timer values.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the DIAMETER base protocol watchdog timer (in DIAMETER peer configuration mode) in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# timer watchdog 300
```

This example shows how to configure the DIAMETER base protocol watchdog timer (in global configuration mode) in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter timer watchdog 300
```

# transport (DIAMETER)

To configure the DIAMETER transport protocol to be used for establishing connection with the peer, use the **transport** command in DIAMETER peer configuration mode. To remove the DIAMETER transport protocol configuration, use the **no** form of this command.

**transport tcp port** *port_num*

## Syntax Description

| | |
|---|---|
| *port_num* | Specifies the port number that the remote peer uses for DIAMETER messages.<br>The range is from 1 to 65535; the default is 3868. |

## Command Default

If the *port_num* is not configured, 3868 becomes the default port number.

## Command Modes

DIAMETER peer configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

Currently, only **tcp** is supported as the DIAMETER transport protocol in BNG.

When the**no** form of the command is issued, all the sessions that are bound to the peer cannot use the connection anymore. In that case, the applications that initiated the pending messages, if any in the queue, are notified so that they can try alternate peers.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the DIAMETER transport protocol to be used for establishing connection with the peer:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# transport tcp port 3868
```

# transport security-type

To configure the security protocol to be used for the DIAMETER connection in BNG, use the **transport security-type** command in DIAMETER peer configuration mode. To remove the DIAMETER security protocol configuration, use the **no** form of this command.

**transport security-type tls**

## Syntax Description

| | |
|---|---|
| **tls** | Specifies Transport Layer Security (TLS) as the security protocol to be used for the DIAMETER connection. |

## Command Default

None

## Command Modes

DIAMETER peer configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

Currently, only **tls** is supported as the security protocol to be used for the DIAMETER connection in BNG.

The default security mechanism is none. When the security mechanism is changed dynamically, the connection to the peer is torn down and re-established.

If the **destination host** is configured under the peer, that is also verified against the server certificate.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to configure the security protocol to be used for the DIAMETER connection in BNG:

```
RP/0/RSP0/CPU0:router(config)# diameter peer diam_server_1
RP/0/RSP0/CPU0:router(config-dia-peer)# transport security-type tls
```

# show diameter

To display global DIAMETER statistics in BNG, use the **show diameter** command in EXEC mode.

**show diameter**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read |

This is a sample output for the **show diameter** command:

```
RP/0/RSP0/CPU0:router# show diameter
Origin Host : abc@xyz.com
Origin Realm : xyz.com
Source Interface :
TLS Trustpoint :
Connection timer value : 30 seconds
Watchdog timer value : 30 seconds
Transaction timer value : 5 seconds
Number of Peers:2
```

## Related Commands

| Command | Description |
|---|---|
| show diameter peer, on page 214 | Displays DIAMETER peer information in BNG. |
| show diameter gx, on page 207 | Displays the status of DIAMETER Gx application in BNG. |
| show diameter gy, on page 209 | Displays the status of DIAMETER Gy application in BNG. |
| show diameter nas, on page 211 | Displays the DIAMETER Network Access Server (NAS) information in BNG. |
| show checkpoint dynamic process (DIAMETER), on page 216 | Displays the checkpoint information of DIAMETER process. |

# show diameter gx

To display the status of DIAMETER Gx application in BNG, use the **show diameter gx** command in EXEC mode.

**show diameter gx** [**checkpoint** *session-id* | **session** *session-id* | **statistics** ]

## Syntax Description

| | |
|---|---|
| **checkpoint** *session-id* | (Optional) Displays checkpoint information of Gx application. |
| **session** *session-id* | (Optional) Displays session information of Gx application. |
| **statistics** | (Optional) Displays Gx application statistics. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read |

This is a sample output for the **show diameter gx statistics** command:

```
RP/0/RSP0/CPU0:router# show diameter gx statistics

CCR Initial Messages                : 1
CCR Initial Messages Sent Failed    : 0
CCR Initial Messages Timed Out      : 0
CCR Initial Messages Retry          : 0
CCR Update Messages                 : 0
CCR Update Messages Sent Failed     : 0
CCR Update Messages Timed Out       : 0
CCR Update Messages Retry           : 0
CCR Terminate Messages              : 0
CCR Terminate Messages Sent Failed  : 0
CCR Terminate Messages Timed Out    : 0
CCR Terminate Messages Retry        : 0
CCA Initial Messages                : 1
CCA Initial Messages Error          : 0
CCA Update Messages                 : 0
CCA Update Messages Error           : 0
CCA Terminate Messages              : 0
CCA Terminate Messages Error        : 0
```

```
RAR Received Messages               : 0
RAR Received Messages Error         : 0
RAA Sent Messages                   : 0
RAA Sent Messages Error             : 0
ASR Received Messages               : 0
ASR Received Messages Error         : 0
ASA Sent Messages                   : 0
ASA Sent Messages Error             : 0
Session Termination Messages Recvd  : 0
Unknown Request Messages            : 0
Restored Sessions                   : 0
Total Opened Sessions               : 1
Total Closed Sessions               : 0
Total Active Sessions               : 1
```

## Related Commands

| Command | Description |
|---|---|
| show diameter gy, on page 209 | Displays the status of DIAMETER Gy application in BNG. |
| show diameter nas, on page 211 | Displays the DIAMETER Network Access Server (NAS) information in BNG. |

# show diameter gy

To display the status of DIAMETER Gy application in BNG, use the **show diameter gy** command in EXEC mode mode.

**show diameter gy** [**checkpoint** *session-id* | **session** *session-id* | **statistics** ]

## Syntax Description

| | |
|---|---|
| **checkpoint** *session-id* | (Optional) Displays checkpoint information of specific Gx application. |
| **session** *session-id* | (Optional) Displays specific Gy application information. |
| **statistics** | (Optional) Displays Gy application statistics. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read |

This is a sample output for the **show diameter gy statistics** command:

```
RP/0/RSP0/CPU0:router# show diameter gy statistics

CCR Initial Messages                : 1
CCR Initial Messages Sent Failed    : 0
CCR Initial Messages Timed Out      : 0
CCR Initial Messages Retry          : 0
CCR Update Messages                 : 4
CCR Update Messages Sent Failed     : 0
CCR Update Messages Timed Out       : 0
CCR Update Messages Retry           : 0
CCR Terminate Messages              : 1
CCR Terminate Messages Sent Failed  : 0
CCR Terminate Messages Timed Out    : 0
CCR Terminate Messsages Retry       : 0
CCA Initial Messages                : 1
CCA Initial Messages Error          : 0
CCA Update Messages                 : 4
CCA Update Messages Error           : 0
CCA Terminate Messages              : 1
CCA Terminate Messages Error        : 0
RAR Received Messages               : 0
```

```
RAR Received Messages Error         : 0
RAA Sent Messages                   : 0
RAA Sent Messages Error             : 0
ASR Received Messages               : 0
ASR Received Messages Error         : 0
ASA Sent Messages                   : 0
ASA Sent Messages Error             : 0
Unknown Request Messages            : 0
Restored Sessions                   : 0
Total Opened Sessions               : 2
Total Closed Sessions               : 1
Total Active Sessions               : 1
```

## Related Commands

| Command | Description |
|---|---|
| show diameter gx, on page 207 | Displays the status of DIAMETER Gx application in BNG. |
| show diameter nas, on page 211 | Displays the DIAMETER Network Access Server (NAS) information in BNG. |

# show diameter nas

To display the DIAMETER Network Access Server (NAS) information in BNG, use the **show diameter nas** command in EXEC mode.

**show diameter nas** [**checkpoint** *session-id* | **session** *session-id* | **summary**]

## Syntax Description

| | |
|---|---|
| **checkpoint** *session-id* | (Optional) Displays checkpoint information of specific NAS session. |
| **session** *session-id* | (Optional) Displays specific NAS session information. |
| **summary** | (Optional) Displays summary of NAS sessions. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read |

This is a sample output for the **show diameter nas session** command:

```
RP/0/RSP0/CPU0:router# show diameter nas session 00070a6f


Nas Session status for [00070a6f]
        Session Status            :  Active
        Diameter Session ID       : 1.1.1.1;4;461423;1187179

        Authentication Status     : NA
        Authorization Status      : SUCCESS
        Accounting Status (Start) : NA
        Accounting Status (Stop)  : NA
        Disconnect status         : NA

  Peer Information :
        Server group     :  NASREQ_SG
        Server Used      :  NASREQ_SERVER
```

This is a sample output for the **show diameter nas summary** command:

```
RP/0/RSP0/CPU0:router# show diameter nas summary
```

```
NAS Statistics :

    NAS Initiated msgs :

        Authentication       ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0

        Authorization        ::

          In                  :          1   Out                 :          1
          Requests received   :          1   Requests send       :          1
          Response received   :          1   Result forwaded     :          1
          Transaction Succeeded:         1   Transactions Failed :          0

        Accounting (Start)   ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0

        Accounting (Stop)    ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0

        Accounting (Interim) ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0

        Disconnect           ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0


    Server Initiated msgs :

        Coa  (RAR)           ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0

        POD  (ASR)           ::

          In                  :          0   Out                 :          0
          Requests received   :          0   Requests send       :          0
          Response received   :          0   Result forwaded     :          0
          Transaction Succeeded:         0   Transactions Failed :          0
Diameter NAS summary
```

**Related Commands**

| Command | Description |
|---|---|
| show diameter gx, on page 207 | Displays the status of DIAMETER Gx application in BNG. |
| show diameter gy, on page 209 | Displays the status of DIAMETER Gy application in BNG. |

# show diameter peer

To display the DIAMETER peer information in BNG, use the **show diameter peer** command in EXEC mode mode.

**show diameter peer** *peer-name*

## Syntax Description

| | |
|---|---|
| **peer** *peer-name* | Specifies the name of the DIAMETER peer. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read |

This is a sample output for the **show diameter peer** command:

```
RP/0/RSP0/CPU0:router# show diamter peer peer1
Origin Host : test
Origin Realm : testrealm
Source Interface :
TLS Trustpoint :
Connection timer value : 30 seconds
Watchdog timer value : 30 seconds
Transaction timer value : 30 seconds
Peer name : peer1
        type : SERVER
        Address/port : 01010101/3868
        Transport protocol : TCP
        Peer security protocol :   NONE
        connection timer : 30 seconds
        watchdog timer value : 30 seconds
        transaction timer value : 30 seconds
        VRF name : default
        Source-interface :
        Destination realm :
        Destination host name :
        Peer connection status : Closed

      Peer Statistics
------------------------------
          IN     /    OUT
------------------------------
ASR  0             0
```

```
ASA  0              0
ACR  0              0
ACA  0              0
CER  0              0
CEA  0              0
DWR  0              0
DWA  0              0
DPR  0              0
DPA  0              0
RAR  0              0
RAA  0              0
STR  0              0
STA  0              0
CCR  0              0
CCA  0              0
Malformed Rcvd   :  0
Prot. Errs Sent  :  0                Prot. Errs Rcvd  :  0
Trans. Errs Sent :  0                Trans. Errs Rcvd :  0
Perm. Errs Sent  :  0                Perm. Errs Rcvd  :  0
```

## Related Commands

| Command | Description |
|---|---|
| show diameter gx, on page 207 | Displays the status of DIAMETER Gx application in BNG. |
| show diameter gy, on page 209 | Displays the status of DIAMETER Gy application in BNG. |
| show diameter nas, on page 211 | Displays the DIAMETER Network Access Server (NAS) information in BNG. |

# show checkpoint dynamic process (DIAMETER)

To display the checkpoint information of DIAMETER process, use the **show checkpoint diameter process** command in the EXEC mode mode.

**show checkpoint dynamic process** *process-name*

## Syntax Description

| | |
|---|---|
| *process-name* | Name of the process (in this case, **diameter** ) for which the checkpoint information must be displayed. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read |

This is a sample output of the **show checkpoint dynamic process diameter** command:

```
RP/0/RSP0/CPU0:router# show checkpoint dynamic process diameter

     Name           Version         ID    Seg #Objects   Length  InfoLen  Flags
--------------------------------------------------------------------------------
0x00000003     0,    0,    0 0x40001c00      M        0      292        4   I M
0x00000004     0,    0,    0 0x40001d00      M        1      264        4   I M
0x00000002     0,    0,    0 0x40001e00      M        1       24        4   I M
0x00000001     0,    0,    0 0x40001f00      M        1       24        4   I M

Segment 0: Number of pages allocated: 4
Segment 0: Number of pages free: 3

Segment 1: Number of pages allocated: 9
Segment 1: Number of pages free: 3

--------------------------------------------------------------------------------
```

## Related Commands

| Command | Description |
|---|---|
| show diameter peer, on page 214 | Displays DIAMETER peer information in BNG. |
| show diameter gx, on page 207 | Displays the status of DIAMETER Gx application in BNG. |

| Command | Description |
|---|---|
| show diameter gy, on page 209 | Displays the status of DIAMETER Gy application in BNG. |
| show diameter nas, on page 211 | Displays the DIAMETER Network Access Server (NAS) information in BNG. |



# Dynamic Template Commands

This module describes the Cisco IOS XR software commands used to configure the Dynamic Template commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- dynamic-template, on page 220
- dynamic-template type ipsubscriber, on page 221
- dynamic-template type ppp, on page 222
- dynamic-template type service, on page 223
- monitor-session (interface-dynamic-template-BNG), on page 224
- service-policy (BNG), on page 226
- test radius coa activate, on page 228
- timeout idle, on page 230
- vrf (dynamic-template-BNG), on page 232

# dynamic-template

To group a set of configuration items that can be applied to a group of subscribers and to enter the dynamic-template configuration mode, use the **dynamic-template** command in the Global Configuration mode. To disable this feature and exit the dynamic-template configuration mode, use the **no** form of this command.

**dynamic-template type** {**ipsubscriber** *name* | **ppp** *name* | **service** *name*}

## Syntax Description

| | |
|---|---|
| **type** | Specifies the type of templates, for example, ppp or ipsubscriber or service. |
| *name* | Specifies the name of the dynamic template type. |
| **ipsubscriber** | Specifies the ipsubscriber dynamic template type. |
| **ppp** | Specifies the ppp dynamic template type. |
| **service** | Specifies the service dynamic template type. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **dynamic-template** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)#
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template type ppp, on page 222 | Enables the ppp dynamic template type. |
| dynamic-template type ipsubscriber, on page 221 | Enables the ipsubscriber dynamic template type. |
| dynamic-template type service, on page 223 | Enables the service dynamic template type. |

# dynamic-template type ipsubscriber

To group a set of configuration items that can be applied to a group of subscribers based on the ipsubscriber template type and to enter the dynamic-template configuration mode, use the **dynamic-template type ipsubscriber** command. To disable this feature and exit the dynamic-template configuration mode, use the **no** form of this command.

**dynamic-template type ipsubscriber** *template-name*

## Syntax Description

| | |
|---|---|
| *template-name* | Specifies the dynamic template name. |

## Command Default

None

## Command Modes

Dynamic template configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **dynamic-template type ipsubscriber** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ipsubscriber ipsub1
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Enables the dynamic template configuration mode. |
| dynamic-template type ppp, on page 222 | Enables the ppp dynamic template type. |
| dynamic-template type service, on page 223 | Enables the service dynamic template type. |

# dynamic-template type ppp

To group a set of configuration items that can be applied to a group of subscribers based on the ppp template type and to enter the dynamic-template configuration mode, use the **dynamic-template type ppp** command. To disable this feature and exit the dynamic-template configuration mode, use the **no** form of this command.

**dynamic-template type ppp** *template-name*

## Syntax Description

| | |
|---|---|
| *template-name* | Specifies the dynamic template name. |

## Command Default

None

## Command Modes

Dynamic template configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **dynamic-template type ppp** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ppp p1
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Enables the dynamic template configuration mode. |
| dynamic-template type ipsubscriber, on page 221 | Enables the ipsubscriber dynamic template type. |
| dynamic-template type service, on page 223 | Enables the service dynamic template type. |

# dynamic-template type service

To group a set of configuration items that can be applied to a group of subscribers based on the service template type and to enter the dynamic-template configuration mode, use the **dynamic-template type service** command. To disable this feature and exit the dynamic-template configuration mode, use the **no** form of this command.

**dynamic-template type service** *template-name*

## Syntax Description

| | |
|---|---|
| *template-name* | Specifies the dynamic template name. |

## Command Default

None

## Command Modes

Dynamic template configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **dynamic-template type service** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type service s1
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Enables the dynamic template configuration mode. |
| dynamic-template type ppp, on page 222 | Enables the ppp dynamic template type. |
| dynamic-template type ipsubscriber, on page 221 | Enables the ipsubscriber dynamic template type. |

# monitor-session (interface-dynamic-template-BNG)

To associate a traffic mirroring session with a specific interface, use the **monitor-session** command in interface configuration mode or dynamic-template configuration mode. To remove the association between a traffic mirroring session and an interface, use the **no** form of this command.

**monitor-session** *session-name* [**direction** {**rx-only** | **tx-only**}] **[port-level]**

## Syntax Description

| | |
|---|---|
| *session-name* | Name of the monitor session to configure. |
| **direction** | Specifies that traffic replication is in only one direction. |
| **rx-only** | Specifies that only ingress traffic is replicated. |
| **tx-only** | Specifies that only egress traffic is replicated. |

## Command Default

Replicates both ingress and egress traffic.

## Command Modes

Interface configuration

Dynamic template configuration (for BNG)

## Command History

| Release | Modification |
|---|---|
| Release 3.9.1 | This command was introduced. |
| Release 4.0.0 | The **acl** and **mirror first** keywords were added. |
| Release 5.1 | The support for this command under dynamic-template configuration mode was added for BNG. |

## Usage Guidelines

Before you can associate a traffic mirroring session to a specific interface, you must define it using the **monitor-session** global configuration command. After the traffic mirroring session is defined, use the **monitor-session** interface configuration command or dynamic template configuration command to associate this session with a specific source interface. For BNG sessions, the subscriber is attached to the monitor session, only when the dynamic template is applied to the subscriber. When the session is associated, all specified traffic on the interface is then replicated to the destination location defined in the monitor session configuration.

The **monitor-session** interface configuration command also enters monitor session configuration mode for you to configure additional features of the mirroring session.

If a physical interface is configured for Layer 3, then the traffic mirroring session can be associated on physical interfaces. Example:

```
interface TenGigE0/1/0/0
ipv4 address 10.0.0.1 255.255.255.0
```

If a physical interface has sub-interfaces configured for Layer 3, then the traffic mirroring session must be associated on each sub-interface. Example:

```
interface TenGigE0/1/0/1.601
ipv4 address 10.0.1.1 255.255.255.0
encapsulation dot1q 601
```

For more information about monitoring a session, see *Configuring Traffic Monitoring* chapter in *Cisco ASR 9000 Series Aggregation Services Router Interface and Hardware Component Configuration Guide*.

## Task ID

| Task ID | Operations |
|---|---|
| interface | read, write |
| config-services | read, write |

## Examples

This example shows how to enter monitor session configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet0/0/0/11
RP/0/RSP0/CPU0:router(config-if)# l2transport
RP/0/RSP0/CPU0:router(config-if-l2)# monitor-session mon1
RP/0/RSP0/CPU0:router(config-if-mon)#
```

This example shows how to configure **monitor-session** command in the dynamic-template configuration mode for BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp ppp_template
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# monitor-session mon1 direction rx-only

RP/0/RSP0/CPU0:router(config-dynamic-template-type)# acl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# mirror first 100
```

# service-policy (BNG)

To associate a service-policy to the dynamic template, use the **service-policy** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**service-policy** {**input** | **output** | **type**} *service-policy_name* [**acct-stats**] [**merge** *seq_num*]

## Syntax Description

| | |
|---|---|
| **input** | Configures an ingress service-policy. |
| **output** | Configures an egress service-policy. |
| **type** | Creates the service policy for policy-based routing (PBR). |
| *service-policy_name* | Name of the service policy. |
| **acct-stats** | (Optional) Enables service accounting. |
| **merge** | (Optional) Enables the policy to be merged. |
| *seq_num* | Sequence number of the policy. Range is from 0 to 255. |

## Command Default

None

## Command Modes

Dynamic template configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Support was added for policy based routing. |
| Release 4.3.1 | **acct-stats** and **merge** keywords were added to support service accounting and policy merge features. |

## Usage Guidelines

Use the **dynamic-template type ppp** command to enter the ppp dynamic template type configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This is an example of configuring the **service-policy** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# accounting aaa list default type session
 periodic-interval 60 dual-stack-delay 1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy input i1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy output o1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy type pbr pbr_policy
```

This example shows how to enable service accounting feature in the dynamic template configuration mode using **service-policy** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type service s1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# accounting aaa list l1 type service
periodic-interval 500
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv4 access-group ACL1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy input QoS1 acct-stats
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy output QoS2 acct-stats
```

This example shows how to merge policy maps using **service-policy** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type service MyService
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy input i1 merge 20
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy output o1 merge 30
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Enables the dynamic template configuration mode. |
| dynamic-template type ppp, on page 222 | Enables the ppp dynamic template type. |
| dynamic-template type ipsubscriber, on page 221 | Enables the ipsubscriber dynamic template type. |

# test radius coa activate

To enable Traffic Mirroring, also known as Switch Port Analyzer (SPAN), on a BNG subscriber interface, use the **test radius coa activate** command in EXEC mode. To disable SPAN, use the **deactivate** form of this command.

**test radius coa activate service** *name* **acct-ses-id** *id*
**test radius coa deactivate service** *name* **acct-ses-id** *id*

## Syntax Description

| | |
|---|---|
| **service** | Specifies the service to be activated or de-activated. |
| *name* | Name of the service, which is same as the dynamic-template name. |
| **acct-ses-id** | Specifies the accounting session ID of the subscriber on which the template is to be activated or de-activated. |
| *id* | ID of the accounting session, in hexadecimal format . |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.1 | This command was introduced. |

## Usage Guidelines

Configure monitor sessions (using **monitor-session** command in Global Configuration mode) and configure source interface attachment to a monitor session (using dynamic templates), as a pre-requisite for executing **test radius coa activate** command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

### Example

This example shows how to enable SPAN on BNG subscriber interface by associating a dynamic template with a specific subscriber :

```
RP/0/RSP0/CPU0:router# test radius coa activate acct-ses-id 0x00000001 service service1
```

This example shows how to disable SPAN on BNG subscriber interface by dis-associating a dynamic template with a specific subscriber :

```
RP/0/RSP0/CPU0:router# test radius coa deactivate acct-ses-id 0x00000001 service service1
```

## Related Commands

| Command | Description |
|---|---|
| **monitor-session** | Defines a traffic mirroring session and enters monitor session configuration mode. |
| **monitor-session (interface-dynamic-template-BNG)** | Associates a traffic mirroring session with a specific interface or dynamic template. |
| **show monitor-session status** | Displays status information about configured traffic mirroring sessions. |
| **show monitor-session counters** | Displays statistics regarding traffic mirroring sessions. |
| **clear monitor-session counters** | Clears the traffic mirroring session statistics. |

# timeout idle

To configure an idle timeout period for the IPoE and PPPoE subscriber sessions on BNG, use the **timeout idle** command in dynamic template type configuration mode. To disable this feature, use the **no** form of this command.

**timeout idle** *seconds* [**threshold** *rate*] [**traffic** {**both** | **inbound** | **outbound**}]

## Syntax Description

| | |
|---|---|
| *seconds* | Idle timeout value for the subscriber sessions, in seconds.<br>The range is from 60 to 4320000. |
| **threshold** | Configures a threshold to track the duration of session idleness. |
| *duration* | Duration of threshold, in minute(s) per packet.<br>The range is from 1 to 10000. Default is 0.<br>**Note** This value should be less than the idle timeout value. |
| **traffic** | Considers the direction of traffic while deriving the duration of session idleness.<br>The default is inbound direction. |
| **both** | Considers inbound and outbound traffic while deriving the duration of session idleness. |
| **inbound** | Considers inbound traffic only while deriving the duration of session idleness. |
| **outbound** | Considers outbound traffic only while deriving the duration of session idleness. |

## Command Default

None

## Command Modes

Dynamic template type configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.1 | This command was introduced. |
| Release 5.1 | The support for **threshold** and **traffic** keywords were added. |

## Usage Guidelines

In Cisco IOS XR software release 4.2.1, both the IPoE and PPPoE sessions are retained idle, when the idle timeout period expires. In Cisco IOS XR software release 4.2.3, only the IPoE sessions are terminated when

the idle timeout period expires. Whereas, the PPPoE sessions are retained idle. From Cisco IOS XR software release 5.1.0 and later, both IPoE and PPPoE sessions are terminated on the expiry of the idle timeout period.

If packets sent or received by BNG, in the configured threshold interval is less than that threshold value, then that particular session is considered idle. For instance, if the **threshold** is configured as 2 packets/minute, and, if the number of packets received in every 2 minutes is only less than 2 (either 0 or 1), then that particular session is considered as idle. Whereas, if the number of packets received is 2 or above, then that session is considered as active.

By default, the sessions are disconnected if the **threshold** is not configured.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Example

This example shows how to configure an idle timeout of 200 seconds, with a threshold of 2 minutes/packet and considering inbound and outbound traffic for determining the duration of session idleness:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp ppp1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# timeout idle 200 threshold 2 traffic
both
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber feature accounting, on page 483 | Displays the feature accounting information of the subscriber. |

# vrf (dynamic-template-BNG)

To set the vrf in which the interface operates, use the **vrf** command in the dynamic template type configuration mode. To disable the VRF, use the **no** form of this command.

**vrf** *vrf-name*

## Syntax Description

| | |
|---|---|
| *vrf_name* | Specifies the name of the vrf. |

## Command Default

None

## Command Modes

Dynamic template type configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This is an example of configuring the **vrf** command in the dynamic template type configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type service s1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# vrf vrf1
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Enables the dynamic template configuration mode. |
| dynamic-template type ppp, on page 222 | Enables the ppp dynamic template type. |
| dynamic-template type ipsubscriber, on page 221 | Enables the ipsubscriber dynamic template type. |



# Excessive Punt Flow Trap Commands

This module describes the Cisco IOS XR software commands used to configure the Excessive Punt Flow Trap commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

**Note** From Release 7.3.1, Excessive Punt Flow Trap feature is deprecated. To control user or subscriber traffic manually, we recommend you to use Access Control List and Access Control List-based Forwarding, Flow Aware QoS, or enable policing through MQC.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- lpts punt excessive-flow-trap, on page 234
- lpts punt excessive-flow-trap dampening , on page 235
- lpts punt excessive-flow-trap interface-based-flow , on page 236
- lpts punt excessive-flow-trap non-subscriber-interfaces, on page 237
- lpts punt excessive-flow-trap penalty-rate, on page 238
- lpts punt excessive-flow-trap penalty-timeout, on page 240
- lpts punt excessive-flow-trap subscriber-interfaces, on page 242
- show lpts punt excessive-flow-trap, on page 243
- show lpts punt excessive-flow-trap information, on page 246
- show lpts punt excessive-flow-trap interface, on page 249
- show lpts punt excessive-flow-trap protocol, on page 251

# lpts punt excessive-flow-trap

To activate the Excessive Punt Flow Trap feature and to enter the control plane policer configuration mode, use the **lpts punt excessive-flow-trap** command in Global Configuration mode. To exit the control plane policer configuration mode and disable the Excessive Punt Flow Trap feature, use the **no** form of this command.

**lpts punt excessive-flow-trap** {**subscriber-interfaces** | **non-subscriber-interfaces** | **penalty-rate** | **penalty-timeout**}

## Syntax Description

| | |
|---|---|
| **subscriber-interfaces** | Enables the Excessive Punt Flow Trap for subscriber interfaces. |
| **non-subscriber-interfaces** | Enables the Excessive Punt Flow Trap for non-subscriber interfaces. |
| **penalty-rate** | Sets the penalty policing rate for a protocol. |
| **penalty-timeout** | Sets the penalty timeout for a protocol. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

Excessive Punt Flow Trap (EPFT) is not supported with BNG Geo Redundancy.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to enable the Excessive Punt Flow Trap feature in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap
RP/0/RSP0/CPU0:router(config-control-plane-policer)#
```

## Related Commands

| Command | Description |
|---|---|
| show lpts punt excessive-flow-trap, on page 243 | Displays the bad actor flows trapped by the Excessive Punt Flow Trap feature. |

# lpts punt excessive-flow-trap dampening

To enable false positive suppression through dampening, use the **lpts punt excessive-flow-trap dampening** command in Global Configuration mode. To remove this configuration, use the **no** form of this command.

**lpts punt excessive flow trap dampening** [*time*]

## Syntax Description

| | |
|---|---|
| *time* | The time (in milliseconds) within which a second bad actor notification must arrive to consider the flow as a repeated offender.<br>The range is from 1 to 60000; the default is 30000 milliseconds (30 seconds). |

## Command Default

By default, the dampening feature is disabled.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure a dampening time of 40 milliseconds:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#lpts punt excessive-flow-trap dampening 40
```

# lpts punt excessive-flow-trap interface-based-flow

To enable interface-based flow (that is, considering all the packets received on a non-subscriber interface, irrespective of the source MAC address, to be a part of a single flow), use the **lpts punt excessive-flow-trap interface-based-flow** command in Global Configuration mode. To remove this interface-based flow configuration, use the **no** form of this command.

**lpts punt excessive-flow-trap interface-based-flow**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

Users cannot enable this command, if EPFT is turned on for the subscriber-interfaces and non-subscriber-interfaces MAC or vice versa. This is because, interface-based flow feature is mutually exclusive with MAC-based EPFT on non-subscriber interface feature.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example show how to enable interface-based flow:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#lpts punt excessive-flow-trap interface-based-flow
```

# lpts punt excessive-flow-trap non-subscriber-interfaces

To enable the Excessive Punt Flow Trap feature on non-subscriber interfaces, use the **lpts punt excessive-flow-trap non-subscriber-interfaces** command in Global Configuration mode. To disable the Excessive Punt Flow Trap feature on subscriber interfaces, use the **no** form of this command.

**lpts punt excessive-flow-trap non-subscriber-interfaces** [**mac**]

## Syntax Description

| | |
|---|---|
| **mac** | Enables MAC-based EPFT on non-subscriber interface. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |
| Release 5.3.0 | The command was modified to add **mac** keyword to enable MAC-based EPFT on non-subscriber interfaces. |

## Usage Guidelines

The user cannot enable **lpts punt excessive-flow-trap interface-based-flow** command, if EPFT is turned on for the subscriber-interfaces and non-subscriber interfaces mac.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to enable the Excessive Punt Flow Trap feature on the non-subscriber interfaces in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap non-subscriber-interfaces
```

This example shows how to enable EPFT on a non-subscriber VLAN sub-interface, based on the source MAC address:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap non-subscriber-interfaces mac
```

## Related Commands

| Command | Description |
|---|---|
| show lpts punt excessive-flow-trap, on page 243 | Displays the bad actor flows trapped by the Excessive Punt Flow Trap feature. |

# lpts punt excessive-flow-trap penalty-rate

To set the penalty policing rate for a protocol, use the **lpts punt excessive-flow-trap penalty-rate** command in Global Configuration mode. To restore the default penalty-rate, use the **no** form of this command.

**lpts punt excessive-flow-trap penalty-rate** {**trace** | **arp** | **icmp** | **dhcp** | **pppoe** | **ppp** | **igmp** | **ip** | **l2tp** | **all** | **interface** | **information** | **unclassified**} *penalty_rate*

## Syntax Description

| | |
|---|---|
| **default** | Sets the default penalty policing rate for all protocols. |
| **arp** | Sets the penalty policing rate for the ARP protocol. |
| **icmp** | Sets the penalty policing rate for the ICMP protocol. |
| **dhcp** | Sets the penalty policing rate for the DHCP protocol. |
| **pppoe** | Sets the penalty policing rate for the PPPoE protocol. |
| **ppp** | Sets the penalty policing rate for the PPP protocol. |
| **igmp** | Sets the penalty policing rate for the IGMP protocol. |
| **ip** | Sets the penalty policing rate for the IPv4 protocol. |
| **l2tp** | Sets the penalty policing rate for the L2TP protocol. |
| **unclassified** | Sets the penalty police rates for unclassified source MAC. |
| *penalty_rate* | Penalty rate in packets per second (pps).<br>The range, in pps, is from 2 to 100; default is 10. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |
| Release 5.3.0 | The command was modified to add **unclassified** keyword to set the penalty police rates for unclassified source MAC. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to set the penalty policing rate of 4 pps for the ARP protocol in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap penalty-rate arp 4
RP/0/RSP0/CPU0:router(config)#
```

## Related Commands

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |

# lpts punt excessive-flow-trap penalty-timeout

To set the penalty timeout value for a protocol, use the **lpts punt excessive-flow-trap penalty-timeout** command in Global Configuration mode. To restore the default penalty timeout value, use the **no** form of this command.

**lpts punt excessive-flow-trap penalty-timeout** {**trace** | **arp** | **icmp** | **dhcp** | **pppoe** | **ppp** | **igmp** | **ip** | **l2tp** | **all** | **interface** | **information**} *timeout*

## Syntax Description

| | |
|---|---|
| **default** | Sets the default penalty timeout for all protocols. |
| **arp** | Sets the penalty timeout for the ARP protocol. |
| **icmp** | Sets the penalty timeout for the ICMP protocol. |
| **dhcp** | Sets the penalty timeout for the DHCP protocol. |
| **pppoe** | Sets the penalty timeout for the PPPoE protocol. |
| **ppp** | Sets the penalty timeout for the PPP protocol. |
| **igmp** | Sets the penalty timeout for the IGMP protocol. |
| **ip** | Sets the penalty timeout for the IPv4 protocol. |
| **l2tp** | Sets the penalty timeout for the L2TP protocol. |

## Command Default

The default value in *minutes* is 15.

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to set the penalty timeout value of 70 minutes for the DHCP protocol in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap penalty-timeout dhcp 70
RP/0/RSP0/CPU0:router(config)#
```

## Related Commands

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |

# lpts punt excessive-flow-trap subscriber-interfaces

To enable the Excessive Punt Flow Trap feature on subscriber interfaces, use the **lpts punt excessive-flow-trap subscriber-interfaces** command in Global Configuration mode. To disable the Excessive Punt Flow Trap feature on subscriber interfaces, use the **no** form of this command.

**lpts punt excessive-flow-trap subscriber-interfaces**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to enable the Excessive Punt Flow Trap feature for subscriber interfaces in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# lpts punt excessive-flow-trap subscriber-interfaces
RP/0/RSP0/CPU0:router(config)#
```

## Related Commands

| Command | Description |
|---|---|
| show lpts punt excessive-flow-trap, on page 243 | Displays the bad actor flows trapped by the Excessive Punt Flow Trap feature. |

# show lpts punt excessive-flow-trap

To display the bad actor flows trapped by Excessive Punt Flow Trap (EPFT), use the **show lpts punt excessive-flow-trap** command in the EXEC mode.

**show lpts punt excessive-flow-trap** {*protocol* | **interface** *interface-type interface-path-id* | **information**} [**location**]

## Syntax Description

| | |
|---|---|
| *protocol* | Enter the protocol type.<br>• arp—Displays ARP bad actors.<br>• icmp—Displays ICMP bad actors.<br>• dhcp—Displays DHCP bad actors.<br>• pppoe—Displays PPPoE bad actors.<br>• ppp—Displays PPP bad actors.<br>• igmp—Displays IGMP bad actors.<br>• ipv4—Displays IPv4 bad actors.<br>• l2tp—Displays L2TP bad actors.<br>• unclassified—Displays unclassified bad actors.<br>• all—Displays bad actors for all protocols. |
| **interface** | Displays the bad actors on an interface. For more information on the interface types, use the question mark (?) online help function. |
| *type* | Specifies the interface type. For more information, use the question mark (?) online help function. |

| | |
|---|---|
| *interface-path-id* | Either a physical interface instance or a virtual interface instance as follows:<br>• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.<br>• *rack*: Chassis number of the rack.<br>• *slot*: Physical slot number of the modular services card or line card.<br>• *module*: Module number. A physical layer interface module (PLIM) is always 0.<br>• *port*: Physical port number of the interface.<br>**Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0 ) and the module is CPU0. Example: interface MgmtEth0/RSP0 /CPU0/0.<br>• Virtual interface instance. Number range varies depending on interface type.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **information** | Displays the Excessive Punt Flow Trap feature information. |
| **location** | Displays bad actors on a line card. |

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |
| Release 5.3.0 | The command was modified to include *unclassified* option in the protocol list, to display unclassified bad actors. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| lpts | read |
| basic-services | read, write |

The **show running-config** output for the above **show lpts punt excessive-flow-trap** command is:

```
RP/0/RSP0/CPU0:router# show running-config lpts punt excessive-flow-trap
lpts punt excessive-flow-trap
```

```
 penalty-rate arp 15
 penalty-rate pppoe 25
 penalty-timeout arp 2
 non-subscriber-interfaces
```

This is a sample output for **show lpts punt excessive-flow-trap unclassified** command:

```
Parent Interface: Bundle-Ether1.1                  Src MAC Addr: 0000.6416.0102
Intf Handle: 0x08000260                            Location: 0/0/CPU0
Protocol: UNCLASSIFIED                             Punt Reason: Unclassified packets for
RSP
Penalty Rate: 0 pps (all packets dropped)          Penalty Timeout: 15 mins
Time Remaining: 13 mins 54 secs
```

This table describes the significant fields shown in the display.

***Table 10: Field Descriptions of show lpts punt excessive-flow-trap command:***

| Field | Description |
|---|---|
| Penalty Rate | The penalty policing rate for a protocol.<br>The range is from 2 to 100. The example shown here is for MAC- based EPFT, where all packets from the source MAC are dropped. Therefore, penalty rate is zero (0). |
| Penalty Timeout | The penalty timeout value for a protocol. A bad actor flow trapped for sending excessive protocol packets (arp, ppp or unclassified), is penalty policed for the period of penalty-timeout configured (in minutes). By default, it is 15 minutes. |

## Related Commands

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |

# show lpts punt excessive-flow-trap information

To display the Excessive Punt Flow Trap feature information, use the **show lpts punt excessive-flow-trap information** command in the EXEC mode.

**show lpts punt excessive-flow-trap information**

**Syntax Description** This command has no keywords or arguments.

**Command Default** None

**Command Modes** EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

**Usage Guidelines** No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| lpts | read |
| basic-services | read, write |

This is an example of **show lpts punt excessive-flow-trap information** command with ARP and PPPoE protocols configured with non-default values:

```
RP/0/RSP0/CPU0:router# show lpts punt excessive-flow-trap information

------------------------------------------------------------
  Global Default Values -
         Police Rate: 10 pps
     Penalty Timeout: 15 mins

------------------------------------------------------------
              Police          Penalty
              Rate (pps)      Timeout (mins)
 Protocol   Default Config   Default Config   Punt Reasons
 --------   --------------   --------------   ---------------
 ARP           10     15        15      2     ARP
                                              Reverse ARP
                                              Dynamic ARP Inspection (DAI)

 ICMP          10     -         15      -     ICMP
                                              ICMP-local
                                              ICMP-app
                                              ICMP-control
                                              ICMP-default

 DHCP          10     -         15      -     DHCP Snoop Request
                                              DHCP Snoop Reply
```

```
PPPOE          10     25        15     -      PPP over Ethernet (PPPoE)
                                              PPPoE packets for RSP
                                              PPPoE packet/config mismatch
                                              PPPoE packet/config mismatch for RSP

PPP            10     -         15     -      Point-to-Point Protocol (PPP)
                                              PPP packets for RSP

IGMP           10     -         15     -      IGMP
                                              IGMP Snoop
                                              MLD Snoop

IPv4/v6        10     -         15     -      IP Subscriber (IPSUB)
                                              IPv4 options
                                              IPv4 FIB
                                              IPv4 TTL exceeded
                                              IPv4 fragmentation needed
                                              IPv4/v6 adjacency
                                              IPV4/v6 unknown IFIB
                                              UDP-known
                                              UDP-listen
                                              Generic Routing Encap (GRE) bad flags
                                              UDP-default
                                              TCP-known
                                              TCP-listen
                                              TCP-cfg-peer
                                              TCP-default
                                              Raw-listen
                                              Raw-default

L2TP           10     -         15     -      Layer 2 Tunneling Protocol, version 2 (L2TPv2)

                                              L2TPv2-default
                                              L2TPv2-known
                                              L2TPv3
```

The corresponding **show running-config** output for the above **show lpts punt excessive-flow-trap information** command is:

