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Preface

From Release 6.1.1 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 6.1.1 document.

The Preface contains these topics:

- Obtaining Documentation and Submitting a Service Request, page ix

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. RSS feeds are a free service.
BNG AAA Commands

This module describes the Cisco IOS XR software commands used to configure the AAA 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.

- `aaa accounting subscriber`, page 3
- `aaa accounting system rp-failover`, page 5
- `aaa attribute format`, page 7
- `aaa authentication subscriber`, page 10
- `aaa authorization subscriber`, page 12
- `aaa group server radius (BNG)`, page 14
- `aaa radius attribute`, page 16
- `aaa server radius dynamic-author`, page 18
- `accounting aaa list`, page 20
- `radius-server attribute`, page 22
- `radius-server dead-criteria`, page 24
- `radius-server deadtime (BNG)`, page 26
- `radius-server disallow null-username`, page 28
- `radius-server host (BNG)`, page 29
- `radius-server ipv4 dscp`, page 32
- `radius-server key (BNG)`, page 33
- `radius-server load-balance`, page 35
- `radius-server retransmit (BNG)`, page 37
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- show radius server-groups detail, page 51
aaa accounting subscriber

To create an accounting list for subscriber accounting, use the `aaa accounting subscriber` command in Global Configuration mode or Global Configuration mode. To disable this accounting list for subscriber accounting, use the `no` form of this command.

```
aaa accounting subscriber {list_name | default} {broadcast group {group_name | radius}| group {group_name | radius}}
no aaa accounting subscriber {list_name | default} {broadcast group {group_name | radius}| group {group_name | radius}}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>default</code></td>
<td>Uses the listed authentication methods that follow this keyword as the default list of methods for authentication.</td>
</tr>
<tr>
<td><code>list-name</code></td>
<td>Represents the character string for the list name for AAA authentication.</td>
</tr>
<tr>
<td><code>broadcast</code></td>
<td>Specifies the broadcast accounting for subscriber.</td>
</tr>
<tr>
<td><code>group</code></td>
<td>Specifies the server-group.</td>
</tr>
<tr>
<td><code>group_name</code></td>
<td>Specifies the server group name.</td>
</tr>
<tr>
<td><code>radius</code></td>
<td>Specifies the list of all RADIUS hosts.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Global Configuration mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

No specific guidelines impact the use of this command.
aaa accounting subscriber

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td></td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the **aaa accounting subscriber** command for sg1 server group:

```
RP/0/RSP0/CPU0:router(config)# aaa accounting subscriber sub1 broadcast group radius group sg1
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa accounting system rp-failover, on page 5</td>
<td>Creates an accounting list for system events.</td>
</tr>
</tbody>
</table>
aaa accounting system rp-failover

To create an accounting list to send rp-failover or rp-switchover start or stop accounting messages, use the `aaa accounting system rp-failover` command in Global Configuration mode. To disable the system accounting for rp-failover, use the `no` form of this command.

```
aaa accounting system rp-failover {list_name {start-stop| stop-only}}| default {start-stop| stop-only}}
no aaa accounting system rp-failover {list_name {start-stop| stop-only}}| default {start-stop| stop-only}}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>list_name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the accounting list name.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the default accounting list.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>start-stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables the start and stop records.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>stop-only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables the stop records only.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `aaa accounting system rp-failover` command for default accounting list:

```
RP/0/RSP0/CPU0:router(config)# aaa accounting system rp-failover default start-stop none
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa attribute format, on page 7</td>
<td>Create an AAA attribute format name.</td>
</tr>
</tbody>
</table>
aaa attribute format

To create an AAA attribute format name and to enter the configuration ID format sub mode, use the `aaa attribute format` command in Global Configuration mode. To disable this AAA attribute format, use the `no` form of this command.

```
aaa attribute format format_name [circuit-id|mac-address|remote-id] [separator separator] format-string [length length] {string [Identity-Attribute]} [mac-address [plus] circuit-id | remote-id] [separator separator] [remote-id [plus] circuit-id | mac-address [separator separator] username-strip {prefix-delimiter|suffix-delimiter} delimiter []
no aaa attribute format format_name
```

### Syntax Description

<table>
<thead>
<tr>
<th><strong>format_name</strong></th>
<th>Specifies the name of the format.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>circuit-id</strong></td>
<td>Specifies the construction of the AAA attribute format name for subscribers based on the circuit-ID.</td>
</tr>
<tr>
<td><strong>format-string</strong></td>
<td>Specifies the extended string format of the AAA attribute format name.</td>
</tr>
<tr>
<td><strong>string</strong></td>
<td>Specifies the regular ASCII characters that includes conversion specifiers. The value is enclosed in double quotes.</td>
</tr>
<tr>
<td><strong>Identity-Attribute</strong></td>
<td>Identifies a session.</td>
</tr>
<tr>
<td><strong>length</strong></td>
<td>Specifies the length of the formatted attribute string.</td>
</tr>
<tr>
<td><strong>length</strong></td>
<td>Length of the formatted string, in integer.</td>
</tr>
<tr>
<td><strong>mac-address</strong></td>
<td>Specifies the construction of the AAA attribute format name for subscribers based on the mac-address. The MAC address must be in the form of three 4-digit values (12 digits in dotted decimal notation).</td>
</tr>
<tr>
<td><strong>remote-id</strong></td>
<td>Specifies the construction of the AAA attribute format name for subscribers based on the remote-ID.</td>
</tr>
<tr>
<td><strong>plus</strong></td>
<td>Specifies the use of additional identifiers.</td>
</tr>
<tr>
<td><strong>separator</strong></td>
<td>Specifies the separator to be used between keys.</td>
</tr>
<tr>
<td><strong>separator</strong></td>
<td>Separator to be used between keys, default is a semicolon.</td>
</tr>
</tbody>
</table>
### username-strip