```
RP/0/RSP0/CPU0:router# show running-config lpts punt excessive-flow-trap
lpts punt excessive-flow-trap
 penalty-rate arp 15
 penalty-rate pppoe 25
 penalty-timeout arp 2
 non-subscriber-interfaces
```

This table describes the significant fields shown in the display.

***Table 11: show lpts punt excessive-flow-trap information Field Descriptions***

| Field | Description |
|---|---|
| penalty-rate | The penalty policing rate for a protocol. For arp the value is 15 and for pppoe the value is 25. |

| Field | Description |
|---|---|
| penalty-timeout | The penalty timeout value for a protocol. For arp the value is 2. |

## Related Commands

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |

# show lpts punt excessive-flow-trap interface

To display the penalty status of an interface for one or all protocols, use the **show lpts punt excessive-flow-trap interface** command in the EXEC mode.

**show lpts punt excessive-flow-trap interface** *type interface-path-id* [*protocol* ]

## Syntax Description

| | |
|---|---|
| *type* | Specifies the interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Either a physical interface instance or a virtual interface instance:<br>• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.<br>  • *rack*: Chassis number of the rack.<br>  • *slot*: Physical slot number of the modular services card or line card.<br>  • *module*: Module number. A physical layer interface module (PLIM) is always 0.<br>  • *port*: Physical port number of the interface.<br>**Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0 ) and the module is CPU0. Example: interface MgmtEth0/RSP0 /CPU0/0.<br>• Virtual interface instance. Number range varies depending on interface type.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| *protocol* | Specifies the protocol type.<br>• arp—Displays ARP bad actors.<br>• icmp—Displays ICMP bad actors.<br>• dhcp—Displays DHCP bad actors.<br>• pppoe—Displays PPPoE bad actors.<br>• ppp—Displays PPP bad actors.<br>• igmp—Displays IGMP bad actors.<br>• ipv4—Displays IPv4 bad actors.<br>• l2tp—Displays L2TP bad actors.<br>• all—Displays bad actors for all protocols. |

## Command Default

None

**Command Modes**

EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| lpts | read |
| basic-services | read, write |

The sample output for the **show lpts punt excessive-flow-trap ip** command is:

```
RP/0/RSP0/CPU0:router# show lpts punt excessive-flow-trap ip
Interface: Bundle-Ether1.100
         Intf Handle: 0x08000320                          Location: 0/6/CPU0
            Protocol: IPv4/v6                          Punt Reason: Raw-default
        Penalty Rate: 10 pps                      Penalty Timeout: 15 mins

      Time Remaining: 14 mins 31 secs
```

This table describes the significant fields shown in the display.

***Table 12: show lpts punt excessive-flow-trap interface Field Descriptions***

| Field | Description |
|---|---|
| Intf Handle | The interface handler for the Bundle Ether interface. |
| location | The location of the interface. |
| protocol | Specifies if it uses the IPv4 or IPv6 protocol. |
| punt reason | The reason to punt the excessive flow trap. |
| penalty-rate | The penalty policing rate for a protocol in pps. |
| penalty-timeout | The penalty timeout value for a protocol in minutes. |

**Related Commands**

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |

# show lpts punt excessive-flow-trap protocol

To display a list of interfaces that are in the penalty box for one or all protocols, use the **show lpts punt excessive-flow-trap** *protocol* command in the EXEC mode.

**show lpts punt excessive-flow-trap** *protocol*

## Syntax Description

| | |
|---|---|
| *protocol* | Enter the protocol type.<br>• arp—Displays ARP bad actors.<br>• icmp—Displays ICMP bad actors.<br>• dhcp—Displays DHCP bad actors.<br>• pppoe—Displays PPPoE bad actors.<br>• ppp—Displays PPP bad actors.<br>• igmp—Displays IGMP bad actors.<br>• ipv4—Displays IPv4 bad actors.<br>• l2tp—Displays L2TP bad actors.<br>• all—Displays bad actors for all protocols. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

The *protocol* option in the **show lpts punt excessive-flow-trap** *protocol* command points to the protocol type. The show output for each of the protocol differs depending on the protocol type you select on the router.

## Task ID

| Task ID | Operation |
|---|---|
| lpts | read |
| basic-services | read, write |

The sample output for the **show lpts punt excessive-flow-trap ip** command is:

```
RP/0/RSP0/CPU0:router# show lpts punt excessive-flow-trap ip
Interface: Bundle-Ether1.100
```

```
    Intf Handle: 0x08000320                         Location: 0/6/CPU0
       Protocol: IPv4/v6                        Punt Reason: Raw-default
   Penalty Rate: 10 pps                    Penalty Timeout: 15 mins

Time Remaining: 14 mins 31 secs
```

This table describes the significant fields shown in the display.

***Table 13: show lpts punt excessive-flow-trap interface Field Descriptions***

| Field | Description |
|---|---|
| Intf Handle | The interface handler for the Bundle Ether interface. |
| location | The location of the interface. |
| protocol | Specifies if it uses the IPv4 or IPv6 protocol. |
| punt reason | The reason to punt the excessive flow trap. |
| penalty-rate | The penalty policing rate for a protocol in pps. |
| penalty-timeout | The penalty timeout value for a protocol in minutes. |

## Related Commands

| Command | Description |
|---|---|
| lpts punt excessive-flow-trap, on page 234 | Enables the Excessive Punt Flow Trap feature. |



# IPoE Commands

This module describes the Cisco IOS XR software commands used to configure the IPoE commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- initiator dhcp, on page 254
- initiator dhcp-snoop, on page 256
- initiator unclassified-ip, on page 258
- initiator unclassified-source, on page 260
- ipsubscriber interface, on page 261
- ipsubscriber l2-connected, on page 262
- ipsubscriber routed, on page 264
- ipsubscriber session-limit, on page 266
- ipsubscriber subscriber-templates , on page 267
- ont-reboot ont-disable-duration, on page 268
- ont-reboot sir-flap-duration, on page 269
- show ipsubscriber access-interface, on page 270
- show ipsubscriber interface, on page 273
- show ipsubscriber summary, on page 277
- show ipsubscriber template-interface , on page 280

# initiator dhcp

To enable DHCP as first-sign-of-life protocol for IPv4 or IPv6 subscriber, use the **initiator dhcp** command in the appropriate configuration submode. To disable this feature, use the **no** form of this command.

**initiator dhcp**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

IP subscriber IPv4 L2-connected configuration

IP subscriber IPv6 L2-connected configuration

IP subscriber IPv4 routed configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Supported was added for IPv6. |

## Usage Guidelines

This command is not supported for IPv6 routed subscriber.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This is an example of configuring the **initiator dhcp** command in the Interface configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv4 l2-connected
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv4-l2conn)# initiator dhcp
```

This is an example of configuring the **initiator dhcp** command in the Interface configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv6 l2-connected
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv6-l2conn)# initiator dhcp
```

## Related Commands

| Command | Description |
|---|---|
| show ipsubscriber summary, on page 277 | Displays the ipsubscriber information. |

| Command | Description |
| --- | --- |
| initiator unclassified-ip, on page 258 | Enables packet-triggered IPv4 or IPv6 routed subscriber session in an access-interface. |

# initiator dhcp-snoop

To configure DHCP to pass the control packets from BNG to the DHCP server to enable DHCP L3 snooping for an IP subscriber, use the **initiator dhcp-snoop** command in the IP subscriber IPv4 (or IPv6) routed configuration mode. To disable this configuration, use the **no** form of this command.

For IPv4:

**initiator dhcp-snoop**

For IPv6:

**initiator dhcp-snoop** [**prefix-len** *prefix-len*]

## Syntax Description

| | |
|---|---|
| **prefix-len** | Configures the prefix-length for IPv6 subscriber route to determine the mask to be used for traffic classification.<br>This option is applicable only for dhcp-snoop IPv6 sessions; not for IPv4 sessions. |
| *prefix-len* | Specifies the value of subscriber route prefix-length.<br>The range is from 0 to 127. |

## Command Default

None

## Command Modes

Interface IP subscriber IPv4 routed

Interface IP subscriber IPv6 routed

## Command History

| Release | Modification |
|---|---|
| Release 6.3.2 | This command was introduced. |
| Release 7.8.1 | This command was deprecated. |

## Usage Guidelines

This is supported only on Cisco IOS XR 64-bit operating system.

If **prefix-length** is configured, only the IAPD-based session and classification are supported. If **prefix-length** is not configured, the value is considered as 128, by default. In that case, the IANA-based session and classification are supported.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to enable IPv6 subscriber session creation based on the DHCP control packets that are not destined for BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gigabitEthernet 0/0/0/0
RP/0/RSP0/CPU0:router(config-if)# ipv4 address 192.0.2.1 255.255.255.0
RP/0/RSP0/CPU0:router(config-if)# proxy-arp
RP/0/RSP0/CPU0:router(config-if)# service-policy type control subscriber policy-map-IPSUBV6
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv6 routed
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv6-routed)# initiator dhcp-snoop
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv6-routed)# commit
```

## Related Commands

| Command | Description |
|---|---|
| initiator dhcp, on page 254 | Enables l2-connected IP subscriber for IPv4 or IPv6. |
| ipsubscriber routed, on page 264 | Enables an access-interface to host routed subscriber sessions. |

# initiator unclassified-ip

To enable packet-triggered routed subscriber sessions (IPv4 and IPv6) on an access-interface in BNG, use the **initiator unclassified-ip** command in the appropriate configuration sub mode. To disable this feature, use the **no** form of this command.

**initiator unclassified-ip** [**prefix-len** *prefix-len*]

## Syntax Description

| | |
|---|---|
| **prefix-len** | Configures the prefix-length for IPv6 subscriber route.<br>This option is available only for packet-triggered IPv6 sessions. |
| *prefix-len* | Specifies the value of subscriber route prefix-length.<br>The range is from 0 to 127. |

## Command Default

None

## Command Modes

IP subscriber IPv4 routed configuration

IP subscriber IPv6 routed configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to host packet-triggered routed IPv4 subscriber sessions in an access-interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether101.201
RP/0/RSP0/CPU0:router(config-subif)# ipsubscriber ipv4 routed
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv4-routed)# initiator unclassified-ip
```

This example shows how to host packet-triggered routed IPv6 subscriber sessions in an access-interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether101.201
RP/0/RSP0/CPU0:router(config-subif)# ipsubscriber ipv6 routed
```

```
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv6-routed)# initiator unclassified-ip prefix-len
56
```

## Related Commands

| Command | Description |
|---|---|
| initiator dhcp, on page 254 | Enables l2-connected IP subscriber for IPv4 or IPv6. |
| ipsubscriber routed, on page 264 | Enables an access-interface to host routed subscriber sessions. |

# initiator unclassified-source

To enable unclassified packets as first-sign-of-life for IPv4 subscriber, use the **initiator unclassified-source** command in the appropriate configuration submode. To disable this feature, use the **no** form of this command.

**initiator unclassified-source**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

IP subscriber IPv4 L2-connected configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines



**Note** Because packet-triggered L2 sessions are not supported for IPv6, this command is not supported for IPv6.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This is an example of configuring the **initiator unclassified-source** command in the IP subscriber IPv4 L2-connected configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv4 l2-connected
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv4-l2conn)# initiator unclassified-source
```

## Related Commands

| Command | Description |
|---|---|
| show ipsubscriber summary, on page 277 | Displays the ipsubscriber information. |

# ipsubscriber interface

To enable interface based static session in BNG, use the **ipsubscriber interface** command in the interface configuration mode. To remove the static session, use the **no** form of this command.

**ipsubscriber interface**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.1.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to enable interface based static session in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface bundle-ether 1.1
RP/0/RSP0/CPU0:router(config-subif)# ipsubscriber interface
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber manager sadb, on page 486 | Displays the subscriber management feature attribute database information. |
| show ipsubscriber access-interface, on page 270 | Shows the access interface information for IP subscriber. |
| show ipsubscriber interface, on page 273 | Shows the interface information for IP subscriber interfaces. |

# ipsubscriber l2-connected

To enable l2-connected IP subscriber for IPv4 or IPv6, use the **ipsubscriber l2-connected** command in the interface configuration mode. To disable this feature, use the **no** form of this command.

**ipsubscriber** {**ipv4** | **ipv6**} **l2-connected initiator** {**dhcp** | **unclassified-source** [**address-unique**]}

## Syntax Description

| | |
|---|---|
| **ipv4** | Specifies IPv4 address prefixes. |
| **ipv6** | Specifies IPv6 address prefixes. |
| **initiator** | Configures the IP subscriber initiator. |
| **dhcp** | Configures DHCP as first-sign-of-life protocol for IPv4 subscriber. |
| **unclassified-source** | Configures unclassified packets as first-sign-of-life for IPv4 subscriber. |
| **address-unique** | Enables subscriber IP uniqueness check during first-sign-of-life processing. |

## Command Default

None

## Command Modes

Interface configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.0 | Supported was added for IPv6 prefixes. |
| Release 5.2.2 | This command was modified to add the **address-unique** option for **unclassified-source** initiator. |

## Usage Guidelines

**Note** Packet-triggered L2 session (**initiator unclassified-source**) is not supported for IPv6.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This is an example of configuring the **ipsubscriber l2-connected** command in the interface configuration mode for IPv4:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv4 l2-connected initiator dhcp
```

This is an example of configuring the **ipsubscriber l2-connected** command in the interface configuration mode for IPv6:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv6 l2-connected initiator dhcp
```

This example shows how to enable subscriber IP uniqueness check during first-sign-of-life processing:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber ipv4 l2-connected initiator unclassified-source
 address-unique
```

## Related Commands

| Command | Description |
|---|---|
| show ipsubscriber summary, on page 277 | Displays the ipsubscriber information. |

# ipsubscriber routed

To host IPv4 or IPv6 routed subscriber sessions in an access-interface, use the **ipsubscriber routed** command in the interface configuration mode. To disable this feature, use the **no** form of this command.

**ipsubscriber** {**ipv4** | **ipv6**} **routed** [**initiator** {**dhcp** | **unclassified-ip** [**prefix-len** *prefix-len*]}]

## Syntax Description

| | |
|---|---|
| **ipv4** | Specifies IPv4 subscriber. |
| **ipv6** | Specifies IPv6 subscriber. |
| **initiator** | Specifies session initiator for routed subscriber. |
| **dhcp** | Configures DHCP as the session initiator for routed subscriber.<br>**Note** **initiator dhcp** is not supported for IPv6 routed subscriber sessions. |
| **unclassified-ip** | Configures unclassified packets as first-sign-of-life for IPv4 or IPv6 subscriber. |
| **prefix-len** | Configures the prefix length of IPv6 subscriber. |
| *prefix-len* | Specifies the prefix length of IPv6 subscriber.<br>The range is from 1 to 127. |

## Command Default

None

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.1.1 | This command was introduced. |
| Release 5.2.2 | Initiator **unclassified-ip** was added for the support of packet-triggered IPv4 or IPv6 routed subscriber sessions. |
| Release 7.8.1 | This command was deprecated. |

## Usage Guidelines

The routed subscriber sessions come up only if a summary route is added on BNG router. The DHCP pool IP address range in BNG must be in compliance with the summary route address range. This DHCP pool IP

address range must also match the IP address subnet of the first hop router, which acts as the DHCP relay or proxy. Also, the summary route VRF must be same as the access-interface VRF in BNG router.

If DHCPv6 is used in standalone mode to provide IA-NA and IA-PD addresses (prefixes) to the routing gateway (RG), and if the RG is directly connected (or connected through an L2 cloud) to the BNG, then the summary route is not required.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to host DHCP-initiated IPv4 routed subscriber sessions in an access-interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether101.201
RP/0/RSP0/CPU0:router(config-subif)# ipsubscriber ipv4 routed initiator dhcp
```

This example shows how to host packet-triggered IPv6 routed subscriber sessions in an access-interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether101.201
RP/0/RSP0/CPU0:router(config-subif)# ipsubscriber ipv6 routed
RP/0/RSP0/CPU0:router(config-subif)# initiator unclassified-ip prefix-len 56
```

## Related Commands

| Command | Description |
|---|---|
| ipsubscriber interface, on page 261 | Enables interface based static session in BNG. |
| show ipsubscriber access-interface, on page 270 | Shows the access interface information for IP subscriber. |
| show subscriber session, on page 503 | Displays the subscriber management session information. |
| initiator unclassified-ip, on page 258 | Enables packet-triggered routed subscriber sessions on an access-interface. |

# ipsubscriber session-limit

To limit the number of IP subscriber sessions on a subscriber interface, use the **ipsubscriber session-limit** command in the interface configuration mode. To disable this feature, use the **no** form of this command.

**ipsubscriber session-limit** {**total** | **unclassified-source**}**per-vlan** *session_limit*

## Syntax Description

| | |
|---|---|
| **total** | Limits IP subscribers for all sources. |
| **unclassified-source** | Limits IP subscribers for unclassified sources. |
| **per-vlan** | Limits the per VLAN subscribers. |
| *session-limit* | Specifies the maximum number to which of the IP subscriber session can be limited. |

## Command Default

None

## Command Modes

Interface configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This is an example of configuring the **ipsubscriber session-limit** command in the interface configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 56
RP/0/RSP0/CPU0:router(config-if)# ipsubscriber session-limit
RP/0/RSP0/CPU0:router(config-ipsub-sess-limit)# total per-vlan 25
RP/0/RSP0/CPU0:router(config-ipsub-sess-limit)# unclassified-source per-vlan 452
```

# ipsubscriber subscriber-templates

To enable template-based session provisioning for IPoE subscribers at an access-interface level, use the **ipsubscriber subscriber-templates** command in interface configuration mode. To disable subscriber templates on an access-interface, use the **no** form of this command.

**ipsubscriber subscriber-templates** *max_templates*

## Syntax Description

| | |
|---|---|
| *max_templates* | Specifies maximum number of templates on the specified access-interface.<br>The range is from 1 to 10. |

## Command Default

None

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

You must clear all subscriber sessions on an access-interface before disabling the subscriber templates or before modifying the number of subscriber templates on that access-interface.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to enable template-based session provisioning for IPoE subscribers:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#interface bundle-ether 1.1
RP/0/RSP0/CPU0:router(config-subif)#ipsubscriber subscriber-templates 7
```

# ont-reboot ont-disable-duration

To modify the ont-disable-duration timer value, use the **ont-reboot ont-disable-duration** command in the subscriber configuration mode.

**ont-reboot ont-disable-duration** *timer_value*

## Syntax Description

| | |
|---|---|
| *timer_value* | Specifies the duration in seconds for which the **ipoe-dhcp-client-reboot** feature will be disabled if Subscriber Infra Readiness (SIR) is flapping.<br>The range is from 0 to 1800 seconds and the default value is 1200 seconds. |

## Command Default

None

## Command Modes

subscriber configuration

## Command History

| Release | Modification |
|---|---|
| Release 24.4.1 | This command was introduced. |

## Usage Guidelines

The **ont-disable-duration** timer is enabled by default. However you can modify the timer values.

You cannot modify the **ont-reboot sir-flap-duration** and **ont-disable-duration** timer values while they are actively running.

This is an example to modify the values for the timers.

```
Router(config)# subscriber
Router(config-subscriber)ont-reboot ont-disable-duration 20 sir-flap-duration 30
```

# ont-reboot sir-flap-duration

To modify the Subscriber Infra Readiness (SIR) flap duration timer (sir-flap-duration) timer to detect the BNG overload events, use the **ont-reboot sir-flap-duration** command in the subscriber configuration mode.

**ont-reboot sir-flap-duration** *timer_value*

## Syntax Description

| | |
|---|---|
| *timer_value* | Specifies the duration in seconds for which the SIR flap is monitored.<br>The range is from 0 to 1800 seconds and the default value is 1200 seconds. |

## Command Default

None

## Command Modes

subscriber configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 24.4.1 | This command was introduced. |

## Usage Guidelines

The **sir-flap-duration** timer is enabled by default. However you can modify the timer value.

You cannot modify the **ont-reboot sir-flap-duration** and **ont-disable-duration** timer values while they are actively running.

This is an example to modify the values for the timers.

```
Router(config)# subscriber
Router(config-subscriber)ont-reboot ont-disable-duration 20 sir-flap-duration 30
```

# show ipsubscriber access-interface

To display the access interface information for IP subscriber, use the **show ipsubscriber access-interface** command in the EXEC mode.

**show ipsubscriber access-interface** {*typeinterface-path-id* | **brief** | **location***location*}

## Syntax Description

| | |
|---|---|
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark ( **?** ) online help function. |
| **brief** | Displays the brief summary of IP Subscriber access interface status and configuration. |
| **location** | Specifies the IP subscriber location. |
| *location* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

For interface-based static sessions in the BNG, the value of *Interface Type* field in the **show ipsubscriber access-interface** command output is displayed as **static**.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show ipsubscriber access-interface** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber access-interface

Interface: GigabitEthernet0/0/0/0 (ifhandle 0x20000040)
  State: UP
  Type: Plain
  Created Jan 18 00:01:32 (age 00:58:28)
```

```
  Initiator DHCP enabled
    Session count 0
    FSOL packets 0, bytes 0
    FSOL dropped packets 0, bytes 0
  Initiator Packet-Trigger enabled
    Session count 0
    FSOL packets 0, bytes 0
    FSOL dropped packets 0, bytes 0
  Initiator DHCPv6 disabled
    Session count 0
    FSOL packets 0, bytes 0
    FSOL dropped packets 0, bytes 0
  Initiator Packet-Trigger-IPv6 enabled
    Session count 0
    FSOL packets 0, bytes 0
    FSOL dropped packets 0, bytes 0

RP/0/RSP0/CPU0:router# show ipsubscriber access-interface brief

Codes: UP - Up, DOWN - Down, DELETED - Deleted State, UNKNOWN - Unknown State,
       PKT - Packet Trigger Initiation, DHCP - DHCP Initiation
       PKTv6 - Packet Trigger Initiation for IPv6, DHCPv6 - DHCPv6 Initiation

Interface             Proto                 DHCP        Pkt Trigger DHCPv6      PktTrigIPv6
 State
---------------------- --------------------- ----------- ----------- ----------- -----------
 ---------
Gi0/0/0/0              DHCP,PKT,DHCPv6,PKTv6           0           2           0
 0        UP
BE1.1                  DHCP,PKT                        0           0           0
 0        UP
```

This is the sample output of the **show ipsubscriber access-interface** command for interface-based static sessions:

```
RP/0/RSP0/CPU0:router# show ipsubscriber access-interface
Interface: Bundle-Ether1.10
  State: UP
  Type: Plain
  Interface Type: Static
  Created Apr  8 09:56:57 (age 00:08:08)
  Initiator DHCP disabled
    Session count 0
    FSOL packets 0
    FSOL dropped packets 0
    FSOL flow rate dropped packets 0
    FSOL session limit dropped packets 0
  Initiator Packet-Trigger enabled
    Session count 1
```

This table describes the significant fields shown in the display.

***Table 14: show ipsubscriber access-interface Field Descriptions***

| Field | Description |
|---|---|
| Interface | Specifies the access interface type. |

| Field | Description |
|---|---|
| Proto | Specifies the prototype, for instance, DHCP, DHCPv6, PKTv6. |
| DHCP | Specifies the DHCP initiation. |
| Pkt Trigger | Specifies the packet trigger Initiation. |
| DHCPv6 | Specifies the packet trigger Initiation for IPv6. |
| PktTrigIPv6 | Specifies the DHCPv6 initiation. |
| State | Specifies the various states of the access interface, for example, up, down, deleted, and unknown state. |

## Related Commands

| Command | Description |
|---|---|
| ipsubscriber l2-connected, on page 262 | Displays the subscriber management session information. |

# show ipsubscriber interface

To display the interface information for the IP subscriber interfaces, use the **show ipsubscriber interface** command in the EXEC mode.

**show ipsubscriber interface** {*type interface-path-id* | **access-interface** | **address-family** | **brief** | **dynamic-routes** [**location** *node-id*] | **location** *node-id* | **outer-vlan-id** *id* [**inner-vlan-id** *id*] | **subscriber-ip** | **subscriber-label** | **subscriber-mac** | **vrf**}

## Syntax Description

| | |
|---|---|
| *type* | Interface type. For more information on interface types available for this command, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark ( **?** ) online help function. |
| **access-interface** | Specifies the access or parent interface. |
| **address-family** | Specifies the address-family in which the IP subscriber interface operates. |
| **brief** | Displays the brief summary of IP Subscriber access interface status and configuration. |
| **dynamic-routes** | Specifies the dynamic routes. |
| **location** | Specifies the IP subscriber location. |
| *node-id* | Specifies the fully qualified location specification. |
| **outer-vlan-id** | Specifies the subscriber outer VLAN ID. |
| *id* | Outer VLAN ID. The range is from 1 to 4094. |
| **inner-vlan-id** | Specifies the subscriber inner VLAN ID. |
| *id* | Inner VLAN ID. The range is from 1 to 4094. |
| **subscriber-ip** | Specifies the subscriber IPv4 address. |
| **subscriber-label** | Specifies the subscriber label. |
| **subscriber-mac** | Specifies the subscriber MAC address. |
| **vrf** | Specifies the VRF in which the IP subscriber interface operates. |

**Command Default** None

**Command Modes** EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.1 | The **outer-vlan-id** keyword along with an optional **inner-vlan-id** keyword was added. |
| Release 5.1 | The **dynamic-routes** keyword was added. |
| Release 5.3.0 | A new output field, *Template ID*, was added for **show ipsubscriber interface internal** command. |

**Usage Guidelines** For interface-based static sessions in the BNG, the value of *Type* field in the **show ipsubscriber interface** command output is displayed as **Static**.

**Task ID**

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show ipsubscriber interface** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber interface

Interface: GigabitEthernet0/1/0/0.11.ip1
      Type: L2-connected
      Ifhandle: 0x201000c0
      Access Interface: GigabitEthernet0/1/0/0.11 (0x20100080)
      Subscriber MAC: 0100.0000.0000
      Subscriber IP: 11.10.10.9         <------- this line will not be shown if empty
      Subscriber IPv6 Prefix: FE80::10  <------- this line will not be shown if empty
      Subscriber Label: 0x8000000
      IPv4: Initiator: Packet-Trigger   <-- this line will not be shown if not enabled
      IPv6: Initiator: DHCPv6           <-- this line will not be shown if not enabled
      Created: May 11 16:33:08 (age 00:03:08)
      VRF: vpn1 (0x60000002), IPv4 Table: default (0xe0000002), IPv6 Table: default
(0xe0000002)
      IPv4: State: Up(9) (old: Adjacency added(8))
            Last state change: May 11 16:33:08 (00:03:08 in current state)
      IPv6: State: Up(9) (old: Adjacency added(8))
            Last state change: May 11 16:33:08 (00:03:08 in current state)

RP/0/RSP0/CPU0:router# show ipsubscriber interface brief

Codes: INV - Invalid, INIT - Initialized, STRTD - Session Creation Started,
       CPEXCTG - Control-Policy Executing, CPEXCTD - Control-Policy Executed,
       FTAPPLD - Session Features Applied, VRFCFGD - VRF Configured,
       ADJADDG - Adding Adjacency, ADJADDD - Adjacency Added, UP - Up,
       DOWN - Down, DISCG - Disconnecting, DISCD - Disconnected, ERR - Error,
       UNKWN - Unknown State, PKT - Packet Trigger Initiation,
       PKTv6 - Packet Trigger Initiation for IPv6,
       DHCP - DHCP Initiation, DHCPv6 - DHCPv6 Initiation
```

```
Interface              Proto Subscriber IP      MAC Address        Sublabel   VRF
State
---------------------- ------ ----------------- ------------------ ---------- ----------
----------
Gi0/0/0/0.ip1          DHCP   1.10.10.9          0100.0000.0000     0x40       default
UP
                       DHCPv6                    0100.0000.0000     0x40       default
UP
Gi0/0/0/0.ip2          PKT    2.20.20.9          0200.0000.0000     0x20       default
UP
                       PKTv6                     0200.0000.0000     0x20       default
UP
Gi0/0/0/0.ip3          DHCPv6 5.40.20.9          0200.2200.0000     0x21       default
UP
Gi0/0/0/0.ip4          PKTv6  7.91.20.9          0200.2210.0000     0x31       default
UP
```

This is the sample output of the **show ipsubscriber interface outer-vlan-id** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber interface outer-vlan-id 200 inner-vlan-id 100

Interface: Bundle-Ether1.200.ip1
  Type: L2-connected
  Access Interface: Bundle-Ether1.200
  Subscriber MAC: 0000.0000.0014
  Subscriber IPv4: 1.10.9.246
  Subscriber Label: 0x4f
  IPv4 Initiator: Packet-Trigger
  VLAN ID: outer 200 inner 100
  Created: Dec 22 00:32:28 (age 00:00:43)
  VRF: default, IPv4 Table: default
  IPv4 State: Up (old: Adjacency added)
       Last state change: Apr 9 00:32:28 (00:00:43 in current state)
```

This is the sample output of the **show ipsubscriber interface dynamic-routes** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber interface dynamic-routes
Interface              Dynamic-Routes
---------------------- ------------------------------------------------------------
BE1.1.ip3              45.1.32.0/24 (vrf vpn1) nhop 12.1.0.32 (vrf vpn1) distance 3 tag 34
 (added)
BE1.1.ip4              45.1.33.0/24 (vrf vpn1) nhop 12.1.0.33 (vrf vpn1) distance 14 tag
340 (added)
```

This is a sample output of the **show ipsubscriber interface internal** command, with BNG Subscriber Templates feature enabled:

```
RP/0/RSP0/CPU0:router# show ipsubscriber interface internal
Tue Nov  4 12:52:33.016 EDT
Interface: Bundle-Ether601.603.ip8
Type: L2-connected
Access Interface: Bundle-Ether601.603
Ifhandle: 0x9e0
Access Ifhandle: 0x560
Subscriber MAC: 0000.6611.0103
Subscriber IPv4: 15.15.0.4
Subscriber Label: 0xc3
IPv4 Initiator: DHCP
VLAN ID: 603
Created: Nov  2 13:42:34 (age 1d23h)
VRF: default (0x60000000), IPv4 Table: default (0xe0000000)
```

```
IPv4 State: Up (old: Adjacency added)
Last state change: Nov  2 13:42:35 (1d23h in current state)
Flags: 0x80030811 (V4_ROUTE_ADDED AFI_IPV4 ACTIVTED )
Flags2: 0x4 (V4_INIT_DONE )
AAA Transaction Id: 8589934603
Interface Number: 8
Wavl Tree Pointer: 0x10827c58
Template ID      : 0x6e0
[IPv4 Event History]
Nov  2 13:42:34.368 FSOL Received
Nov  2 13:42:34.368 Session Created
Nov  2 13:42:34.880 IM Intf Created
Nov  2 13:42:35.008 VRF Received
Nov  2 13:42:35.008 VRF Conf Received
Nov  2 13:42:35.008 Feature-Conf Activated
Nov  2 13:42:35.520 EA-DPC Success
Nov  2 13:42:35.520 Subscriber Route Added
Nov  2 13:42:35.520 All RIB Route Added
```

This table describes the significant fields shown in the display.

***Table 15: show ipsubscriber interface Field Descriptions***

| Field | Description |
|---|---|
| Interface | Specifies the access interface type. |
| Proto | Specifies the prototype, for instance, DHCP, DHCPv6, PKTv6. |
| Subscriber IP | Specifies the IP address of the subscriber interface. |
| MAC Address | Specifies the MAC address for each interface type. |
| Sublabel | Specifies the sub label type for each interface. |
| VRF | Specifies the default VRF type. |
| State | Specifies the various states of the access interface, for example, up, down, deleted, and unknown state. |

## Related Commands

| Command | Description |
|---|---|
| ipsubscriber l2-connected, on page 262 | Displays the subscriber management session information. |

# show ipsubscriber summary

To display the summary information for the IP subscriber interfaces, use the **show ipsubscriber summary** command in the EXEC mode.

**show ipsubscriber summary location** *location*

## Syntax Description

| | |
|---|---|
| **location** | Specifies the IP subscriber location. |
| *location* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show ipsubscriber summary** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber summary
IPSUB Summary for all nodes

Interface Counts:
                                DHCP  Pkt Trigger
                            ---------- ------------
                    Invalid:          0            0
                Initialized:          0            0
    Session creation started:         0            0
    Control-policy executing:         0            0
     Control-policy executed:         0            0
    Session features applied:         0            0
              VRF configured:         0            0
            Adding adjacency:         0            0
             Adjacency added:         0            0
                         Up:          0            0
                       Down:          0            0
               Disconnecting:         0            0
                Disconnected:         0            0
               Unknown state:         0            0
                      Error:          0            0
                            ---------- ------------
                     Total:          0            0

                                   DHCPv6 PktTrig-IPv6
```

```
                              ---------- ------------
                     Invalid:          0            0
                 Initialized:          0            0
    Session creation started:          0            0
    Control-policy executing:          0            0
     Control-policy executed:          0            0
    Session features applied:          0            0
              VRF configured:          0            0
            Adding adjacency:          0            0
             Adjacency added:          0            0
                          Up:          0            0
                        Down:          0            0
                Disconnecting:          0            0
                 Disconnected:          0            0
                Unknown state:          0            0
                       Error:          0            0
                              ---------- ------------
                       Total:          0            0

Routes Per VRF (0 VRFs):
                                    Count
                              ----------

Access Interface Counts (1 interfaces):

                                     DHCP  Pkt Trigger
                              ---------- ------------
                  FSOL Packets:          0            0
                    FSOL Bytes:          0            0

                                 DHCPv6 PktTrig-IPv6
                              ---------- ------------
                  FSOL Packets:          0            0
                    FSOL Bytes:          0            0
```

This table describes the significant fields shown in the display.

***Table 16: show ipsubscriber summary Field Descriptions***

| Field | Description |
|---|---|
| Invalid | Specifies the number of invalid packets for DHCP and Packet Trigger. |
| Initialized | Specifies the number of packets that were initialized for DHCP and Packet Trigger. |
| Session creation started | Specifies the total number of session initiation that was created. |
| Control-policy executing | Specifies the control policies that are executing for DHCP and Packet Trigger. |
| Control-policy executed | Specifies the control policies that were executed for DHCP and Packet Trigger. |
| Session features applied | Specifies the number of session features that were applied for DHCP and Packet Trigger. |
| VRF configured | Specifies the VRFs configured. |
| Up | Specifies the number of packets that are in the UP state. |
| Down | Specifies the number of packets that are in the DOWN state. |

| Field | Description |
|---|---|
| Disconnecting | Specifies the number of packets that are disconnecting. |
| Disconnected | Specifies the number of packets that are disconnected. |
| Unknown State | Specifies the packets that are in the unknown state. |
| Error | Specifies the number of packets that are errored out. |

## Related Commands

| Command | Description |
|---|---|
| ipsubscriber l2-connected, on page 262 | Displays the subscriber management session information. |

# show ipsubscriber template-interface

To display the template information for the IP subscriber interfaces, use the **show ipsubscriber template-interface** command in the EXEC mode.

**show ipsubscriber template-interface** [**access-interface** *interface-name*] [**internal**]

## Syntax Description

| | |
|---|---|
| **access-interface** | (Optional) Specifies the IP subscriber template interfaces for an access-interface. |
| *interface-name* | Interface type. For more information on interface types available for this command, use the question mark (?) online help function. |
| **internal** | (Optional) Displays the internal information of IP subscriber template interfaces. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show ipsubscriber template-interface** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber template-interface

Tue Nov  4 12:52:56.924 EDT

Template Subscriber Name                 Template Subscriber Ifhandle
-----------------------------------------------------------------------------------
Bundle-Ether601.603.tmpl1                0x6e0
Bundle-Ether601.603.tmpl2                0x720
Bundle-Ether601.603.tmpl3                0x760
Bundle-Ether601.603.tmpl4                0x7a0
Bundle-Ether601.603.tmpl5                0x7e0
Bundle-Ether601.604.tmpl1                0x820
Bundle-Ether601.604.tmpl2                0x860
Bundle-Ether601.604.tmpl3                0x8a0
Bundle-Ether601.604.tmpl4                0x8e0
Bundle-Ether601.604.tmpl5                0x920
```

This is a sample output of the **show ipsubscriber template-interface internal** command:

```
RP/0/RSP0/CPU0:router# show ipsubscriber template-interface internal
```

```
Template Subscriber Internal
-------------------------------------------------------------------------------

  Template Interface Name : Bundle-Ether601.603.tmpl1

  Ifhandle              : 0x6e0
  Parent Interface      : 0xBundle-Ether601.603 (560)
  Interface Number      : 1
  Creation time         : Nov  2 13:34:49


  Template Interface Name : Bundle-Ether601.603.tmpl2

  Ifhandle              : 0x720
  Parent Interface      : 0xBundle-Ether601.603 (560)
  Interface Number      : 2
  Creation time         : Nov  2 13:34:49


  Template Interface Name : Bundle-Ether601.603.tmpl3

  Ifhandle              : 0x760
  Parent Interface      : 0xBundle-Ether601.603 (560)
  Interface Number      : 3
  Creation time         : Nov  2 13:34:49


  Template Interface Name : Bundle-Ether601.603.tmpl4

  Ifhandle              : 0x7a0
  Parent Interface      : 0xBundle-Ether601.603 (560)
  Interface Number      : 4
  Creation time         : Nov  2 13:34:49


  Template Interface Name : Bundle-Ether601.603.tmpl5

  Ifhandle              : 0x7e0
  Parent Interface      : 0xBundle-Ether601.603 (560)
  Interface Number      : 5
  Creation time         : Nov  2 13:34:49


  Template Interface Name : Bundle-Ether601.604.tmpl1

  Ifhandle              : 0x820
  Parent Interface      : 0xBundle-Ether601.604 (5a0)
  Interface Number      : 1
  Creation time         : Nov  2 13:34:51


  Template Interface Name : Bundle-Ether601.604.tmpl2

  Ifhandle              : 0x860
  Parent Interface      : 0xBundle-Ether601.604 (5a0)
  Interface Number      : 2
  Creation time         : Nov  2 13:34:51


  Template Interface Name : Bundle-Ether601.604.tmpl3

  Ifhandle              : 0x8a0
  Parent Interface      : 0xBundle-Ether601.604 (5a0)
  Interface Number      : 3
```

```
Creation time         : Nov  2 13:34:51


Template Interface Name : Bundle-Ether601.604.tmpl4

Ifhandle              : 0x8e0
Parent Interface      : 0xBundle-Ether601.604 (5a0)
Interface Number      : 4
Creation time         : Nov  2 13:34:51


Template Interface Name : Bundle-Ether601.604.tmpl5

Ifhandle              : 0x920
Parent Interface      : 0xBundle-Ether601.604 (5a0)
Interface Number      : 5
Creation time         : Nov  2 13:34:51
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber database, on page 475 | Displays the configuration details of subscriber database. |
| show subscriber database template, on page 481 | Displays the template interface handle and template session information of a subscriber session in BNG. |
| show ipsubscriber interface, on page 273 | Shows the interface information for IP subscriber interfaces. |



# Multicast Commands

This module describes the Cisco IOS XR software commands used to configure the Multicast commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- multicast (BNG), on page 284
- unicast-qos-adjust, on page 285

# multicast (BNG)

To configure the mode in which the multicast components will work for subscriber sessions associated with a dynamic template, use the **multicast** command in the dynamic-template configuration mode. To disable this feature, use the **no** form of this command.

**multicast** [**ipv4**] {**qos-correlation** | **passive**}

| | |
|---|---|
| **qos-correlation** | Configures multicast in a IGMP-HQOS correlation mode. |
| **passive** | Configures multicast is an passive mode. |
| **ipv4** | Optional. Specifies configuration for IPv4 address family. |

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 6.2.1 | The command was extended to IPoE subscribers as well. |

**Usage Guidelines**

Use the **dynamic-template type ppp** command to enter dynamic template type ppp configuration mode.

**Task ID**

| Task ID | Operation |
|---|---|
| multicast | read, write |

This is an example of configuring the **multicast** command in the dynamic-template configuration mode for type PPP:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ppp foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# multicast ipv4 qos-correlation
```

This is an example of enabling IGMP QoS correlation for IPoE subscribers:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
RP/0/RSP0/CPU0:router(config-dynamic-template)# type ipsubscriber foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# multicast ipv4 qos-correlation
```

# unicast-qos-adjust

To configure the IGMP QOS Shaper for subscriber unicast traffic, use the **unicast-qos-adjust** command in the IGMP configuration mode. To disable this feature, use the **no** form of this command.

**unicast-qos-adjust** {**adjustment-delay** | **download-interval** | **holdoff**}

## Syntax Description

| | |
|---|---|
| **adjustment-delay** | Configures the time to wait before programming rate in QOS. |
| **download-interval** | Configures the time before downloading a batch of interfaces to QOS. |
| **holdoff** | Configures the hold-off time before QOS clears the stale entries. |

## Command Default

None

## Command Modes

IGMP configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template type ppp** command to enter dynamic template type ppp configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| multicast | read, write |

This is an example of configuring the **unicast-qos-adjust** command in the IGMP configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router igmp
RP/0/RSP0/CPU0:router(config-igmp)# unicast-qos-adjust
```



# Neighbor Discovery Commands

This module describes the Cisco IOS XR software commands used to configure the Neighbor Discovery Commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- ipv6 nd dad attempts (BNG), on page 288
- ipv6 nd framed-prefix-pool, on page 291
- ipv6 nd hop-limit, on page 292
- ipv6 nd managed-config-flag (BNG), on page 293
- ipv6 nd ns-interval (BNG), on page 295
- ipv6 nd mtu suppress, on page 297
- ipv6 nd nud-enable, on page 298
- ipv6 nd other-config-flag (BNG), on page 299
- ipv6 nd ra dns server, on page 301
- ipv6 nd ra-initial, on page 302
- ipv6 nd ra-interval (BNG), on page 304
- ipv6 nd ra-lifetime (BNG), on page 306
- ipv6 nd ra-unicast, on page 308
- ipv6 nd reachable-time (BNG), on page 309
- ipv6 nd router-preference , on page 311
- ipv6 nd start-ra-on-ipv6-enable, on page 312
- ipv6 nd suppress-cache-learning, on page 314
- ipv6 nd suppress-ra (BNG), on page 315

# ipv6 nd dad attempts (BNG)

To configure the number of consecutive neighbor solicitation messages that are sent on an interface while duplicate address detection is performed on the unicast IPv6 addresses of the interface, use the **ipv6 nd dad attempts** command in an appropriate configuration mode. To return the number of messages to the default value, use the **no** form of this command.

**ipv6 nd dad attempts** *value*

## Syntax Description

| | |
|---|---|
| *value* | Number of neighbor solicitation messages. Range is 0 to 600. Configuring a value of 0 disables duplicate address detection processing on the specified interface; a value of 1 configures a single transmission without follow-up transmissions. |

## Command Default

Duplicate address detection on unicast IPv6 addresses with the sending of one neighbor solicitation message is enabled. The default is one message.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

Duplicate address detection verifies the uniqueness of new unicast IPv6 addresses before the addresses are assigned to interfaces (the new addresses remain in a tentative state while duplicate address detection is performed). Duplicate address detection uses neighbor solicitation messages to verify the uniqueness of unicast IPv6 addresses.

The DupAddrDetectTransmits node configuration variable (as specified in RFC 2462, *IPv6 Stateless Address Autoconfiguration*) is used to automatically determine the number of consecutive neighbor solicitation messages that are sent on an interface while duplicate address detection is performed on a tentative unicast IPv6 address.

The interval between the sending of duplicate address detection neighbor solicitation messages (the duplicate address detection timeout interval) is specified by the neighbor discovery-related variable RetransTimer (as specified in RFC 2461, *Neighbor Discovery for IP Version 6 [IPv6]*), which is used to determine the time between retransmissions of neighbor solicitation messages to a neighbor when the address is being resolved or when the reachability of a neighbor is being probed. This is the same management variable used to specify the interval for neighbor solicitation messages during address resolution and neighbor unreachability detection. Use the **ipv6 nd ns-interval** command to configure the interval between neighbor solicitation messages that are sent during duplicate address detection.

Duplicate address detection is suspended on interfaces that are administratively down. While an interface is administratively down, the unicast IPv6 addresses assigned to the interface are set to a pending state. Duplicate address detection is automatically restarted on an interface when the interface returns to being administratively up.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

**Note** An interface returning to administratively up restarts duplicate address detection for all of the unicast IPv6 addresses on the interface. While duplicate address detection is performed on the link-local address of an interface, the state for the other IPv6 addresses is still set to tentative. When duplicate address detection is completed on the link-local address, duplicate address detection is performed on the remaining IPv6 addresses.

When duplicate address detection identifies a duplicate address, the state of the address is set to duplicate and the address is not used. If the duplicate address is the link-local address of the interface, the processing of IPv6 packets is disabled on the interface and an error message similar to the following is issued:

```
ipv6_nd[145]: %IPV6_ND-3-ADDRESS_DUPLICATE : Duplicate address 111::1 has been detected
```

If the duplicate address is a global address of the interface, the address is not used and an error message similar to the following is issued:

```
%IPV6-4-DUPLICATE: Duplicate address 3000::4 on GigabitEthernet
```

All configuration commands associated with the duplicate address remain as configured while the state of the address is set to duplicate.

If the link-local address for an interface changes, duplicate address detection is performed on the new link-local address and all of the other IPv6 address associated with the interface are regenerated (duplicate address detection is performed only on the new link-local address).

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) shows how to set the number of consecutive neighbor solicitation messages for interface 0/2/0/1 to 1 and then display the state (tentative or duplicate) of the unicast IPv6 address configured for an interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/2/0/1
RP/0/RSP0/CPU0:router(config-if)# ipv6 nd dad attempts 1
RP/0/RSP0/CPU0:router(config-if)# Uncommitted changes found, commit them before
exiting(yes/no/cancel)? [cancel]:y

RP/0/RSP0/CPU0:router# show ipv6 interface
gigabitethernet2/2/0/0 is Up, line protocol is Up
  IPv6 is disabled, link-local address unassigned
  No global unicast address is configured
gigabitethernet2/2/0/1 is Up, line protocol is Up
  IPv6 is enabled, link-local address is fe80::203:fdff:fe1b:4501
  Global unicast address(es):
    1:4::1, subnet is 1:4::/64 [DUPLICATE]
  MTU is 1514 (1500 is available to IPv6)
```

```
  ICMP redirects are disabled
  ND DAD is enabled, number of DAD attempts 1
  ND reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  Hosts use stateless autoconfig for addresses.
gigabitethernet2/2/0/2 is Shutdown, line protocol is Down
  IPv6 is enabled, link-local address is fe80::200:11ff:fe11:1111 [TENTATIVE]
  Global unicast address(es):
    111::2, subnet is 111::/64 [TENTATIVE]
  MTU is 1514 (1500 is available to IPv6)
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts 1
  ND reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  Hosts use stateless autoconfig for addresses.
```

For BNG, this example shows how to display the state (tentative or duplicate) of the unicast IPv6 address on the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv6 nd dad attempts 1
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 nd ns-interval (BNG), on page 295 | Configures the interval between IPv6 neighbor solicitation transmissions on an interface. |

# ipv6 nd framed-prefix-pool

To set the IPv6 Neighbor Discovery (ND) framed prefix pool, use the **ipv6 nd framed-prefix-pool** command in the dynamic template configuration mode. To disable the framed prefix pool configuration, use the **no** form of this command.

**ipv6 nd framed-prefix-pool** *pool_name*

## Syntax Description

| | |
|---|---|
| *pool_name* | Specifies the framed address pool name. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

This value is included in all IPv6 router advertisements sent out from this interface. Very short intervals are not recommended in normal IPv6 operation. When a nondefault value is configured, the configured time is both advertised and used by the router itself.

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example creates an IPv6 framed prefix pool in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv6 nd framed-prefix-pool pool1
```

# ipv6 nd hop-limit

To configure the IPv6 ND router advertisement (RA) hop limit on the VLAN, use the **ipv6 nd hop-limit** command in the dynamic template or cnbng-nal configuration mode. To clear IPv6 hop limit, use the **no** form of this command.

**ipv6 nd hop-limit unspecified**

## Syntax Description

| | |
|---|---|
| **unspecified** | Notifies the unspecified IPv6 Neighbor Discovery (ND) RA hop limit value.<br>If the value is 0 it means the hop-limit is unspecified in the RAs originating on the current VLAN. |

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure the IPv6 ND router advertisement hop limit in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd ipv6 nd hop-limit unspecified
```

This example shows how to configure the IPv6 ND router advertisement hop limit in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ipv6 nd hop-limit unspecified
```

# ipv6 nd managed-config-flag (BNG)

To set the managed address configuration flag in IPv6 router advertisements, use the **ipv6 nd managed-config-flag** command in an appropriate configuration mode. To clear the flag from IPv6 router advertisements, use the **no** form of this command.

**ipv6 nd managed-config-flag**

## Syntax Description

This command has no keywords or arguments.

## Command Default

The managed address configuration flag is not set in IPv6 router advertisements.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

Setting the managed address configuration flag in IPv6 router advertisements indicates to attached hosts whether they should use stateful autoconfiguration to obtain addresses. If the flag is set, the attached hosts should use stateful autoconfiguration to obtain addresses. If the flag is not set, the attached hosts should not use stateful autoconfiguration to obtain addresses.

Hosts may use stateful and stateless address autoconfiguration simultaneously.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For Cloud Native BNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) shows how to configure the managed address configuration flag in IPv6 router advertisements on GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd managed-config-flag
```

For BNG, this example shows how to configure the managed address configuration flag in IPv6 router advertisements on dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd managed-config-flag
```

For Cloud Native BNG, this example shows how to configure the managed address configuration flag in IPv6 router advertisements in the cnbng-nalconfiguration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd managed-config-flag
```

# ipv6 nd ns-interval (BNG)

To configure the interval between IPv6 neighbor solicitation retransmissions on an interface, use the **ipv6 nd ns-interval** command in an appropriate configuration mode. To restore the default interval, use the **no** form of this command.

**ipv6 nd ns-interval** *milliseconds*

## Syntax Description

| | |
|---|---|
| *milliseconds* | Interval (in milliseconds) between IPv6 neighbor solicit transmissions. Range is 1000 to 3600000 (BNG) and 4294967295 (for Cloud Native BNG) . |

## Command Default

0 milliseconds (unspecified) is advertised in router advertisements, and the value 1000 is used for the neighbor discovery activity of the router itself.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

This value is included in all IPv6 router advertisements sent out from this interface. Very short intervals are not recommended in normal IPv6 operation. When a nondefault value is configured, the configured time is both advertised and used by the router itself.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For cnBNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) configures an IPv6 neighbor solicit transmission interval of 9000 milliseconds for GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd ns-interval 9000
```

For BNG, this example configures an IPv6 neighbor solicit transmission interval of 9000 milliseconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd ns-interval 9000
```

For Cloud Native BNG, this example configures an IPv6 neighbor solicit transmission interval of 9000 milliseconds in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ns-interval 9000
```

# ipv6 nd mtu suppress

To suppress the MTU option in IPv6 Neighbor Discovery (ND) Router Advertisement (RA) header, use the **ipv6 nd mtu** command in the dynamic template or cnbng-nal configuration mode. To disable IPv6 nd mtu, use the **no** form of this command.

**ipv6 nd mtu suppress**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to suppress the MTU option in IPv6 ND Router RA header in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd mtu suppress
```

This example shows how to suppress the MTU option in IPv6 ND Router RA header in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd mtu suppress
```

# ipv6 nd nud-enable

To enable the IPv6 neighbor un-reachability detection (NUD), use the **ipv6 nd nud-enable** command in the dynamic template or cnbng-nal configuration mode. To disable IPv6 NUD, use the **no** form of this command.

**ipv6 nd nud-enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enable IPv6 neighbor un-reachability detection in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd nud-enable
```

This example shows how to enable IPv6 neighbor un-reachability detection in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd nud-enable
```

# ipv6 nd other-config-flag (BNG)

To set the other stateful configuration flag in IPv6 router advertisements, use the **ipv6 nd other-config-flag** command in an appropriate configuration mode. To clear the flag from IPv6 router advertisements, use the **no** form of this command.

**ipv6 nd other-config-flag**

## Syntax Description

This command has no keywords or arguments.

## Command Default

The other stateful configuration flag is not set in IPv6 router advertisements.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The setting of the other stateful configuration flag in IPv6 router advertisements indicates to attached hosts how they can obtain autoconfiguration information other than addresses. If the flag is set, the attached hosts should use stateful autoconfiguration to obtain the other (nonaddress) information.

**Note** If the managed address configuration flag is set using the **ipv6 nd managed-config-flag** command, then an attached host can use stateful autoconfiguration to obtain the other (nonaddress) information regardless of the setting of the other stateful configuration flag.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For cnBNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example (not applicable for BNG) configures the “other stateful configuration” flag in IPv6 router advertisements on GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd other-config-flag
```

For BNG, this example configures the other stateful configuration flag for IPv6 router advertisements in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd other-config-flag
```

For Cloud Native BNG, this example configures other stateful configuration flag for IPv6 router advertisements in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd other-config-flag
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 nd managed-config-flag (BNG), on page 293 | Sets the managed address configuration flag in IPv6 router advertisements. |

# ipv6 nd ra dns server

To add the DNS server information in the IPv6 nd router advertisement message, use the **ipv6 nd ra dns server** command in the dynamic template configuration mode. To remove the DNS server information, use the **no** form of this command.

**ipv6 nd ra dns server** *IPv6 address* { *lifetime* | **infinite-lifetime** | **zero-lifetime** }

## Syntax Description

| | |
|---|---|
| **dns server** *IPv6 address* | Specifies the DNS server IPv6 address.<br>The format of the IPv6 address should be *x:x::y*. |
| *lifetime* | Specifies the IPv6 RA DNS server lifetime interval in seconds.<br>It's a 32-bit unsigned integer. The maximum time in seconds over which these recursive DNS addresses are used for name resolution. |
| **infinite-lifetime** | Sets the IPv6 RA DNS server lifetime to infinity and the lifetime doesn't expire. |
| **zero-lifetime** | Sets the IPv6 RA DNS server lifetime to zero and DNS addresses is no longer used. |

## Command Default

None

## Command Modes

Dynamic template configuration (for BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was introduced. |

## Usage Guidelines

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run the **dynamic-template** command in the Global Configuration mode.

## Examples

For BNG, this example configures an IPv6 RA lifetime of 3500 seconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp PPP_PTA_TEMPLATE
Router(config-dynamic-template-type)# ipv6 nd ra dns server 2620:119:35::35 3500
```

# ipv6 nd ra-initial

To set the IPv6 initial router advertisement count and interval, use the **ipv6 nd ra-initial** command in the dynamic template or cnbng-nal configuration mode. To restore the default interval, use the **no** form of this command.

**ipv6 nd ra-initial** *count interval*

## Syntax Description

| | |
|---|---|
| *value* | The initial count or the initial number of the IPv6 router advertisements. The value ranges from 0-32. |
| *interval* | The interval (in seconds) between IPv6 router advertisement counts. The value ranges from 4-1800. |

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was introduced for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example shows how to configure an IPv6 router advertisement count of 5 and an interval of 201 seconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd ra-initial 5 201
```

This example shows how to configure IPv6 router advertisement count of 5 and an interval of 201 seconds in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
```

```
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ra-initial 5 201
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 nd ra-interval (BNG), on page 304 | Configures the interval between IPv6 router advertisement transmissions on an interface. |

# ipv6 nd ra-interval (BNG)

To configure the interval between IPv6 router advertisement transmissions on an interface, use the **ipv6 nd ra-interval** command in an appropriate configuration mode. To restore the default interval, use the **no** form of this command.

**ipv6 nd ra-interval** *seconds*

## Syntax Description

| | |
|---|---|
| *seconds* | The interval (in seconds) between IPv6 router advertisement transmissions. |

## Command Default

*seconds* : 200 seconds

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The interval between transmissions should be less than or equal to the IPv6 router advertisement lifetime if the router is configured as a default router by using the **ipv6 nd ra-lifetime** command. To prevent synchronization with other IPv6 nodes, randomly adjust the actual value used to within 20 percent of the specified value.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For Cloud Native BNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) configures an IPv6 router advertisement interval of 201 seconds on GigabitEthernet  interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd ra-interval 201
```

For BNG, this example configures an IPv6 router advertisement interval of 201 seconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1Router
Router(config-dynamic-template-type)# ipv6 nd ra-interval 201
```

For Cloud Native BNG, this example configures an IPv6 router advertisement interval of 201 seconds in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ra-interval 201
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 nd ra-lifetime (BNG), on page 306 | Configures the lifetime of an IPv6 router advertisement. |

# ipv6 nd ra-lifetime (BNG)

To configure the router lifetime value in IPv6 router advertisements on an interface, use the **ipv6 nd ra-lifetime** command in an appropriate configuration mode. To restore the default lifetime, use the **no** form of this command.

**ipv6 nd ra-lifetime** *seconds*

## Syntax Description

| | |
|---|---|
| *seconds* | The validity (in seconds) of this router as a default router on this interface. |

## Command Default

*seconds* : 1800 seconds

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The router lifetime value is included in all IPv6 router advertisements sent out the interface. The value indicates the usefulness of the router as a default router on this interface. Setting the value to 0 indicates that the router should not be considered a default router on this interface. The router lifetime value can be set to a nonzero value to indicate that it should be considered a default router on this interface. The nonzero value for the router lifetime value should not be less than the router advertisement interval.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For Cloud Native BNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) configures an IPv6 router advertisement lifetime of 1801 seconds on GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd ra-lifetime 1801
```

For BNG, this example configures an IPv6 router advertisement lifetime of 1801 seconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd ra-lifetime 1801
```

For Cloud Native BNG, this example configures an IPv6 router advertisement lifetime of 1801 seconds in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ra-lifetime 1801
```

## Related Commands

| Command | Description |
|---|---|
| ipv6 nd ra-interval (BNG), on page 304 | Configures the interval between IPv6 router advertisement transmissions on an interface. |

# ipv6 nd ra-unicast

To enable the IPv6 unicast router advertisement (RA), use the **ipv6 nd ra-unicast** command in the dynamic template or cnbng-nal configuration mode. To disable IPv6 unicast RA, use the **no** form of this command.

**ipv6 nd ra-unicast**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enable the IPv6 unicast router advertisement in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd ra-unicast
```

This example shows how to to enable the IPv6 unicast router advertisement in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd ipv6 nd ra-unicast
```

## Related Commands

| Command | Description |
|---|---|
| dynamic-template, on page 220 | Groups a set of configuration items that can be applied to a group of subscribers. |

# ipv6 nd reachable-time (BNG)

To configure the amount of time that a remote IPv6 node is considered reachable after some reachability confirmation event has occurred, use the **ipv6 nd reachable-time** command in an appropriate configuration mode. To restore the default time, use the **no** form of this command.

**ipv6 nd reachable-time** *milliseconds*

## Syntax Description

| | |
|---|---|
| *milliseconds* | The amount of time (in milliseconds) that a remote IPv6 node is considered reachable. The range is from 0 to 3600000. |

## Command Default

0 milliseconds (unspecified) is advertised in router advertisements and 30000 (30 seconds) is used for the neighbor discovery activity of the router itself.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

The configured time enables the router to detect unavailable neighbors. Shorter configured times enable the router to detect unavailable neighbors more quickly; however, shorter times consume more IPv6 network bandwidth and processing resources in all IPv6 network devices. Very short configured times are not recommended in normal IPv6 operation.

The configured time is included in all router advertisements sent out of an interface so that nodes on the same link use the same time value. A value of 0 indicates that the configured time is unspecified by this router.

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

For Cloud Native BNG, ensure you run this command in the cnbng-nal configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |

| Task ID | Operations |
|---|---|
| config-services | read, write |

## Examples

This example (not applicable for BNG) shows how to configure an IPv6 reachable time of 1,700,000 milliseconds for GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd reachable-time 1700000
```

For BNG, this example shows how to configure an IPv6 reachable time of 1,700,000 milliseconds in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd reachable-time 1700000
```

For Cloud Native BNG, shows how to configure an IPv6 reachable time of 1,700,000 milliseconds in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd reachable-time 1700000
```

# ipv6 nd router-preference

To set the IPv6 neighbor discovery router preference, use the **ipv6 nd router-preference** command in the dynamic template or cnbng-nal configuration mode. To disable IPv6 nd router preference, use the **no** form of this command.

**ipv6 nd router-preference low medium High**

## Syntax Description

| | |
|---|---|
| **low** | Specifies the router preference as low. |
| **medium** | Specifies the router preference as medium. |
| **high** | Specifies the router preference as high. |

## Command Default

None

## Command Modes

Dynamic template configuration

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to set the IPv6 neighbor discovery router preference in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd router-preference high
```

This example shows how to set the IPv6 neighbor discovery router preference in cnbng-nal configuration mode for Cloud Native BNG:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd router-preference high
```

# ipv6 nd start-ra-on-ipv6-enable

To automatically send IPv6 router advertisements to a subscriber interface after configuring IPv6 (by using **ipv6-enable** command), use the **ipv6 nd start-ra-on-ipv6** command in the dynamic template or cnbng-nal configuration mode. To disable the IPv6 router advertisements, use the **no** form of this command.

**ipv6 nd** [**start-ra-on-ipv6-enable**]

## Syntax Description

This command has no keywords or arguments.

## Command Default

On a dual stack environment, the IPv6 router advertisements are supported by default. The default behavior is that IPv6 neighbor discovery(ND) waits for the IPv6 stack to boot up before triggering a router advertisement.

## Command Modes

Dynamic template configuration mode (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 6.0 | This command was introduced. |

## Usage Guidelines

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run dynamic-template command in the Global Configuration mode.

For Cloud Native BNG, ensure you run this command in the cnbng-nal configuration mode.

This command can be used only for IPoE subscriber sessions

## Task ID

| Task ID | Operation |
|---|---|
| ipv6 | read,write |
| network | read,write |
| config-services | read,write |

### Example

This example shows how to enable IPv6 router advertisements on an IPv4 subscriber interface:

```
Router(config)#  dynamic-template type ipsubscriber ipv6ra
```

For Cloud Native BNG, this example shows how to enable IPv6 router advertisements in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd start-ra-on-ipv6-enable
```

**Related Commands**

| Command | Description |
|---|---|
| show ipv6 nd idb interface <subscriber-interface> detail location <member-location> | Displays the usability status of interfaces configured for IPv6. |

# ipv6 nd suppress-cache-learning

To suppress cache learning for IPv6 neighbor discovery, use the **ipv6 nd suppress-cache-learning** command in the dynamic template or cnbng-nal configuration mode. To disable cache learning suppress, use the **no** form of this command.

**ipv6 nd suppress-cache-learning**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to suppress cache learning for IPv6 neighbor discovery in dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd suppress-cache-learning
```

For Cloud Native BNG, this example shows how to suppress cache learning for IPv6 neighbor discovery in the cnbng-nal configuration mode:

```
Router#configure
Router(config)#interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd suppress-cache-learning
```

# ipv6 nd suppress-ra (BNG)

To suppress IPv6 router advertisement transmissions on a LAN interface, use the **ipv6 nd suppress-ra** command in an appropriate configuration mode. To reenable the sending of IPv6 router advertisement transmissions on a LAN interface, use the **no** form of this command.

**ipv6 nd suppress-ra**

## Syntax Description

This command has no keywords or arguments.

## Command Default

IPv6 router advertisements are automatically sent on other types of interlaces if IPv6 unicast routing is enabled on the interfaces. IPv6 router advertisements are not sent on other types of interfaces.

## Command Modes

Interface configuration (not applicable for BNG)

Dynamic template configuration (for BNG)

cnbng-nal configuration (for Cloud Native BNG)

## Command History

| Release | Modification |
|---|---|
| Release 7.10.1 | This command was supported in the cnbng-nal configuration mode for Cloud Native BNG. |
| Release 4.3.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 3.7.2 | This command was introduced. |

## Usage Guidelines

Use the **no ipv6 nd suppress-ra** command to enable the sending of IPv6 router advertisement transmissions on non-LAN interface types (for example, serial or tunnel interfaces).

For BNG, ensure you run this command in the dynamic template configuration mode. To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ipv6 | read, write |
| network | read, write |
| config-services | read, write |

## Examples

This example (not applicable for BNG) shows how to suppress IPv6 router advertisements on GigabitEthernet interface 0/1/1/0:

```
Router(config)# interface gigabitethernet 0/1/1/0
Router(config-if)# ipv6 nd suppress-ra
```

For BNG, this example shows how to suppress IPv6 router advertisements in the dynamic template configuration mode:

```
Router(config)# dynamic-template type ppp p1
Router(config-dynamic-template-type)# ipv6 nd suppress-ra
```

For Cloud Native BNG, this example shows how to suppress IPv6 router advertisements in the cnbng-nal configuration mode:

```
Router# configure
Router(config)# interface Bundle-Ether1.1
Router(config-subif)# cnbng-nal ipv6 nd suppress-ra
```



# BNG PPP Commands

This module describes the Cisco IOS XR software commands used to configure the PPP commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- ppp authentication (BNG), on page 318
- ppp chap, on page 321
- ppp duplicate-framed-route, on page 322
- ppp ipcp, on page 323
- ppp lcp, on page 325
- ppp max-bad-auth (BNG), on page 326
- ppp max-configure (BNG), on page 328
- ppp max-failure (BNG), on page 330
- ppp ms-chap, on page 332
- ppp timeout, on page 333
- show ppp interfaces (BNG), on page 335
- show ppp statistics, on page 341
- show ppp summary, on page 344

# ppp authentication (BNG)

To enable Challenge Handshake Authentication Protocol (CHAP), MS-CHAP, or Password Authentication Protocol (PAP), and to specify the order in which CHAP, MS-CHAP, and PAP authentication is selected on the interface, use the **ppp authentication** command in an appropriate configuration mode. To disable PPP authentication, use the **no** form of this command.

**ppp authentication** *protocol* [*protocol* [*protocol*]] {*list-name* | **default**}

## Syntax Description

| | |
|---|---|
| *protocol* | Name of the authentication protocol used for PPP authentication. See Table 17: PPP Authentication Protocols for Negotiation, on page 319 for the appropriate keyword. You may select one, two, or all three protocols, in any order. |
| *list-name* | (Optional) Used with authentication, authorization, and accounting (AAA). Name of a list of methods of authentication to use. If no list name is specified, the system uses the default. The list is created with the **aaa authentication ppp** command. |
| **default** | (Optional) Specifies the name of the list of methods created with the **aaa authentication ppp** command. |

## Command Default

PPP authentication is not enabled.

## Command Modes

Interface configuration

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.9.0 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

When you enable CHAP or PAP authentication (or both), the local router requires the remote device to prove its identity before allowing data traffic to flow. PAP authentication requires the remote device to send a name and a password, which is checked against a matching entry in the local username database or in the remote security server database. CHAP authentication sends a challenge message to the remote device. The remote device encrypts the challenge value with a shared secret and returns the encrypted value and its name to the local router in a response message. The local router attempts to match the remote device's name with an associated secret stored in the local username or remote security server database; it uses the stored secret to encrypt the original challenge and verify that the encrypted values match.

You can enable CHAP, MS-CHAP, or PAP in any order. If you enable all three methods, the first method specified is requested during link negotiation. If the peer suggests using the second method, or refuses the first method, the second method is tried. Some remote devices support only one method. Base the order in which you specify methods on the remote device's ability to correctly negotiate the appropriate method, and on the level of data line security you require. PAP usernames and passwords are sent as clear text strings, which can be intercepted and reused.

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

**Note** If you use a *list-name* value that was not configured with the **aaa authentication ppp** command, then authentication does not complete successfully and the line does not come up.

Table 17: PPP Authentication Protocols for Negotiation, on page 319 lists the protocols used to negotiate PPP authentication.

***Table 17: PPP Authentication Protocols for Negotiation***

| Protocol | Description |
|---|---|
| chap | Enables CHAP on an interface. |
| ms-chap | Enables Microsoft's version of CHAP (MS-CHAP) on an interface. |
| pap | Enables PAP on an interface. |

Enabling or disabling PPP authentication does not affect the ability of the local router to authenticate itself to the remote device.

MS-CHAP is the Microsoft version of CHAP. Like the standard version of CHAP, MS-CHAP is used for PPP authentication. In this case, authentication occurs between a personal computer using Microsoft Windows NT or Microsoft Windows 95 and a Cisco router or access server acting as a network access server.

Enabling or disabling PPP authentication does not affect the local router authenticating itself to the remote device.

## Task ID

| Task ID | Operations |
|---|---|
| ppp | read, write |
| aaa | read, write |

## Examples

In this example, CHAP is enabled on POS 0/4/0/1 and uses the authentication list MIS-access:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface POS 0/4/0/1
RP/0/RSP0/CPU0:router(config-if)# encapsulation ppp
RP/0/RSP0/CPU0:router(config-if)# ppp authentication chap MIS-access
```

This is an example of configuring the **ppp authentication** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp authentication chap ms-chap pap
```

## Related Commands

| Command | Description |
|---|---|
| **aaa authentication ppp** | Specifies one or more AAA authentication methods for use on serial interfaces running PPP. |
| **encapsulation** | Sets the encapsulation method used by the interface. |
| **username** | Configures a new user with a username, establishes a password, and grants permissions for the user. |

# ppp chap

To enable a router calling a collection of routers to configure a common Challenge Handshake Authentication Protocol (CHAP) for PPP interfaces, use the **ppp chap** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**ppp chap hostname** *chap_hostname*

## Syntax Description

| | |
|---|---|
| **hostname** | Sets the CHAP hostname. |
| *chap_hostname* | Specifies the CHAP hostname. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template type ppp** command to enter the ppp dynamic template type configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This is an example of configuring the **ppp chap** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp chap hostname host1
```

## Related Commands

| Command | Description |
|---|---|
| ppp authentication (BNG), on page 318 | Sets PPP link authentication method. |

# ppp duplicate-framed-route

To enable duplicate Framed-Routes for PTA subscribers, use the **ppp duplicate-framed-route** command in the global configuration mode. To disable this feature, use the **no** form of this command.

**ppp duplicate-framed-route**

## Syntax Description

| | |
|---|---|
| **duplicate-framed-route** | Enables the duplicate framed-routes. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 24.4.1 | This command was introduced. |

## Usage Guidelines

These are the guidelines and restrictions that you need to be aware of before configuring duplicate Framed-Routes:

- A maximum of two Framed-Route sessions are supported. If a third session with the same Framed-Route is detected, PPPoE will disconnect that subscriber.
- No PPPoE PTA sessions should be active when you enable the duplicate Framed-Routes on the router.
- Before disabling duplicate Framed-Routes using the **no** form of the **ppp duplicate-framed-route** command, ensure there are no active PPPoE PTA subscribers.
- Duplicate Framed-Routes functionality works only within the same node.

  For example, if node 0/0/CPU0 has framed-route 10.10.1.1/24, then another subscriber with the same framed-route 10.10.1.1/24 can only come up on 0/0/CPU0, not any other node.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |
| aaa | read, write |

This example shows how to enable the BNG router to allow duplicate Framed-Routes:

```
Router# configure
Router(config)# ppp duplicate-framed-route
Router(config)# commit
```

# ppp ipcp

To set Internet Protocol Control Protocol (IPCP) negotiation options, use the **ppp ipcp** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**ppp ipcp** [ **dns** { *primary_ip_addresssecondary_ip_address* } | **mask** *peer_netmask_address* | **peer-address** { **default***peer_ipaddress* | **pool***pool_name* } | **renegotiation ignore** | **wins** | *primary_ipaddress* | *secondary_ipaddress* ]

## Syntax Description

| | |
|---|---|
| **dns** | Configures the dns options. |
| *primary_ip_address* | Specifies the primary DNS IP addresses. |
| *secondary_ip_address* | Specifies the secondary DNS IP addresses. |
| **mask** | Specifies the IPv4 netmask to use for the peer. |
| *peer_netmask_address* | Specifies the peer netmask address. |
| **peer-address** | Specifies the change in peer-address configuration. |
| **default** | Specifies the default peer IP address. |
| *peer_ipaddress* | Specifies the peer IP address. |
| **pool** | Configures the pool options. |
| *pool_name* | Specifies the pool name. |
| **renegotiation** | Specifies the peer negotiation options. |
| **wins** | Specifies the WINS options. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template type ppp** command to enter the ppp dynamic template type configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

| Task ID | Operation |
|---|---|
| aaa | read, write |

This is an example of configuring the **ppp ipcp** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp ipcp
```

## Related Commands

| Command | Description |
|---|---|
| ppp authentication (BNG), on page 318 | Sets PPP link authentication method. |

# ppp lcp

To enable the link control protocol (LCP) on PPP interfaces, use the **ppp lcp** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**ppp lcp** [ **delay** *delay_seconds* *delay_milliseconds* | **renegotiation** **ignore** ]

## Syntax Description

| | |
|---|---|
| **delay** | Sets the time to delay before starting active LCP negotiations. |
| *delay_seconds* | Specifies the delay time in seconds. The value ranges from 0-255. |
| *delay_milliseconds* | Specifies the delay time in milliseconds. The value ranges from 0-999. |
| **renegotiation** | Specifies the peer renegotiation options. |
| **ignore** | Specifies the number of attempts that can be ignored by the peer to renegotiate LCP. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template type ppp** command to enter the ppp dynamic template type configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |
| aaa | read, write |

This is an example of configuring the **ppp lcp** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp lcp delay 45 890
```

## Related Commands

| Command | Description |
|---|---|
| ppp authentication (BNG), on page 318 | Sets PPP link authentication method. |

# ppp max-bad-auth (BNG)

To configure a PPP interface not to reset itself immediately after an authentication failure but instead to allow a specified number of authentication retries, use the **ppp max-bad-auth** command in the appropriate configuration mode. To reset to the default of immediate reset, use the **no** form of this command.

**ppp max-bad-auth** *retries*

## Syntax Description

| | |
|---|---|
| *retries* | Number of retries after which the interface is to reset itself. Range is from 0 to 10. Default is 0 retries. |

## Command Default

*retries*: 0

## Command Modes

Interface configuration

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.9.0 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

The **ppp max-bad-auth** command applies to any interface on which PPP encapsulation is enabled.

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ppp | read, write |
| aaa | read, write |

## Examples

In this example, POS interface 0/3/0/1 is set to allow two additional retries after an initial authentication failure (for a total of three failed authentication attempts):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface POS 0/3/0/1
RP/0/RSP0/CPU0:router(config-if)# encapsulation ppp
RP/0/RSP0/CPU0:router(config-if)# ppp authentication chap
RP/0/RSP0/CPU0:router(config-if)# ppp max-bad-auth 3
```

This example shows how to allow two additional retries after an initial authentication failure in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp max-configure 5
```

# ppp max-configure (BNG)

To specify the maximum number of configure requests to attempt (without response) before stopping the requests, use the **ppp max-configure** command in an appropriate configuration mode. To disable the maximum number of configure requests and return to the default, use the **no** form of this command.

**ppp max-configure** *retries*

## Syntax Description

| | |
|---|---|
| *retries* | Maximum number of retries. Range is 4 through 20. Default is 10. |

## Command Default

*retries*: 10

## Command Modes

Interface configuration

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.9.0 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

Use the **ppp max-configure** command to specify how many times an attempt is made to establish a Link Control Protocol (LCP) session between two peers for a particular interface. If a configure request message receives a reply before the maximum number of configure requests are sent, further configure requests are abandoned.

To enter the dynamic template configuration mode, run **dynamic-template** command in the Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ppp | read, write |
| aaa | read, write |

## Examples

This example shows a limit of four configure requests:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface POS 0/3/0/1
RP/0/RSP0/CPU0:router(config-if)# encapsulation ppp
RP/0/RSP0/CPU0:router(config-if)# ppp max-configure 4
```

This example shows how a limit of four configure requests is specified in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp ipcp
```

## Related Commands

| Command | Description |
|---|---|
| ppp max-failure (BNG), on page 330 | Configures the maximum number of consecutive CONFNAKs to permit before terminating a negotiation. |

# ppp max-failure (BNG)

To configure the maximum number of consecutive Configure Negative Acknowledgments (CONFNAKs) to permit before terminating a negotiation, use the **ppp max-failure** command in an appropriate configuration mode. To disable the maximum number of CONFNAKs and return to the default, use the **no** form of this command.

**ppp max-failure** *retries*

## Syntax Description

| | |
|---|---|
| *retries* | Maximum number of CONFNAKs to permit before terminating a negotiation. Range is from 2 to 10. Default is 5. |

## Command Default

*retries*: 5

## Command Modes

Interface configuration

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 3.9.0 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |

## Usage Guidelines

To enter the dynamic template configuration mode, run **dynamic-template** command in the

Global Configuration mode.

## Task ID

| Task ID | Operations |
|---|---|
| ppp | read, write |
| aaa | read, write |

## Examples

The **ppp max-failure** command specifies that no more than three CONFNAKs are permitted before terminating the negotiation:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface POS 0/3/0/1
RP/0/RSP0/CPU0:router(config-if)# encapsulation ppp
RP/0/RSP0/CPU0:router(config-if)# ppp max-failure 3
```

This example shows how no more than three CONFNAKs are permitted before terminating the negotiation in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp max-failure 4
```

## Related Commands

| Command | Description |
|---|---|
| ppp max-configure (BNG), on page 328 | Specifies the maximum number of configure requests to attempt (without response) before stopping the requests. |

# ppp ms-chap

To configure CHAP using the point-to-point protocol, use the **ppp ms-chap** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**ppp ms-chap hostname** *chap_hostname*

## Syntax Description

| | |
|---|---|
| **hostname** | Sets the MS-CHAP hostname. |
| *chap_hostname* | Specifies the name of the MS-CHAP hostname. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter the dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |
| aaa | read, write |

This is an example of configuring the **ppp ms-chap** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp ms-chap hostname host1
```

## Related Commands

| Command | Description |
|---|---|
| ppp authentication (BNG), on page 318 | Sets PPP link authentication method. |

# ppp timeout

To configure timeouts for PPP protocol, use the **ppp timeout** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

**ppp timeout** [ **absolute** *absolute_minutes* | **authentication** *auth_seconds* | **retry** *retry_seconds* ]

## Syntax Description

| | |
|---|---|
| **absolute** | Specifies the absolute timeout for a PPP session. |
| **authentication** | Specifies the maximum wait time to receive an authentication response. |
| **retry** | Specifies the maximum time to wait for a response during PPP negotiation. |
| *absolute_minutes* | Specifies the absolute timeout in minutes. This value ranges from 0-70000000. |
| *auth_seconds* | Specifies the authentication wait time in seconds. This value ranges from 3-30. |
| *retry_seconds* | Specifies the retry timeout in seconds. This value ranges from 1-10. |

## Command Default

None

## Command Modes

Dynamic template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **dynamic-template** command to enter the dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |
| aaa | read, write |

This is an example of configuring the **ppp timeout** command in the dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp timeout absolute 56
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp timeout authentication 4
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp timeout retry 5
```

**Related Commands**

| Command | Description |
|---|---|
| ppp authentication (BNG), on page 318 | Sets PPP link authentication method. |

# show ppp interfaces (BNG)

To display PPP state information for an interface, use the **show ppp interfaces** command in EXEC mode.

**show ppp interfaces** [**brief** | **detail**] {**all** | *type interface-path-id* | **location** *node-id*}

## Syntax Description

| | |
|---|---|
| **brief** | (Optional) Displays brief output for all interfaces on the router, for a specific POS interface instance, or for all interfaces on a specific node. |
| **detail** | (Optional) Displays detailed output for all interfaces on the router, for a specific interface instance, or for all interfaces on a specific node. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (**?**) online help function. |
| **all** | (Optional) Displays detailed PPP information for all nodes. |
| **location** *node-id* | (Optional) Displays detailed PPP information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation. |

## Command Default

No default behavior or values

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 3.9.0 | This command was introduced. |
| Release 4.2.0 | This command was supported in the dynamic template configuration mode for BNG. |
| Release 5.3.2 | The command was modified to include a new output display field, **SRG-state**, as part of geo redundancy support for PPPoE sessions in BNG router. |

## Usage Guidelines

There are seven possible PPP states applicable for either the Link Control Protocol (LCP) or the Network Control Protocol (NCP).

The command output displays a summary of the interface as it is in the PPP Interface Descriptor Block (IDB). The output includes the following information (where applicable):

- Interface state
- Line protocol state
- Link Control Protocol (LCP) state
- Network Control Protocol (NCP) state
- Multilink PPP state
- Multilink PPP configuration
- Keepalive configuration
- Authentication configuration
- Negotiated MRUs
- Negotiated IP addresses

This command can display information for a single interface, all interfaces on a specified node, or all interfaces on the router.

Multilink PPP and POS are not supported for BNG Geo Redundancy.

## Task ID

| Task ID | Operations |
|---|---|
| ppp | read |

## Examples

This example shows how to display PPP state information for a POS interface:

```
RP/0/RSP0/CPU0:router# show ppp interface POS 0/2/0/3

    POS0/2/0/3 is up, line protocol is up
      LCP: Open
         Keepalives enabled (10 sec)
         Local MRU: 4470 bytes
         Peer  MRU: 4470 bytes
      Authentication
         Of Us:    CHAP (Completed as 'test-user')
         Of Peer:  PAP (Completed as 'peer-user')
      CDPCP: Listen
      IPCP: Open
         Local IPv4 address: 55.0.0.1
         Peer IPv4 address:  55.0.0.2
         Peer DNS Primary:   55.0.0.254
         Peer DNS Secondary: 155.0.0.254
      IPV6CP: Open
         Local IPv6 address: fe80::3531:35ff:fe55:5747/128
         Peer IPv6 address:  fe80::3531:35ff:fe55:4213/128
      MPLSCP: Stopped
```

This example shows how to display PPP state information for a POS interface that is running as a Layer 2 attachment circuit:

```
RP/0/0/CPU0:# show ppp interface POS0/2/0/2

    POS0/2/0/2 is up, line protocol is up
      LCP: Open
         Running as L2 AC
```

This example shows how to display PPP state information for a multilink interface:

```
RP/0/RSP0/CPU0:router:# show ppp interface Multilink 0/3/0/0/100

    Multilink0/3/0/0/100 is up, line protocol is down
      LCP: Open
         SSO-State: Standby-Up
         Keepalives disabled
      IPCP: Open
         SSO-State: Standby-Up
         Local IPv4 address: 100.0.0.1
         Peer IPv4 address:  100.0.0.2
      IPV6CP: Open
         Local IPv6 address: fe80::3531:35ff:fe55:4600/128
         Peer IPv6 address:  fe80::3531:35ff:fe55:3215/128
      Multilink
         Local MRRU: 1500 bytes
         Peer MRRU:  1500 bytes
         Local Endpoint Discriminator: 1234567812345678
         Peer Endpoint Discriminator:  1111222233334444
         MCMP classes: Local 4, Remote 2
         Member links: 2 active, 6 inactive (min-active 2)
           - Serial0/3/1/3/1  ACTIVE
           - Serial0/3/1/3/2  ACTIVE
           - Serial0/3/1/3/3  INACTIVE : LCP not negotiated
           - Serial0/3/1/3/4  INACTIVE : Mismatching peer endpoint
           - Serial0/3/1/3/5  INACTIVE : Mismatching peer auth name
           - Serial0/3/1/3/6  INACTIVE : MRRU option rejected by Peer
           - Serial0/3/1/3/7  INACTIVE : Mismatching local MCMP classes
           - Serial0/3/1/3/8  INACTIVE : MCMP option rejected by peer
```

This example shows how to display PPP state information for a serial interface:

```
RP/0/RSP0/CPU0:router# show ppp interface Serial 0/3/1/3/1

    Serial0/3/1/3/1 is down, line protocol is down
      LCP: Open
         SSO-State: Standby-Up
         Keepalives enabled (10 sec)
         Local MRU: 1500 bytes
         Peer MRU:  1500 bytes
         Local Bundle MRRU: 1500 bytes
         Peer Bundle MRRU:  1500 bytes
         Local Endpoint Discriminator: 1234567812345678
         Peer Endpoint Discriminator:  1111222233334444
         Local MCMP Classes:  Not negotiated
         Remote MCMP Classes: Not negotiated
      Authentication
         Of Us:    CHAP (Completed as 'test-user')
         Of Peer:  PAP (Completed as 'peer-user')
      Multilink
         Multilink group id: 100
         Member status: ACTIVE
```

This is a sample output of the **show ppp interfaces** command in the BNG router, having subscriber redundancy group (SRG) in geo redundancy enabled for PPPoE sessions:

```
RP/0/RSP0/CPU0:router# show ppp interfaces

Bundle-Ether2.1.pppoe16534 is down, line protocol is up
 SRG Role: Slave
  LCP: Open
```

```
   Keepalives enabled (60 sec, retry count 5)
   Local MRU: 1492 bytes
   Peer  MRU: 65531 bytes
Authentication
   Of Peer: PAP (Completed as user1@domain.com)
   Of Us:   <None>
IPCP: Open
   Local IPv4 address: 12.16.0.1
   Peer IPv4 address:  12.0.250.23
IPv6CP: Initial
   Local IPv6 address: fe80::
   Peer IPv6 address:  fe80::
```

***Table 18: show ppp interfaces Field Descriptions***

| Field | Description |
|---|---|
| Ack-Rcvd | Configuration acknowledgemt was received; waiting for peer to send configuration request. |
| Ack-Sent | Configuration acknowledgemt was sent; waiting for peer to respond to configuration request. |
| Authentication | Type of user authentication configured on the local equipment and on the peer equipment. Possible PPP authentication protocols are Challenge Handshake Authentication Protocol (CHAP), MS-CHAP, and Password Authentication Protocol (PAP). |
| Closed | Lower layer is up, but this layer is not required. |
| Closing | Shutting down due to local change. |
| Initial | Connection is idle. |
| IPCP | IP Control Protocol (IPCP) state. The seven possible states that may be displayed are as follows:<br>• Initial—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.<br>• Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). The Restart timer is not running in the Starting state. When the lower layer becomes available (Up), a Configure-Request is sent.<br>• Closed— IPCP is not currently trying to negotiate.<br>• Stopped—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.<br>• Closing—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Upon reception of a Terminate-Ack, the Closed state is entered. Upon the expiration of the Restart timer, a new Terminate-Request is transmitted, and the Restart timer is restarted. After the Restart timer has expired Max-Terminate times, the Closed state is entered.<br>• Stopping—A Terminate-Request has been sent and the Restart timer is running, but a IPCP-Ack has not yet been received. Req-Sent.<br>• ACKsent—IPCP has received a request and has replied to it.<br>• ACKrcvd—IPCP has received a reply to a request it sent.<br>• Open—IPCP is functioning properly. |

| Field | Description |
|---|---|
| Keepalive | Keepalive setting and interval in seconds for echo request packets. |
| LCP | Indicates the current state of LCP. The state of the LCP will report the following states:<br>• Initial—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.<br>• Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). The Restart timer is not running in the Starting state. When the lower layer becomes available (Up), a Configure-Request is sent.<br>• Closed— LCP is not currently trying to negotiate.<br>• Stopped—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.<br>• Closing—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Upon reception of a Terminate-Ack, the Closed state is entered. Upon the expiration of the Restart timer, a new Terminate-Request is transmitted, and the Restart timer is restarted. After the Restart timer has expired Max-Terminate times, the Closed state is entered.<br>• Stopping—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Req-Sent.<br>• ACKsent—LCP has received a request and has replied to it.<br>• ACKrcvd—LCP has received a reply to a request it sent.<br>• Open—LCP is functioning properly |
| Local IPv4 address | IPv4 address for the local interface. |
| Local MRU | Maximum receive unit. The maximum size of the information transported, in bytes, in the PPP packet received by the local equipment. |
| Open | Connection open. |

| Field | Description |
|---|---|
| OSICP | Open System Interconnection Control Protocol (OSICP) state. The possible states that may be displayed are as follows:<br>• Initial—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.<br>• Starting—An administrative Open has been initiated, but the lower layer is still unavailable (Down). The Restart timer is not running in the Starting state. When the lower layer becomes available (Up), a Configure-Request is sent.<br>• Closed— OSICP is not currently trying to negotiate.<br>• Stopped—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.<br>• Closing—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Upon reception of a Terminate-Ack, the Closed state is entered. Upon the expiration of the Restart timer, a new Terminate-Request is transmitted, and the Restart timer is restarted. After the Restart timer has expired Max-Terminate times, the Closed state is entered.<br>• Stopping—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Req-Sent.<br>• ACKsent—OSICP has received a request and has replied to it.<br>• ACKrcvd—OSICP has received a reply to a request it sent.<br>• Open—OSICP is functioning properly. |
| Peer IPv4 address | IPv4 address for the peer equipment. |
| Peer MRU | Maximum receive unit. The maximum size of the information transported, in bytes, in the PPP packet received by the peer equipment. |
| Req-Sent | Configuration request was sent; waiting for peer to respond. |
| Starting | This layer is required, but lower layer is down. |
| Stopped | Listening for a configuration request. |
| Stopping | Shutting down as a result of interactions with peer. |

# show ppp statistics

To display the statistics information for PPP interfaces, use the **show ppp statistics** command in EXEC mode.

**show ppp statistics** {**extended** | {**location***location*} | **interface** | {*interface-typeinterface-path-id*} | **summary** | {**location***location*}}

## Syntax Description

| | |
|---|---|
| **extended** | Displays the extended PPP statistics across all interfaces. |
| **interface** | Displays the PPP statistics for a single interface. |
| **summary** | Displays aggregated PPP statistics across all interfaces. |
| **location** | Displays the PPP statistics for interfaces at a location. |
| *location* | Specifies the location details. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This example shows the output of the **show ppp statistics** command:

```
RP/0/RSP0/CPU0:router# show ppp statistics summary location 0/RSP0/CPU0
```

```
Thu Sep  6 06:38:17.668 DST
LCP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Code-Rej                            0                    0
Proto-Rej                           0                    0
Echo-Req                            0                    0
Echo-Rep                            0                    0
Disc-Req                            0                    0
Line state brought up: 0
Keepalive Link Failures: 0
Authentication
Packets                          Sent             Received
PAP
Request                          0                    0
Ack                              0                    0
Nak                              0                    0
(MS-)CHAP
Challenge                        0                    0
Response                         0                    0
Rep Success                      0                    0
Rep Fail                         0                    0
AAA authentication timeouts: 0
CDPCP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Proto-Rej                           0                    0
IPCP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Proto-Rej                           0                    0
IPCPIW
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Proto-Rej                           0                    0
IPv6CP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
```

```
Proto-Rej                          0                    0
MPLSCP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Proto-Rej                           0                    0
OSICP
Packets                          Sent             Received
Conf-Req                            0                    0
Conf-Ack                            0                    0
Conf-Nak                            0                    0
Conf-Rej                            0                    0
Term-Req                            0                    0
Term-Ack                            0                    0
Proto-Rej                           0                    0
```

## Related Commands

| Command | Description |
|---|---|
| show ppp interfaces (BNG), on page 335 | Displays the PPP interfaces. |
| show ppp summary, on page 344 | Displays the PPP summary. |

# show ppp summary

To display the summary information for the PPP interfaces, use the **show ppp summary** command in EXEC mode.

**show ppp summary location** *location*

## Syntax Description

| | |
|---|---|
| **location** | Displays the PPP summary for interfaces at a location. |
| *location* | Specifies the location details. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This example shows the output of the **show ppp summary** command for interfaces running PPP:

```
RP/0/RSP0/CPU0:router# show ppp summary location 0/5/CPU0

====================================
 Interfaces running PPP
====================================
 POS                    0
 Serial                 200
 PPPoE                  10000
 Multilink Bundles      100
 ---------------------------
 Total                  10300

====================================
 CP FSM States
====================================
                    ACK   ACK   REQ   Stop- Clos- Stop- Clos- Start-
 Name   Total Open  sent  rcvd  sent  ping  ing   ped   ed    ing  Initial
 ------ ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
 LCP    10300 10300     0     0     0     0     0     0     0     0     0
 CDPCP    100     0     0     0   100     0     0     0     0     0     0
 IPCP   10000 10000     0     0     0     0     0     0     0     0     0
 IPv6CP     0     0     0     0     0     0     0     0     0     0     0
 MPLSCP     0     0     0     0     0     0     0     0     0     0     0
 OSICP      0     0     0     0     0     0     0     0     0     0     0
```

```
====================================
 LCP/Authentication Phases
====================================
 LCP Not Negotiated             100
 Authenticating                   0
 Line held down                   0
 Line Up (Local Termination)  10200
 Line Up (L2 Forwarded)           0
 Line UP (VPDN Tunneled)        100
```

## Related Commands

| Command | Description |
|---|---|
| show ppp statistics, on page 341 | Displays the PPP statistics. |
| show ppp interfaces (BNG), on page 335 | Displays the PPP interfaces. |



# PPPoE LAC-Specific Commands

This module describes the Cisco IOS XR software commands used to configure the PPPoE LAC-specific commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- l2tp-class, on page 348
- l2tp-source-ip, on page 350
- process-failures switchover, on page 351
- redundancy (BNG), on page 352
- session-limit (BNG), on page 353
- template (BNG), on page 354
- tunnel, on page 355
- vpdn, on page 356
- vpn, on page 357
- show l2tpv2, on page 358
- show l2tpv2 redundancy, on page 360
- show l2tpv2 redundancy mirroring, on page 362
- show vpdn, on page 364
- show vpdn redundancy, on page 367
- show vpdn redundancy mirroring, on page 368

# l2tp-class

To create the l2tp class that needs to be used for L2TP parameters for the vpdn-group and to enter the l2tp class configuration submode, use the **l2tp-class** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**l2tp-class** { **c1** | **l1** | *l2tp_class_name* } [ **authentication** | **congestion-control** | **digest** | **hello-interval** | **hidden** | **hostname** | **ip** | **password** | **receive-window** | **retransmit** | **security** | **timeout** | **tunnel** ]

| | |
|---|---|
| **c1** | Specifies the l2tp class name. |
| **l1** | Specifies the l2tp class name. |
| *l2tp_class_name* | Specifies the l2tp class name. |
| **authentication** | Authenticates the L2TP control connection. |
| **congestion-control** | Enables L2Tp congestion control. |
| **digest** | Specifies message digest configuration for L2TPv3 control connection. |
| **hello-interval** | Hides AVPs in outgoing control messages. |
| **hidden** | Sets HELLO message interval. |
| **hostname** | Specifies the local hostname for control connection authentication. |
| **ip** | Specifies the settings for tunnel. |
| **password** | Specifies the password for control connection authentication. |
| **receive-window** | Receives the window size for control connection. |
| **retransmit** | Specifies the control message retransmission parameters. |
| **security** | Specifies the L2TP security command. |
| **timeout** | Specifies the control connection timeout parameters. |
| **tunnel** | Specifies the tunnel settings. |

**Command Default** No default behavior or values

**Command Modes** Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2tp-class c1
RP/0/RSP0/CPU0:router(config)# l2tp-class c1 congestion-control
```

## Related Commands

| Command | Description |
|---|---|
| tunnel, on page 355 | Configures l2tp tunnel. |

# l2tp-source-ip

To configure the tunnel source IP address for the subscriber redundancy group, use the **l2tp-source-ip** command in subscriber redundancy group configuration mode. To remove the tunnel source IP address configuration, use the **no** form of this command.

**l2tp-source-ip** *ip-address*

## Syntax Description

| | |
|---|---|
| *ip-address* | Source IP address of the L2TP tunnel. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.2 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure the L2TP tunnel source IP address for the subscriber redundancy group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy group 1
RP/0/RSP0/CPU0:router(config-susbscr-red-group)# l2tp-source-ip 10.10.10.1
```

# process-failures switchover

To force a switchover in case of a process failure, use the **process-failures switchover** command in VPDN redundancy configuration mode.

**process-failures switchover**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

VPDN redundancy configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of enabling process-failures switchover.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn
RP/0/RSP0/CPU0:router(config-vpdn)# redundancy
RP/0/RSP0/CPU0:router(config-vpdn-redundancy)# process-failures switchover
RP/0/RSP0/CPU0:router(config-vpdn-redundancy)#
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and enters the VPDN sub-configuration mode. |
| redundancy (BNG), on page 352 | Enables VPDN redundancy and enters the VPDN redundancy configuration mode. |

# redundancy (BNG)

To enable VPDN redundancy and to enter the VPDN redundancy configuration mode, use the **redundancy** command in VPDN configuration mode. To disable VPDN redundancy, use the **no** form of this command.

**redundancy**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

VPDN configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of enabling the vpdn **redundancy** and entering the vpdn redundancy configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn
RP/0/RSP0/CPU0:router(config-vpdn)# redundancy
RP/0/RSP0/CPU0:router(config-vpdn-redundancy)#
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and enters the VPDN sub-configuration mode. |

# session-limit (BNG)

To configure maximum simultaneous VPDN sessions, use the **session-limit** command in vpdn configuration mode. To disable this feature, use the **no** form of this command.

**session-limit** *number*

## Syntax Description

| | |
|---|---|
| *number* | Specifies the number of sessions and the value can range between 1-131072. |

## Command Default

The default and max value for global session-limit is 65536(64k sessions).

## Command Modes

VPDN configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **vpdn** command to enter vpdn configuration submode.

**Note** Per vpdn group session limiting is not supported on LAC.

If limit is configured after a number of sessions are up, then those sessions remain up irrespective of the limit and new sessions will not come up based on the limit. The **no** form of the command results in removing limits on number of sessions and new sessions are accepted by vpdn.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of configuring the **session-limit** command in vpdn configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn
RP/0/RSP0/CPU0:router(config-vpdn)# session-limit 567
```

# template (BNG)

To configure the VPDN template and enter the vpdn template configuration mode, use the **template** command in vpdn configuration mode. To disable vpdn template, use the **no** form of this command.

**template** *vpdn-template_name* {**description** | **caller-id** | **ip** | **dsl-line-forwarding** | **ipv4** | **l2tp-class** | **tunnel** | **vpn**}

## Syntax Description

| | |
|---|---|
| *vpdn-template_name* | Specifies the vpdn template name. |
| **description** | Specifies the description of the vpdn template. |
| **caller-id** | Specifies the options to apply on calling station id. |
| **ip** | Specifies the tos ip value. |
| **dsl-line-forwarding** | Enables dsl line information forwarding. |
| **ipv4** | Specifies the ipv4 settings for tunnel. |
| **l2tp-class** | Specifies the l2tp class name. |
| **tunnel** | Specifies the l2tp tunnel commands. |
| **vpn** | Specifies the vpn id/vrf name. |

## Command Default

None

## Command Modes

VPDN configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **vpdn** command, to enter vpdn configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of configuring the **template** command in vpdn configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn
RP/0/RSP0/CPU0:router(config-vpdn)# template temp1
RP/0/RSP0/CPU0:router(config-vpdn-temp)#
```

# tunnel

To configure the amount of time that the peer will be put in a dead cache, use the **tunnel** command in vpdn template configuration mode. To disable this feature, use the **no** form of this command.

**tunnel busy list timeout** *timeout_value*

## Syntax Description

| | |
|---|---|
| *timeout_value* | Specifies the amount of time in seconds that the peer will remain in dead cache. This value ranges from 60 to 65535. |

## Command Default

None

## Command Modes

VPDN template configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **vpdn template** command to enter vpdn template configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of configuring the **tunnel** command in vpdn template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn template
RP/0/RSP0/CPU0:router(config-vpdn-template)# tunnel busy list timeout 56
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and to enter the VPDN sub-configuration mode. |

# vpdn

To configure VPDN and to enter the VPDN configuration submode, use the **vpdn** command in Global Configuration mode. To disable vpdn, use the **no** form of this command.

**vpdn** {**caller-id** | **history** | **l2tp** | **logging** | **session-limit** | **softshut** | **template**}

## Syntax Description

| | |
|---|---|
| **caller-id** | Specifies the options to apply on calling station id. |
| **history** | Enables VPDN history logging. |
| **l2tp** | Specifies the l2tpv2 protocol commands. |
| **logging** | Enables logging for VPDN. |
| **session-limit** | Allows to configure maximum simultaneous VPDN sessions. |
| **softshut** | Specifies that a new session is no longer allowed. |
| **template** | Specifies the VPDN template configuration. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **vpdn** command in Global Configuration mode to enter vpdn sub-configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of configuring the **vpdn** command in Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn
RP/0/RSP0/CPU0:router(config-vpdn)# history failure
RP/0/RSP0/CPU0:router(config-vpdn)# softshut
```

# vpn

To configure the VPN ID or VRF name, use the **vpn** command in vpdn template configuration mode. To disable this feature, use the **no** form of this command.

**vpn** { **id** *vpn_index* | **vrf** *vrf_name* }

## Syntax Description

| | |
|---|---|
| **id** | Specifies the VPN ID. |
| **vrf** | Specifies the VRF. |
| *vpn_index* | Specifies a value between 0-ffffff. |
| *vrf_name* | Specifies the name of the vrf. |

## Command Default

None

## Command Modes

VPDN template configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

Use the **vpdn template** command to enter vpdn template configuration submode.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read, write |

This is an example of configuring the **vpn** command in vpdn template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vpdn template
RP/0/RSP0/CPU0:router(config-vpdn-template)# vpn vrf vrf1
```

# show l2tpv2

To display the tunnel-related information, use the **show l2tpv2** command in the EXEC mode.

**show l2tpv2** {**class** | **counters** | **session** | **statistics** | **tunnel**}

## Syntax Description

| | |
|---|---|
| **class** | Displays the L2TP class details. |
| **counters** | Displays the L2TP counter information. |
| **session** | Displays the L2TP session information. |
| **statistics** | Displays the L2TP protocol statistics. |
| **tunnel** | Displays the L2TP tunnel information. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ipv4 | read |
| network | read |

This is the sample output of the **show l2tpv2** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show l2tpv2 class name c1
RP/0/RSP0/CPU0:router# show l2tpv2 counters forwarding tunnel id 67
RP/0/RSP0/CPU0:router# show l2tpv2 session brief if 89 789
RP/0/RSP0/CPU0:router# show l2tpv2 statistics | file tftp: vrf vrf1 |
RP/0/RSP0/CPU0:router# show l2tpv2 tunnel accounting statistics | file tftp: vrf vrf1 |
```

Show output for l2tpv2 session:

```
Sun Dec  4 22:37:48.554 PST

Session id 46362 is up, tunnel id 58775, logical session id 131086
  Remote session id is 16, remote tunnel id 54970
  Locally initiated session
Call serial number is 2062300015
Remote tunnel name is ios_lns
  Internet address is 3.3.3.4
Local tunnel name is blah_client_auth_id
  Internet address is 1.1.1.1
```

```
IP protocol 17
  Session is L2TP signaled
  Session state is established, time since change 00:06:56
  UDP checksums are enabled
  Sequencing is off
  Conditional debugging is disabled
  Unique ID is 0
  Session username is user3_vpdn@domain.com
    Interface GigabitEthernet0_0_0_1.pppoe14
```

Show output for l2tpv2 tunnel detail:

```
  Mon Dec  5 20:37:55.891 PST
Tunnel id 133 is up, remote id is 15705, 1 active sessions
  Locally initiated tunnel
  Tunnel state is established, time since change 6d09h
Tunnel transport is UDP (17)
  Remote tunnel name is IOS_LNS
    Internet Address 3.3.3.3, port 1701
  Local tunnel name is XR_LAC
    Internet Address 1.1.1.1, port 1701
  VRF name: default
  Tunnel group id
  L2TP class for tunnel is VPDN_3.3.3.3
  Control Ns 9205, Nr 342
  Local RWS 512 (default), Remote RWS 1024
  Control channel Congestion Control is disabled
  Tunnel PMTU checking disabled
  Retransmission time 1, max 1 seconds
  Unsent queuesize 0, max 0
  Resend queuesize 0, max 2
  Total resends 0, ZLB ACKs sent 340
  Total out-of-order dropped pkts 0
  Total out-of-order reorder pkts 0
  Total peer authentication failures 0
  Current no session pak queue check 0 of 5
  Retransmit time distribution: 0 0 0 0 0 0 0 0 0
  Control message authentication is disabled
```

## Related Commands

| Command | Description |
|---|---|
| l2tp-class, on page 348 | Configures the l2tp class. |

# show l2tpv2 redundancy

To display the L2TP redundancy related information, use the **show l2tpv2 redundancy** command in the EXEC mode.

**show l2tpv2 redundancy**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read |

This is the sample output of the **show l2tpv2 redundancy** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show l2tpv2 redundancy

  L2TP Tunnels:     0/0/0/0 (total/enabled/syncing/synced)
  L2TP Sessions:    0/0/0 (total/enabled/synced)

L2TP HA Timestamps:
  APP VPDN:
    Configured:                   TRUE
    Enabled:                      TRUE
    Time Configured:              Oct 12 14:00:25
    Time Unconfigured:            Oct 12 14:00:25
    Time Enabled:                 Oct 12 14:00:35
    Time Disabled:
    Time Ready:                   Oct 12 14:00:35
    Time Not-Ready:

L2TP Switchover Resync Statistics:
  Poisoned sessions:                          0
  Unestablished sessions:                     0
  No app sessions:                            0
  Sessions cleared by peer:                   0
  Attempted during resync sessions:           0
  Tunnel poisoned sessions:                   0
  Tunnel cleared by peer sessions:            0
  Excess restrans tunnel sessions:            0
  Unestablished tunnel sessions:              0
  Tunnel cleared other sessions:              0
```

```
Other cleared sessions:                   0
Poisoned sessions:                        0
Peer cleared tunnels:                     0
Excess retrans tunnel:                    0
Unestablished tunnels:                    0
Other cleared tunnels:                    0
```

## Related Commands

| Command | Description |
|---|---|
| l2tp-class, on page 348 | Configures the L2TP class. |

# show l2tpv2 redundancy mirroring

To display the L2TP related mirroring statistics, use the **show l2tpv2 redundancy mirroring** command in the EXEC mode.

**show l2tpv2 redundancy mirroring**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

This command displays mirrored data on the backup RP. If the data in the show command is not applicable on the backup RP, then trivial output such as '0' or empty is displayed.

## Task ID

| Task ID | Operation |
|---|---|
| tunnel | read |

This is the sample output of the **show l2tpv2 redundancy mirroring** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show l2tpv2 redundancy mirroring

L2TPv2 Mirroring Statistics
                                                  Since Last CLear
                          Send/Receive/Drop       Send/Receive/Drop
CCSync                          0/       0/       0       0/       0/       0
CCProtoSync                     0/       0/       0       0/       0/       0
CCUnsync                        0/       0/       0       0/       0/       0
CCSyncAck                       0/       0/       0       0/       0/       0
CCIAck                          0/       0/       0       0/       0/       0
CCSessionSyncDone               0/       0/       0       0/       0/       0
SessionSync                     0/       0/       0       0/       0/       0
AppStatus                       0/       1/       0       0/       1/       0
AddCCSteadyState                0/       1/       0       0/       1/       0
DelCCSteadyState                0/       0/       0       0/       0/       0
ADDSessionSteadyState           0/       5/       3       0/       5/       3
DelSessionSteadyState           0/       0/       0       0/       0/       0
CCOtherPackets                  0/       0/       0       0/       0/       0
ZLB ACK                         0/       0/       0       0/       0/       0
SCCRQ                           0/       0/       0       0/       0/       0
SCCRP                           0/       0/       0       0/       0/       0
SCCCN                           0/       1/       0       0/       1/       0
StopCCN                         0/       0/       0       0/       0/       0
Hello                           0/       0/       0       0/       0/       0
OCRQ                            0/       0/       0       0/       0/       0
OCRP                            0/       0/       0       0/       0/       0
```

```
OCCN                            0/       0/       0         0/       0/       0
ICRQ                            0/       1/       0         0/       1/       0
ICRP                            0/       0/       0         0/       0/       0
ICCN                            0/       4/       0         0/       4/       0
CDN                             0/       0/       0         0/       0/       0
WEN                             0/       0/       0         0/       0/       0
SLI                             0/       0/       0         0/       0/       0
L2TP QAD Send Statistics
                                     Total    Since Last Clear
  Messages Sent:                         0                   0
  Acks Sent:                             1                   1
  No Partner:                            0                   0
  Messages Failed:                       0                   0
  Acks Failed:                           0                   0
  Pending Acks:                          0                   0
  Suspends:                              0                   0
  Resumes:                               0                   0
  Sends Fragmented:                      0                   0
L2TP QAD Receive Statistics
                                     Total    Since Last Clear
  Messages Recevied:                     6                   6
  Acks Received:                         0                   0
  Acks Failed:                           0                   0
  Timeouts:                              0                   0
  Messages Processed:                    6                   6
  Message Drops:                         0                   0
  Stale Messages:                        0                   0
  Unknown Acks received:                 0                   0
```

## Related Commands

| Command | Description |
|---|---|
| l2tp-class, on page 348 | Configures the L2TP class. |

# show vpdn

To display all vpdn-related information, use the **show vpdn** command in theEXEC mode.

**show vpdn** {**client** | **config** | **history** | **tunnel destination** | **session**}

## Syntax Description

| | |
|---|---|
| **client** | Displays VPDN client information. |
| **config** | Dislays VPDN configuration information. |
| **history** | Displays the vpdn session history information. |
| **tunnel destination** | Displays the vpdn tunnel destination information. |
| **session** | Displays the vpdn session information. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.3.2 | The command was modified to include a new output display field, **SRG-state**, as part of geo redundancy support for PPPoE sessions. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ipv4 | read |
| network | read |

These are some of the options to use the **show vpdn** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show vpdn history failure | file tftp: vrf vrf1 |
RP/0/RSP0/CPU0:router# show vpdn client location 0/0/CPU0
RP/0/RSP0/CPU0:router# show vpdn tunnel destination detail |
RP/0/RSP0/CPU0:router# show vpdn session destination 4.5.4.5
```

Show output for vpdn session:

```
Sun Dec  4 22:34:19.328 PST

Subscriber label: 0x45, interface name: GigabitEthernet0/0/0/1.pppoe14
user name: user3_vpdn@domain.com
parent interface: GigabitEthernet0/0/0/1
state: est last change: 00:03:26
```

```
time to setup session:   0:164(s:msec)
conditional debug flags: 0
L2TP data
  local end point: 1.1.1.1 remote end point: 3.3.3.4
  call serial number: 2062300015
  local tunnel id: 58775 remote tunnel id: 54970
  local session id: 46362 remote session id: 16 remote port: 1701
  tunnel client authentication id: blah_client_auth_id
  tunnel server authentication id: ios_lns
  tunnel authentication: disabled
  class attribute mask:
      local hostname from AAA
      tunnel password from AAA
Subscriber data
  NAS port id: lac_circuit_id.lac_remote_id
  NAS port type: PPPoE over Ethernet
  physical channel id: 0
  Rx speed: 1000000000, Tx speed: 1000000000
Configuration data
  table id: 0xe0000000, VRF id: 0x60000000, VPN id: 0:0
  VRF name: default
  dsl line info forwarding: disabled, l2tp busy timeout: 60
  TOS mode: set, value: 13
```

Show output for tunnel destination:

```
Sun Dec  4 22:36:15.296 PST
Destination     VRF-name      Status  Load
3.3.3.4         default       active  1
```

This is a sample output of the **show vpdn session** command, with geo redundancy enabled for PPPoE sessions:

```
RP/0/RSP0/CPU0:router# show vpdn session

SRG Role: Master
Subscriber label: 0x42, interface name: Bundle-Ether1.10.pppoe3
 user name: user1@lns2.com
 parent interface: Bundle-Ether1.10
 state: est last change: 00:01:01
 time to setup session:   0:2  (s:msec)
 conditional debug flags: 0
 L2TP data
  local end point: 11.1.1.1 remote end point: 19.9.9.2
  call serial number: 1970100002
  local tunnel id: 46813 remote tunnel id: 40849
  local session id: 36198 remote session id: 33437 remote port: 1701
  tunnel assigned id:
  tunnel client authentication id: LAC
  tunnel server authentication id: LNS
  tunnel authentication: disabled
  class attribute mask:
 Subscriber data
  NAS port id: 0/0/1/10
  NAS port type: Virtual PPPoE over VLAN
  physical channel id: 0
  Rx speed: 1000000000, Tx speed: 1000000000
 Configuration data
  table id: 0xe0000000, VRF id: 0x60000000, VPN id: 0:0
  VRF name: default
  dsl line info forwarding: disabled, l2tp busy timeout: 60
```

```
TOS mode: default
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and enters the VPDN sub-configuration mode. |

# show vpdn redundancy

To display all vpdn redundancy related information, use the **show vpdn redundancy** command in the EXEC mode.

**show vpdn redundancy**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show vpdn redundancy** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show vpdn redundancy

VPDN HA STATUS      :       STEADY_STATE

VPDN HA SUMMARY
Total Sessions      :        2000
Sessions Synced     :        2000

VPDN HA TIME STAMPS
Init sync started   :        Dec 15 04:37:56
Init sync finished  :        Dec 15 04:37:56
Init sync aborted   :
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and enters the VPDN sub-configuration mode. |
| redundancy (BNG), on page 352 | Enables VPDN redundancy and enters the VPDN redundancy configuration mode. |

# show vpdn redundancy mirroring

To display vpdn related mirroring statistics, use the **show vpdn redundancy mirroring** command in the EXEC mode.

**show vpdn redundancy mirroring**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

This command displays mirrored data on the backup RP. If the data in the show command is not applicable on the backup RP, then trivial output such as '0' or empty is displayed.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show vpdn redundancy mirroring** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show vpdn redundancy mirroring

HA SSO Msg Stats

Sync not conn count                       0
SSO error count                           0
SSO batch error count                     0
ALLOC error count                         0
ALLOC count                               0

VPDN QAD Send Statistics
                                    Total    Since Last Clear
Messages :                              0              0
Acks :                                  2              2
Messages Failed:                        0              0
Acks Failed:                            0              0
Pending Acks:                           0              0
Suspends:                               0              0
Resumes:                                0              0
Sends Fragmented:                       0              0

VPDN QAD Receive Statistics
                                    Total    Since Last Clear
Messages Recevied:                      2              2
Acks Received:                          0              0
Acks Failed:                            0              0
Timeouts:                               0              0
```

```
Messages Processed:                 2               2
Message Drops:                      0               0
Stale Messages:                     0               0
Unknown Acks received:              0               0
```

## Related Commands

| Command | Description |
|---|---|
| vpdn, on page 356 | Configures VPDN and enters the VPDN sub-configuration mode. |
| redundancy (BNG), on page 352 | Enables VPDN redundancy and enters the VPDN redundancy configuration mode. |



# PPPoE Commands

This module describes the Cisco IOS XR software commands used to configure the PPPoE commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- pado delay, on page 372
- pado delay circuit-id, on page 373
- pado delay remote-id, on page 375
- pado delay service-name, on page 377
- pppoe bba-group, on page 379
- pppoe enable bba-group, on page 383
- pppoe in-flight-window, on page 384
- pppoe sessions limit, on page 385
- pppoe sessions throttle, on page 388
- clear pppoe statistics, on page 390
- show pppoe interfaces, on page 392
- show pppoe limits, on page 394
- show pppoe statistics, on page 398
- show pppoe summary, on page 401
- show pppoe throttles, on page 403

# pado delay

To set a delay for a PPPoE Active Discovery Offer (PADO) message for a particular PPPoE BBA-Group, use the **pado delay** command in PPPoE BBA-Group configuration mode. To disable the PADO delay configuration, use the **no** form of this command.

**pado delay** *delay*

## Syntax Description

| | |
|---|---|
| *delay* | Delay value for PADO message, in milliseconds.<br>The range is from 0 to 10000. |

## Command Default

None

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

Setting a value of 0 for *delay* means that no transmission delay is set for PADO message. Setting a value of 10000 means that an infinite delay is set for PADO message or in other words, PADO message is never sent.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

### Example

This example shows how to configure a delay of 1000 milliseconds for the PADO message:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay 1000
```

## Related Commands

| Command | Description |
|---|---|
| pado delay circuit-id, on page 373 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Circuit-ID received in PADI message. |
| pado delay remote-id, on page 375 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Remote-ID received in PADI message. |
| pado delay service-name, on page 377 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Service-Name received in PADI message. |

# pado delay circuit-id

To set a delay for a PPPoE Active Discovery Offer (PADO) message for a particular PPPoE BBA-Group, based on the Circuit-ID received in PPPoE Active Discovery Initiator (PADI) message, use the **pado delay circuit-id** command in PPPoE BBA-Group configuration mode. To disable the PADO delay configuration based on the Circuit-ID, use the **no** form of this command.

**pado delay circuit-id** {*delay* | {**string** | **contains**} *string* *delay*}

## Syntax Description

| | |
|---|---|
| *delay* | Delay value for PADO message, in milliseconds, based on the Circuit-ID.<br>The range is from 0 to 10000. |
| **string** | Delays the PADO message, when the Circuit-ID string received in PADI message matches the configured *string*. |
| **contains** | Delays the PADO message, when the Circuit-ID received in PADI message contains the configured *string*. |
| *string* | String received in PADI message, that needs to be exactly matching the Circuit-ID (when used along with **string** keyword) or the string received in PADI message, that needs to be contained within the Circuit-ID (when used along with the **contains** keyword). |

## Command Default

None

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

Setting a value of 0 for *delay* means that no transmission delay is set for the PADO message. Setting a value of 10000 means that an infinite delay is set for PADO message; or, in other words, the PADO message is never sent.

Within the category of Circuit-ID matches, full string matches are preferred to sub-string matches. If more than one sub-string match occur, the selection is based on a random order.

If there is neither a string match nor a sub-string match, the configured Circuit-ID delay is used (if a Circuit-ID is present in the PADI message), followed by the configured Remote-ID delay (if a Remote-ID is present in the PADI message).

If there are no matches, the configured pado delay is used for PADO message.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure a delay of 1000 milliseconds for the PADO message:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay circuit-id 1000
```

This example shows how to configure a delay of 8000 milliseconds for the PADO message, if the Circuit-ID received in the PADI message exactly matches the configured string (**circuit1** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay circuit-id string circuit1 8000
```

This example shows how to configure a delay of 5000 milliseconds for the PADO message, if the Circuit-ID received in the PADI message contains the configured string (**circuit2** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay circuit-id contains circuit2 5000
```

## Related Commands

| Command | Description |
|---|---|
| pado delay, on page 372 | Configures a specific delay for PPPoE PADO message for a PPPoE BBA-Group in BNG. |
| pado delay remote-id, on page 375 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Remote-ID received in PADI message. |
| pado delay service-name, on page 377 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Service-Name received in PADI message. |

# pado delay remote-id

To set a delay for a PPPoE Active Discovery Offer (PADO) message for a particular PPPoE BBA-Group, based on the Remote-ID received in PPPoE Active Discovery Initiator (PADI) message, use the **pado delay remote-id** command in PPPoE BBA-Group configuration mode. To disable the PADO delay configuration based on the Remote-ID, use the **no** form of this command.

**pado delay remote-id** {*delay* | {**string** | **contains**} *string* *delay*}

## Syntax Description

| | |
|---|---|
| *delay* | Delay value for PADO message, in milliseconds, based on the Remote-ID.<br>The range is from 0 to 10000. |
| **string** | Delays the PADO message, when the Remote-ID received in PADI message matches the configured *string*. |
| **contains** | Delays the PADO message, when the Remote-ID received in PADI message contains the configured *string*. |
| *string* | String received in PADI message, that needs to be matching the Remote-ID (when used along with **string** keyword) or the string received in PADI message, that needs to be contained within the Remote-ID (when used along with the **contains** keyword). |

## Command Default

None

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

Setting a value of 0 for *delay* means that no transmission delay is set for the PADO message. Setting a value of 10000 means that an infinite delay is set for PADO message; or, in other words, the PADO message is never sent.

Within the category of Remote-ID matches, full string matches are preferred to sub-string matches. If more than one sub-string match occurs, the selection is based on a random order.

If there is neither a string match nor a sub-string match, the configured Circuit-ID delay is used (if a Circuit-ID is present in PADI message), followed by the configured Remote-ID delay (if a Remote-ID is present in PADI message).

If there are no matches, the configured pado delay is used for PADO message.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure a delay of 1000 milliseconds for the PADO message:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay remote-id 1000
```

This example shows how to configure a delay of 8000 milliseconds for the PADO message, if the Remote-ID received in the PADI message exactly matches the configured string (**remote1** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay remote-id string remote1 8000
```

This example shows how to configure a delay of 5000 milliseconds for the PADO message, if the remote-id received in the PADI message contains the configured string (**remote2** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay remote-id contains remote2 5000
```

## Related Commands

| Command | Description |
|---|---|
| pado delay, on page 372 | Configures a specific delay for PPPoE PADO message for a PPPoE BBA-Group in BNG. |
| pado delay circuit-id, on page 373 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Circuit-ID received in PADI message. |
| pado delay service-name, on page 377 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Service-Name received in PADI message. |

# pado delay service-name

To set a delay for a PPPoE Active Discovery Offer (PADO) message for a particular PPPoE BBA-Group, based on the Service-Name received in PPPoE Active Discovery Initiator (PADI) message, use the **pado delay service-name** command in PPPoE BBA-Group configuration mode. To disable the PADO delay configuration based on the Service-Name, use the **no** form of this command.

**pado delay service-name** {**string** | **contains**} *string* *delay*

## Syntax Description

| | |
|---|---|
| **string** | Delays the PADO message, when the Service-Name string received in PADI message matches the configured *string*. |
| **contains** | Delays the PADO message, when the Service-Name received in PADI message contains the configured *string*. |
| *string* | String received in PADI message, that needs to be matching the Service-Name (when used along with **string** keyword) or the string received in PADI message, that needs to be contained within the Service-Name (when used along with the **contains** keyword). |
| *delay* | Delay value for PADO message, in milliseconds, based on the Service-Name.<br>The range is from 0 to 10000. |

## Command Default

None

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

Setting a value of 0 for *delay* means that no transmission delay is set for the PADO message. Setting a value of 10000 means that an infinite delay is set for PADO message; or, in other words, the PADO message is never sent.

Within the category of service-name matches, full string matches are preferred to sub-string matches. If more than one sub-string match occurs, the selection is based on a random order.

If there is neither a string match nor a sub-string match, the configured Circuit-ID delay is used (if a Circuit-ID is present in PADI message), followed by the configured Remote-ID delay (if a Remote-ID is present in PADI message).