Configures a network access server (NAS) to strip both suffixes and/or prefixes from the username before forwarding the username to the remote RADIUS server.

### prefix-delimiter

Enables prefix stripping and specifies the character that will be recognized as a prefix delimiter.

### suffix-delimiter

Enables suffix stripping and specifies the character that will be recognized as a suffix delimiter.

**Delimiter**

Suffix or prefix delimiter.

#### Command Default

None

#### Command Modes

Global Configuration mode

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.1</td>
<td>The support for format-string keyword was added.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

#### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

#### Examples

This is an example of configuring the `aaa attribute format` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# aaa attribute format form1
RP/0/RSP0/CPU0:router(config-id-format)# format-string "%s%s"
RP/0/RSP0/CPU0:router(config-id-format)# username-strip prefix-delimiter @
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa accounting subscriber, on page 3</td>
<td>Creates an accounting list for subscriber accounting.</td>
</tr>
</tbody>
</table>
aaa authentication subscriber

To create a method list for subscriber authentication, use the `aaa authentication subscriber` command in Global Configuration mode. To disable this subscriber authentication method, use the `no` form of this command.

```
aaa authentication subscriber {list_name | default} group {server_group_name | radius}
no aaa authentication subscriber {list_name | default} group {server_group_name | radius}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>default</code></td>
<td>Uses the listed authentication methods that follow this keyword as the default list of methods for authentication.</td>
</tr>
<tr>
<td><code>list-name</code></td>
<td>Represents the character string for the list name for AAA authentication.</td>
</tr>
<tr>
<td><code>group</code></td>
<td>Specifies the server-group.</td>
</tr>
<tr>
<td><code>radius</code></td>
<td>Specifies the list of all RADIUS hosts.</td>
</tr>
<tr>
<td><code>server_group_name</code></td>
<td>Specifies the server group name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This is an example of configuring the **aaa authentication subscriber** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# aaa authentication subscriber sub1 group sg1 group sg2
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa authorization subscriber, on page 12</td>
<td>Creates authorization-related configurations</td>
</tr>
</tbody>
</table>
aaa authorization subscriber

To create authorization-related configurations, use the `aaa authorization subscriber` command in Global Configuration mode. To disable this subscriber authorization method, use the `no` form of this command.

`aaa authorization subscriber {list_name|default} group {server_group_name | radius}
no aaa authorization subscriber {list_name|default} group {server_group_name|radius}`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>default</code></td>
<td>Uses the listed authentication methods that follow this keyword as the default list of methods for authentication.</td>
</tr>
<tr>
<td><code>list-name</code></td>
<td>Represents the character string for the list name for AAA authorization.</td>
</tr>
<tr>
<td><code>group</code></td>
<td>Specifies the server-group.</td>
</tr>
<tr>
<td><code>radius</code></td>
<td>Specifies the list of all RADIUS hosts.</td>
</tr>
<tr>
<td><code>server_group_name</code></td>
<td>Specifies the server group name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `aaa authorization subscriber` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# aaa authorization subscriber sub1 group sg1 group sg2
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa authentication subscriber, on page 10</td>
<td>Creates a method list for subscriber authentication.</td>
</tr>
</tbody>
</table>
aaa group server radius (BNG)

To configure a group server radius, use the `aaa group server radius` command in Global Configuration mode. To disable this AAA group server radius, use the `no` form of this command.

`aaa group server radius server_group_name [accounting | authorization | deadtime | load-balance | server | server-private | source-interface | throttle | vrf]`

`no aaa group server radius server_group_name [accounting | authorization | deadtime | load-balance | server | server-private | source-interface | throttle | vrf]`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>server_group_name</code></td>
<td>Specifies the AAA group server RADIUS name.</td>
</tr>
<tr>
<td><code>accounting</code></td>
<td>Specifies a RADIUS attribute filter for accounting.</td>
</tr>
<tr>
<td><code>authorization</code></td>
<td>Specifies a RADIUS attribute filter for authorization.</td>
</tr>
<tr>
<td><code>deadtime</code></td>
<td>Specifies the time in minutes after which a RADIUS server will be marked up after it has gone dead.</td>
</tr>
<tr>
<td><code>load-balance</code></td>
<td>Specifies the radius load-balancing options.</td>
</tr>
<tr>
<td><code>server</code></td>
<td>Specifies the RADIUS server.</td>
</tr>
<tr>
<td></td>
<td>Accepts IP address (IPv4) or hostname of the RADIUS server. The hostname option is supported only for IPv4 domain address.</td>
</tr>
<tr>
<td><code>server-private</code></td>
<td>Specifies a private RADIUS server.</td>
</tr>
<tr>
<td></td>
<td>Accepts IP address (IPv4) or hostname of the RADIUS server. The hostname option is supported only for IPv4 domain address.</td>
</tr>
<tr>
<td><code>source-interface</code></td>
<td>Specifies interface for source address in RADIUS packet.</td>
</tr>
<tr>
<td><code>throttle</code></td>
<td>Specifies RADIUS throttling options.</td>
</tr>
<tr>
<td><code>vrf</code></td>
<td>Specifies the VRF to which the server group belongs.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode
Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This is an example of configuring the `aaa group server radius` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)#aaa group server radius SG1
RP/0/RSP0/CPU0:router(config-ag-radius)#server 99.1.1.10 auth-port 1812 acct-port 1813
RP/0/RSP0/CPU0:router(config-ag-radius)#throttle access 10 access-timeout 5 accounting 5
```
aaa radius attribute

To configure a format encode string for particular interface or NAS-Port type and to create an AAA radius attribute format configuration, use the `aaa radius attribute` command in Global Configuration mode. To disable this AAA Radius attribute, use the `no` form of this command.

```
aaa radius attribute {called-station-id {format format_name|type value}| calling-station-id {format format_name|type value}| nas-port {format e format_name|type value}| nas-port-id {format e format_name|type value}}

no aaa radius attribute {called-station-id {format format_name|type value}| calling-station-id {format format_name|type value}| nas-port {format e format_name|type value}| nas-port-id {format e format_name|type value}}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>called-station-id</td>
<td>Specifies the AAA nas-port attribute.</td>
</tr>
<tr>
<td>calling-station-id</td>
<td>Specifies the AAA nas-port attribute.</td>
</tr>
<tr>
<td>nas-port</td>
<td>Specifies the AAA nas-port attribute.</td>
</tr>
<tr>
<td>nas-port-id</td>
<td>Specifies the AAA nas-port-id attribute.</td>
</tr>
<tr>
<td>format</td>
<td>Specifies the AAA nas-port attribute format.</td>
</tr>
<tr>
<td>e</td>
<td>Specifies the AAA format type.</td>
</tr>
<tr>
<td>format_name</td>
<td>Specifies a 32 character string representing the format to be used.</td>
</tr>
<tr>
<td>type</td>
<td>Specifies the AAA nas-port attribute format.</td>
</tr>
<tr>
<td>value</td>
<td>Specifies the Nas-Port-Type value to apply format string on. The nas port value ranges from 0-44.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
To use this command, 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 a command, contact your AAA administrator for assistance.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

This is an example of configuring the `aaa radius attribute` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# aaa radius attribute format e red type 40
```
aaa server radius dynamic-author

To configure radius dynamic author server, use the `aaa server radius dynamic-author` command in Global Configuration mode or Admin Configuration mode. To disable this subscriber authentication method, use the `no` form of this command.

```
aaa server radius dynamic-author {client hostname | ignore {server-key | session-key}} | port port_number | server-key {0 | 7 | line_number}
```

```
no aaa server radius dynamic-author
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>session-key</code></td>
<td>Specifies that the session-key could be ignored.</td>
</tr>
<tr>
<td><code>client</code></td>
<td>Represents the CoA client configuration.</td>
</tr>
<tr>
<td><code>hostname</code></td>
<td>Specifies the hostname (IPv4 address or domain of the CoA client).</td>
</tr>
<tr>
<td><code>ignore</code></td>
<td>Specifies the ignore options.</td>
</tr>
<tr>
<td><code>port</code></td>
<td>Specifies the CoA server port to listen on.</td>
</tr>
<tr>
<td><code>server-key</code></td>
<td>Sets the shared secret to verify client CoA requests.</td>
</tr>
<tr>
<td><code>port_number</code></td>
<td>Represents the port number and the value ranges from 1000 to 5000.</td>
</tr>
<tr>
<td><code>0</code></td>
<td>Specifies that the unencrypted key will follow.</td>
</tr>
<tr>
<td><code>7</code></td>
<td>Specifies that the encrypted key will follow.</td>
</tr>
<tr>
<td><code>line_number</code></td>
<td>Represents the unencrypted (cleartext) key.</td>
</tr>
</tbody>
</table>

### Command Default

No default behavior or values.

### Command Modes

Global Configuration mode.

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.1</td>
<td>The support for the keywords, <code>auth-key</code> and <code>ignore {session-key}</code> were removed.</td>
</tr>
</tbody>
</table>
Usage Guidelines
To use this command, 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 a command, contact your AAA administrator for assistance.

If multiple session identification keys are present in the CoA request, an AND operation is performed such that all the keys participate in the session selection. That is, if the CoA request contains the Accounting-Session-ID attribute and a Framed-IP-Address, then these parameters must match on the targeted session. For example, if the Session-ID referenced is 0001111 and the Framed-IP-Address is 10.0.0.10, and if the BNG is having a subscriber session with ID as 00011111 but with address as 10.10.10.1, then the session is not subjected to the CoA action. A CoA NACK is returned in this case.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td></td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples
RP/0/RSP0/CPU0:router(config)# aaa server radius dynamic-author ignore server-key

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show radius (BNG), on page 48</td>
<td>Displays various RADIUS statistics.</td>
</tr>
<tr>
<td>show aaa trace, on page 46</td>
<td>Displays all trace data for AAA sub-system</td>
</tr>
</tbody>
</table>
accounting aaa list

To configure the subscriber accounting feature, use the **accounting aaa list** command in the dynamic template configuration mode. To disable this feature, use the **no** form of this command.