If there are no matches, the configured pado delay is used for the PADO message.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure a delay of 8000 milliseconds for the PADO message, if the Service-Name received in the PADI message exactly matches the configured string (**service1** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay service-name string service1 8000
```

This example shows how to configure a delay of 5000 milliseconds for the PADO message, if the Service-Name received in the PADI message contains the configured string (**service** in this example):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# pado delay service-name contains service 5000
```

## Related Commands

| Command | Description |
|---|---|
| pado delay, on page 372 | Configures a specific delay for PPPoE PADO message for a PPPoE BBA-Group in BNG. |
| pado delay circuit-id, on page 373 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Circuit-ID received in PADI message. |
| pado delay remote-id, on page 375 | Configures a delay for PPPoE PADO message for a PPPoE BBA-Group in BNG, based on the Remote-ID received in PADI message. |

# pppoe bba-group

To add configuration for a particular BBA-Group and to enter the BBA-Group submode, use the **pppoe bba-group** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**pppoe bba-group** { *bba-group name* | **global** } { **ac** | **name** *new_name* | **control-packets** | **priority** *priority_bits* | **service** | **mtu** | { **name** *new_name* | **selection** | **disable** } | **sessions** | { **access-interface** | **circuit-id** | **mac** | **mac-iwf** | { **access-interface** | **pair** | **limit** } | **max** | { **access-interface** | **limit** | **throttle** } } | **limit** *session_limit* | **tag** | { **ppp-max-payload** | { **deny** | **minimum** *minimum_payload* } } }

## Syntax Description

| | |
|---|---|
| *bba-group-name* | Specifies the bba group name. |
| **global** | Specifies the global bba-group.<br>**Note** This is a reserved keyword for IOS XR PPPoE call flow, you must use a different keyword for subscriber redundancy group (SRG). |
| **ac** | Enables modification of the access concentrator configuration. |
| **name** | Indicates the name change to include in the AC tag. |
| *new_name* | Specifies the new name. |
| **control-packets** | Enables change of control-packets configuration. |
| **priority** | Sets the priority to use in PPPoE and PPP control packets. |
| *priority_bits* | Specifies the priority bits for outgoing PPPoE and PPP control packets. This ranges between 0 and 7, where 0 indicates highest priority and 7 indicates the lowest. |
| **service** | Enables modification of service configuration. |
| **mtu** | Configures the default maximum payload for subscriber interfaces when the client does not negotiate an MTU. Range: 500–2000. |
| **name** | Configures the service name. |
| *new_name* | Specifies the new service name. |
| **selection** | Specifies the selection of unrequested service names. |
| **disable** | Disables the advertising of unrequested service names. |
| **sessions** | Enables modification of sessions configuration. |
| **access-interface** | Limits PPPoE sessions on any one access interface. |

| | |
|---|---|
| **circuit-id** | Limits PPPoE sessions with any one circuit-id. |
| **mac** | Limits or throttles PPPoE sessions from any one mac-address. |
| **mac-iwf** | Limits or throttles IWF PPPoE sessions from any one mac-address. |
| **max** | Sets a per-card session limit. |
| **limit** | Specifies the action of limiting the PPPoE sessions for various attributes. |
| *session_limit* | Specifies the access-interface session limit. The value ranges from 1 to 65535. |
| **tag** | Enables modification of tag configuration. |
| **ppp-max-payload** | Sets the minimum and maximum payload values that can be negotiated with a client during MTU negotiation. |
| **deny** | Ignores MTU negotiation even if the client sends the **ppp-max-payload** TLV to negotiate MTU. |
| **minimum** | Configures the minimum payload. |
| *minimum_payload* | Specifies the value of the minimum payload. The value ranges from 500 to 2000. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 6.2.1 | Modified the command to include **global** BBA-Group. |

## Usage Guidelines

BBA-Groups are configured globally (these are essentially configuration templates), containing the PPPoE configuration settings.

When this configuration changes to use a different BBA-Group, then all existing PPPoE sessions running under the interface are terminated.

Among the various BBA-Groups that can be configured on a router, one BBA-Group can be configured as a global BBA-Group. If the maximum limit for PPPoE sessions is set under **pppoe bba-group global** configuration, it indicates the limit for the total number of sessions on the node.

**Note**

- For RP subscribers, the node is the complete chassis.
- For LC subscribers, the node is the LC. For LC subscribers, each LC considers the maximum limit set by the global limit. But with multiple LC in the chassis, the session count in the chassis can be multiplied by the number of active LC.

To use a BNG-wide limit for LC based subscribers, you can use either bundles or pre authentication.

- For a single member, when you are using bundles, the sessions are maintained on the RP and the control is moved to the RP for all sessions. The bba group limit applies to all sessions regardless to the number of line cards carrying subscribers:

```
interface GigabitEthernet0/0/0/0
bundle id 100 mode on
```

- In a pre authentication method, when PADI is received, an authorization request is sent to AAA . An authorisation request determines the session count on radius for it to accept or reject the request. When the request is accepted, a PADO is sent. When the request is rejected the PADI is discarded and ignored.

Global BBA-Group support in BNG is subjected to these restrictions:

- Currently global BBA-Group supports only configurations related to session limit, except AAA override configuration. For more details, see usage guidelines section of **pppoe sessions limit** command.
- You cannot change the configuration at run time for global BBA-Group.
- The **global** BBA-Group is not valid for subscriber redundancy group (SRG) in BNG, and hence the **pppoe bba-group global** command must not be used in BNG geo redundancy scenarios.

**Task ID**

| Task ID | Operation |
|---|---|
| ppp | read, write |

This is an example of configuring the **pppoe bba-group** command in Global Configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group global
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions max limit 250
```

This is an example of configuring maximum PPPoE sessions limit for the entire router, under global PPPoE BBA-Group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group global
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions max limit 250
```

## Related Commands

| Command | Description |
|---|---|
| pppoe enable bba-group, on page 383 | Enables PPPoE on an interface. |

# pppoe enable bba-group

To enable pppoe on an interface, use the **pppoe enable bba-group** command in interface configuration mode. To disable the pppoe on the interface, use the **no** form of this command.

**pppoe enable bba-group** *bba-group name*

## Syntax Description

| | |
|---|---|
| *bba-group name* | Specifies the name of the bba-group. |

## Command Default

If no BBA-Group is specified, then the default configuration options are used, else the BBA-Group's configuration is used on this interface.

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

When this configuration changes to use a different BBAGroup, then all existing PPPoE sessions running under the interface are terminated.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This is an example of configuring the **pppoe enable bba-group** command in interface configuration mode:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router(config)#interface Bundle-Ether100.10
RP/0/RSP0/CPU0:router(config-if)# pppoe enable bba-group bba1
```

## Related Commands

| Command | Description |
|---|---|
| pppoe bba-group, on page 379 | Enables you to add configuration for a particular bba-group. |

# pppoe in-flight-window

To configure a limit for the number of PPPoE sessions that are in progression towards established state in BNG, use the **pppoe in-flight-window** command in Global Configuration mode. To remove this limit, use the **no** form of this command.

**pppoe in-flight-window** *size*

## Syntax Description

| | |
|---|---|
| *size* | Specifies the window-size for the number of PPPoE sessions that are in progression towards established state in BNG. |

## Command Default

None

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.3.1 | This command was introduced. |

## Usage Guidelines

The recommended in-flight-window *size* for RP-based subscribers is 200, and that for LC-based subscribers is 50. Values higher than these are not recommended for production deployment, as it can lead to system instability.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure the in-flight-window size for PPPoE sessions in BNG:

```
RP/0/RSP0/CPU0:router(config)# pppoe in-flight-window 200
```

## Related Commands

| Command | Description |
|---|---|
| pppoe sessions limit, on page 385 | Configures a limit for PPPoE sessions for a PPPoE BBA-Group in BNG. |
| pppoe sessions throttle, on page 388 | Configures a throttle value for PPPoE sessions for a PPPoE BBA-Group in BNG. |

# pppoe sessions limit

To set the PPPoE sessions limit for a particular PPPoE BBA-Group or for the entire router, use the **sessions limit** command in PPPoE BBA-Group configuration mode. To remove the specified limit for PPPoE sessions, use the **no** form of this command.

**sessions** {**access-interface** | **circuit-id** | **circuit-id-and-remote-id** | **inner-vlan** | {**mac** | **mac-iwf**} [**access-interface**] | **max** | **outer-vlan** | **remote-id** | **vlan**} **limit** *limit-value* [**threshold** *threshold-value*]

## Syntax Description

| | |
|---|---|
| **access-interface** | Limits PPPoE sessions on any one access interface. |
| **circuit-id** | Limits PPPoE sessions with any one circuit-ID. |
| **circuit-id-and-remote-id** | Limits PPPoE sessions by circuit-id and remote-id. |
| **inner-vlan** | Limits PPPoE sessions with any one inner-vlan id. |
| **mac** | Limits PPPoE sessions from any one mac address. |
| **mac-iwf** | Limits IWF PPPoE sessions from any one mac address. |
| **max** | Sets a per-card session limit. |
| **outer-vlan** | Limits PPPoE sessions with any one outer-vlan id. |
| **remote-id** | Limits PPPoE sessions with any one remote-id. |
| **vlan** | Limits PPPoE sessions with matching vlan ids. |
| **limit** | Specifies the action of limiting the PPPoE sessions for various attributes. |
| *limit-value* | Specifies the session limit value.<br>The range is from 1 to 65535. The default is 65535. |
| **threshold** | Specifies the action of generating a log message when the threshold has reached. |
| *threshold-value* | Specifies the threshold value.<br>The range is from 1 to 65535. |

## Command Default

None

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

| Release | Modification |
|---|---|
| Release 4.3.1 | The PPPoE sessions limit support was extended for **mac access-interface**, **mac-iwf access-interface**, **inner-vlan**, **outer-vlan**, **vlan**, and **circuit-id-and-remote-id**<br>Support for the optional argument, **threshold** was added. |
| Release 6.2.1 | Functionality was included to set a global PPPoE session limit, that is, a session limit for the entire router. |

## Usage Guidelines

If a session limit is configured after the limit has already been exceeded, the existing sessions are torn down until the number of sessions matches the configured limit.

If both mac limit and mac-iwf limit are configured, only IWF limit is used for IWF sessions, so that a higher IWF limit than the limit for non-IWF sessions can be used. The same is the case if both mac access-interface limit and mac-iwf access-interface limit are configured.



**Note** The **sessions outer-vlan limit** command limits the sessions only in single VLAN tag scenarios. You must use the **sessions vlan limit** command, to limit the sessions in double VLAN tag scenarios; this limits the maximum number of sessions allowed for each inner VLAN and outer VLAN, for each access-interface.

In order to set a global PPPoE session limit, use the **sessions max limit** command under **pppoe bba-group global** configuration mode. The combined number of sessions on all individual BBA-Groups cannot exceed this global limit. For example, consider a configuration where the global limit is set as 250, the limit of BBA-Group 1 (say, *bba1*) is set as 100, and the limit of BBA-Group 2 (say, *bba2*) is set as 200. If 100 sessions are already created with *bba1*, then only 150 sessions (that is, 250 -100) can be created with *bba2*, even though *bba2* has a session limit of 200. Similarly there can be different combinations of sessions with local BBA-Groups as long as the global session limit is not exceeded. For more details, see **pppoe bba-group** command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure a pppoe session limit of 1000, for each access-interface in a PPPoE BBA-Group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions access-interface limit 1000
```

This example shows how to configure a pppoe session limit of 5000 and a threshold value of 4900, for each peer mac-address under individual access-interface in a PPPoE BBA-Group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions mac access-interface limit 5000 threshold
```

```
4900
```

This example shows how to set the global PPPoE session limit for a router as 250:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group global
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions max limit 250
```

## Related Commands

| Command | Description |
|---|---|
| pppoe bba-group, on page 379 | Adds configuration for a particular BBA-Group and enters the BBA-Group submode. |
| pppoe sessions throttle, on page 388 | Configures a throttle value for PPPoE sessions for a PPPoE BBA-Group in BNG. |
| show pppoe limits, on page 394 | Shows the PPPoE session limit information. |

# pppoe sessions throttle

To set a throttle value for the PPPoE sessions for a particular PPPoE BBA-Group, use the **sessions throttle** command in PPPoE BBA-Group configuration mode. To remove the specified throttle value for PPPoE sessions, use the **no** form of this command.

**sessions** {**circuit-id** | **circuit-id-and-remote-id** | **inner-vlan** | **mac** [**access-interface**] | **mac-iwf access-interface** | **outer-vlan** | **remote-id** | **vlan**} **throttle** *request-count request-period blocking-period*

## Syntax Description

| | |
|---|---|
| **access-interface** | Throttles PPPoE sessions based on any one access interface |
| **circuit-id** | Throttles PPPoE sessions with any one circuit-id. |
| **circuit-id-and-remote-id** | Throttles PPPoE sessions by circuit-id and remote-id. |
| **inner-vlan** | Throttles PPPoE sessions with any one inner-vlan id. |
| **mac** | Throttles PPPoE sessions from any one mac address. |
| **mac-iwf** | Throttles Inter-Working Function (IWF) sessions from any one mac address. |
| **outer-vlan** | Throttles PPPoE sessions with any one outer-vlan id. |
| **remote-id** | Throttles PPPoE sessions with any one remote-id. |
| **vlan** | Throttles PPPoE sessions with matching vlan ids. |
| **throttle** | Specifies the action of throttling the PPPoE sessions for various attributes. |
| *request-count* | Specifies the number of session requests allowed before throttling. |
| *request-period* | Specifies the time interval during which the session requests are counted. |
| *blocking-period* | Specifies the time interval during which no more requests from the subscriber are accepted, when the subscriber has already been throttled. |

## Command Default

Sessions throttle is disabled by default.

## Command Modes

PPPoE BBA-Group configuration

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

| Release | Modification |
|---|---|
| Release 4.3.1 | The pppoe sessions throttle support was extended for **circuit-id**, **remote-id**, **inner-vlan**, **outer-vlan**, **vlan** and **circuit-id-and-remote-id**<br>Support for the variables, *request-count*, *request-period* and *blocking-period* was added. |

## Usage Guidelines

If both mac access-interface throttle and mac-iwf access-interface throttle are configured, only IWF throttle is used for IWF sessions, so that different throttling can be applied to IWF and non-IWF sessions.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows how to configure a throttle for pppoe sessions for each circuit-id in a PPPoE BBA-Group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions circuit-id throttle 1000 50 25
```

This example shows how to configure a throttle for IWF session requests for each peer mac-address under individual access-interface in a PPPoE BBA-Group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# pppoe bba-group bba1
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions mac-iwf access-interface throttle 5000 100
 50
```

## Related Commands

| Command | Description |
|---|---|
| pppoe sessions limit, on page 385 | Configures a limit for PPPoE sessions for a PPPoE BBA-Group in BNG. |
| show pppoe throttles, on page 403 | Shows the throttle information for the PPPoE sessions. |

# clear pppoe statistics

To clear the statistics of packets received and sent by the PPPoE sessions in BNG, use the **clear pppoe statistics** command in the EXEC mode.

**clear pppoe statistics** [**internal**] **location** *node-id*

## Syntax Description

| | |
|---|---|
| **internal** | Clears internal PPPoE statistics. |
| **location** | Clears PPPoE statistics for a given node. |
| *node-id* | Specifies the node ID.<br>The node-id argument is entered in the rack/slot/module notation. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read, write |

This example shows the sample output before and after clearing the PPPoE statistics:

```
RP/0/RSP0/CPU0:router# show pppoe statistics
Tue Feb  5 21:17:36.137 UTC

0/RSP1/CPU0
-----------
Packets                      Sent        Received         Dropped
-------------------------------------------------------------------
PADI                            0           16163              60
PADO                        16103               0               0
PADR                            0           16103               0
PADS (success)              16102               0               0
PADS (error)                    1               0               0
PADT                        28173              19               0
Session-stage                   0            8200               0
Other                           0               0               0
                            -----           -----           -----
TOTAL                       60379           40485              60
```

```
Packet Error                                          Count
------------------------------------------------------------
Session-stage packet for unknown session               4097
Session-stage packet with no error                        6
                                                      -----
TOTAL                                                  4103

RP/0/RSP0/CPU0:router# clear pppoe statistics location 0/RSP1/CPU0


RP/0/RSP0/CPU0:router# show pppoe statistics
Tue Feb  5 21:18:10.509 UTC

0/RSP1/CPU0
-----------
Packets                      Sent        Received         Dropped
------------------------------------------------------------------
PADI                            0               0               0
PADO                            0               0               0
PADR                            0               0               0
PADS (success)                  0               0               0
PADS (error)                    0               0               0
PADT                            0               0               0
Session-stage                   0               0               0
Other                           0               0               0
                            -----           -----           -----
TOTAL                           0               0               0

Packet Error                                          Count
------------------------------------------------------------
                                                      -----
TOTAL                                                     0

RP/0/RSP0/CPU0:router#
```

## Related Commands

| Command | Description |
|---|---|
| show pppoe statistics, on page 398 | Shows the counters for packets received and sent by the PPPoE sessions. |

# show pppoe interfaces

To display a summary of the protocol state for the specified PPPoE interface filtered by circuit-id, remote-id, interface or location, use the **show pppoe interfaces** command in the EXEC mode mode.

**show pppoe interfaces** [**circuit-id** *circuit_id* | **remote-id** *remote_id* | **access-interface** *type interface-path-id* | **location** *node* | **all**]

## Syntax Description

| | |
|---|---|
| **circuit-id** | Shows information for a given circuit-id. |
| *circuit_id* | Specifies the circuit-id to show data for. |
| **remote-id** | Show information for a given remote-id. |
| *remote_id* | Specifies the remote-id to show data for. |
| **access-interface** | Shows PPPoE status for all sessions on a single access interface. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **location** | Shows PPPoE status for all sessions at a location. |
| *node* | Specifies the fully qualified location specification. |
| **all** | Shows PPPoE status for all sessions. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.3.2 | The command was modified to include a new output display field, **SRG-state**, as part of geo redundancy support for PPPoE sessions. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This is a sample output of the **show pppoe interfaces** command:

```
RP/0/RSP0/CPU0:router# show pppoe interfaces Loopback1
Loopback1 is Complete
Session id: 1
Access interface: Loopback1
BBA-Group: blue
Local MAC address: aabb.cc00.8301
Remote MAC address: aabb.cc00.8201
Tags:
Service-Name: service1
Max-Payload: 1500
IWF
Circuit-ID: circuit1
Remote-ID: remote1
```

This is a sample output of the **show pppoe interfaces** command, with geo redundancy enabled for PPPoE sessions:

```
RP/0/RSP0/CPU0:router# show pppoe interfaces
Bundle-Ether2.1.pppoe16534 is Complete
  Session id: 16534
  Parent interface: Bundle-Ether2.1
  BBA-Group: BBA1
  Local MAC address: 0002.0003.0004
  Remote MAC address: 0000.6201.0103
  Outer VLAN ID: 10
  Tags:
    Service name: AGILENT
    Host-Uniq: 4 bytes, (000e0000)
  SRG-state: SRG-Standby
```

# show pppoe limits

To show the PPPoE session limit information, use the **show pppoe limits** command in the EXEC mode mode.

**show pppoe limits** [**active**] [**access-interface** *type interface-path-id* | **bba-group** *bba-group-name* | **location** *node*]

## Syntax Description

| | |
|---|---|
| **active** | Shows only those throttles that are currently blocking packets. |
| **access-interface** | Shows PPPoE status for all sessions on a single access interface. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **bba-group** | Shows throttles for all interfaces with a given bba-group. |
| *bba_group_name* | Specifies the bba-group to show throttle for. |
| **location** | Shows PPPoE status for all sessions at a location. |
| *node* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.1 | The command output was extended for the session limits of **mac access-interface**, **mac-iwf access-interface**, **inner-vlan**, **outer-vlan**, **vlan** and **circuit-id-and-remote-id** |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This is a sample output of the **show pppoe limits** command:

```
RP/0/RSP0/CPU0:router# show pppoe limits active access-interfaces loopback 45
BBA-Group TEST
--------------
Card session limit information:
Maximum session limit: 50 sessions
Warning threshold: 40 sessions
State #Sessions
----- ---------
Block 50
Access-interface session limits not configured.
MAC session limits not configured.
MAC-IWF session limits not configured.
Circuit-ID session limit information:
Maximum session limit: 50 sessions
Warning threshold: 40 sessions
Circuit-ID State #Sessions
---------- ----- ---------
circuit_id1 Block 50
circuit_id_field_which_can_be_up_to_sixty_four_chars_long Warn 45
circuit_id2 OK 32
circuit_id,/[]* OK 1
BBA-Group TEST2
---------------
Card session limits not configured.
Access-interfaces session limit information:
Maximum session limit: 50 sessions
Warning threshold: 40 sessions
Access-Interface State #Sessions
---------------- ----- ---------
GE0/1/0/0/0 Block 50
GE0/1/0/0/1 Warn 45
GE0/1/0/0/2 OK 32
GE0/1/0/0/0.12 OK 1
MAC session limits not configured.
MAC-IWF session limits not configured.
Circuit-ID session limits not configured.
```

This is another sample output of **show pppoe limits** command:

```
RP/0/RSP0/CPU0:router# show pppoe limits
Tue Feb  5 21:09:40.823 UTC

0/RSP1/CPU0
-----------
BBA-Group BNG_BBA
-----------------
Card session limits not configured.

Access-interface session limits not configured.

MAC session limits not configured.

MAC-IWF session limits not configured.

Circuit-ID session limit information:
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Circuit-ID                                                 State   #Sessions
  ----------                                                 -----   ---------
  circuit0                                                   Block          10

Remote-ID session limit information:
```

```
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Remote-ID                                                 State   #Sessions
  ----------                                                -----   ---------
  remote10                                                  Block          10

MAC-Access-Interface session limits not configured.

MAC-IWF-Access-Interface session limits not configured.

Inner-VLAN-ID session limit information:
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Access-Int                  Inner VLAN ID                 State   #Sessions
  ----------                  -------------                 -----   ---------
  BE2.10                      10                            Block          10

Outer-VLAN-ID session limit information:
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Access-Int                  Outer VLAN ID                 State   #Sessions
  ----------                  -------------                 -----   ---------
  BE2.10                      10                            Block          10

VLAN-ID session limit information:
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Access-Int            Outer, Inner VLAN ID                State   #Sessions
  ----------            --------------------                -----   ---------
  BE2.10                   10, 10                           Block          10

Circuit-ID-and-Remote-ID session limit information:
  Maximum session limit: 10 sessions
  Warning threshold:     8 sessions

  Circuit-ID                                                State   #Sessions
    Remote-ID                                                         (/Max)
  -----------                                               -----   ---------
  circuit0                                                  Block          10
    remote10
```

This table describes the significant fields displayed in the **show pppoe limits** command output :

| Field | Description |
|---|---|
| Block | Specifies that the number of sessions is at the maximum limit. |
| OK | Specifies that the number of sessions is below the maximum limit and the warning threshold (if configured). |

| Field | Description |
|---|---|
| Warn | Specifies that the number of sessions is at or above the warning threshold (if configured). No warning threshold is used when a limit is overridden. |

## Related Commands

| Command | Description |
|---|---|
| pppoe sessions limit, on page 385 | Configures a limit for PPPoE sessions for a PPPoE BBA-Group in BNG. |
| show pppoe throttles, on page 403 | Shows the throttle information for the PPPoE sessions. |
| show pppoe interfaces, on page 392 | Shows a summary of the protocol state for the specified PPPoE interface filtered by circuit-id, remote-id, interface, or location. |
| show pppoe statistics, on page 398 | Shows the counters for packets received and sent by the PPPoE sessions. |
| show pppoe summary, on page 401 | Shows summary information of the PPPoE sessions. |

# show pppoe statistics

To show the counters for packets received and sent by the PPPoE sessions, use the **show pppoe statistics** command in the EXEC mode mode.

**show pppoe statistics** {**access-interface***typeinterface-path-id* | **internal** | { **location***node*} | **location***node*}

## Syntax Description

| | |
|---|---|
| **access-interface** | Shows PPPoE status for all sessions on a single access interface. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **internal** | Shows internal PPPoE statistics. |
| **location** | Shows PPPoE status for all sessions at a location. |
| *node* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This is the sample output of the **show pppoe statistics** command:

```
RP/0/RSP0/CPU0:router# show pppoe statistics access-interfaces Loopback 156

Packets Sent Received Dropped
-----------------------------------------------------------------
PADI 0 3723 18
PADO 3182 0 0
PADR 0 1732 93
```

```
PADS (success) 1601 0 0
PADS (error) 38 0 0
PADT 158 552 9
Session-stage 0 18 17
Other 0 2 2
----- ----- -----
TOTAL 3979 6063 139

RP/0/RSP0/CPU0:router# show pppoe statistics location 0/2/cpu0

Packets Sent Received Dropped
-------------------------------------------------------------
PADI 0 3723 18
PADO 3182 0 0
PADR 0 1732 93
PADS (success) 1601 0 0
PADS (error) 38 0 0
PADT 158 552 9
Session-stage 0 18 17
Other 0 2 2
----- ----- -----
TOTAL 3979 6063 139
Packet Error Count
-----------------------------------------------------
No interface handle 1
No packet payload 1
No packet mac-address 1
Invalid version-type value 3
Bad packet length 7
Unknown interface 11
PADO receive
ed 1
PADS received 1
Unknown packet type received 1
Unexpected Session-ID in packet 1
No Service-Name Tag 11
PADT for unknown session 13
PADT with wrong peer-mac 7
PADT before PADS sent 1
Session-stage packet for unknown session 13
Session-stage packet with wrong mac 19
Session-stage packet with no error 1
Tag too short 1
Bad tag-length field 1
Multiple Service-Name tags 1
Multiple Max-Payload tags 1
Invalid Max-Payload tag 1
Multiple Vendor-specific tags 1
Unexpected AC-Name tag 1
Unexpected error tags 3
Unknown tag received 1
No IANA code in vendor tag 1
Invalid IANA code in vendor tag 1
Vendor tag too short 1
Bad vendor tag length field 1
Multiple Host-Uniq tags 1
Multiple Circuit-ID tags 1
Multiple Remote-ID tags 1
Invalid DSL tag 1
Multiple of the same DSL tag 1
Invalid IWF tag 1
Multiple IWF tags 1
Unknown vendor-tag 11
No space left in packet 1
```

```
Duplicate Host-Uniq tag received 1
Packet too long 1
-----
TOTAL 140
```

# show pppoe summary

To show the summary information for the PPPoE sessions, use the **show pppoe summary** command in the EXEC mode mode.

**show pppoe summary** {**per-access-interface** | **total**} { **location***node*}

## Syntax Description

| | |
|---|---|
| **per-access-interface** | Summarizes PPPoE sessions running on each access-interface. |
| **total** | Shows the overall summary information of access-interfaces and sessions. |
| **location** | Shows PPPoE status for all sessions at a location. |
| *node* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This is the sample output of the **show pppoe summary** command:

```
RP/0/RSP0/CPU0:router# show pppoe summary per-access-interfaces location 0/1/cpu0

COMPLETE: Complete PPPoE Sessions
INCOMPLETE: PPPoE sessions being brought up or torn down
Interface BBA-Group READY TOTAL COMPLETE INCOMPLETE
--------------------------------------------------------------------------------
Fa0/1/0/0 blue Y 20 18 2
Fa0/1/0/1.1 red Y 128000 100010 27990
Fa0/1/0/1.2 green N 0 0 0
---------------------------------
TOTAL 2 128020 100028 27992
RP/0/0/CPU0:demo#show pppoe summary total location 0/5/cpu0
==============================
Configured Access Interfaces
==============================
Ready 300
Not-Ready 15
----------------------------
TOTAL 315
```

```
==============================
PPPoE Sessions
==============================
Complete 3812
Incomplete 302
------------------------------
TOTAL 4114
==============================
Flow Control
==============================
Limit 1000
In Flight 12
Dropped 212
Disconnected 6
Successful 1021
```

# show pppoe throttles

To show the throttle information for the PPPoE sessions, use the **show pppoe throttles** command in the EXEC mode mode.

**show pppoe throttles** [**active**] [**access-interface** *type interface-path-id* | **bba-group** *bba-group-name* | **location** *node*]

## Syntax Description

| | |
|---|---|
| **active** | Shows only those throttles that are currently blocking packets. |
| **access-interface** | Shows PPPoE status for all sessions on a single access interface. |
| *type* | Interface type. For more information, use the question mark (?) online help function. |
| *interface-path-id* | Physical interface or virtual interface.<br>**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.<br>For more information about the syntax for the router, use the question mark (?) online help function. |
| **bba-group** | Shows throttles for all interfaces with a given bba-group. |
| *bba_group_name* | Specifies the bba-group name. |
| **location** | Shows PPPoE status for all sessions at a location. |
| *node* | Specifies the fully qualified location specification. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.1 | The command output was extended for the throttle for **circuit-id**, **remote-id**, **inner-vlan**, **outer-vlan**, **vlan** and **circuit-id-and-remote-id**. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| ppp | read |

This is the sample output of the **show pppoe throttles** command:

```
RP/0/RSP0/CPU0:router# show pppoe throttles location 0/2/cpu0

BBA-Group TEST
--------------
MAC throttle information:
Max packets per request period: 5
Request period duration: 20s
Blocking period duration: 5s
Time Since
MAC Address State left reset PADI PADR
----------- ----- ---- ----- ---- ----
aabb.ccdd.1123 Idle 30s 16s 0 0
7582.1352.e29a Monitor 3s 20s 5 5
7582.1352.e29a Block 4s 17s 6 5
MAC Access-interface throttle information:
Max packets per request period: 5
Request period duration: 20s
Blocking period duration: 5s
Time Since
Access-Int MAC Address State left reset PADI PADR
---------- ----------- ----- ---- ----- ---- ----
GE0/1/0/0 aabb.ccdd.1123 Idle 30s 16s 0 0
GE0/1/0/0 7582.1352.e29a Monitor 3s 20s 5 5
GE0/1/0/0 7582.1352.e29a Block 4s 17s 6 5
MAC IWF throttle information:
Max packets per request period: 5
Request period duration: 20s
Blocking period duration: 5s
Time Since
MAC Address State left reset PADI PADR
----------- ----- ---- ----- ---- ----
aabb.ccdd.1123 Idle 30s 16s 0 0
7582.1352.e29a Mon 3s 20s 5 5
7582.1352.e29a Block 4s 17s 6 5
BBA-Group TEST2
--------------
MAC throttling is not configured.
MAC Access-interface throttling is not configured.
MAC IWF throttling is not configured.
```

Another sample output of the **show pppoe throttles** command:

```
RP/0/RSP0/CPU0:router# show pppoe throttles
BBA-Group BNG_BBA1
------------------
MAC throttles not configured.

MAC-Access-interface throttles not configured.

MAC-IWF-Access-interface throttles not configured.

Circuit-ID throttle information:
  Max packets per request period: 10
  Request period duration:        10s
  Blocking period duration:       100s

                                                    Time  Since
  Circuit-ID                                State   left  reset  PADI  PADR
  ----------                                -----   ----  -----  ----  ----
```

```
  circuit0                                  Block     91s     8s    10    10

Remote-ID throttle information:
  Max packets per request period: 10
  Request period duration:        10s
  Blocking period duration:       100s

                                                      Time  Since
  Remote-ID                                 State     left  reset  PADI  PADR
  ----------                                -----     ----  -----  ----  ----
  remote10                                  Block     91s     8s    10    10

Inner-VLAN-ID throttle information:
  Max packets per request period: 10
  Request period duration:        10s
  Blocking period duration:       100s

                                                      Time  Since
  Access-Int                  Inner VLAN ID State     left  reset  PADI  PADR
  ----------                  ------------- -----     ----  -----  ----  ----
  BE2.10                      10            Block     91s     8s    10    10

Outer-VLAN-ID throttle information:
  Max packets per request period: 10
  Request period duration:        10s
  Blocking period duration:       100s

                                                      Time  Since
  Access-Int                  Outer VLAN ID State     left  reset  PADI  PADR
  ----------                  ------------- -----     ----  -----  ----  ----
  BE2.10                      10            Block     91s     8s    10    10

VLAN-ID throttle information:
  Max packets per request period: 10
  Request period duration:        10s
  Blocking period duration:       100s

                                                      Time  Since
  Access-Int            Outer, Inner VLAN ID  State     left  reset  PADI  PADR
  ----------            --------------------  -----     ----  -----  ----  ----
  BE2.10                   10, 10             Block     91s     8s    10    10

Circuit-ID-and-Remote-ID throttle information:
  Max packets per request period: 0
  Request period duration:        0s
  Blocking period duration:       0s

                                                      Time  Since
  Circuit-ID                                State     left  reset  PADI  PADR
    Remote-ID
  -----------                               -----     ----  -----  ----  ----
  circuit0                                  Block     91s     8s    10    10
    remote10
```

This table describes the significant fields displayed in the **show pppoe throttles** command output :

| Field | Description |
|---|---|
| Block | Specifies that the throttle is active and that packets are dropped. |
| Idle | Specifies that the packets relevant to the throttle are not yet received. |

| Field | Description |
|---|---|
| Monitor | Specifies that the packets are counted, but the throttle is not yet active. |
| Time left | Specifies the time remaining until the throttle enters idle state, or if the throttle is already in idle state, the time until the throttle entry is removed. |
| Since reset | Specifies the time since the throttle counters were last reset. Throttle counters are reset upon entering the idle state. |
| PADI | Specifies the number of PADI messages received which match the entry criteria (say, mac address). |
| PADR | Specifies the number of PADR messages received which match the entry criteria (say, mac address). |

## Related Commands

| Command | Description |
|---|---|
| pppoe sessions throttle, on page 388 | Configures a throttle value for PPPoE sessions for a PPPoE BBA-Group in BNG. |
| show pppoe limits, on page 394 | Shows the PPPoE session limit information. |
| show pppoe interfaces, on page 392 | Shows a summary of the protocol state for the specified PPPoE interface filtered by circuit-id, remote-id, interface, or location. |
| show pppoe statistics, on page 398 | Shows the counters for packets received and sent by the PPPoE sessions. |
| show pppoe summary, on page 401 | Shows summary information of the PPPoE sessions. |



# Subscriber and Session Redundancy Commands

This module describes the Cisco IOS XR software commands used to configure the subscriber and session redundancy commands for Broadband Network Gateway (BNG) on the Cisco ASR 9000 Series Router. For details regarding the related configurations, refer to the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.


- access-tracking (BNG), on page 409
- accounting interim variation, on page 411
- bng-interface (subscriber), on page 412
- clear session-redundancy, on page 413
- clear subscriber session, on page 414
- clear subscriber manager , on page 416
- clear subscriber srg, on page 417
- core-tracking, on page 421
- disable (BNG) , on page 422
- enable-fast-switchover, on page 424
- hold-timer (BNG), on page 425
- holdtimer-default-disable, on page 427
- http-enrichment parameter-list, on page 428
- http-enrichment parameter-list (subscriber), on page 430
- hw-module tcp-mss-adjust, on page 432
- interface-list (BNG), on page 434
- ipv4 tcp-mss-adjust enable, on page 437
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- session redundancy, on page 448
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- state-control-route, on page 453
- subscriber arp scale-mode-enable, on page 455
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- subscriber featurette dhcp-renew-author, on page 460
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- tracking-disable (BNG), on page 469
- virtual-mac, on page 470
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- show sessionmon license, on page 473
- show subscriber database, on page 475
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- show subscriber feature accounting, on page 483
- show subscriber manager sadb, on page 486
- show subscriber manager statistics, on page 487
- show subscriber redundancy group, on page 495
- show subscriber redundancy summary, on page 499
- show subscriber running-config, on page 501
- show subscriber session, on page 503
- show subscriber session filter, on page 512
- show subscriber session history, on page 514

# access-tracking (BNG)

To configure object tracking for detecting access connectivity for the specific Subscriber Redundancy Group (SRG) or Session Redundancy Group (SERG), use the **access-tracking** command in the respective group configuration mode.

To remove the object tracking configuration, use the **no** form of this command.

**access-tracking** *access-tracking-obj*

## Syntax Description

| | |
|---|---|
| *access-tracking-obj* | Access tracking object for the specific SRG. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

Session redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

Object tracking feature allows correlation of the role of BNG SRG/SERG with the role or status of the underlying access-interface, and it is the key for automatic switchovers and for handling failure scenarios.

You must configure the track object first and then configure that track object under the SRG/SERG which holds that particular interface. This ensures that SRG/SERG primary or subordinate role follows the underlying access role.

Advertisement of the summary route for the subscriber address/subnet pool can be also controlled through the same access-tracking object (See example section). This ensures that the subscriber summary route (or routes) is activated only when the underlying access is up or active and only then it is re-distributed into core routing. The subordinate does not advertise the route into the core.

For details on configuring track object, see *System Management Configuration Guide for Cisco ASR 9000 Series Routers*.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure object tracking for detecting access connectivity for the specific SRG in MC-LAG scenario:

Configuring the track object:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# track mclag-be1
RP/0/RSP0/CPU0:router(config-track)# type line-protocol state
RP/0/RSP0/CPU0:router(config-track-line-prot)# interface Bundle-Ether1
```

Configuring that track object under the SRG which holds that particular interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# access-tracking mc-lag-be1
```

Configuring access-tracking - Routing:

```
router static
 address-family ipv4 unicast
  200.0.0.0/16 Null0 track mc-lag-be1
address-family ipv6 unicast
  20::/64 Null0 track mc-lag-be1


router isis 1
 address-family ipv4 unicast
  redistribute static
 address-family ipv6 unicast
  redistribute static
```

# accounting interim variation

To introduce a random delay between successive interim accounting messages of sessions or services in BNG, use the **accounting interim variation** command in subscriber manager configuration mode. To remove this random delay, use the **no** form of this command.

**accounting interim variation** *value*

## Syntax Description

| | |
|---|---|
| *value* | Interim timeout randomization value, in percentage.<br>The range is from 0 to 50. By default, this value is zero (0), which means there is no interim timeout randomization. |

## Command Default

By default, randomization is disabled.

## Command Modes

Subscriber manager configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

Follow these usage guidelines while applying randomization:

- Randomization cannot be applied for too small interim timeouts (that is, for timeouts less than 2 minutes).
- If interim timeout is T seconds, the value *x* is selected from an interval [L, T]. By default, L is 100 percent of T (that is, 0% variance from T).
- The maximum value of T- L is 900 seconds (that is, 15 minutes).

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure a random delay of 50% variance between successive interim accounting messages of sessions or services:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber manager
RP/0/RSP0/CPU0:router(config-subscriber-manager)# accounting interim variation 50
```

# bng-interface (subscriber)

To set the interface that need to be used as bng identifier, use the **bng-interface** command in the subscriber configuration mode.

**bng-interface** *interface-name*

## Syntax Description

| | |
|---|---|
| *interface-name* | Specifies the interface that will be set as the bng-identifier. The IPv4/IPv6 address of this interface is used as the bng IP address. |

## Command Default

None

## Command Modes

Subscriber configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.5.1 | This command was introduced. |

## Usage Guidelines

None

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to set the bng-identfier interface.

```
RP/0/RSP0/CPU0:router(configure)# subscriber
RP/0/RSP0/CPU0:router(config-subscriber)# bng-interface Loopback8
```

## Related Commands

| Command | Description |
|---|---|
| http-enrichment parameter-list, on page 428 | Enables http header enrichment feature for BNG subscribers. |
| http-enrichment parameter-list (subscriber), on page 430 | Configures the primary list of all the parameters for http-enrichment. |

# clear session-redundancy

To clear the sessions for an SERG use the **clear session-redundancy** command in EXEC mode mode.

**clearsession-redundancy** [ **group** *name* [ **interface** *interface-type interface-name interface-id* ] ]

**Syntax Description**

| | |
|---|---|
| *interface-id* | Identifier value for the access interface mapped to the subordinate SERG. |

**Command Default**

None

**Command Modes**

Privileged Executive mode

**Command History**

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| network | execute |

This example shows how to clear the subscriber sessions for an SERG.

```
RP/0/RSP0/CPU0:router# clear session-redundancy group 1
```

# clear subscriber session

To clear the subscriber sessions in BNG, use the **clear subscriber session** command in EXEC mode mode.

**clear subscriber session** {**all** | **debug** { **subscriber-label** } | **identifier** { **access-interface** *interface-type interface-instance*[ {**ipv4** | **ipv6 IANA**} *ip-address*] | **interface** *interface-type interface-instance* } } [**location** *node-id*]

## Syntax Description

| | |
|---|---|
| **all** | Clears all subscriber sessions. |
| **debug subscriber-label** | Clears debug tracking of unique subscriber session. |
| **identifier** | Clears the subscriber session information based on the identifier(s) you select. |
| **access-interface** | Clears the subscriber session based on the access interface name. |
| *interface-type* | Specifies the interface type whose subscriber sessions you want to delete. |
| *interface-instance* | Specifies either a physical interface instance or a virtual interface instance that you want to delete.<br>The details of the interface instance are as follows:<br>• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.<br>  • *rack*: Chassis number of the rack.<br>  • *slot*: Physical slot number of the modular services card or line card.<br>  • *module*: Module number. A physical layer interface module (PLIM) is always 0.<br>  • *port*: Physical port number of the interface.<br>**Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.<br>• Virtual interface instance. Number range varies depending on interface type. |
| **ipv4** | Clears the DHCP IPv4 subscriber session information specific to an interface and IPv4 network-address/prefix. |

| | |
|---|---|
| **ipv6 IANA** | Clears the DHCP IPv6 subscriber session information specific to an interface and IPv6 address/prefix. |
| **location** | Clears the subscriber session information of a specific location. |
| *node-id* | Specifies the node whose subscriber sessions you want to delete. The node-id argument is entered in the rack/slot/module notation. |

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was modified to include the option to clear DHCP IPv6 IANA subscriber sessions on an access-interface. |
| Release 4.2.0 | This command was introduced. |

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

| Task ID | Operation |
|---|---|
| network | execute |

This example shows how to clear all the subscriber sessions in a particular node location:

```
RP/0/RSP0/CPU0:router# clear subscriber session all location 0/RSP0/CPU0
```

This example shows how to clear DHCP IPv6 subscriber sessions on a particular access-interface:

```
RP/0/RSP0/CPU0:router# clear subscriber session identifier access-interface bundle-ether
1.1 ipv6 IANA 2001:DB8:1::1
```

**Related Commands**

| Command | Description |
|---|---|
| show subscriber session, on page 503 | Displays the subscriber management session information. |

# clear subscriber manager

To clear the subscriber managment internal manager information, use the **clear subscriber manager** command in EXEC mode.

**clear subscriber managerservice-profileservice-name***service-name*

## Syntax Description

| | |
|---|---|
| **service-profile** | Indicates the sububscriber management service profile information. |
| **service-name** *service-name* | Indicates the service name. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 6.3.3 | This command was introduced. |

## Usage Guidelines

The user has to clear the service profile cache from the radius download. To do this, use the **show subscriber database configuration brief service-profile** command to view the state of service in the "In Use By Subscriber" field. If the entry is “False”, then use the **clear subscriber manager service-profile service-name** *service-name*command to clear the service profile cache. If the entry is “True”, then it indicates that the subscriber session is already in use and therefore the service profile cache must not be cleared.

## Task ID

| Task ID | Operation |
|---|---|
| network | execute |

This example shows how to clear the subscriber sessions.