```
accounting aaa list {method_list_name| default} type session {dual-stack-delay time| periodic-interval time}

no accounting aaa list {method_list_name| default} type session {dual-stack-delay time| periodic-interval time}
```

**Syntax Description**

- **method_list_name**: Specifies the preconfigured method list name.
- **default**: Specifies the default method list.
- **type**: Specifies the type of accounting performed.
- **session**: Applies the accounting to a session.
- **dual-stack-delay**: Specifies the dual stack set delay wait in seconds.
- **time**: Specifies the value of the dual stack delay time in seconds. The value ranges from 1-30.
- **periodic-interval**: Specifies the periodic accounting interval in minutes.
- **time**: Specifies the value of the periodic accounting interval in minutes. The value ranges from 1-65535.

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the **dynamic-template** command to enter dynamic template configuration mode.
This is an example of configuring `accounting aaa list` command for periodic accounting interval of 456 minutes:

```
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)# accounting aaa list l1 type session
periodic-interval 456
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dynamic-template, on page 146</td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
<tr>
<td>dynamic-template type ppp, on page 150</td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td>dynamic-template type ipsubscriber, on page 148</td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
</tbody>
</table>
radius-server attribute

To customize the selected radius attributes, use the `radius-server attribute` command in the Global Configuration mode. To disable the Radius server attribute, use the `no` form of this command.

```
radius-server attribute list list_name [attribute {list|vendor-id value}]
noradius-server attribute list list_name [attribute {list|vendor-id value}]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>list</td>
<td>Specifies a list of attributes that are used in conjunction with server-groups to accept or reject a list of attributes.</td>
</tr>
<tr>
<td>list_name</td>
<td>Specifies the list name.</td>
</tr>
<tr>
<td>attribute</td>
<td>Specifies a list of Radius attributes.</td>
</tr>
<tr>
<td>list</td>
<td>Specifies the list of comma-delimited Radius attributes.</td>
</tr>
<tr>
<td>vendor-id</td>
<td>Specifies the vendor-id of the RADIUS attribute.</td>
</tr>
<tr>
<td>value</td>
<td>Specifies the vendor-id value. The value ranges from 0 to 429496729.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This is an example of configuring the `radius-server attribute` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# radius-server attribute list list1
RP/0/RSP0/CPU0:router(config-attribute-filter)# attribute list 1
RP/0/RSP0/CPU0:router(config-attribute-filter)# radius-server attribute vendor-id 429
```
radius-server dead-criteria

To configure the dead server detection criteria for a configured RADIUS server, use the `radius-server dead-criteria` command in the Global Configuration mode. To disable the Radius server dead-criteria, use the `no` form of this command.

```
radius-server dead-criteria {time value|tries number_of_tries}
no radius-server dead-criteria {time value|tries number_of_tries}
```

**Syntax Description**

- **time**
  - Specifies the minimum time that must elapse since a response was received from this RADIUS server.

- **value**
  - Specifies the time in seconds. The value ranges from 1 to 120.

- **tries**
  - Specifies the minimum number of transmissions (original attempts plus retransmits) to this RADIUS server.

- **number_of_tries**
  - Specifies the number of tries. The range is from 1 to 100.

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This is an example of configuring the `radius-server dead-criteria` command with 100s time and 34 tries:

```bash
RP/0/RSP0/CPU0:router(config)#radius-server dead-criteria time 100
RP/0/RSP0/CPU0:router(config)#radius-server dead-criteria tries 34
```
radius-server deadtime (BNG)

To improve RADIUS response times when some servers are unavailable and cause the unavailable servers to be skipped immediately, use the `radius-server deadtime` command. To set deadtime to 0, use the `no` form of this command.

```
radius-server deadtime value
no radius-server deadtime value
```

**Syntax Description**

| value | Length of time, in minutes, for which a RADIUS server is skipped over by transaction requests, up to a maximum of 1440 (24 hours). The range is from 1 to 1440. The default value is 0. |

**Command Default**

Dead time is set to 0.