```
RP/0/RSP0/CPU0:router# clear subscriber manager service-profile service-name group1
```

# clear subscriber srg

To clear the subscriber redundancy Group (SRG) subordinate and primary sessions use the **clear subscriber srg** command in EXEC mode mode.

**clear subscriber srg** { **master** | **slave** } **session** { **all** | **afi** { **dual-partial-up** | **dual-up** | **in-progress** | **ipv4-only** | **ipv6-only** | **lac** } | **identifier** { **access-interface interface-type interface-instance** [ **ipv4** | **ipv6 IANA** ] **ipadress** | **interface interface-type interface-instance** } | **mac-address mac-address** | **subscriber-label id** } [ **location** *node-id* ]

## Syntax Description

| | |
|---|---|
| **master** | Clears the subscriber management SRG primary information. |
| **slave** | Clears the subscriber management SRG subordinate information. |
| **all** | Clears all SRG primary or subordinate sessions. |
| **afi** | Clears SRG primary or subordinate sessions based on the specified address-family.<br>You can clear the SRG primary or subordinate sessions based on the following keywords:<br>• **dual-partial-up** : Clears the dual stack subscriber sessions (IPv4 and IPv6) that are partially established.<br>• **dual-up** : Clears the dual stack subscriber sessions (IPv4 + IPv6) that are fully established.<br>• **in-progress** : Clears the subscriber sessions that are in progress.<br>• **ipv4-only**: Clears the established single stack IPv4 subscriber.<br>• **ipv6-only**: Clears the established single stack IPv6 subscriber sessions.<br>• **lac**: Clears the L2TP subscriber sessions. |
| **identifier** | Clears the SRG primary or subordinate sessions based on one or more identifiers you select. |
| **access-interface** | Clears the SRG primary or subordinate sessions based on the access interface name. |

| | |
|---|---|
| **interface-type** *interface-instance* | Specifies the interface type whose SRG primary or subordinate sessions you want to delete.<br>The details of the interface instance are as follows:<br>• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation<br>• *Rack*: Chassis number of the rack<br>• *slot*: Physical slot number of the modular services card or line card<br>• *module*: Module number. A physical layer interface module (PLIM) is always 0.<br>• *port*: Physical port number of the interface<br>**Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.<br>• Virtual interface instance. Number range varies depending on interface type. |
| **ipv4** | Clears the DHCP IPv4 SRG primary or subordinate sessions specific to an interface and IPv4 network-address/prefix. |
| **ipv6 IANA** | Clears the DHCP IPv6 SRG primary or subordinate sessions specific to an interface and IPv6 address/length. |
| **location** *node-id* | Clears the SRG primary or subordinate sessions of a specific location.<br>The *node-id* argument is entered in the rack/slot/module notation. |
| **mac-address** | Clears the SRG primary or subordinate sessions based on the MAC address specified. |
| **subscriber-label** | Clears the SRG primary or subordinate sessions based on the subscriber session ID |

## Command Default

None

## Command Modes

Privileged Executive mode

## Command History

| Release | Modification |
|---|---|
| Release 6.5.2 | This command was introduced. |

## Usage Guidelines

The command **clear subscriber srg master session** is equivalent to **clear subscriber session.**

Subscriber sessions should always be in sync between the SRG primary and subordinate. Don't clear all the SRG subscriber sessions manually. In an exceptional situation, follow the recommended steps for safe clearing of all SRG subscriber sessions using the **clear subscriber srg slave session all** command. For the recommended steps, see *Setting up BNG Subscriber Redundancy Group* of the *BNG Geo Redundancy* chapter in the *Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Configuration Guide*.

## Task ID

| Task ID | Operation |
|---|---|
| network | execute |

This example shows how to clear the SRG subordinate session based on identifier:

```
Router# clear subscriber srg slave session identifier access-interface bundle-ether 1
 ipv4 192.1.1.1/24 location 0/0/1
```

This example shows how to clear the SRG subordinate session based on subscriber-label:

```
Router# clear subscriber srg slave session subscriber-label 1 location 0/0/1
```

This example shows how to clear the SRG subordinate session based on address family.

```
Router# clear subscriber srg slave session afi dual-partial-up location 0/0/1
```

This example shows how to clear all subscriber sessions manually for SRG subordinate sessions at the global configuration:

```
RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# shutdown

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy disable
RP/0/RSP0/CPU0:router#clear subscriber srg slave session all

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy

RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# no shutdown
```

This example shows how to clear all subscriber sessions manually for SRG master sessions at the global configuration:

```
RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy switchover group 1

RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# shutdown

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# disable

RP/0/RSP0/CPU0:router#clear subscriber srg master session all

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy

RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# no shutdown
```

This example shows how to clear all subscriber sessions manually for SRG subordinate sessions at the group level configuration:

```
RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# shutdown

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy group 1 disable
RP/0/RSP0/CPU0:router#clear subscriber srg slave session all

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy group 1

RP/0/RSP0/CPU0# configure
RP/0/RSP0/CPU0(config)# interface Hu0/0/0/1
RP/0/RSP0/CPU0(config-if)# no shutdown
```

# core-tracking

To configure an additional object for track connectivity to the core network (such as RADIUS or DHCP servers), and to initiate automatic switchover in the event of a BNG connectivity loss even while access is up or active, use the **core-tracking** command in subscriber redundancy group configuration mode. To remove the object tracking configuration, use the **no** form of this command.

**core-tracking** *core-tracking-obj*

## Syntax Description

| | |
|---|---|
| *core-tracking-obj* | Core tracking object for the specific SRG. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

This is an optional command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure object tracking for detecting core connectivity for the specific SRG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# core-tracking route-to-radius
```

# disable (BNG)

To disable BNG geo redundancy feature across all subscriber redundancy groups (SRGs) or session redundancy groups (SERG), use the **disable** command in the respective group configuration mode.

To disable a specific SRG/SERG, use the **disable** command in the respective group configuration mode. To remove the disable configuration, use the **no** prefix for this command.

**disable**

This command has no keywords or arguments.

## Command Default

None

## Command Modes

subscriber redundancy

subscriber redundancy group

session redundancy

session redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to disable geo redundancy feature for all SRGs:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# disable
```

This example shows how to disable a specific SRG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# disable
```

### Session Redundancy Group

This example shows how to disable geo redundancy feature for all SERGs:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# disable
```

This example shows how to disable a specific SERG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# disable
```

# enable-fast-switchover

To enable traffic between peer-to-peer subscriber redundancy groups in BNG, use the **enable-fast-switchover** command in subscriber redundancy group configuration mode. To disable this feature, use the **no** form of this command.

**enable-fast-switchover**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

The **enable-fast-switchover** command must be configured prior to configuring **state-control-route**. If **state-control-route** is already configured, you must remove that configuration and re-configure it after **enable-fast-switchover** is configured.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enable traffic between peer-to-peer subscriber redundancy groups in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy group 110
RP/0/RSP0/CPU0:router(config-subscr-red-group)# enable-fast-switchover
```

# hold-timer (BNG)

To configure the duration for which the dynamic switchover is suspended after a role change in BNG geo redundancy feature scenario, use the **hold-timer** command in subscriber/session redundancy configuration mode. To configure hold timer for a specific subscriber redundancy group (SRG) or a session redundancy group (SERG), use this command in the respective group configuration mode.

To remove the hold timer configuration, use the **no** prefix for this command.

**hold-timer** *hold-timer*

## Syntax Description

| | |
|---|---|
| *hold-timer* | Hold timer value, in minutes.<br>The range is from 1 to 65535. |

## Command Default

By default, the hold-time is zero. That is, back to back switchovers are allowed.

## Command Modes

Subscriber redundancy

Subscriber redundancy group

Session redundancy

Session redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

This is an optional command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Session Redundancy Group

This example shows how to configure hold-timer across all SERGs, in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# hold-timer 15
```

This example shows how to configure hold-timer for a specific SERG, in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# hold-timer 20
```

# holdtimer-default-disable

To disable the default hold timer configuration, use the **holdtimer-default-disable** command in subscriber redundancy configuration mode. To disable the default hold timer for a specific subscriber redundancy group (SRG), use this command in the respective group configuration mode.

To enable the default hold timer configuration, use the **no** prefix for this command.

**holdtimer-default-disable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Subscriber redundancy

Subscriber redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 7.2.1 | This command was introduced for SRG. |

## Usage Guidelines

This is an optional command.

If you have not configured the hold timer, using the **hold-timer** command, by default the system configures the hold timer based on the system and group load to specify the duration for which the dynamic switchover is suspended after a role change in BNG geo redundancy feature scenario.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Session Redundancy Group

This example shows how to disable the default hold timer:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# holdtimer-default-disable
```

This example shows how to disable the default hold timer for a group:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# holdtimer-default-disable
```

# http-enrichment parameter-list

To enable the enrichment of the HTTP GET request header with the parameters specified and proxying of the enriched HTTP request, use the **http-enrichment parameter-list** action under the respective class-map in the policy-map configuration mode.

**http-enrichment parameter-list** {**bng-interface** | **hostname** | **subscriber-ip** | **subscriber-mac**}

## Syntax Description

| | |
|---|---|
| **bng-interface** | Specifies that the IPv4/IPv6 address of the interface that is configured as the BNG interface will be added as part of the enrichment header. If IPv4 address is not configured for the BNG interface it will be set as 0.0.0.0 and if IPv6 address is not configured it will be set as 0::0. |
| **hostname** | Specifies that the hostname of the router will be added as enrichment header. |
| **subscriber-ip** | Specifies that the subscriber's IPv4 and IPv6 address will be added as enrichment header. |
| **subscriber-mac** | Specifies that the subscriber's MAC address will be added as enrichment header. |

## Command Default

None

## Command Modes

Policy-map configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.5.1 | This command was introduced. |

## Usage Guidelines

This command supports the setting of all possible combinations of the defined parameters, that is,15 combinations with 4 parameters. For any changes required in the parameter list, the user will have to configure a new parameter-list. This will override the previously configured parameter-list.

## Task ID

| Task ID | Operation |
|---|---|
| qos | read, write |

This example shows how to configure a PBR based policy-map with http-enrichment enabled on one of the classes.

```
RP/0/RSP0/CPU0:router(configure)# policy-map type pbr http-enrichment-policy
RP/0/RSP0/CPU0:router(config-pmap)# class type traffic open-garden-class
RP/0/RSP0/CPU0:router(config-pmap-c)# transmit
RP/0/RSP0/CPU0:router(config-pmap-c)# exit
```

```
RP/0/RSP0/CPU0:router(config-pmap)# class type traffic http-enrich-class1
RP/0/RSP0/CPU0:router(config-pmap-c)# http-enrichment parameter-list subscriber-mac hostname
 bng-interface
RP/0/RSP0/CPU0:router(config-pmap-c)# exit
RP/0/RSP0/CPU0:router(config-pmap)# class class-default
RP/0/RSP0/CPU0:router(config-pmap-c)# drop
```

## Related Commands

| Command | Description |
|---|---|
| http-enrichment parameter-list (subscriber), on page 430 | Configures the primary list of all the parameters for http-enrichment. |
| bng-interface (subscriber), on page 412 | Specifies the interface that is the bng identifier. |

# http-enrichment parameter-list (subscriber)

To configure the primary list of all the parameters that are needed for http enrichment across all class-map http-enrichment actions, use the **http-enrichment parameter-list** command in the subscriber configuration mode.

**http-enrichment parameter-list** {**bng-interface** | **hostname** | **subscriber-ip** | **subscriber-mac**}

## Syntax Description

| | |
|---|---|
| **bng-interface** | Specifies that the IPv4/IPv6 address of the interface that is configured as the BNG interface will be added as part of the enrichment header. If IPv4 address is not configured for the BNG interface it will be set as 0.0.0.0 and if IPv6 address is not configured it will be set as 0::0. |
| **hostname** | Specifies that the hostname of the router will be added as enrichment header. |
| **subscriber-ip** | Specifies that the subscriber's IPv4 and IPv6 address will be added as enrichment header. |
| **subscriber-mac** | Specifies that the subscriber's MAC address will be added as enrichment header. |

## Command Default

None

## Command Modes

Subscriber configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.5.1 | This command was introduced. |

## Usage Guidelines

This command supports the setting of all possible combinations of the defined parameters, that is,15 combinations with 4 parameters. For any changes required in the parameter list, the user will have to configure a new parameter-list. This will override the previously configured parameter-list.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure the primary-list of http-enrichment parameters that are used in http-enrichment actions configured across all class-maps.

```
RP/0/RSP0/CPU0:router(configure)# subscriber
```

```
RP/0/RSP0/CPU0:router(config-subscriber)# http-enrichment parameter-list subscriber-mac
hostname bng-interface
```

## Related Commands

| Command | Description |
|---|---|
| http-enrichment parameter-list, on page 428 | Enables http header enrichment feature for BNG subscribers. |
| bng-interface (subscriber), on page 412 | Specifies the interface that is the bng identifier. |

# hw-module tcp-mss-adjust

To configure the TCP MSS adjustment maximum limit in the router, use the **hw-module tcp-mss-adjust** command in EXEC mode.

**hw-module location** <*slot/card/cpu*> **tcp-mss-adjust np** <*npu_number*> **value** <*mss_value*>

## Syntax Description

| | |
|---|---|
| **location**<*slot/card/cpu*> | Interface details. |
| **tcp-mss-adjust** | Specified the TCP MSS adjustment details follows. |
| **np** <*npu_number*> | Specifies the NPU number for the TCP MSS adjustment. |
| **value**<*mss_value*> | Specifies the maximum TCP MSS limit.<br>The supported range for TCP MSS is 1280 to 1535 bytes. |

## Command Default

The default value of TCP MSS is 1436 bytes.

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 25.2.1 | This command was modified. |
| Release 7.5.1 | This command was introduced. |

## Usage Guidelines

The supported range for TCP MSS is 1280 to 1535 bytes.

You can configure the hardware module settings multiple times. When a new configuration is applied, the router evaluates and prioritizes the configurations based on a predefined order of precedence. The precedence categories are as follows:

1. Location-Specific NP Specific: Applies to a specific node in the router associated with a specific NPU. Example: **`location 0/0/CPU0 NP 1`**
2. Location-Specific NP All: Applies to a specific node in the router associated with all NPUs. Example: **`location 0/0/CPU0 NP All`**
3. Location All NP Specific: Applies to all nodes in the router associated with a specific NPU. Example: **`location All NP 1`**
4. Location All NP All: Applies to all nodes in the router associated with all NPUs. Example: **`location All NP All`**

For example, consider configuring the TCP MSS adjustment value using the **`hw-module tcp-mss-adjust`** command:

1. If you configure **`location 0/0/CPU0 NP All`** first, followed by **`location All NP All`**:

- The TCP MSS value for **location 0/0/CPU0 NP All** will take precedence for the node at **0/0/CPU0**. This means the node at **0/0/CPU0** will use the TCP MSS value defined for **location 0/0/CPU0 NP All**.
- For all other nodes in the router, the TCP MSS value defined for **location All NP All** will apply.

2. If you configure **location All NP All** first, followed by location **0/0/CPU0 NP All**:
   - The TCP MSS value for **location 0/0/CPU0 NP All** will still take precedence for the node at **0/0/CPU0**.
   - In this case, the setting for **location 0/0/CPU0 NP All** will override the broader configuration for **location All NP All** specifically for this node.
   - For all other nodes, the TCP MSS value for **location All NP All** will apply, provided no other specific configurations have been made.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to configure TCP MSS adjestment limit:

```
Router(config)# hw-module location 0/0/CPU0 tcp-mss-adjust np 1 value 1280
Router(config)# hw-module location 0/1/CPU0 tcp-mss-adjust np 1 value 1524
```

# interface-list (BNG)

To configure the interface list (mapping list of all access ports) that are part of a specific subscriber redundancy group (SRG) or a session redundancy group (SERG), use the **interface-list** command in the respective group configuration mode. To remove the interface list configuration, use the **no** form of this command.

**interface-list** [**interface** *interface-type interface-name* {**id** *interface-id* | **sub-if-range** *sub-if-start-range sub-if-end-range* **id-range** *id-start-range id-end-range*}]

## Syntax Description

| | |
|---|---|
| **id** | Specifies the mapping identifier of the interface-list.<br>The identifier for particular interface must be same on both primary and subordinate nodes. |
| *interface-id* | Identifier value for the interface to be mapped on to the subordinate SRG/SERG. |
| **sub-if-range** | Specifies the range of sub-interfaces to be added for the given interface. |
| *sub-if-start-range* | Start value of sub-interface range.<br>The range is from 0 to 2147483647. |
| *sub-if-end-range* | End value of sub-interface range.<br>The range is from 0 to 2147483647. |
| **id-range** | Specifies the range of interface-list identifiers. |
| *id-start-range* | Start ID of the interface to be mapped on to the SRG/SERG peer.<br>The range is from 1 to 65535. |
| *id-end-range* | End ID of the interface to be mapped on to the SRG/SERG peer.<br>The range is from 1 to 65535. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

Because BNG works only on sub-interfaces, it is required to configure sub-interfaces under SRG/SERG; not the entire bundle or port.

Sub-interfaces on physical ports spanning different line cards (LC), or mix of physical port sub-interfaces and bundle (or other virtual interfaces like Pseudowire Headend) sub-interfaces is not allowed.

One access sub-interface can belong to only one SRG/SERG.

Because the scope of mapping ID is only within a particular SRG/SERG, same ID can be used in a different SRG/SERG.

The ID assigned to sub-interfaces within an SRG/SERG is used for correlation or mapping of sub-interface pairings across the peer routers. This allows for pairing of different interface or port numbers or types across routers.

Access interfaces can also be explicitly configured even if those sub-interfaces are not existing. Those interfaces become operational under the SRG/SERG when they are actually created.

Removal or modification (for example, change of mapping ID) of sub-interfaces in SRG/SERG during runtime has the same effect of disabling redundancy on them. This results in corresponding sessions getting cleared on the subordinate side.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to assign one or more access sub-interface under a subscriber redundancy group (SRG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# interface-list
RP/0/RSP0/CPU0:router(config-subscr-red-grp-intf)# interface Bundle-Ether1.10 id 210
RP/0/RSP0/CPU0:router(config-subscr-red-grp-intf)# interface Bundle-Ether1.11 id 211
```

This example shows how to assign one or more access sub-interface (as a range) under an SRG in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# interface-list
RP/0/RSP0/CPU0:router(config-subscr-red-grp-intf)# interface Bundle-Ether1 sub-if-range 1
9 id-range 201 209
```

### Session Redundancy Group

This example shows how to assign one or more access sub-interface under a session redundancy group (SERG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# interface-list
RP/0/RSP0/CPU0:router(config-session-red-grp-intf)# interface Bundle-Ether1.10 id 210
```

```
RP/0/RSP0/CPU0:router(config-session-red-grp-intf)# interface Bundle-Ether1.11 id 211
```

This example shows how to assign one or more access sub-interface (as a range) under an SERG in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# interface-list
RP/0/RSP0/CPU0:router(config-session-red-grp-intf)# interface Bundle-Ether1 sub-if-range 1
 9 id-range 201 209
```

# ipv4 tcp-mss-adjust enable

To configure TCP Maximum Segment Size (MSS) adjustment for IPv4 traffic on an interface, use the **ipv4 tcp-mss-adjust enable** command in interface configration mode.

**ipv4 tcp-mss-adjust enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Interface configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 25.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

This example shows how to enable TCP MSS adjustment in am interface:

```
Router(config)# interface GigabitEthernet0/0/0/1
Router(config-if)# ip address 10.10.10.1 255.255.255.0
Router(config-if)# ipv4 tcp-mss-adjust enable
```

# ipv6 tcp-mss-adjust enable

To configure TCP Maximum Segment Size (MSS) adjustment for IPv6 traffic on an interface, use the **ipv6 tcp-mss-adjust enable** command in interface configration mode.

**ipv6 tcp-mss-adjust enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Interface configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 25.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

This example shows how to enable TCP MSS adjustment in am interface:

```
Router(config)# interface GigabitEthernet0/0/0/0
Router(config-if)# ipv6 tcp-mss-adjust enable
```

# peer (BNG)

To configure the peer router for a subscriber redundancy group (SRG) or session redundancy group (SERG) in BNG, use the **peer** command in the respective group configuration mode.

To remove the peer router configuration, use the **no** prefix for this command.

**peer** *peer-ip*

## Syntax Description

| | |
|---|---|
| *peer-ip* | The peer IPv4 or IPv6 address that is used to establish channel to the peering router in the SRG/SERG. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

The IPv4 or global IPv6 address of the source-interface configured on the peer router must be configured using this command. You must ensure that the configured addresses are reachable from the respective peer routers.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to configure a peer router for a subscriber redundancy group (SRG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# peer 1.1.1.2
```

### Session Redundancy Group

This example shows how to configure a peer router for a session redundancy group (SERG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# peer 1.1.1.2
```

# preferred-role (BNG)

To configure the initial role preference as primary or subordinate, in a BNG geo redundancy feature scenario, use the **preferred-role** command in subscriber redundancy group (SRG) or a session redundancy group (SERG). To configure the initial role for a specific group, use this command in the respective group configuration mode.

To remove the preferred role configuration, use the **no** prefix for this command.

**preferred-role** {**master** | **slave**}

## Syntax Description

| | |
|---|---|
| **master** | Specifies the preferred role as primary. |
| **slave** | Specifies the preferred role as subordinate. |

## Command Default

None

## Command Modes

Subscriber redundancy

Subscriber redundancy group

Session redundancy

Session redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

This is an optional command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to configure preferred role across all SRGs as primary using the **master** keyword in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# preferred-role master
```

This example shows how to configure preferred role for a specific SRG as subordinate using the **slave** keyword, in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# preferred-role slave
```

### Session Redundancy Group

This example shows how to configure preferred role across all SERGs as primary using the **master** keyword, in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# preferred-role master
```

This example shows how to configure preferred role for a specific SERG as subordinate using the **slave** keyword, in BNG geo redundancy feature scenario:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# group 1
RP/0/RSP0/CPU0:router(config-session-red-group)# preferred-role slave
```

# peer route-disable

To disable the route on geo redundancy hot-standby peer, so that the subscriber routes are not installed in the RIB even when the subscriber sessions are brought up on the standby peer, use the **peer route-disable** command in subscriber redundancy group configuration mode. To disable this feature, use the **no** form of this command.

**peer route-disable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.3.3 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to disable the route on geo redundancy hot-standby peer in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy group 110
RP/0/RSP0/CPU0:router(config-subscr-red-group)# peer route-disable
```

# revertive-timer (BNG)

To set the auto-revertive timer in BNG to regain the primary role after a failover, use the **revertive-timer** in subscriber redundancy or subscriber redundancy group configuration mode. To disable the timer, use the **no** form of this command.

**revertive-timer** *timer-value* **maximum** *max-value*

## Syntax Description

| | |
|---|---|
| *timer-value* | Specifies the timer value in minutes. The range is from 1 to 65535.<br>This value is doubled every time access tracking goes down after the first instance of auto-revert to the primary role. When the timer-value exceeds the *max-value* limit, it is reset to the originally configured value. |
| *max-value* | Specifies the maximum value until which the *timer-value* doubles for each instance of access down. |

## Command Default

None

## Command Modes

Subscriber redundancy

Subscriber redundancy group

Session redundancy

Session redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced for SRG.. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

The recommended value of *max-value* is 4 x *timer-value* .

If auto-revertive timer is configured at both subscriber redundancy level and at subscriber redundancy group level, the group level configuration takes precedence over the other.

Revertive-timer should not be running in a primary node. If it does, it is an error condition.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to set the auto-revertive timer in BNG to 20 minutes. In this example, if the access goes down again after the first switch back to primary role, the timer runs for 40 minutes

(that is, double the previous value). This repeats until it exceeds the max-value of 80 minutes. Once it exceeds 80 minutes, the timer value is reset to 20 minutes.

```
RP/0/RSP0/CPU0:router(config-subscr-red)#auto-revertive 20 max-value 80
```

### Session Redundancy Group

This example shows how to set the auto-revertive timer in BNG to 20 minutes. In this example, if the access goes down again after the first switch back to primary role, the timer runs for 40 minutes (that is, double the previous value). This repeats until it exceeds the max-value of 80 minutes. Once it exceeds 80 minutes, the timer value is reset to 20 minutes.

```
RP/0/RSP0/CPU0:router(config-session-red)#auto-revertive 20 max-value 80
```

# source-interface (BNG)

To configure the interface whose IP address must be used for peering with other routers in BNG geo redundancy scenario, use the **source-interface** command in subscriber redundancy group (SRG) or session redundancy group (SERG) configuration mode.

To remove this configuration, use the **no** prefix for this command.

**source-interface** *interface-type interface-name*

## Syntax Description

| | |
|---|---|
| *interface-type* | Type of the source interface. |
| *interface-name* | Name of the source interface. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

Session redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

It is recommended to use a loopback address that is advertised from the router for peer and the interface must have IPv4 or IPv6 (or both) global address depending on which one is to be used for peering.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

### Subscriber Redundancy Group

This example shows how to configure source interface in subscriber redundancy sub-mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# source-interface loopback0
```

### Session Redundancy Group

This example shows how to configure source interface in session redundancy sub-mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)# source-interface loopback0
```

# session redundancy

To enable session redundancy feature globally in BNG and to enter the session redundancy configuration sub mode, use the **session redundancy** command in Global Configuration mode. To remove the configurations for session redundancy feature in BNG, use the **no** form of this command.

**session redundancy**

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global configuration.

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

The option **slave-mode** is not supported in BNG geo redundancy. The default redundancy mode is hot-standby.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enter session redundancy sub mode to configure session redundancy options:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy
RP/0/RSP0/CPU0:router(config-session-red)#
```

# session redundancy group

To configure session redundancy group (SERG) in BNG, use the **session redundancy group** command in Global Configuration mode. To remove the session redundancy group configuration, use the **no** form of this command.

**session redundancy group** *group-id* [**description** *line*]

## Syntax Description

| | |
|---|---|
| *group-id* | Group identifier name that needs to be configured on the BNG pair routers. |
| **description** | Specifies the description for the specific SERG. |
| *line* | Description for the specific SERG, in words. |

## Command Default

None

## Command Modes

Global configuration.

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

For successful peering between the BNG pair routers, the same *group-id* must be configured on both the routers.

You can configure multiple groups (with unique IDs) for peering with the same peer router or across different peer routers.

The SERG does not get activated until the first access-interface is assigned under it.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure a session redundancy group (SERG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# session redundancy group 1
RP/0/RSP0/CPU0:router(config-session-red-group)#
```

# session redundancy switchover

To execute session redundancy switchover in BNG, use the **session redundancy switchover** command in EXEC mode.

**session redundancy switchover** [**group** *group-num* | **location** *node-id*] [**force**]

## Syntax Description

| | |
|---|---|
| **group** | Specifies the session redundancy group (SERG) number to be switched over. |
| *group-num* | The SERG number.<br>The range is from 1 to 999. |
| **location** | Specifies a particular location to be switched over. |
| **force** | Specifies a forced switchover. |

## Command Default

None

## Command Modes

Exec.

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

The **session redundancy activate** command is currently not supported.

In most cases, the switchovers are triggered automatically by changes in the underlying access interfaces or due to other failures. This command is used for planned maintenance events or for exceptional cases where implementation of access-tracking is not possible or desired. It can be used to initiate switchover for all groups on the router, or on a particular location or for a specific SERG.

Switchover is triggered from the subordinate only when you choose the **force** option. The use of this option on either primary or subordinate overrides any negotiation or arbitration rules.

Even for manual (or admin-triggered) switchovers, it is highly recommended to initiate triggers through operations on the underlying access, to ensure consistency between the BNG and access roles or status. When switchover happens, logs that indicate the reason of the switchover, are generated on the system console and reported on a per SERG basis on both peering routers. After the switchover, you must check the SERG details on both peering routers to ensure consistency and to ensure that session service is not interrupted.

You must ensure consistency between the roles of the underlying access interfaces (active-standby or up-down) and the BNG SERG role (primary or subordinate). Failing this, the traffic may get disrupted especially when a proper access-tracking is not used.

To ensure network and service stability, it is recommended not to perform back to back switchovers (even though the feature allows it). After a reload, you must ensure sufficient stabilization time for any router or line card (LC) recovery and sync. Until then it must only be in subordinate or standby mode (through a hold-time or pre-empt mechanism in the underlying access). Depending on the integration aspects with RADIUS or PCRF, accounting updates may be sent from both primary and subordinate after the switchover. Therefore, it is recommended to give sufficient time for these operations to complete and stabilize.

**Task ID**

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to initiate session redundancy switchover for a particular SERG:

```
RP/0/RSP0/CPU0:router# session redundancy switchover group 210
```

# session redundancy synchronize

To initiate or verify synchronization or consistency between sessions on the primary and subordinate routers in a session redundancy scenario in BNG, use the **session redundancy synchronize** command in EXEC mode.

**session redundancy synchronize** [**group** *group-num* | **location** *node-id*]

## Syntax Description

| | |
|---|---|
| **group** | Specifies the session redundancy group (SERG) number to be synchronized. |
| *group-num* | The SERG number.<br>The range is from 1 to 999. |
| **location** | Specifies a particular location to be synchronized. |

## Command Default

None

## Command Modes

Exec.

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

Synchronization may be required in these scenarios:

- When errors are detected between primary and subordinate due to transient resource constraints.
- To fix inconsistencies or errors when the BNG or the SERG configuration is changed on primary or subordinate.
- Prior to performing a planned or admin-initiated maintenance activity.

You can initiate synchronization for all groups on the router, or on a particular location or for a specific SERG. This command can be issued on either primary or subordinate (recommendation is to give on primary first, and then on the subordinate only if it is still required).

Logs are generated on the router console to indicate the status of synchronization. However, it may take further time for any session inconsistency to be resolved and it must be verified using **show session session** command, or by checking the service status of the concerned session.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to initiate session redundancy synchronization for a particular SERG:

```
RP/0/RSP0/CPU0:router# session redundancy synchronize group 210
```

# state-control-route

To control the route advertisement to the core network, based on the role of the subscriber redundancy group (SRG), use the **state-control-route** command in subscriber redundancy group configuration mode. To disable this feature, use the **no** form of this command.

`state-control-route {ipv4` *ipv4-address*`|ipv6 {iana|iapd}` *ipv6-address*`} [vrf` *vrf-name*`] [tag` *tag-value*`]`

`no state-control-route {ipv4` *ipv4-address*`|ipv6 {iana|iapd}` *ipv6-address*`} [vrf` *vrf-name*`] [tag` *tag-value*`]`

## Syntax Description

| | | |
|---|---|---|
| **tag** | *tag-value* | Specifies the option to filter out summary routes to be redistributed through the routing protocol, to get advertised to the core. |
| **vrf** | *vrf-name* | Specifies the option to add summary route for a specific VRF, for a subscriber.<br>See Usage Guidelines section for more details. |

## Command Default

Disabled

## Command Modes

Subscriber redundancy group

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |
| Release 6.3.1 | Added the support for **vrf** option, as part of the support for multiple state control route for each subscriber redundancy group (SRG). |

## Usage Guidelines

The route-policy with the respective tag (that is, tag 1 in this example) must be already defined, before configuring the **state-control-route** command.

The **vrf** *vrf-name* option helps to add state control routes in VRF routing table. If the **vrf** option is not specified, then the routes are added in the default VRF, that is, global routing table.

A maximum of 30 state control routes can be added in each subscriber redundancy group (SRG), with a limit of 10 state control routes for each route type. That is, user can have a maximum 10 IPv4 routes, 10 IANA routes and 10 IAPD routes in each SRG. In these 30 routes, user can have routes in either the default or the non-default VRF.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to filter out the summary routes to be advertised to the core:

```
RP/0/RSP0/CPU0:router(config-subscr-red-group)#state-control-route ipv4 192.0.2.0/9 tag 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)#state-control-route ipv6 iana 2001:DB8::/32
```

```
 tag 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)#state-control-route ipv6 iapd 2001:DB8:1::1/32
 tag 1
```

This example shows how to add multiple summary routes for each SRG:

```
RP/0/RSP0/CPU0:router(config-subscr-red-group)#state-control-route ipv4 192.0.2.0/9 vrf
vrf-name tag 1
```

# subscriber arp scale-mode-enable

To prevent default ARP entry creations (mainly in deployment scenarios where the unnumbered subscriber access-interfaces inherit all the attributes, including the secondary IP addresses, from the associated loopback interface) per subscriber interface, use the **subscriber arp scale-mode-enable** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**subscriber arp scale-mode-enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 5.3.3 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to prevents default ARP entry creations per subscriber interface in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber arp scale-mode-enable
```

# subscriber arp uncond-proxy-arp-enable

To enable unconditional proxy ARP responses in BNG so as to allow communication with static IP addresses, use the **subscriber arp uncond-proxy-arp-enable** command in Global Configuration mode. To disable unconditional proxy ARP responses in BNG, use the **no** form of this command.

**subscriber arp uncond-proxy-arp-enable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enable unconditional proxy ARP responses in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber arp uncond-proxy-arp-enable
```

# subscriber database

Due to the occurrence of multiple events on the line cards, subscriber feature programming time varies. Sometimes, the line card is too busy in processing local events. This results in a large backlog for subscriber control plane activities. The `backpressure-level` parameter in subscriber database policy blocks new subscribers from coming up, if the XR infrastructure is not able to complete the operations in a timely fashion. Whereas, the `batch-control` parameter defines how long the system has to wait before generating the batches.

**subscriber database** `[ backpressure-level | batch-control]`

## Syntax Description

| | |
|---|---|
| **backpressure**-level | Higher level, aggressive back pressure mechanism. Values range from 0-7 seconds. Default is 2 seconds.<br><br>0-Disable. Does not perform adaptive handling of slow hardware.<br><br>1-Stops new subscriber programming, if the average time of hardware programming exceeds 17 seconds. Resumes after it drops to 13 seconds.<br><br>2-Stops new subscriber programming, if the average time of hardware programming exceeds 23 seconds. Resumes after it drops to 19 seconds.<br><br>3-Stops new subscriber programming, if the average time of hardware programming exceeds 37 seconds. Resumes after it drops to 29 seconds.<br><br>4-Stops new subscriber programming, if the average time of hardware programming exceeds 47 seconds. Resumes after it drops to 41 seconds.<br><br>5-Stops new subscriber programming, if the average time of hardware programming exceeds 59 seconds. Resumes after it drops to 53 seconds.<br><br>6-Stops new subscriber programming, if the average time of hardware programming exceeds 67 seconds. Resumes after it drops to 57 seconds.<br><br>7-Stops new subscriber programming, if the average time of hardware programming exceeds 71 seconds. Resumes after it drops to 61 seconds. |

| | |
|---|---|
| `batch-control` | Higher level, better batching, more delay.<br>Starting from Release 7.4.1, the following values are supported:<br>Values range from 0-4. Default is 0.<br>• 0-Disable. Subscribers are processed in batches of 50ms.<br>• 1-Subscribers are processed in batches of 100ms.<br>• 2-Subscribers are processed in batches of 200ms.<br>• 3-Subscribers are processed in batches of 400ms.<br>• 4-Subscribers are processed in batches of 650ms.<br>**Note**<br>The following are the values supported, prior to Release 7.4.1:<br>Values range from 0-4. Default is 4.<br>• 0-Disable. Subscribers are processed in batches of 75ms.<br>• 1-Subscribers are processed in batches of 150ms.<br>• 2-Subscribers are processed in batches of 300ms.<br>• 3-Subscribers are processed in batches of 600ms.<br>• 4-Subscribers are processed in batches of 1000ms. |

## Command Default

2 for `subscriber database backpressure-level` and 4 for `subscriber database batch-control`.

## Command Modes

config

## Command History

| Release | Modification |
|---|---|
| Release 6.6.3 | This command was introduced. |
| Release 7.4.1 | The value for the **batch-contro**l keyword was modified. |

## Usage Guidelines

**Note** Do not modify the default values unless explicitly suggested by Cisco TAC.

### Configuring subscriber database parameters

```
RP/0/RSP0/CPU0:router(config)#subscriber database ?
  backpressure-level  backpressure level
  batch-control       batching performance control
RP/0/RSP0/CPU0:router(config)#subscriber database batch-control ?
```

```
  <0-4>  higher level, better batching, more delay. <0 - disable>
RP/0/RSP0/CPU0:router(config)#subscriber database batch-control 0
RP/0/RSP0/CPU0:router(config)#commit
```

# subscriber featurette dhcp-renew-author

To enable AAA authorization during subscriber session lease renewal, use the **subscriber featurette dhcp-renew-author** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**subscriber featurette dhcp-renew-author**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to enable AAA authorization during DHCP renew or rebind event in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber featurette dhcp-renew-author
RP/0/RSP0/CPU0:router(config-subscriber)# commit
```

# subscriber featurette identity-change

To enable identity change for DHCP Remote-Id parameter, thereby allowing modification of the subscriber service, use the **subscriber featurette identity-change** command in Global Configuration mode. To disable this feature, use the **no** form of this command.

**subscriber featurette identity-change**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration

## Command History

| Release | Modification |
|---|---|
| Release 6.2.1 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| aaa | read, write |

This example shows how to enable identity change for DHCP Remote-Id parameter to allow modification of the subscriber service in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber featurette identity-change
```

# subscriber redundancy

To enable subscriber redundancy feature globally in BNG and to enter the subscriber redundancy configuration sub mode, use the **subscriber redundancy** command in Global Configuration mode. To remove the configurations for subscriber redundancy feature in BNG, use the **no** form of this command.

**subscriber redundancy**

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The option **slave-mode** is not supported in BNG geo redundancy. The default redundancy mode is hot-standby.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to enter subscriber redundancy sub mode to configure subscriber redundancy options:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)#
```

# subscriber redundancy group

To configure subscriber redundancy group (SRG) in BNG, use the **subscriber redundancy group** command in Global Configuration mode. To remove the subscriber redundancy group configuration, use the **no** form of this command.

**subscriber redundancy group** *group-id* [**description** *line*]

## Syntax Description

| | |
|---|---|
| *group-id* | Group identifier name that needs to be configured on the BNG pair routers. |
| **description** | Specifies the description for the specific SRG. |
| *line* | Description for the specific SRG, in words. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

For successful peering between the BNG pair routers, the same *group-id* must be configured on both the routers.

You can configure multiple groups (with unique IDs) for peering with the same peer router or across different peer routers.

The SRG does not get activated until the first access-interface is assigned under it.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure a subscriber redundancy group (SRG) in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)#
```

# subscriber redundancy switchover

To execute subscriber redundancy switchover in BNG, use the **subscriber redundancy switchover** command in EXEC mode.

**subscriber redundancy switchover** [**group** *group-num* | **location** *node-id*] [**force**]

## Syntax Description

| | |
|---|---|
| **group** | Specifies the subscriber redundancy group (SRG) number to be switched over. |
| *group-num* | The SRG number.<br>The range is from 1 to 999. |
| **location** | Specifies a particular location to be switched over. |
| **force** | Specifies a forced switchover. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The **subscriber redundancy activate** command is currently not supported.

In most cases, the switchovers are triggered automatically by changes in the underlying access interfaces or due to other failures. This command is used for planned maintenance events or for exceptional cases where implementation of access-tracking is not possible or desired. It can be used to initiate switchover for all groups on the router, or on a particular location or for a specific SRG.

Switchover is triggered from the subordinate only when you choose the **force** option. The use of this option on either primary or subordinate overrides any negotiation or arbitration rules.

Even for manual (or admin-triggered) switchovers, it is highly recommended to initiate triggers through operations on the underlying access, to ensure consistency between the BNG and access roles or status. When switchover happens, logs that indicate the reason of the switchover, are generated on the system console and reported on a per SRG basis on both peering routers. After the switchover, you must check the SRG details on both peering routers to ensure consistency and to ensure that subscriber service is not interrupted.

You must ensure consistency between the roles of the underlying access interfaces (active-standby or up-down) and the BNG SRG role (primary or subordinate). Failing this, the traffic may get disrupted especially when a proper access-tracking is not used.