**Command Modes**

Global configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

A RADIUS server marked as dead is skipped by additional requests for the duration of minutes unless all other servers are marked dead and there is no rollover method.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This example specifies five minutes of deadtime for RADIUS servers that fail to respond to authentication requests for the `radius-server deadtime` command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius-server deadtime 5
```
radius-server disallow null-username

To drop radius access-requests that has blank or no username, use the radius-server disallow null-username command in the Global Configuration mode. To disable the Radius server disallow null-username, use the no form of this command.

radius-server disallow null-username
no radius-server disallow null-username

Syntax Description
This command has no keywords or arguments.

Command Default
None

Command Modes
Global Configuration mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines
To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples
This is an example of configuring the radius-server disallow null-username command in the Global Configuration mode:

RP/0/RSP0/CPU0:router(config)#radius-server disallow null-username
radius-server host (BNG)

To specify a RADIUS server host, use the `radius-server host` command in Global Configuration mode. To delete the specified RADIUS host, use the `no` form of this command.

```
radius-server host ip-address [auth-port port-number] [acct-port port-number] [timeout seconds] [retransmit retries] [key string]
no radius-server host ip-address [auth-port port-number] [acct-port port-number]
```

**Syntax Description**

- `ip-address` (Optional) IP address of the RADIUS server host. IPv6 address is not supported.
- `auth-port port-number` (Optional) Specifies the User Datagram Protocol (UDP) destination port for authentication requests; the host is not used for authentication if set to 0. If unspecified, the port number defaults to 1645.
- `acct-port port-number` (Optional) Specifies the UDP destination port for accounting requests; the host is not used for accounting if set to 0. If unspecified, the port number defaults to 1646.
- `timeout seconds` (Optional) The time interval (in seconds) that the router waits for the RADIUS server to reply before retransmitting. This setting overrides the global value of the `radius-server timeout` command. If no timeout value is specified, the global value is used. Enter a value in the range from 1 to 1000. Default is 5.
- `retransmit retries` (Optional) The number of times a RADIUS request is re-sent to a server, if that server is not responding or is responding slowly. This setting overrides the global setting of the `radius-server retransmit` command. If no retransmit value is specified, the global value is used. Enter a value in the range from 1 to 100. Default is 3.
- `key string` (Optional) Specifies the authentication and encryption key used between the router and the RADIUS server. This key overrides the global setting of the `radius-server key` command. If no key string is specified, the global value is used. The key is a text string that must match the encryption key used on the RADIUS server. Always configure the key as the last item in the `radius-server host` command syntax. This is because the leading spaces are ignored, but spaces within and at the end of the key are used. If you use spaces in the key, do not enclose the key in quotation marks unless the quotation marks themselves are part of the key.

**Command Default**

No RADIUS host is specified; use global `radius-server` command values.

**Command Modes**

Global Configuration mode
Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

You can use multiple `radius-server host` commands to specify multiple hosts. The Cisco IOS XR software searches for hosts in the order in which you specify them.

If no host-specific timeout, retransmit, or key values are specified, the global values apply to each host.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This example shows how to establish the host with IP address 172.29.39.46 as the RADIUS server, use ports 1612 and 1616 as the authorization and accounting ports, set the timeout value to 6, set the retransmit value to 5, and set “rad123” as the encryption key, matching the key on the RADIUS server:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius-server host 172.29.39.46 auth-port 1612 acct-port 1616 timeout 6 retransmit 5 key rad123
```

To use separate servers for accounting and authentication, use the zero port value as appropriate.

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>aaa accounting subscriber</code></td>
<td>Creates a method list for accounting.</td>
</tr>
<tr>
<td><code>aaa authentication subscriber</code></td>
<td>Creates a method list for authentication.</td>
</tr>
<tr>
<td><code>aaa authorization subscriber</code></td>
<td>Creates a method list for authorization.</td>
</tr>
<tr>
<td><code>radius-server key (BNG)</code></td>
<td>Sets the authentication and encryption key for all RADIUS communications between the router and the RADIUS daemon.</td>
</tr>
<tr>
<td><code>radius-server retransmit (BNG)</code></td>
<td>Specifies how many times Cisco IOS XR software retransmits packets to a server before giving up.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>radius-server timeout (BNG), on page 40</td>
<td>Sets the interval a router waits for a server host to reply.</td>
</tr>
</tbody>
</table>
radius-server ipv4 dscp

To mark the dscp bit for the ipv4 packets, use the radius-server ipv4 dscp command in the Global Configuration mode. To disable the Radius server IPv4 dscp, use the no form of this command.

radius-server ipv4 dscp value
no radius-server ipv4 dscp value

Syntax Description

| value | Specifies the differentiated services codepoint value. The value ranges from 1 to 63. |

Command Default

None

Command Modes

Global Configuration mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This is an example of configuring the radius-server ipv4 dscp command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)#radius-server ipv4 dscp 34
```
radius-server key (BNG)

To set the authentication and encryption key for all RADIUS communications between the router and the RADIUS daemon, use the radius-server key command. To disable the key, use the no form of this command.

```
radius-server key {0 clear-text-key| 7 encrypted-key| clear-text-key}
no radius-server key
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 clear-text-key</td>
<td>Specifies an unencrypted (cleartext) shared key.</td>
</tr>
<tr>
<td>7 encrypted-key</td>
<td>Specifies an encrypted shared key.</td>
</tr>
<tr>
<td>clear-text-key</td>
<td>Specifies an unencrypted (cleartext) shared key.</td>
</tr>
</tbody>
</table>

**Command Default**

The authentication and encryption key is disabled.

**Command Modes**

Global configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

The key entered must match the key used on the RADIUS server. All leading spaces are ignored, but spaces within and at the end of the key are used. If you use spaces in your key, do not enclose the key in quotation marks unless the quotation marks themselves are part of the key.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This example shows how to set the cleartext key to "samplekey":

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius-server key 0 samplekey
```

This example shows how to set the encrypted shared key to "anykey":

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius-server key 7 anykey
```
radius-server load-balance

To configure the RADIUS load-balancing options, use the `radius-server load-balance` command in the Global Configuration mode. To disable the Radius server load-balance, use the `no` form of this command.

```
radius-server load-balance method least-outstanding [batch-size value] ignore-preferred-server
no radius-server load-balance method least-outstanding
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>method</code></td>
<td>Specifies the method by which the next host will be picked.</td>
</tr>
<tr>
<td><code>least-outstanding</code></td>
<td>Picks the server with the least transactions outstanding.</td>
</tr>
<tr>
<td><code>batch-size</code></td>
<td>Specifies the batch size for the selection of the server.</td>
</tr>
<tr>
<td><code>value</code></td>
<td>Specifies the batch size value. The value ranges from 1 to 1500. The default is 25.</td>
</tr>
<tr>
<td><code>ignore-preferred-server</code></td>
<td>Disables the preferred server for this server group.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This is an example of configuring the **radius-server load-balance** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)#radius-server load-balance method lead-outstanding batch-size 25
RP/0/RSP0/CPU0:router(config)#radius-server load-balance method lead-outstanding batch-size ignore-preferred-server
```
radius-server retransmit (BNG)

To specify the number of times the Cisco IOS XR software retransmits a packet to a server before giving up, use the `radius-server retransmit` command. The `no` form of this command sets it to the default value of 3.

```
radius-server retransmit {retries disable}
no radius-server retransmit {retries disable}
```

**Syntax Description**

- `retries` Maximum number of retransmission attempts. The range is from 1 to 100. Default is 3.
- `disable` Disables the radius-server transmit command.

**Command Default**
The RADIUS servers are retried three times, or until a response is received.

**Command Modes**
Global configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

The RADIUS client tries all servers, allowing each one to time out before increasing the retransmit count.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to specify a retransmit counter value of five times:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius-server retransmit 5
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>radius-server key (BNG), on page 33</td>
<td>Sets the authentication and encryption key for all RADIUS communications between the router and the RADIUS daemon.</td>
</tr>
</tbody>
</table>
radius-server source-port

To configure the NAS to use a total of 50 ports as the source ports for sending out RADIUS requests, use the `radius-server source-port` command in the Global Configuration mode. To disable the Radius server source-port, use the `no` form of this command.

radius-server source-port extended
no radius-server source-port extended

**Syntax Description**

| extended | Specifies that the source-port can be extended to 50. |

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Having 200 source ports allows up to 256*200 authentication and accounting requests to be outstanding at one time. During peak call volume, typically when a router first boots or when an interface flaps, the extra source ports allow sessions to recover more quickly on large-scale aggregation platforms.

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
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</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `radius-server source-port` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)#radius-server source-port extended
```
radius-server timeout (BNG)

To set the interval for which a router waits for a server host to reply before timing out, use the **radius-server timeout** command. To restore the default, use the **no** form of this command.

```
radius-server timeout seconds
no radius-server timeout
```

### Syntax Description

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>seconds</td>
<td>Number that specifies the timeout interval, in seconds. Range is from 1 to 1000.</td>
</tr>
</tbody>
</table>

### Command Default

The default radius-server timeout value is 5 seconds.

### Command Modes

Global configuration mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the **radius-server timeout** command to set the number of seconds a router waits for a server host to reply before timing out.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to change the interval timer to 10 seconds:

```
RP/0/RSP0/CP00:router# configure
RP/0/RSP0/CP00:router(config)# radius-server timeout 10
```
radius-server vsa attribute ignore unknown

To specify the unknown vsa ignore configuration for RADIUS server, use the **radius-server vsa attribute ignore unknown** command in the Global Configuration mode. To disable this feature, use the **no** form of this command.

**radius-server vsa attribute ignore unknown**

**no radius-server vsa attribute ignore unknown**

**Syntax Description**

This command has no keywords or arguments.

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the **radius-server vsa attribute ignore unknown** command in the Global Configuration mode:

```
RP/0/RSP0/CPUD0:router(config)#radius-server vsa attribute ignore unknown
```
radius-server throttle

To configure RADIUS throttling options for access and accounting to flow control the number of access and accounting requests sent to a RADIUS server, use the `radius-server throttle` command in the Global Configuration mode. To disable the radius server throttle, use the `no` form of this command.