To ensure network and service stability, it is recommended not to perform back to back switchovers (even though the feature allows it). After a reload, you must ensure sufficient stabilization time for any router or line card (LC) recovery and sync. Until then it must only be in subordinate or standby mode (through a hold-time or pre-empt mechanism in the underlying access). Depending on the integration aspects with RADIUS or PCRF, accounting updates may be sent from both primary and subordinate after the switchover. Therefore, it is recommended to give sufficient time for these operations to complete and stabilize.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to initiate subscriber redundancy switchover for a particular SRG:

```
RP/0/RSP0/CPU0:router# subscriber redundancy switchover group 210
```

## Related Commands

| Command | Description |
|---|---|
| subscriber redundancy synchronize, on page 466 | Initiates subscriber redundancy synchronization in BNG. |

# subscriber redundancy synchronize

To initiate or verify synchronization or consistency between sessions on the primary and subordinate routers in a subscriber redundancy scenario in BNG, use the **subscriber redundancy synchronize** command in EXEC mode.

**subscriber redundancy synchronize** [**group** *group-num* | **location** *node-id*]

## Syntax Description

| | |
|---|---|
| **group** | Specifies the subscriber redundancy group (SRG) number to be synchronized. |
| *group-num* | The SRG number.<br>The range is from 1 to 999. |
| **location** | Specifies a particular location to be synchronized. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

Synchronization may be required in these scenarios:

- When errors are detected between primary and subordinate due to transient resource constraints.
- To fix inconsistencies or errors when the BNG or the SRG configuration is changed on primary or subordinate.
- Prior to performing a planned or admin-initiated maintenance activity.

You can initiate synchronization for all groups on the router, or on a particular location or for a specific SRG. This command can be issued on either primary or subordinate (recommendation is to give on primary first, and then on the subordinate if it is still required).

Logs are generated on the router console to indicate the status of synchronization. However, it may take further time for any session inconsistency to be resolved and it must be verified using **show subscriber session** command, or by checking the service status of the concerned subscriber.

## Task ID

| Task ID | Operation |
|---|---|
| network | read, write |

This example shows how to initiate subscriber redundancy synchronization for a particular SRG:

```
RP/0/RSP0/CPU0:router# subscriber redundancy synchronize group 210
```

## Related Commands

| Command | Description |
|---|---|
| subscriber redundancy switchover, on page 464 | Executes subscriber redundancy switchover in BNG. |

# subscriber session limit

To configure a limit for subscriber sessions, use the **subscriber session limit** command in Global Configuration mode. To remove the session limit for subscribers, use the **no** form of this command.

**subscriber session limit** *session_limit*

## Syntax Description

| | |
|---|---|
| *session_limit* | Limit for subscriber sessions.<br>The range is from 1 to 200000. |

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

| Release | Modification |
|---|---|
| Release 5.1.1 | This command was introduced. |
| Release 5.2.0 | The *session_limit* was made an optional parameter for the **no** form of this command. |

## Usage Guidelines

This command does not limit the number of un-authenticated sessions on the router, until the overall session count reaches *session_limit*. If a new session comes up after router reached the *session_limit*, then the long-lived un-authenticated subscriber session is deleted. The new session can be an authenticated or un-authenticated session.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure a limit for subscriber sessions:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber session limit 100000
```

This example shows how to remove the subscriber sessions limit configuration:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# no subscriber session limit
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber session, on page 503 | Displays the subscriber management session information. |

# tracking-disable (BNG)

To disable the use of tracking objects status for automatic switchovers in BNG geo redundancy, use the **tracking-disable** command in subscriber redundancy group (SRG) or session redundancy group (SERG) configuration mode.

To re-enable the use of tracking objects status for automatic switchovers, use the **no** prefix for this command.

**tracking-disable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

Session redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced for SRG. |
| Release 6.2.1 | This command was introduced for SERG. |

## Usage Guidelines

This is an optional command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to temporarily disable the use of tracking objects status for automatic switchovers in BNG geo redundancy:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# tracking-disable
```

# virtual-mac

To configure the virtual MAC explicitly for a specific subscriber redundancy group(SRG), while BNG being in primary redundancy mode, use the **virtual-mac** command in subscriber redundancy group configuration sub-mode. To remove this configuration, use the **no** form of this command.

**virtual-mac** *virtual-mac*

## Syntax Description

| | |
|---|---|
| *virtual-mac* | Virtual MAC address. |

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The usage guidelines of this command remain the same as that for **virtual-mac-prefix** command.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure virtual MAC explicitly for an SRG in a subscriber redundancy feature scenario in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-gr)# virtual-mac 0001.0002.0001
```

## Related Commands

| Command | Description |
|---|---|
| virtual-mac-prefix, on page 472 | Configures the gateway MAC (for the subscribers) used by BNG while being in primary redundancy mode. |

# virtual-mac-disable

To disable the inheritance of the virtual MAC prefix for a specific subscriber redundancy group (SRG), use the **virtual-mac-prefix** command in subscriber redundancy group configuration mode. To re-enable the inheritance of the virtual MAC prefix, use the **no** form of this command.

**virtual-mac-disable**

## Syntax Description

This command has no keywords or arguments.

## Command Default

None

## Command Modes

Subscriber redundancy group configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The virtual MAC configuration must be done before any subscriber session is set up because any change in this configuration affects the gateway MAC as seen by the CPE devices causing service disruption of existing sessions.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to disable the inheritance of the virtual MAC prefix for a specific subscriber redundancy group in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# group 1
RP/0/RSP0/CPU0:router(config-subscr-red-group)# virtual-mac-disable
```

# virtual-mac-prefix

To configure the gateway MAC (for the subscribers) used by BNG while being in primary redundancy mode, use the **virtual-mac-prefix** command in subscriber redundancy configuration mode. To remove this configuration, use the **no** form of this command.

**virtual-mac-prefix** *virtual-mac*

## Syntax Description

| | |
|---|---|
| *virtual-mac* | Virtual mac prefix address. |

## Command Default

None

## Command Modes

Subscriber redundancy configuration.

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The virtual MAC configuration must be done before any subscriber session is set up because any change in this configuration affects the gateway MAC as seen by the CPE devices causing service disruption of existing sessions.

The virtual MAC configuration is required for access protocols such as MST-AG, G.8032 and so on, where interface MAC is not same for the two peering routers.

The easiest way to provision virtual MAC is to select a locally-administered unicast MAC prefix (the last four digits must be zero (0)) and configure it on all redundant BNGs. This ensures that each subscriber redundancy group (SRG) gets its own vMAC, which is offset by the group ID, automatically.

The virtual MAC can alternatively be configured for a specific SRG by using **virtual-mac** command in subscriber redundancy group configuration sub-mode.

## Task ID

| Task ID | Operation |
|---|---|
| config-services | read, write |

This example shows how to configure virtual MAC prefix in a subscriber redundancy feature scenario in BNG:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# subscriber redundancy
RP/0/RSP0/CPU0:router(config-subscr-red)# virtual-mac-prefix 0001.0002.0000
```

## Related Commands

| Command | Description |
|---|---|
| virtual-mac, on page 470 | Configures the virtual MAC explicitly for a specific subscriber redundancy group (SRG), while BNG being in primary redundancy mode. |

# show sessionmon license

To display the subscriber session statistics required for BNG Smart Licensing, use the **show sessionmon license** command in the EXEC mode.

**show sessionmon license** [**detail**] **statistics**

## Syntax Description

| | |
|---|---|
| **statistics** | Displays the peak hour session statistics. |
| **detail** | (Optional) Displays the detailed session statistics that include current statistics along with the peak hour statistics. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 6.1.2 | This command was introduced. |

## Usage Guidelines

One license is required for every group of 8000 subscribers or a fraction of it. For example, two licenses are required for 9000 subscribers.

The license is consumed based on the peak count, and not on the current count.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show sessionmon license statistics** command for non-Geo redundancy sessions. Here, two A9K-BNG-LIC-8K licenses are triggered for active sessions, as the session count is more than 8000.

```
Router#show sessionmon license statistics
Mon Mar 21 18:34:10.726 IST

                                Active     Standby
                                =====      =======
           Peak (24 hours)      8001         0
```

This is a sample output of the **show sessionmon license detail statistics** command for non-Geo redundancy sessions. Here, one A9K-BNG-LIC-8K license is triggered for active sessions, as the session count is less than 8000.

```
Router#show sessionmon license detail statistics
Thu Jun 23 11:58:36.089 IST

                                Active     Standby
                                =====      =======
```

```
            Current              1000         0
            Peak (24 hours)      1500         0
```

This is a sample output of the **show sessionmon license detail statistics** command for Geo redundancy sessions. Here, six A9K-BNG-LIC-8K licenses are triggered for active sessions and two A9K-BNG-ADV-8K licenses are triggered for standby sessions.

```
Router#show sessionmon license detail statistics
Thu Jun 23 11:58:36.089 IST
 nodename = node0_0_CPU0
 ------------

                                 Active      Standby
                                 =====       =======
            Current              36000       12200
            Peak (24 hours)      42000       14300

 nodename = node0_1_CPU0
 ------------
 - -
 - -
```

| Field | Description |
|---|---|
| Active | Number of active session on the router. |
| Standby | Number of standby session on the router. |
| Current | Current session count. |
| Peak (24 hours) | Peak number of session within a 24 hour time frame. |

# show subscriber database

To display the configuration details of subscriber database, use the **show subscriber database** command in the EXEC mode.

**show subscriber database** {**association** | **configuration** | **connection** | **interface** | **session** {**state** | **subscriber-label** *label*} | **statistics** | **summary**}

## Syntax Description

| | |
|---|---|
| **association** | Displays the association between subscriber sessions and dynamic templates. |
| **configuration** | Displays the configuration database information. |
| **connection** | Displays subscriber client connection identifiers. |
| **interface** | Displays the mapping between subscriber labels and interface handles. |
| **statistics** | Displays the show subscriber database statistics information. |
| **summary** | Displays the show subscriber database summary counts. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.3.0 | A new output field, *Template Interface Id*, was added to **show subscriber database session subscriber-label** command, to indicate whether the subscriber uses templates or not. |

## Usage Guidelines

If the *Template Interface Id* field displays a value of 0x00000000, it indicates that the subscriber is not using templates. If that field displays a non-zero value (for example, 0x00802c80), it indicates that the subscriber is using template with that particular interface-handle value.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

The sample output of the **show subscriber database** command is:

```
RP/0/RSP0/CPU0:router# show subscriber database association

Mon Jun 14 16:24:50.432 EDT
Object Name: TEMPL1
  Object Type: IP-SUBSCRIBER-TEMPLATE
  Feature Name: IPV4
    Attribute Name: ipv4/unnumbered
                    reference count : 1
                    sysDb pathname  :
```

```
/cfg/gl/dynamic-templates/ipsubscriber/TEMPL1/ipv4/unnumbered
                    datatype        : string
                    length          : 10
                    value           : Loopback0

Object Name: TEMPL2
  Object Type: IP-SUBSCRIBER-TEMPLATE
  Feature Name: IPV4
    Attribute Name: ipv4/mtu
                    reference count : 1
                    sysDb pathname  : /cfg/gl/dynamic-templates/ipsubscriber/ss/ipv4/mtu
                    datatype        : uint32
                    length          : 4
                    value           : 1500
  Feature Name: QoS
    Attribute Name: qos/service_policy_in/qos_policy
                    reference count : 1
                    sysDb pathname  :
/cfg/gl/dynamic-templates/ipsubscriber/ss/qos/service_policy_in/:qos_policy
                    datatype        : packed
                    length          : 20
                    value           : packed
                                          AB CD 43 21 02 00 04 00
  00 00 00 03 00 00 03 00
                                        00 06 00 00
  Feature Name: 'RSI'
    Attribute Name: rsi/vrf
                    reference count : 1
                    sysDb pathname  : /cfg/gl/dynamic-templates/ipsubscriber/ss/rsi/vrf
                    datatype        : 3
                    length          : 5
                    value           : blue

RP/0/RSP0/CPU0:router# show subscriber database connection

Tue Jun 15 11:00:19.650 EDT

Client Connection Identifier:  0x0
=====================================
    ref_count        = 3
    req_count        = 0
    bpi_reg_count    = 0
    spi_reconciled   = TRUE
    bpi_reconciled   = FALSE
    client_restarted = FALSE
    client_name      = template-mgr
    timer_running    = FALSE

    spi_cb_info:  N/A


    Persistent Information:
        in_use                  = TRUE
        forced_full_resync      = FALSE
        client_flags            = TMPL_PROD
        state                   = SUBDB_CLIENT_FULL
        instance_no             = 0
        num_bpi_regs            = 0
        num_send_drop_bpi_msg   = 0
        num_send_drop_spi_msg   = 0
        num_recv_drop_bpi_msg   = 0
        num_recv_drop_spi_msg   = 0
        num_sent_bpi_msg        = 0
        num_sent_spi_msg        = 0
```

```
    num_recv_bpi_msg          = 0
    num_recv_spi_msg          = 0
    num_sent_pulse            = 0

SPI AIPC Information:
    conn_present              = 0
    tx_attempt_count          = 0
    tx_count                  = 0
    rx_count                  = 0
    notify_connect_count      = 0
    notify_queue_high_count   = 0
    notify_queue_low_count    = 0
    notify_queue_full_count   = 0
    notify_data_waiting_count = 0
    notify_error_count        = 0
    notify_close_count        = 0
    notify_sendstatus_count   = 0
    notify_open_count         = 0
    pulse_data_waiting_count  = 0
    queue_full                = 0
    queue_full_drop           = 0
   outstanding_buffers       = 0
    overflow_queue_size       = 0
    cumulative_overflow_msgs  = 0
    hwm_overflow_msgs         = 0
BPI AIPC Information:
    conn_present              = 1
    tx_attempt_count          = 0
    tx_count                  = 0
    rx_count                  = 1
    notify_connect_count      = 0
    notify_queue_high_count   = 0
    notify_queue_low_count    = 0
    notify_data_waiting_count = 1
    notify_error_count        = 0
    notify_close_count        = 0
    notify_sendstatus_count   = 0
    notify_open_count         = 1
    queue_full                = 0
    queue_full_drop           = 0
    outstanding_buffers       = 0
    overflow_queue_size       = 0
    cumulative_overflow_msgs  = 0
    hwm_overflow_msgs         = 0
Feature Information (number of entries = 3):
-------------------------------------------------
 ***Feature Name***     = RSI
    Connection ID       = 0x1
    Session type        = SUBDB_SESSION_LABEL_TYPE_IP_SUB_INBAND
    Activate Required   = FALSE
    Config Set ID       = 1
    Registration Handle = 0x1
    whichevent[0]       = SUBDB_CB_EVENT_NONE
    whichevent[1]       = SUBDB_CB_EVENT_ALL
    Feature State       = SUBDB_FEATURE_REGISTERED

 ***Feature Name***     = RSI
    Connection ID       = 0x1
    Session type        = SUBDB_SESSION_LABEL_TYPE_PPPOE_SUB
    Activate Required   = FALSE
    Config Set ID       = 1
    Registration Handle = 0x2
    whichevent[0]       = SUBDB_CB_EVENT_NONE
    whichevent[1]       = SUBDB_CB_EVENT_ALL
```

```
        Feature State       = SUBDB_FEATURE_REGISTERED

     ***Feature Name***     = RSI
        Connection ID       = 0x1
        Session type        = SUBDB_SESSION_LABEL_TYPE_IP_SUB_DHCP
        Activate Required   = FALSE
        Config Set ID       = 1
        Registration Handle = 0x3
        whichevent[0]       = SUBDB_CB_EVENT_NONE
        whichevent[1]       = SUBDB_CB_EVENT_ALL
        Feature State       = SUBDB_FEATURE_REGISTERED

Client Connection Identifier:  0x2
====================================
    ref_count        = 2
    req_count        = 0
    bpi_reg_count    = 0
    spi_reconciled   = TRUE
    bpi_reconciled   = TRUE
    client_restarted = FALSE
    client_name      = iedge SVM
    timer_running    = FALSE

    spi_cb_info:
        SUBDB_SPI_CB_PROD_ALL_DONE          = SUBDB_CB_EVENT_NONE
        SUBDB_SPI_CB_SESSION_PROD_DONE      = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_SESSION_ACTIVATED      = SUBDB_CB_EVENT_NONE
        SUBDB_SPI_CB_SESSION_CREATED        = SUBDB_CB_EVENT_NONE
        SUBDB_SPI_CB_SESSION_DESTROYED      = SUBDB_CB_EVENT_NONE
        SUBDB_SPI_CB_SESSION_ASSOCIATED     = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_SESSION_UNASSOCIATED   = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_SESSION_CONFIG_CHANGED = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_TEMPLATE_INSTALLED     = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_TEMPLATE_UNINSTALLED   = SUBDB_CB_EVENT_ALL
        SUBDB_SPI_CB_OBJECT_AGEOUT          = SUBDB_CB_EVENT_ALL


    Persistent Information:
        in_use                    = TRUE
        forced_full_resync        = FALSE
        client_flags              = TMPL_PROD, SESS_PROD
        state                     = SUBDB_CLIENT_FULL
        instance_no               = 1
        num_bpi_regs              = 0
        num_send_drop_bpi_msg     = 0
        num_send_drop_spi_msg     = 0
        num_recv_drop_bpi_msg     = 0
        num_recv_drop_spi_msg     = 0
        num_sent_bpi_msg          = 0
        num_sent_spi_msg          = 0
        num_recv_bpi_msg          = 0
        num_recv_spi_msg          = 1
        num_sent_pulse            = 0

    SPI AIPC Information:
        conn_present              = 1
        tx_attempt_count          = 0
        tx_count                  = 0
        rx_count                  = 2
        notify_connect_count      = 0
        notify_queue_high_count   = 0
        notify_queue_low_count    = 0
        notify_queue_full_count   = 0
        notify_data_waiting_count = 2
```

```
        notify_error_count        = 0
        notify_close_count        = 0
        notify_sendstatus_count   = 0
        notify_open_count         = 1
        pulse_data_waiting_count  = 0
        queue_full                = 0
        queue_full_drop           = 0
        outstanding_buffers       = 0
        overflow_queue_size       = 0
        cumulative_overflow_msgs  = 0
        hwm_overflow_msgs         = 0
    BPI AIPC Information:
        conn_present              = 0
        tx_attempt_count          = 0
        tx_count                  = 0
        rx_count                  = 0
        notify_connect_count      = 0
        notify_queue_high_count   = 0
        notify_queue_low_count    = 0
        notify_data_waiting_count = 0
        notify_error_count        = 0
        notify_close_count        = 0
        notify_sendstatus_count   = 0
        notify_open_count         = 0
        queue_full                = 0
        queue_full_drop           = 0
        outstanding_buffers       = 0
        overflow_queue_size       = 0
        cumulative_overflow_msgs  = 0
        hwm_overflow_msgs         = 0
    Feature Information (number of entries = 0):
    -----------------------------------------------------

RP/0/RSP0/CPU0:router# show subscriber database interface
Tue Jun 15 09:05:53.769 EDT
Interface Ifhandle  Session ID:
Gi0/2/0/0.ip1 0x1000040  0x4000000
Gi0/2/0/0.ip2 0x1000060  0x4000082

RP/0/RSP0/CPU0:router# show subscriber database statistics

Tue Jun 15 09:05:53.769 EDT
3 wrapping entries (2048 possible, 0 filtered, 3 total)
Jun 15 06:49:40.123 subdb/common 0/0/CPU0 t4004322208 Process client ID '2' with connection
 event 'RESTARTED'
Jun 15 06:49:40.125 subdb/common 0/0/CPU0 t4153857728 Process SPI END RECONCILE msg for
client '2 [ring index '0']
Jun 15 06:49:40.125 subdb/common 0/0/CPU0 t4004322208 Process client ID '2' with connection
 event 'RECONCILED'
```

This is a sample output of the **show subscriber database session subscriber-label** command, with subscriber templates enabled:

```
RP/0/RSP0/CPU0:router# show subscriber database session subscriber-label 0x42
Fri Nov  7 16:14:20.683 IST

Subscriber Object Information
-----------------------------------------------------------------
Subscriber Label:                                   0x00000042
Session State:                                      CFG_DONE
Activate Request Identifier:                        26
Transaction Identifier (PD or PAD):                 None
```

```
PD Request Identifier:                                    15
PD Request Options:                                       0x00000003
Config Changed Due to Template Change:                    FALSE
Destroy Request Received:                                 NO
Destroy Request Identifier:                               0
Creator of Connection Gone:                               FALSE
Number of Pending BPI Request Sent:                       0
Current Apply Level for the Added/Modified Feature Tree:  None
Current Apply Level for the Deleted Feature Tree:         None
Delete Notification Done:                                 TRUE
Add/Modify Notification Done:                             TRUE
Need to be rolled back:                                   FALSE
Rollback in progress:                                     FALSE
Server restart apply:                                     FALSE
Rollback performed:                                       FALSE
Replication pending:                                      FALSE
Activate timer running:                                   FALSE
Apply timer running:                                      FALSE
Event queue size:                                         0
Restart Vector:                                           0x00000000
Template Interface Id:                                    0x00802c80

Add/Modify Level Tree (Number of Levels = 0):
---------------------------------------------

Delete Level Tree (Number of Levels = 0):
---------------------------------------------
```

# show subscriber database template

To display the template interface handle and template session information of a subscriber session, use the **show subscriber database template** command in the EXEC mode.

**show subscriber database template** [**parent-if-handle** *if-handle* | **parent-if-name** *interface-type interface-name*] [**location** *node-id*]

## Syntax Description

| | |
|---|---|
| **parent-if-handle** | (Optional) Specifies parent interface handle. |
| *if-handle* | Hex value of parent interface handle. The range is from 0 to ffffffff. |
| **parent-if-name** | (Optional) Specifies the parent interface name. |
| *interface-type* | Specifies the interface type. |
| *interface-name* | |
| **location** | (Optional) Displays the node location by interface. |
| *node-id* | Displays the fully qualified location specification of an interface. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 5.3.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show subscriber database template** command:

```
RP/0/RSP0/CPU0:router# show subscribber database template

Location 0/RSP0/CPU0
--------------------------------
Interface                       Tmpl-Ifhandle  Tmpl-Sub-Label  Session Count
------------------------------  -------------  --------------  -------------
Bundle-Ether121.104.tmpl2          0x00000c60     0xfc000012       1
<<<<<<<  check  here
Bundle-Ether121.104.tmpl1          0x00000c20
Bundle-Ether121.104.tmpl3          0x00000ca0
Bundle-Ether121.104.tmpl4          0x00000ce0
Bundle-Ether121.104.tmpl5          0x00000d20
Bundle-Ether121.104.tmpl6          0x00000d60
Bundle-Ether121.104.tmpl7          0x00000da0
```

```
Bundle-Ether121.104.tmpl8          0x00000de0
Bundle-Ether121.104.tmpl9          0x00000e20
Bundle-Ether121.104.tmpl10         0x00000e60
```

This is a sample output of the **show subscriber database template parent-if-handle** command:

```
RP/0/RSP0/CPU0:router# show subscriber database template parent-if-handle 0x1d80

Fri Nov  7 15:41:02.982 IST
Location 0/1/CPU0
---------------------------------
Interface                        Tmpl-Ifhandle  Tmpl-Sub-Label  Session Count
-------------------------------  -------------  --------------  -------------
Bundle-Ether1.1.tmpl11            0x00802c80     0xfc000001       1
Bundle-Ether1.1.tmpl12            0x00802d80
Bundle-Ether1.1.tmpl13            0x00802e80
Bundle-Ether1.1.tmpl14            0x00802f80
Bundle-Ether1.1.tmpl15            0x00803080
```

This is a sample output of the **show subscriber database template parent-if-name** command:

```
RP/0/RSP0/CPU0:router# show subscriber database template parent-if-name Bundle-Ether1.1

Fri Nov  7 15:41:14.363 IST
Location 0/1/CPU0
---------------------------------
Interface                        Tmpl-Ifhandle  Tmpl-Sub-Label  Session Count
-------------------------------  -------------  --------------  -------------
Bundle-Ether1.1.tmpl11            0x00802c80     0xfc000001       1
Bundle-Ether1.1.tmpl12            0x00802d80
Bundle-Ether1.1.tmpl13            0x00802e80
Bundle-Ether1.1.tmpl14            0x00802f80
Bundle-Ether1.1.tmpl15            0x00803080
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber database, on page 475 | Displays the configuration details of subscriber database. |
| show ipsubscriber template-interface , on page 280 | Displays the template information for the IP subscriber interfaces. |

# show subscriber feature accounting

To display the feature accounting information of the subscriber, use the **show subscriber feature accounting** command in the EXEC mode.

**show subscriber feature accounting ma** {**statistics debug** [**location** *location*] | **subscriber-label** *subscriber-id* | **summary** [**location** *location*] | **trace** {**all** | **error** | **event**}}

## Syntax Description

| | |
|---|---|
| **ma** | Displays the subscriber accounting feature management agent information. |
| **statistics** | Displays the accounting feature statistics. |
| **debug** | Displays the debug statistics. |
| **location** | Specifies the location of the node. |
| *location* | Fully qualified location name. |
| **subscriber-label** | Specifies the unique subscriber ID. |
| *subscriber-id* | ID of the subscriber, in hexadecimal. |
| **summary** | Displays the summary data. |
| **trace** | Displays the accounting feature ltrace data. |
| **all** | Displays trace of all errors and events. |
| **error** | Displays trace of errors. |
| **event** | Displays trace of events. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.1 | The show command output was extended to display session Idle Timeout feature information. |
| Release 5.3.0 | The show command output was extended to display the prepaid feature information. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show subscriber feature accounting** command in the EXEC mode mode:

```
RP/0/RSP0/CPU0:router# show subscriber feature accounting ma subscriber-label 0x40
Subscriber Label: 0x40         Interface: Gi0/0/0/0.pppoe1

  Feature:  Session Accounting      Method-list: default

  Feature:  Session Idle Timeout
    Timeout value:         200 seconds
    Threshold value:       3 minutes per packet
    Timeout direction:     both
```

This table describes the significant fields displayed in the **show subscriber feature accounting** command output :

| Field | Description |
|---|---|
| Timeout value | Specifies the timeout value configured for that particular subscriber session. |
| Threshold value | Specifies the threshold value configured for that particular subscriber session, to decide on the duration of the session inactivity. |
| Timeout direction: both | Specifies that both the ingress and egress traffic is considered for the determination of the idle time for that particular subscriber session. |

This is a sample output of the **show subscriber feature accounting** command, with the DIAMETER prepaid feature configured:

```
RP/0/RSP0/CPU0:router# show subscriber feature accounting ma subscriber-label 0x42

Subscriber Label: 0x42         Interface: Gi0/0/0/0.pppoe3

Feature:  Session Accounting      Method-list: default
Periodic interval: 3000

Feature:  Service Accounting
Service-ID: 0x4000004      Method-list: default    Periodic interval: 6000

Flow Label: 0x4     Direction: Both Ingress and Egress
Feature:  Prepaid   Prepaid-Config: foo4

FSM-Type         FSM-State              Threshold
-------------------------------------------------
Volume FSM   NEW-QUOTA-ARRIVED           0
Time FSM     NOT-ACTIVE                  60

Quota-type   : Input-Volume        Output-Volume       Bi-Directional-Volume
-------------------------------------------------------------------------------
New-Arrived  : 0                   0                   600
New-Used     : 0                   0                   0
```

```
Total-arrived: 0                  0                   1200
Total-Used   : 0                  0                   0
Pre-Tariff   : 0                  0                   0
Post-Tariff  : 0                  0                   0
num is a[0] is 0num is a[1] is 0num is a[2] is 57num is a[3] is 1918
Waiting for Volume Quota update: 57 seconds.

Time(in seconds): Quota-Time       Validity-Time    Holding-Time     Tariff-Time
-------------------------------------------------------------------------------
New-Arrived     : 0                2000             66               0
Total           : 0                2000             66               0
Expiry in       : 0                1918             0                0
State           : DISABLED         ENABLED          DISABLED         DISABLED
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber database, on page 475 | Displays the configuration details of subscriber database. |
| show subscriber manager statistics, on page 487 | Displays the subscriber management internal manager information. |
| show subscriber running-config, on page 501 | Displays the subscriber running configuration derived from dynamic template. |
| show subscriber session, on page 503 | Displays the subscriber management session information. |

# show subscriber manager sadb

To display the database information of the subscriber management feature attribute, use the **show subscriber manager sadb** command in the EXEC mode mode.

**show subscriber manager sadb** [**location** *location*]

## Syntax Description

| | |
|---|---|
| **location** | Specifies the location of the node. |
| *location* | Fully qualified location name. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the show subscriber manager sadb command:

```
RP/0/RSP0/CPU0:router#show subscriber manager sadb
Mon Apr  8 10:02:24.274 IST

Sublabel: 0x00000095 Node_ID: 00000000 Signature: 0xabcdef12 Version: 1 Rev: 9
Length: 168

Attribute list: 135469872
1:  outer-vlan-id   len=  4  10(a)
2:  port-type       len=  4  Virtual IP over VLAN
3:  static-session  len=  1  true
4:  parent-if-handle len=  4  1664(680)
5:  string-session-id len=  8  00000049
6:  interface       len=  8  0/0/1/10
7:  username        len=  6  BNG:10
8:  if-handle       len=  4  1664(680)
9:  vrf-id          len=  4  0(0)
10:  ipv4-session-state len=  1  true
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber session, on page 503 | Displays the subscriber management session information. |
| ipsubscriber interface, on page 261 | Enables interface based static session in BNG. |

# show subscriber manager statistics

To display the subscriber management internal manager information, use the **show subscriber manager statistics** command in the EXEC mode mode.

**show subscriber manager statistics** {**AAA COA** | **HA** | **PPSM** | **PRE** | **SVM** | **debug** | **performance** | **summary**}

## Syntax Description

| | |
|---|---|
| **AAA** | Displays the Authentication, Authorization, Accounting Coordinator statistics. |
| **HA** | Displays the High Availability statistics. |
| **PPSM** | Displays the Policy Plane Session Manager statistics. |
| **PRE** | Displays the Policy Rule Engine statistics. |
| **SVM** | Displays the Service Manager statistics. |
| **debug** | Displays the debug statistics. |
| **performance** | Displays the performance statistics. |
| **summary** | Displays the summary statistics. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 5.2.0 | The output of show subscriber manager statistics command was modified to track the statistics for singleton and multiple-service CoA requests separately for **show subscriber manager statistics AAA COA [ location <> ]** , to display the **Multi-Service** field for **show subscriber manager statistics AAA COA**, **show subscriber manager statistics PRE event**, and **show subscriber manager statistics PRE action total location <>** commands, and to display **MA-CoA RB Success** and **MA-CoA RB Failure** fields for **show subscriber manager statistics SVM events location <>** command. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is the sample output of the **show subscriber manager statistics** command in the EXEC mode mode:

```
RP/0/RSP0/CPU0:router# show subscriber manager statistics summary total
```

The show subscriber manager statistics output is as follows:

```
Wed Jan 23 09:57:41.855 GMT

[ IEDGE SUMMARY STATISTICS ]

 Location: 0/0/CPU0

IEDGE SUMMARY
=============
Control Policy errors
  Subscriber control policy not applied on interface = 0
  No class match in Start Request                    = 0

Attribute format warnings
  NAS Port                                           = 0
  NAS Port id                                        = 0
  Destination station id                             = 0
  Calling station id                                 = 0
  User Name                                          = 0

User Profile Statistics
  User Profile Install                               = 0
  User Profile Install errors                        = 0
  User Profile Removes                               = 0
  User Profile Errors                                = 0

Session Disconnect Flow Control
  Inflight                                           = 0
  Queued                                             = 0

 Location: 0/1/CPU0

IEDGE SUMMARY
=============
Control Policy errors
  Subscriber control policy not applied on interface = 0
  No class match in Start Request                    = 0

Attribute format warnings
  NAS Port                                           = 72
  NAS Port id                                        = 0
  Destination station id                             = 72
  Calling station id                                 = 72
  User Name                                          = 0

User Profile Statistics
  User Profile Install                               = 0
  User Profile Install errors                        = 0
  User Profile Removes                               = 0
  User Profile Errors                                = 0

Session Disconnect Flow Control
  Inflight                                           = 0
  Queued                                             = 0
```

This table describes the significant fields shown in the display.

*Table 19: show subscriber manager statistics Field Descriptions*

| Field | Description |
|---|---|
| Control Policy errors | Specifies the errors in the control policy. |
| Attribute format warnings | Specifies the attribute format warnings. |
| User Profile Statistics | Specifies the user profile statistics. |
| Session Disconnect Flow Control | Specifies the session disconnect flow control. |

These are the sample outputs for the **show subscriber manager statistics** command with multi-action CoA enabled, in EXEC mode mode:

```
RP/0/0/CPU0server:# show subscriber manager statistics AAA COA

Wed Jun 27 10:08:37.331 EDT

[ CHANGE OF AUTHORIZATION STATISTICS ]

 Location: 0/0/CPU0

CoA Requests:
                 Type     Received        Acked        NAKed
                 ====     ========        =====        =====
        Account Logon            0            0            0
       Account Logoff            0            0            0
       Account Update            0            0            0
           Disconnect            0            0            0
 Single Service Logon            0            0            0
Single Service Logoff            0            0            0
     Multiple Service           10           10            0

Errors:
  None

RP/0/0/CPU0:server#
```

In the above show output, see the **Multiple Service** row to fetch information on how many MA-CoA requests were issued, the number of MA-CoA requests acknowledged, and the number of MA-CoA requests that were not acknowledged.

```
RP/0/0/CPU0server:#show subscriber manager statistics PRE event

Wed Jun 27 11:00:27.029 EDT

[ EVENT STATISTICS ]

 Location: 0/0/CPU0

Events executed         Success Fail    Pending
===============         ======= ====    =======
3                       2       1       0

Detail Statistics
=========================
Type                            Total   Success Fail    Pending
====                            =====   ======= ====    =======
```

```
Session-Start                   1       1       0       0
Session-Update                  0       0       0       0
Session-Up                      0       0       0       0
Session-Down                    0       0       0       0
Session-Disconnect              0       0       0       0
Session-Disconnect Request      0       0       0       0
Session-Force-Kill              0       0       0       0
Session-Restart                 0       0       0       0
Session-Activate                1       1       0       0
Service-Start                   0       0       0       0
Service-Stop                    0       0       0       0
Multi-Service                   0       0       0       0
Account-Logon                   0       0       0       0
Account-Logoff                  0       0       0       0
Account-Update                  0       0       0       0
Flow-Start                      0       0       0       0
Flow-Stop                       0       0       0       0
Accounting-Start                0       0       0       0
Accounting-Stop                 0       0       0       0
Accounting-Update               0       0       0       0
Absolute-Timeout                0       0       0       0
Idle-Timeout                    0       0       0       0
Idle-Awake                      0       0       0       0
Timer-Expiry                    0       0       0       0
Keepalive-Success               0       0       0       0
Keepalive-Failure               0       0       0       0
Link-status up                  0       0       0       0
Link-status down                0       0       0       0
Credit-Exhausted                0       0       0       0
Quota-Depleted                  0       0       0       0
Threshold_Reached               0       0       0       0
Prepaid-start                   0       0       0       0
Prepaid reauthorize             0       0       0       0
Prepaid idle-timeout            0       0       0       0
Prepaid accounting-start        0       0       0       0
Prepaid accounting-stop         0       0       0       0
Session-Deactivate-request      0       0       0       0
Author Failure                  0       0       0       0
Author No Response              0       0       0       0
Authen Failure                  1       0       1       0
Authen No Response              0       0       0       0
Exception                       0       0       0       0

RP/0/0/CPU0:server#
```

In the above show output, see the **Multi-Service** and **Exception** rows to fetch debug information related to MA-CoA requests.

```
RP/0/RSP0/CPU0server:# show subscriber manager statistics PRE action total location
0/RSP0/CPU0

[14:09:22.543 UTC Thu Feb 13 2014] +++


[ PRE ACTION STATISTICS ]

Actions executed        Success Fail    Pending
================        ======= ====    =======
5               5       0       0

Detail Statistics
=========================
```

```
Type                          Total   Success Fail    Pending
====                          =====   ======= ====    =======
authenticate                    0       0       0       0
unauthenticate                  0       0       0       0
authorize                       0       0       0       0
accounting start                0       0       0       0
accounting stop                 0       0       0       0
accounting update               0       0       0       0
set-timer                       0       0       0       0
stop-timer                      0       0       0       0
disconnect                      0       0       0       0
collect                         0       0       0       0
quota-replenish                 0       0       0       0
prepaid                         0       0       0       0
proxy                           0       0       0       0
activate                        0       0       0       0
deactivate                      0       0       0       0
multi-service                   5       5       0       0
inline policy                   0       0       0       0
session-update                  0       0       0       0
session-up                      0       0       0       0
session-down                    0       0       0       0
session-idle                    0       0       0       0
apply user profile              0       0       0       0
query ANCP                      0       0       0       0
monitor                         0       0       0       0
```

In the above show output, see the **multi-service** row to fetch debug information related to MA-CoA requests.

```
RP/0/RSP0/CPU0server:#show subscriber manager statistics SVM events location 0/RSP0/CPU0
[14:09:23.571 UTC Thu Feb 13 2014] +++

[ IEDGE SVM EVENT STATISTICS ]

 Location:

SVM INTERNAL EVENT COUNTERS (125):
            EVT                    COUNT
       Sess Create invocations         0
      Sess Create (bad client)         0
             Sess Create (DUP)         0
             Sess Create (BAD)         0
          Sess Create (ASYNC)          0
       Sess Create (BAD STATE)         0
             SVMB (uB) Creates         1
             SVMB (uB) Removes         0
             SVMS (SB) Creates        14
             SVMS (SB) Removes        10
             SVMA (AS) Creates        14
             SVMA (AS) Removes         0
         SVM KEY Creates/Dups         43
               SVM KEY Removes        25
            Apply invocations         0
         Apply (bad argument)         0
            Apply (no memory)         0
        Apply (missing create)        0
          Apply (create error)        0
           Apply (assoc error)        0
             Apply (call back)        34
       Apply (call back error)        0
            Apply (successful)        24
          Unapply invocations         0
```

```
        Unapply (bad argument)        0
             Unapply (no svmb)        0
             Unapply (no svma)        0
Unapply rejected (wrong state)        0
               Unapply failed         0
       Unapply (unassoc error)       25
           Unapply (call back)       15
     Unapply (call back error)        0
           Replace invocations        0
         Replace (bad argument)       0
       Replace (Duplicate data)       0
                Replace failed        0
         User Profile before PM       0
     User Profile PM callbacks        0
      User Profile invocations        0
User Profile Recon invocations        0
           User Profile Merges        0
           User Profile Applys        0
         User Profile Unapplys        0
 Prod All Done Post Instl proc        0
          User Profile Removes        0
       User Profile Uninstalls        0
        User Profile Clean ups        0
   User Profile Install errors        0
     User Profile Assoc errors        0
           User Profile Errors        0
  User Prof Apply during recon        0
 User Prof Remove during recon        0
       Remove sess invocations        0
           Remove sess missing        0
            Remove sess failed        0
          Prod Done invocations        5
            Prod Done (no svmb)        0
            Prod Done (bad arg)        0
          Prod Done (bad state)        0
             Prod Done (failed)        0
         Prod Done (not needed)        0
          Prod Done (real call)        5
            Prod Done (SubDB CB)       11
            Prod Done (GENED CB)        0
            Prod Done (COMPL CB)       11
            Prod Done (ERROR CB)        0
     Prod Done (BAD REASON CB)        0
  Prod Done(SubDB CB) on recon        0
  Prod Done(GENED CB) on recon        0
  Prod Done(COMPL CB) on recon        0
     Prod All Done invocations        0
   Prod All Done Bad Rtn Code         0
      Prod All Done Callbacks         0
  Prod All Done NULL Callback         0
 Prod All Done Callback Error         0
           PAD Calls on recon         0
        PAD Callbacks on recon        0
     PAD Callback err on recon        0
          HA Session callbacks        5
        HA Session CB bad args        0
      HA Session CB no session        0
          HA Session CB all OK        5
    HA Session CB User Profile        0
HA Sess CB NULL flat attr list        0
    HA Session CB NULL UP name        0
    HA Session CB PQOS present        0
       HA Session CR callbacks        1
        HA Session CR bad args        0
```

```
        HA Session CR no label        0
       HA Session CR too short        0
        HA Session CR bad size        0
      HA Session CR data in OK        1
          HA Session CR all OK        1
              HA SP ADD enters       10
            HA SP ADD bad size        0
           HA SP ADD no memory        0
          HA SP ADD write fail        0
              HA SP ADD all OK       10
               HA SP GET enter        0
               HA SP GET error        0
            HA SP DELETE enter       10
       HA SP DELETE bad param        0
           HA SP DELETE error        0
          HA SP DELETE all OK       10
         HA SP Restart enters        1
    HA SP Restart next error        0
    HA SP Restart records OK        4
  HA SP Rest OK, CLI on Host        4
   HA SP Rest OK, SP on Host        0
HA SP Rest OK, SP on Server        0
                Utility Error1        0
                Utility Error2        0
                Utility Error3        0
                Utility Error4        0
                Utility Error5        0
                Utility Error6        0
                Utility Error7        0
                Utility Error8        0
                Utility Error9        0
               Utility Error10        0
               Utility Error11        0
             MA-CoA RB Success        5
             MA-CoA RB Failure        0
             Subdb Recon Begin        1
               Subdb Recon End        1
```

In the above show output, see the **MA-CoA RB Success** and **MA-CoA RB Failure** rows to fetch debug information related to MA-CoA rollback success and failures.

```
RP/0/0/CPU0:# show subscriber manager statistics perf non-zero

Tue Jun  3 13:14:34.547 IST

[ IEDGE PERFORMANCE DATA ]

                          Type       Ave(ms)    StdDev(ms)     Min(ms)     Max(ms)     Count
                          ====       =======    ==========     =======     =======     =====



RP/0/0/CPU0:# show subscriber manager statistics performance

Tue Jun  3 13:14:34.547 IST

[ IEDGE PERFORMANCE DATA ]

                         Type       Ave(ms)    StdDev(ms)     Min(ms)     Max(ms)
                          ====       =======    ==========     =======     =======

Transactions:
```

| | | | | |
|---|---|---|---|---|
| Absolute-timeout request | 0.0 | 0.0 | 0.0 | 0.0 |
| Account logon event | 0.0 | 0.0 | 0.0 | 0.0 |
| Account logoff event | 0.0 | 0.0 | 0.0 | 0.0 |
| Account update event | 0.0 | 0.0 | 0.0 | 0.0 |
| Accounting request | 0.0 | 0.0 | 0.0 | 0.0 |
| Authentication continue | 0.0 | 0.0 | 0.0 | 0.0 |
| Session Activate request | 0.0 | 0.0 | 0.0 | 0.0 |
| Bind request | 0.0 | 0.0 | 0.0 | 0.0 |
| Flow disconnect ack | 0.0 | 0.0 | 0.0 | 0.0 |
| Flow disconnect event | 0.0 | 0.0 | 0.0 | 0.0 |
| Flow disconnect request | 0.0 | 0.0 | 0.0 | 0.0 |
| Flow start request | 0.0 | 0.0 | 0.0 | 0.0 |
| Idle Timeout request | 0.0 | 0.0 | 0.0 | 0.0 |
| Identity release request | 0.0 | 0.0 | 0.0 | 0.0 |
| Session update request | 0.0 | 0.0 | 0.0 | 0.0 |
| Keepalive status request | 0.0 | 0.0 | 0.0 | 0.0 |
| Link status request | 0.0 | 0.0 | 0.0 | 0.0 |
| Prepaid request | 0.0 | 0.0 | 0.0 | 0.0 |
| Service start event | 0.0 | 0.0 | 0.0 | 0.0 |
| Service stop event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session disconnect ack | 0.0 | 0.0 | 0.0 | 0.0 |
| Session disconnect event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session disconnect request | 0.0 | 0.0 | 0.0 | 0.0 |
| Session kill event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session start request | 0.0 | 0.0 | 0.0 | 0.0 |
| Timer expiry event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session deactivate request | 0.0 | 0.0 | 0.0 | 0.0 |
| Passthru Accounting request | 0.0 | 0.0 | 0.0 | 0.0 |
| Author no response event | 0.0 | 0.0 | 0.0 | 0.0 |
| Author failed event | 0.0 | 0.0 | 0.0 | 0.0 |
| Authen no response event | 0.0 | 0.0 | 0.0 | 0.0 |
| Authen failed event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session Up and Update request | 0.0 | 0.0 | 0.0 | 0.0 |
| Session Down request | 0.0 | 0.0 | 0.0 | 0.0 |
| Session State AF Register | 0.0 | 0.0 | 0.0 | 0.0 |
| Session info update | 0.0 | 0.0 | 0.0 | 0.0 |
| Mobility Failure event | 0.0 | 0.0 | 0.0 | 0.0 |
| Session disconnect queuing | 0.0 | 0.0 | 0.0 | 0.0 |

# show subscriber redundancy group

To display the operational summary (including the active subscriber sessions under each subscriber redundancy group (SRG) and the transient sessions awaiting synchronization to the peer) of all the configured SRGs, use the **show subscriber redundancy group** command in the EXEC mode mode.