```
radius-server throttle {access value {access-timeout time| accounting value} | accounting acc_value}
no radius-server throttle {access value {access-timeout time| accounting value} | accounting acc_value}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>access value</td>
<td>Controls the number of access requests sent to a radius server.</td>
</tr>
<tr>
<td>value</td>
<td>Specifies the number of outstanding access requests after which throttling should be performed. The value ranges from 0 to 65535 and the preferred value 100.</td>
</tr>
<tr>
<td>access-timeout</td>
<td>Specifies the number of timeouts exceeding which a throttled access request is dropped.</td>
</tr>
<tr>
<td>time</td>
<td>Specifies the number of timeouts for a transaction. The default value is 3.</td>
</tr>
<tr>
<td>accounting acc_value</td>
<td>Specifies the number of outstanding accounting transactions after which throttling should be performed. The value ranges from 0 to 65535 and the preferred value 100.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Global Configuration mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

This is an example of configuring the **radius-server throttle** command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router(config)# radius-server throttle access 10 access-timeout 5 accounting 10
```
radius source-interface (BNG)

To force RADIUS to use the IP address of a specified interface or subinterface for all outgoing RADIUS packets, use the `radius source-interface` command. To prevent only the specified interface from being the default and not from being used for all outgoing RADIUS packets, use the `no` form of this command.

```bash
radius source-interface interface [vrf vrf_name]
no radius source-interface interface
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface-name</code></td>
<td>Name of the interface that RADIUS uses for all of its outgoing packets.</td>
</tr>
<tr>
<td><code>vrf vrf-id</code></td>
<td>Specifies the name of the assigned VRF.</td>
</tr>
</tbody>
</table>

**Command Default**

If a specific source interface is not configured, or the interface is down or does not have an IP address configured, the system selects an IP address.

**Command Modes**

Global configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported on BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `radius source-interface` command to set the IP address of the specified interface or subinterface for all outgoing RADIUS packets. This address is used as long as the interface or subinterface is in the up state. In this way, the RADIUS server can use one IP address entry for every network access client instead of maintaining a list of IP addresses.

The specified interface or subinterface must have an IP address associated with it. If the specified interface or subinterface does not have an IP address or is in the down state, then RADIUS reverts to the default. To avoid this, add an IP address to the interface or subinterface or bring the interface to the up state.

The `radius source-interface` command is especially useful in cases in which the router has many interfaces or subinterfaces and you want to ensure that all RADIUS packets from a particular router have the same IP address.
### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

This example shows how to make RADIUS use the IP address of subinterface s2 for all outgoing RADIUS packets:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# radius source-interface loopback 10 vrf vrf1
```
show aaa trace

To display all trace data for AAA sub-system, use the **show aaa trace** command in the EXEC mode.

```
show aaa trace [basic| errors| file| func| hexdump| job| last| location| reverse| stats| tailf| unique| usec| verbose| wide| wrapping]
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>basic</td>
<td>Displays the data for AAA basic events.</td>
</tr>
<tr>
<td>errors</td>
<td>Displays the data for AAA client library errors.</td>
</tr>
<tr>
<td>file</td>
<td>Displays the specific file.</td>
</tr>
<tr>
<td>func</td>
<td>Displays the data for AAA function.</td>
</tr>
<tr>
<td>hexdump</td>
<td>Displays the traces in hexadecimal.</td>
</tr>
<tr>
<td>job</td>
<td>Displays the job ID.</td>
</tr>
<tr>
<td>last</td>
<td>Displays the last n entries.</td>
</tr>
<tr>
<td>location</td>
<td>Displays the card location.</td>
</tr>
<tr>
<td>reverse</td>
<td>Displays the latest traces first.</td>
</tr>
<tr>
<td>stats</td>
<td>Displays the statistics.</td>
</tr>
<tr>
<td>tailf</td>
<td>Displays the new traces as they were added.</td>
</tr>
<tr>
<td>unique</td>
<td>Displays the unique entries with counts.</td>
</tr>
<tr>
<td>verbose</td>
<td>Displays the internal debugging information.</td>
</tr>
<tr>
<td>wrapping</td>
<td>Displays the wrapping entries.</td>
</tr>
<tr>
<td></td>
<td>Displays the output modifiers.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

This is the sample output of the `show aaa trace` command:

```
RP/0/RSP0/CPU0:router# show aaa trace func
Tue Jan 15 07:59:10.381 UTC
4 wrapping entries (1088 possible, 64 allocated, 0 filtered, 4 total)
Jan 15 06:11:00.958 aaa/func 0/RSP0/CPU0 t5 ENTERING aaa_connect2
Jan 15 06:11:00.962 aaa/func 0/RSP0/CPU0 t5 ENTERING get_unique_context
Jan 15 06:11:00.963 aaa/func 0/RSP0/CPU0 t5 EXITING get_unique_context
Jan 15 06:11:00.963 aaa/func 0/RSP0/CPU0 t5 EXITING aaa_connect2
```
show radius (BNG)