**show subscriber redundancy group** [*group-id* [**session** | **tunnel**]] [**location** *node-id*]

## Syntax Description

| | |
|---|---|
| **group** | Displays the summary information of all SRGs. |
| *group-id* | Displays the detailed information of a specific SRG. |
| **session** | Displays the key information about the sessions active under the SRG. |
| **tunnel** | Displays the tunnel information specific to each SRG group. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.3.2 | This command was modified to add the new keyword, **tunnel**. |
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The details listed under the **show subscriber redundancy group** command for a specific SRG include:

- Various applied operational parameters.
- Details of tracking objects registered on the SRG and their status. This shows if it is configured or not, if it is set in the SRG but unknown because the tracking object is not configured and shows the current status of object as reported.
- Details about the peer that include the status of connection and info (for example, its tracking status and roles) that it provided to this router in the previous negotiation, the timestamp of last negotiation and the time when the peer went up or down.
- Details about switchover that include the last role change along with the reason, number of switchovers and information regarding hold-timer (whether the timer is currently running and if running, the remaining time).
- The active subscriber session statistics and any pending updates or deletions to be sent to the peer.
- The session entries that experienced failures in synchronization with the peer. Generally, this may be seen on the subordinate where provisioning failed due to configuration mismatch or due to some other resource constraints.
- The number and list of active access sub-interfaces under the SRG.

The retry mechanisms of the subscriber redundancy feature take care of recovery from transient errors. Also, logs with more details on the specific errors are generated for persistent synchronization errors.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show subscriber redundancy group** command:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy group

Subscriber Redundancy Agent Group Summary

Flags    : E - Enabled, D - Disabled, M - Preferred Master, S - Preferred Slave
           H - Hot Mode, W - Warm Mode, T - Object Tracking Enabled

P/S      : Peer Status
           I - Initialize, Y - Retry, X - Cleanup, T - Connecting
           L - Listening, R- Registered, C - Connected, E - Established

I/F Count: Interface Count
SS Count : Subscriber Session Count

-------------------------------------------------------------------------------------------
Node Name | Group ID | Role | Flags | Peer Address | P/S | I/F Count | SS Count | Sync
                                                                                 Pending
-------------------------------------------------------------------------------------------
0/RSP0/CPU0  210     Master   EMHT    11::2          E        1        8000       0
0/RSP0/CPU0  410     Slave    EMHT    1.1.1.2        E        1        8000       0

Session Summary Count(Master/Slave/Total): 8000/8000/16000
```

This table describes the significant fields shown in the display:

| Field | Description |
|---|---|
| Initialize | Initial state when some configuration is incomplete or SRG is disabled. |
| Connecting or Listening or Registering | During the process of TCP connection establishment between client and server. |
| Connected or Established | TCP connection is done and moves to steady state after role negotiation. |
| Retry or Cleanup | Transient error conditions. |

This is a sample output of the **show subscriber redundancy group** command that displays the key information about the sessions active under the SRG:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy group 210

Subscriber Redundancy Group ID: 210
  Description : <<not-configured>>

  Status              : Enabled
  Init-Role           : Master
```

```
  Negotiated-Role     : Master               Current-Role : Master

  Slave-mode          : Hot                     Hold Time : 15

  Virtual MAC Address : 0000.0000.2020
  L2TP Source Address : <<not-configured>>

  Core-Tracking       : <<not-configured>>
    Status            : n/a
  Access-Tracking     : vlan210
    Status            : Up
  Tracking Status     : Enabled

Peer:
    11::2                                          Status : Established
    Role(Init/Neg/Cur): Slave/Slave/Slave
    Tracking Status   : Down

    Last Neg-Time     : 2014 Sep 12 07:12:11
    Last Up-Time      : 2014 Sep 11 14:47:55
    Last Down-Time    : 2014 Sep 11 14:26:45

 Switchover:
    Last Switchover   : 2014 Sep 12 07:12:11       Reason : Object Tracking Status Change
    Switchover Count  : 4
    Hold Time         : Not-Running

 Subscriber Session Statistics:
    Count             : 8000               Slave-Upd-Fail : 0
    Pending Update    : 0                  Pending Delete : 0
    Tunnel Count      : 0

Interface Count     : 1
    Bundle-Ether1.10                       Map-ID         : 210
```

This table describes the significant fields shown in the display:

| Field | Description |
|---|---|
| Init-role | Specifies if primary-subordinate preference is set. |
| Negotiated-role | Specifies the desired role during previous and next role negotiation exchange. |
| Current-role | Specifies the current role assumed. |

This is a sample output of the show subscriber redundancy group session command:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy group 210 session

Subscriber Redundancy Agent Group Session
------------------------------------------------------------------------------
 Parent Interface              |   MAC Address  | In/Out VLAN | PPPoE/L2TP ID
------------------------------------------------------------------------------
 Bundle-Ether1.10                0000.680b.0102   0/210          0/0
 Bundle-Ether1.10                0000.680b.0103   0/210          0/0
 Bundle-Ether1.10                0000.680b.0104   0/210          0/0
 Bundle-Ether1.10                0000.680b.0105   0/210          0/0
 Bundle-Ether1.10                0000.680b.0106   0/210          0/0
 Bundle-Ether1.10                0000.680b.0107   0/210          0/0
```

```
 Bundle-Ether1.10                0000.680b.0108   0/210          0/0
 Bundle-Ether1.10                0000.680b.0109   0/210          0/0
 Bundle-Ether1.10                0000.680b.010a   0/210          0/0
 Bundle-Ether1.10                0000.680b.010b   0/210          0/0
 Bundle-Ether1.10                0000.680b.010c   0/210          0/0
 Bundle-Ether1.10                0000.680b.010d   0/210          0/0
 Bundle-Ether1.10                0000.680b.010e   0/210          0/0
 Bundle-Ether1.10                0000.680b.010f   0/210          0/0
 Bundle-Ether1.10                0000.680b.0110   0/210          0/0
```

This is a sample output of the show subscriber redundancy group command that displays the tunnel information:

```
RP/0/RSP0/CPU0:router show subscriber redundancy group 1 tunnel

Subscriber Redundancy Agent Group Tunnel
 Operational: SA-SRGA, L2-L2TP
       Flags: U-Update, D-Delete, S-InSync, F-TxListFail, T-Dirty
-------------------------------------
 L2TP TID      |  Operational Flag
-------------------------------------
 4557              M--   SA{S} L2{S}
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber redundancy summary, on page 499 | Displays the global status of BNG geo redundancy feature. |

# show subscriber redundancy summary

To display the global status of BNG geo redundancy feature, use the **show subscriber redundancy summary** command in the EXEC mode mode.

**show subscriber redundancy summary** [**group** | **interface**]

## Syntax Description

| | |
|---|---|
| **group** | Displays the subscriber redundancy summary of all configured SRGs. |
| **interface** | Displays the subscriber redundancy summary of all access sub-interfaces configured under SRGs. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 5.2.2 | This command was introduced. |

## Usage Guidelines

The details listed under this output of this command include, the IPv4 and IPv6 addresses from the source-interface that is used for peering by this router, and the snapshot of the active subscriber redundancy groups, interfaces and their roles.

The details listed under **show subscriber redundancy summary group** output also include the attributes or settings of the SRGs in operation and their roles. The output also indicates the RP or LC where the control plane for the SRG is being hosted for troubleshooting purposes.

The details listed under **show subscriber redundancy summary interface** output also include the mapping group, ID and role of the SRGs.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show subscriber redundancy summary** command:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy summary

Subscriber Redundancy Summary

  Status        : Enabled                     Process State: Active
  Preferred-Role: None
  Slave-Mode    : <<not-configured>>          Hold Time    : 0

Source Interface: GigabitEthernet0/1/0/1
  VRF Name      : default
    IPv4 Address: 1.1.1.1
    IPv6 Address: 11::1

Group Statistics:
```

```
  Count          : 10                          Disabled     : 0
  Master         : 5                           Slave        : 5

Interface Statistics:
  Count          : 12
  Master         : 6                           Slave        : 6
```

This is a sample output of the **show subscriber redundancy summary group** command:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy summary group

Subscriber Redundancy Group Summary
Options: E - Enabled, D - Disabled
         M - Preferred Master, S - Preferred Slave
         H - Hot Mode, W - Warm Mode
         T - Object Tracking Enabled
------------------------------------------------------------------------
ID | Role | Virtual MAC Addr | Peer Address | I/F Count | Options | Node
------------------------------------------------------------------------
210  Master  0001.0002.00D2   11::2             2    EM-T    0/RSP0/CPU0
211  Master  0001.0002.00D3   11::2             1    EM-T    0/RSP0/CPU0
212  Master  0001.0002.00D4   11::2             1    EM-T    0/RSP0/CPU0
213  Master  0001.0002.00D5   11::2             1    EM-T    0/RSP0/CPU0
214  Master  0001.0002.00D6   11::2             1    EM-T    0/RSP0/CPU0
410  Slave   0001.0002.019A   1.1.1.2           2    EM-T    0/RSP0/CPU0
411  Slave   0001.0002.019B   1.1.1.2           1    EM-T    0/RSP0/CPU0
412  Slave   0001.0002.019C   1.1.1.2           1    EM-T    0/RSP0/CPU0
413  Slave   0001.0002.019D   1.1.1.2           1    EM-T    0/RSP0/CPU0
414  Slave   0001.0002.019E   1.1.1.2           1    EM-T    0/RSP0/CPU0
```

This is a sample output of the **show subscriber redundancy interface** command:

```
RP/0/RSP0/CPU0:router#show subscriber redundancy interface

Subscriber Redundancy Interface Summary
Status: E - Exists, F - Forward Reference
-----------------------------------------------------------
 Interface Name      | Status | Group ID | Map ID |  Role
-----------------------------------------------------------
 Bundle-Ether1.1       E        210        210       Master
 Bundle-Ether1.10      E        210        210       Master
 Bundle-Ether1.11      E        211        211       Master
 Bundle-Ether1.12      E        212        212       Master
 Bundle-Ether1.13      E        213        213       Master
 Bundle-Ether1.14      E        214        214       Master
 Bundle-Ether3.1       E        410        410       Slave
 Bundle-Ether3.10      E        410        410       Slave
 Bundle-Ether3.11      E        411        411       Slave
 Bundle-Ether3.12      E        412        412       Slave
 Bundle-Ether3.13      E        413        413       Slave
 Bundle-Ether3.14      E        414        414       Slave
```

## Related Commands

| Command | Description |
|---|---|
| show subscriber redundancy group, on page 495 | Displays the operational summary of subscriber redundancy groups. |

# show subscriber running-config

To display the subscriber running configuration derived from dynamic template, use the **show subscriber running-config** command in EXEC mode.

**show subscriber running-config** {**location** | **subscriber-label**}

## Syntax Description

| | |
|---|---|
| **location** | Displays subscriber database running configuration information for all sessions at specified location. |
| **subscriber-label** | Allows to enter a hex value subscriber-value that ranges between 0X0-0xffffffff. |
| \| | Specifies the output modifiers. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |

This is a sample output of the **show subscriber running-config** command:

```
RP/0/RSP0/CPU0:router# show subscriber running-config

Tue Jun 15 09:05:53.769 EDT
Session ID: 0x4000000
dynamic-template
 type ipsubscriber TEMPL1
  ipv4 unnumbered Loopback0
 !
!
dynamic-template
 type ipsubscriber TEMPL2
  service-policy input qos_policy
  vrf blue
  ipv4 mtu 1500
 !
!
Session ID: 0x4000082
dynamic-template
 type ipsubscriber TEMPL1
  ipv4 unnumbered Loopback0
 !
!
```

```
dynamic-template
 type ipsubscriber TEMPL2
  service-policy input qos_policy
  vrf blue
  ipv4 mtu 1500
 !
!
```

# show subscriber session

To display the subscriber management session information, use the **show subscriber session** command in the EXEC mode mode.

**show subscriber session** {**all** [**detail** | **summary** | **username**] **internal**[**location** *node-id*] | **debug** | **filter** | **subscriber-label** *session-id*}

## Syntax Description

| | |
|---|---|
| **all** | Displays all subscriber sessions. |
| **debug** | Displays unique subscriber session selected for debugging. |
| **filter** | Displays the search results of the subscriber session database based on the filter criteria. |
| **subscriber-label** | Displays the unique ID of the subscriber session. |
| *session-id* | Hex value of subscriber session ID. The range is from 0 to ffffffff. |

## Command Default

None

## Command Modes

EXEC mode

## Command History

| Release | Modification |
|---|---|
| Release 4.2.0 | This command was introduced. |
| Release 4.3.1 | Added example output for **show subscriber session all detail** command to display service accounting feature information. |
| Release 5.2.0 | The output of **show subscriber session all username** command was modified to display the fields, **Username** , **Interface** , **State** and **Subscriber IP Addr** , instead of **Type** , **Interface** , **State** and **Username** |

## Usage Guidelines

For interface-based static sessions in the BNG, the value of *Type* field in the **show ipsubscriber session** command output is displayed as **IP: Static**.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |
| config-services | read |

These are some of the options for the **show subscriber session** command in the EXEC mode:

```
RP/0/RSP0/CPU0:router# show subscriber session all
RP/0/RSP0/CPU0:router# show subscriber session all summary location 0/1/CPU0
```

```
RP/0/RSP0/CPU0:router# show subscriber session filter vrf vrf1 location 0/1/CPU0
RP/0/RSP0/CPU0:router# show subscriber session subscriber-label 40
```

This is the sample output of the **show subscriber session all** command:

```
Wed Jan 23 10:20:58.344 GMT
Codes: IN - Initialize, CN - Connecting, CD - Connected, AC - Activated,
       ID - Idle, DN - Disconnecting, ED - End

Type         Interface                State     Subscriber IP Addr / Prefix
                                                LNS Address (Vrf)
-------------------------------------------------------------------------------
PPPoE:PTA    Gi0/1/0/0.pppoe1         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe2         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe3         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe1       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe2       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe3       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe1       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe2       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe3       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe1       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe2       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe3       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe4         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe5         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe6         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe4       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe5       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe6       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe4       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe5       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe6       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe4       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe5       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe6       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe7         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe8         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe9         AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe7       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe8       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe9       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe7       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe8       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe9       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe7       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe8       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe9       AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe10        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe11        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe12        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe10      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe11      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe12      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe10      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe11      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe12      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe10      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe11      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe12      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe13        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe14        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe15        AC        100.0.0.1 (default)
```

```
PPPoE:PTA    Gi0/1/0/0.1.pppoe13      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe14      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe15      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe13      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe14      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe15      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe13      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe14      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe15      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe16        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe17        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.pppoe18        AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe16      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe17      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.1.pppoe18      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe16      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe17      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.2.pppoe18      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe16      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe17      AC        100.0.0.1 (default)
PPPoE:PTA    Gi0/1/0/0.3.pppoe18      AC        100.0.0.1 (default)
```

This table describes the significant fields shown in the display.

***Table 20: show subscriber session Field Descriptions***

| Field | Description |
|---|---|
| Type | Specifies the subscriber session type. |
| Interface | Specifies the interface type. |
| State | Specifies the states of the subscriber session such as initiate, connecting, connected, activated, disconnected, idle, end. |
| Subscriber IP Addr / Prefix LNS Address (Vrf) | Specifies the IP address of the subscriber interface. |

This is the sample output for the **show subscriber session** command in EXEC mode:

```
RP/0/0/CPU0:server#show subscriber session all detail internal location$
[14:09:18.244 UTC Thu Mar21 13 2019] +++
Interface:                Bundle-Ether2.111.ip1
Circuit ID:               Unknown
Remote ID:                Unknown
Type:                     IP: DHCP-trigger
IPv4 State:               Up, Thu Mar 21 17:26:42 2019
IPv4 Address:             95.1.10.133, VRF: vrf1
IPv4 Up helpers:          0x00000040 {IPSUB}
IPv4 Up requestors:       0x00000040 {IPSUB}
Mac Address:              0000.0201.8d8f
Account-Session Id:       00000001
Nas-Port:                 Unknown
User name:                0000.0201.8d8f
Formatted User name:      unknown
Client User name:         unknown
Outer VLAN ID:            11
Inner VLAN ID:            10
Subscriber Label:         0x00000040
Created:                  Thu Mar 21 17:26:40 2019
```

```
State:                    Activated
Authentication:           unauthenticated
Authorization:            authorized
Ifhandle:                 0x00000b20
Session History ID:       1
Access-interface:         Bundle-Ether2.111
SRG Flags:                0x00404000(M)
Policy Executed:

Session Accounting:
  Acct-Session-Id:          00000001
  Method-list:              default
  Accounting started:       Thu Mar 21 18:30:43 2019
  Interim accounting:       On, interval 10 mins
    Last successful update: Fri Mar 22 09:28:36 2019
    Next update in:         00:00:01 (dhms)
    Last update sent:       Fri Mar 22 09:28:36 2019
    Updates sent:           40
    Updates accepted:       40
    Updates rejected:       0
    Update send failures:   55
Service Accounting:         TurboAcctSvc
  Acct-Session-Id:          00017701
  Method-list:              ACCT
  Accounting started:       Thu Mar 21 18:31:24 2019
  Interim accounting:       On, interval 10 mins
    Last successful update: Never
    Next update in:         00:08:36 (dhms)
    Last update sent:       Fri Mar 22 10:07:11 2019
    Updates sent:           43
    Updates accepted:       0
    Updates rejected:       43
    Update send failures:   53
Last COA request received: unavailable
User Profile received from AAA:
Attribute List: 0x1500ddf0
1:  ip-vrf          len=  4  value= vrf1
2:  addr-pool       len=  9  value= pool-vrf1
3:  ipv6-enable     len=  4  value= 1(1)
Services:
  Name        : GEO_IP_2-vrf1
  Service-ID  : 0x400001d
  Type        : Multi Template
  Status      : Applied
-------------------------
  Name        : TurboAcctSvc
  Service-ID  : 0x4000011
  Type        : Multi Template
  Status      : Applied
-------------------------
[Event History]
   Mar 21 17:26:42.432 SUBDB produce done
   Mar 21 17:26:42.432 IPv4 Up
```

In the following table, the descriptions for different SRG flags is provided:

| SRG Flags | SRG Flag Values | Description |
|---|---|---|
| IEDGE_SRG_FLAG_NONE | 0x00000000 | SRG function is not supported. |
| IEDGE_SRG_MASTER_DEL_PENDING | 0x00000001 | Deletion is pending for SRG Primary Subscriber. |

| SRG Flags | SRG Flag Values | Description |
|---|---|---|
| IEDGE_SRG_MASTER_EOMS_INTF_PENDING | 0x00000002 | EOMS is pending. |
| IEDGE_SRG_MASTER_EOMS_INTF_RECEIVED | 0x00000004 | EOMS is received. |
| IEDGE_SRG_MASTER_EOMS_DEL_PENDING | 0x00000008 | EOMS is pending because there is delayed delete send for the session. |
| IEDGE_SRG_SENT_TO_TXLIST | 0x00000010 | Session is sent over txlist successfully. |
| IEDGE_SRG_DONT_SEND_TO_TXLIST | 0x00000020 | Don't send this session over txlist. |
| IEDGE_SRG_ENCODE_DONE_IN_TXLIST | 0x00000040 | Encode callback is completed for this session in txlist. |
| IEDGE_SRG_SKIP_INTF_ROLE_CHECK | 0x00000080 | Skip INTF-ROLE-CHECK to push data over txlist. |
| IEDGE_SRG_TXLIST_ENFORCE_REPOSITION | 0x00000100 | Reposition entry in txlist. |
| IEDGE_SRG_SLAVE_SEND_NACK | 0x00000200 | SRG-SUBORDINATE has send NACK before delete. |
| IEDGE_SRG_OPCODE_FLAG_NONE | 0x00000400 | No SRG sync. |
| IEDGE_SRG_OPCODE_FLAG_UPDATE | 0x00000800 | OPCODE flag is created or updated. |
| IEDGE_SRG_OPCODE_FLAG_DELETE | 0x00001000 | OPCODE flag is deleted. |
| IEDGE_SRG_STATE_FLAG_NONE | 0x00002000 | SRG state is none. |
| IEDGE_SRG_STATE_FLAG_MASTER | 0x00004000 | SRG State Primary flags. |
| IEDGE_SRG_STATE_FLAG_MASTER_IN_TXLIST | 0x00008000 | State Primary flags in the txlist. |
| IEDGE_SRG_STATE_FLAG_SLAVE | 0x00010000 | SRG State Subordinate flags. |
| IEDGE_SRG_ROLE_CHANGE | 0x00020000 | SRG role change flags. |
| IEDGE_SRG_FC_STATE_INFLIGHT | 0x00040000 | SRG flow control flags. |
| IEDGE_SRG_STATE_FLAG_INVALID | 0x00080000 | SRG State flag is invalid. |
| IEDGE_SRG_STATE_FLAG_SESSION_RESTORE | 0x00100000 | SRG State Session Restore flag. |

| SRG Flags | SRG Flag Values | Description |
|---|---|---|
| • IEDGE_NONSRG_INTERIM_ACCT_TRIGGER<br>• IEDGE_NONSRG_SESSION_ESTABLISHED<br>• IEDGE_NONSRG_IPV4_ADDR_SET<br>• IEDGE_NONSRG_IPV6_ADDR_SET<br>• IEDGE_NONSRG_IPV6_PD_SET<br>• IEDGE_NONSRG_IPV6_PREFIX_SET | • 0x00200000<br>• 0x0400000<br>• 0x00800000<br>• 0x01000000<br>• 0x02000000<br>• 0x04000000 | This is set per subscriber when the first AF comes up. Make sure to set this once in the life cycle of subscriber. |

This is the sample output of the **show subscriber session all username** command:

```
RP/0/0/CPU0:server#show subscriber session all username
Thu Mar 13 16:25:21.861 IST
Codes: IN - Initialize, CN - Connecting, CD - Connected, AC - Activated,
       ID - Idle, DN - Disconnecting, ED - End

Username             Interface              State  Subscriber IP Addr / Prefix

                                                       LNS Address (Vrf)

------------------------------------------------------------------------------
basic@cisco.com      Gi0/0/0/0.pppoe1         AC        10.0.0.2 (default)
basic@cisco.com      Gi0/0/0/0.pppoe2         AC        10.0.0.3 (default)
basic@cisco.com      Gi0/0/0/0.pppoe3         AC        10.0.0.1 (default)
basic@cisco.com      Gi0/0/0/0.1.pppoe1       AC        10.0.0.4 (default)
```

This example shows the detailed information about all the subscriber sessions including service accounting information.

```
RP/0/RSP0/CPU0:router# show subscriber session all detail

Interface:               Bundle-Ether12.125.ip643
Circuit ID:              Unknown
Remote ID:               00066c9ced63ef20
Type:                    IP: DHCP-trigger
IPv6 State:              Up, Fri Feb  8 16:42:57 2013
IPv6 Address:            2001:2::b246, VRF: default
Delegated IPv6 Prefix:   3000:2:0:8546::/64, VRF: default
IPv6 Interface ID:       0004007d000c (30 30 30 34 30 30 37 64 30 30 30 63)
Mac Address:             0010.6401.0102
Account-Session Id:      00008ad2
Nas-Port:                Unknown
User name:               0010.6401.0102
Outer VLAN ID:           125
Subscriber Label:        0x00000046
Created:                 Fri Feb  8 16:42:57 2013
State:                   Activated
Authentication:          unauthenticated
Access-interface:        Bundle-Ether12.125
Policy Executed:
policy-map type control subscriber BNG-Test
  event Session-Start match-first [at Fri Feb  8 16:42:57 2013]
    class type control subscriber PPPoE do-until-failure [Failed]
    class type control subscriber IPoE-DS do-until-failure [Succeeded]
      1 activate dynamic-template IPoE [Succeeded]
```

```
      10 authorize aaa list default [Succeeded]
      15 activate dynamic-template test-svc1 [Succeeded]
      16 activate dynamic-template test-svc2 [Succeeded]
Session Accounting:
  Acct-Session-Id:          00008ad2
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       Off
Service Accounting:         AcctTurbo1G
  Acct-Session-Id:          00008ad3
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       On, interval 2 mins
    Last successful update: Never
    Next update in:         00:01:48 (dhms)
Service Accounting:         test-svc3
  Acct-Session-Id:          00008ad4
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       On, interval 2 mins
    Last successful update: Never
    Next update in:         00:01:48 (dhms)
Service Accounting:         svcAcct
  Acct-Session-Id:          00008ad5
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       Off
Service Accounting:         test-svc1
  Acct-Session-Id:          00008ad6
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       On, interval 2 mins
    Last successful update: Never
    Next update in:         00:01:48 (dhms)
Service Accounting:         test-svc2
  Acct-Session-Id:          00008ad7
  Method-list:              default
  Accounting started:       Fri Feb  8 16:43:27 2013
  Interim accounting:       On, interval 2 mins
    Last successful update: Never
    Next update in:         00:01:48 (dhms)
Last COA request received: unavailable
```

This sample output of **show subscriber session all** command, displays the active IPv4 or IPv6 client sessions for a dual-stack configuration.

```
RP/0/RSP0/CPU0:router# show subscriber session all

Tue Jan 29   12:49:25.237 UTC

Codes: IN -   Initialize, CN - Connecting, CD - Connected, AC - Activated,

       ID - Idle, DN - Disconnecting, ED -   End

Type         Interface               State     Subscriber IP Addr / Prefix

                                                 LNS Address (Vrf)

------------------------------------------------------------------------------

IP:DHCP     BE1.10.ip22             AC       10.10.10.10 (default)
```

```
                                                    2001::2 (default)
```

This sample output of **show subscriber session all detail** command, displays the detailed information of the active IPv4 or IPv6 client sessions for a dual-stack configuration.

```
RP/0/RSP0/CPU0:router# show subscriber session all detail

Tue Jan 29   12:49:27.752 UTC

Interface:               Bundle-Ether1.10.ip22

Circuit ID:               Unknown

Remote ID:               Unknown

Type:                     IP: DHCP-trigger

IPv4 State:               Up, Tue Jan 29 12:46:32 2013

IPv4   Address:             10.10.10.10, VRF:   default

IPv6 State:               Up, Tue Jan 29 12:46:42 2013

IPv6   Address:            2001::2, VRF: default

IPv6 Interface   ID:       ..d..... (02 00 64 ff fe 01   01 02)

Mac   Address:             0000.6401.0102

Account-Session   Id:       0000001c

Nas-Port:                 Unknown

User name:               0000.6401.0102

Outer VLAN ID:           10

Subscriber   Label:         0x00000055

Created:                 Tue Jan 29 12:46:32 2013

State:                   Activated

Authentication:           unauthenticated

Access-interface:         Bundle-Ether1.10

Policy Executed:

policy-map type   control subscriber pm-src-mac

event Session-Start match-all [at Tue Jan   29 12:46:32 2013]

   class type control subscriber   dual_stack_class_map do-all [Succeeded]

     1 activate dynamic-template   Dual_stack_IPoE [Succeeded]

     2 authorize aaa list default   [Succeeded]

Session   Accounting:
```

```
Acct-Session-Id:         0000001c

Method-list:             default

Accounting started:       Tue Jan 29 12:46:32 2013

Interim accounting:       On, interval 1 mins

   Last successful update: Tue Jan 29   12:48:34 2013

   Next update in:         00:00:06 (dhms)

Last COA request   received: unavailable
```

# show subscriber session filter

To show the search results of the subscriber sessions database based on the filter criteria, use the **show subscriber session filter** command in the EXEC mode.

**show subscriber session filter** [**interface** *type interface-path-id* | **ipv4-address** *ipv4_address* | **ipv6-address IANA** *ipv6_address* | **mac-address** *mac_address* | **state** *subscriber_state* | **username** *user_name* | **vrf** *vrf_name*] [**detail** | **location**]

## Syntax Description

| | |
|---|---|
| **interface** | Filters on local subscriber interface name. |
| **ipv4-address** | Filters on subscriber IPv4 address. |
| **ipv6-address IANA** | Filters on subscriber IPv6 IANA address. |
| **mac-address** | Filters on subscriber MAC address. |
| **state** | Filters on subscriber session state. |
| **username** | Filters on user name. |
| **vrf** | Filters on subscriber within a particular vrf. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 6.4.1 | This command was modified to include an option to display the output for DHCP IPv6 IANA subscriber sessions. |
| Release 4.2.0 | This command was introduced. |

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **dynamic-template** command to enter dynamic template configuration mode.

## Task ID

| Task ID | Operation |
|---|---|
| network | read |
| config-services | read |

```
RP/0/RSP0/CPU0:router# show subscriber session filter interface Bundle-ether100.10 0/1/0/3
RP/0/RSP0/CPU0:router# show subscriber session filter ipv4-address 5.5.5.5 detail location
 0/1/CPU0
```

```
RP/0/RSP0/CPU0:router# show subscriber session filter mac-address 56.56.5
RP/0/RSP0/CPU0:router# show subscriber session filter username user1
RP/0/RSP0/CPU0:router# show subscriber session filter state t1
RP/0/RSP0/CPU0:router# show subscriber session filter vrf vrf1
```

This example shows a sample output of DHCP IPv6 IANA subscriber session details on a particular access-interface:

```
RP/0/RSP0/CPU0:router# show subscriber session filter ipv6-address IANA 2001:DB8:1::1 detail
Fri Mar  9 13:56:26.710 EDT
Interface:                Bundle-Ether512.10.ip10
Circuit ID:               Unknown
Remote ID:                Unknown
Type:                     IP: DHCP-trigger
IPv6 State:               Up, Fri Mar  9 13:55:42 2018
IPv6 Address:             2001:DB8:1::1, VRF: default
IPv6 Interface ID:        ."...... (12 22 c0 ff fe a8 00 2e)
Mac Address:              A.B.C
Account-Session Id:       0000000a
Nas-Port:                 Unknown
User name:                unknown
Formatted User name:      unknown
Client User name:         unknown
Outer VLAN ID:            10
Subscriber Label:         0x00000248
Created:                  Fri Mar  9 13:55:42 2018
State:                    Activated
Authentication:           unauthenticated
Authorization:            unauthorized
Access-interface:         Bundle-Ether512.10
Policy Executed:
policy-map type control subscriber pm-ipoe-httpe
  event Session-Start match-first [at Fri Mar  9 13:55:42 2018]
    class type control subscriber httpeCL do-until-failure [Succeeded]
      1 activate dynamic-template tmp1-dtmp1-1 [Succeeded]
      2 activate dynamic-template httpr-service-pldt [Succeeded]
Session Accounting: disabled
Last COA request received: unavailable
```

## Related Commands

| Command | Description |
|---|---|
| class-map type control subscriber, on page 49 | Enables the class-map. |
| policy-map type control subscriber, on page 60 | Enables the policy-map. |
| event, on page 53 | Enables the event in the policy-map. |
| show subscriber session, on page 503 | Displays the subscriber management session information. |

# show subscriber session history

To show the search results from the Unified Session History (USH) database for the subscriber sessions based on the key type, use the **show subscriber session history** command in the EXEC mode.

**show subscriber session history** [**subscriber-mac** *mac-address* | **analytics** | **subscriber-ifhandle** *if-handle* | **subscriber-label** *subscriber-label* | [**subscriber-ip** *IPv4-address* | **vrf** *vrf-name*] | [**subscriber-ipv6** *IPv6-address* | **vrf** *vrf-name*] ] [**disconnected** | **errored** | **location**]

## Syntax Description

| | |
|---|---|
| **subscriber-mac** | Displays the event history for the specified subscriber MAC address. |
| **analytics** | Displays USH data analytics. |
| **subscriber-ifhandle** | Displays the event history for the specified subscriber interface handle. |
| **subscriber-label** | Displays the event history for the specified subscriber label. |
| **subscriber-ip** | Displays the event history for the specified subscriber IPv4 address. |
| **subscriber-ipv6** | Displays the event history for the specified subscriber IPv6 address. |
| **vrf** | Displays the event history for the specified subscriber within a particular vrf. |
| **disconnected** | Displays the event history for the successfully disconnected session. |
| **errored** | Displays the event history of an errored session. |

## Command Default

None

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| Release 6.5.1 | This command was introduced. |

## Usage Guidelines

None

## Task ID

| Task ID | Operation |
|---|---|
| network | read |
| config-services | read |

```
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0020.9400.000c
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0010.9400.0094
disconnected
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0020.9400.000c errored
```

This example shows a sample output of the event history of an active subscriber which has the specified subscriber MAC address:

```
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0020.9400.000c
oper/ush/&&/key path  mac/0020.9400.000c/0

          STAF event history

Subscriber state: Active

SubscriberMAC:0020.9400.000c

ifhandle: 0x0000cba0

sublabel: 0x00000052

ipv4 Address:192.168.1.42

ipv6 Address: No IPv6 address

vrf:0x60000000 (default)

Time stamp               comp_name       event

----------------------------------------------------------------
11/07/2018 16:34:52:743135       dhcp            Discover pkt procsd

11/07/2018 16:34:52:743135       iedge           IPv4 Start

11/07/2018 16:34:52:747135       aaa             Radiusd recieved Authorization request

11/07/2018 16:34:52:748134       aaa             Radiusd successfully built Access-Request
 packet

11/07/2018 16:34:52:750134      aaa            Radiusd Successfully sent packet and started
 timout handler

11/07/2018 16:34:52:753134       aaa             Radiusd recieved Access-Accept

11/07/2018 16:34:52:753134       aaa             Decode radius packet success

11/07/2018 16:34:52:753134       aaa             Radiusd sending reply back to client

11/07/2018 16:34:52:759133       dhcp            Session Created     - Init state

11/07/2018 16:34:52:760133       dhcp            IP allocated        - Init state
11/07/2018 16:34:52:764132       dhcp            Request pkt procsd  - Post Offer sent

11/07/2018 16:34:52:764132       ipsub           IPSub intf creation started

11/07/2018 16:34:52:764132       ipsub           IPSub init callback from Ifmg

11/07/2018 16:34:52:764132       ipsub           IPSub session start event to iEdge

11/07/2018 16:34:52:764132       ipsub           IPSub init to Ifmgr

11/07/2018 16:34:52:884114       ipsub           IPSub received VRF details

11/07/2018 16:34:52:951103       iedge           SUBDB produce done

11/07/2018 16:34:52:976099       ipsub           IPSub RIB details added

11/07/2018 16:34:53:078084       ipsub           IPSub session up
```

```
11/07/2018 16:34:53:079084       iedge           IPv4 Up

11/07/2018 16:34:53:079084       dhcp            Session DPM success
```

This example shows a sample output of the event history of a successfully disconnected subscriber which has the specified subscriber MAC address:

```
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0010.9400.0094
disconnected
oper/ush/&&/key path  mac/0010.9400.0094/0
STAF event history
Subscriber state: Successfully disconnected
SubscriberMAC:0010.9400.0094
ifhandle: 0x00000260
sublabel: 0x000025d7
ipv4 Address:200.0.0.29
ipv6 Address:
vrf:0x60000000 (default)
Time stamp                       comp_name       event
----------------------------------------------------------------
05/12/2016 12:45:35:328697       dhcp            Discover pkt procsd
05/12/2016 12:45:35:328697       iedge           IPv4 Start
05/12/2016 12:45:38:412225       ipsub           IPSub session up
05/12/2016 12:45:38:417224       iedge           IPv4 Up
05/12/2016 12:45:38:422223       iedge           SUBDB produce done
06/12/2016 07:07:12:330971       dhcp            Lease expired for client
```

This example shows a sample output of the event history of an errored subscriber session which has the specified subscriber MAC address:

```
RP/0/RSP0/CPU0:router# show subscriber session history subscriber-mac 0020.9400.000c errored

/oper/ush/&&/key path  mac/0020.9400.000c/2

          STAF event history

Subscriber state: Errored

SubscriberMAC:0020.9400.000c

ifhandle: 0x00000000

sublabel: 0x00000051

ipv4 Address: No IPv4 address

ipv6 Address: No IPv6 address

Time stamp               comp_name       event

----------------------------------------------------------------

11/07/2018 16:32:28:386225       dhcp            Discover pkt procsd

11/07/2018 16:32:28:386225       iedge           IPv4 Start

11/07/2018 16:32:28:389225       aaa             Radiusd recieved Authorization request

11/07/2018 16:32:28:391224       aaa             Radiusd successfully built Access-Request
 packet

11/07/2018 16:32:28:392224      aaa            Radiusd Successfully sent packet and started
```

```
 timout handler

11/07/2018 16:32:33:783399      aaa           Radiusd Successfully sent packet and started
 timout handler

11/07/2018 16:32:38:790633      aaa           Radiusd Successfully sent packet and started
 timout handler

11/07/2018 16:32:43:801866      aaa           Radiusd Successfully sent packet and started
 timout handler

11/07/2018 16:32:48:808100       aaa             Radius packet sending failed  Reason:
'RADIUS' detected the 'fatal' condition 'No server information is available'

11/07/2018 16:32:48:808100       iedge           policy rule failed  Reason: 'AAA_BASE'
detected the 'fatal' condition 'Invalid state (aaa base lib error)'

11/07/2018 16:32:48:809100       iedge           Disconnect session
```