To display the tunnel-related information, use the show radius command in the EXEC mode.

```
show radius [accounting| authentication| dead-criteria| double-dip| location| server-groups]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>accounting</td>
<td>Displays the RADIUS accounting data.</td>
</tr>
<tr>
<td>authentication</td>
<td>Displays the RADIUS authentication data.</td>
</tr>
<tr>
<td>dead-criteria</td>
<td>Displays the RADIUS dead-server detection criteria.</td>
</tr>
<tr>
<td>double-dip</td>
<td>Displays the RADIUS double-dip data.</td>
</tr>
<tr>
<td>location</td>
<td>Specifies the RADIUS instance location.</td>
</tr>
<tr>
<td>server-groups</td>
<td>Displays the RADIUS server group information.</td>
</tr>
<tr>
<td></td>
<td>Displays the output modifiers.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read</td>
</tr>
</tbody>
</table>
This is the sample output of the `show radius` command:

```
RP/0/RSP0/CPU0:router# show radius | file tftp: vrf vrf1 |
```

The show radius output is as follows:

```
Wed Mar  7 19:22:40.392 IST
Global dead time: 0 minute(s)
Number of Servers:2

Server: 10.1.0.3/1645/1646 is UP
Total Deadtime: 0s Last Deadtime: 0s
Timeout: 5 sec, Retransmit limit: 3
Quarantined: No
Authentication:
  1 requests, 0 pending, 0 retransmits
  1 accepts, 0 rejects, 0 challenges
  0 timeouts, 0 bad responses, 0 bad authenticators
  0 unknown types, 0 dropped, 50 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Access Transactions: 0
Maximum Throttled Access Transactions: 0

Automated TEST Stats:
  0 requests, 0 timeouts, 0 response, 0 pending

Accounting:
  1 requests, 0 pending, 0 retransmits
  1 responses, 0 timeouts, 0 bad responses
  0 bad authenticators, 0 unknown types, 0 dropped
  189 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Accounting Transactions: 0
Maximum Throttled Accounting Transactions: 0

Automated TEST Stats:
  0 requests, 0 timeouts, 0 response, 0 pending

Server: 1.1.1.1/1645/1646 is UP
Total Deadtime: 0s Last Deadtime: 0s
Timeout: 5 sec, Retransmit limit: 3
Quarantined: No
Authentication:
  0 requests, 0 pending, 0 retransmits
  0 accepts, 0 rejects, 0 challenges
  0 timeouts, 0 bad responses, 0 bad authenticators
  0 unknown types, 0 dropped, 0 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Access Transactions: 0
Maximum Throttled Access Transactions: 0

Automated TEST Stats:
  0 requests, 0 timeouts, 0 response, 0 pending

Accounting:
  0 requests, 0 pending, 0 retransmits
  0 responses, 0 timeouts, 0 bad responses
  0 bad authenticators, 0 unknown types, 0 dropped
  0 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Accounting Transactions: 0
Maximum Throttled Accounting Transactions: 0

Automated TEST Stats:
  0 requests, 0 timeouts, 0 response, 0 pending

RP/0/RSP0/CPU0:router# show rad server-groups SG1

Server group 'SG1' has 1 server(s)
  VRF (id 0x0)
  Dead time: 0 minute(s) (inherited from global)
Contains 1 server(s)
Server 10.1.0.3/1645/1646

Authentication:
1 requests, 0 pending, 0 retransmits
1 accepts, 0 rejects, 0 challenges
0 timeouts, 0 bad responses, 0 bad authenticators
0 unknown types, 0 dropped, 50 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Access Transactions: 0
Maximum Throttled Access Transactions: 0

Automated TEST Stats:
0 requests, 0 timeouts, 0 response, 0 pending

Accounting:
1 requests, 0 pending, 0 retransmits
1 responses, 0 timeouts, 0 bad responses
0 bad authenticators, 0 unknown types, 0 dropped
189 ms latest rtt
Throttled: 0 transactions, 0 timeout, 0 failures
Estimated Throttled Accounting Transactions: 0
Maximum Throttled Accounting Transactions: 0

Automated TEST Stats:
0 requests, 0 timeouts, 0 response, 0 pending

This table describes the significant fields shown in the display.

### Table 1: show radius Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>Server IP address/UDP destination port for authentication requests/UDP destination port for accounting requests.</td>
</tr>
<tr>
<td>Timeout</td>
<td>Number of seconds the router waits for a server host to reply before timing out.</td>
</tr>
<tr>
<td>Retransmit limit</td>
<td>Number of times the Cisco IOS XR software searches the list of RADIUS server hosts before giving up.</td>
</tr>
<tr>
<td>Deadtime</td>
<td>Length of time in minutes for a RADIUS server to remain marked dead.</td>
</tr>
</tbody>
</table>
show radius server-groups detail

To display the detailed summary of the RADIUS server group information, use the `show radius server-groups detail` command in the EXEC mode.

### Syntax Description

```
server_group_name
```

Specifies the name of the RADIUS server group.

### Command Default

None

### Command Modes

EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>read</td>
</tr>
</tbody>
</table>

### Examples

This is sample output of the `show radius server-groups detail` command:

```
RP/0/RSP0/CPU0:router# show radius server-groups SG1 detail
Wed Jan 18 06:04:59.432 EST
Server group 'SG1' has 1 server(s)
  VRF (id 0x0)
  Dead time: 0 minute(s) (inherited from global)
  Contains 1 server(s)
  Server 99.0.0.10/1812/1813
  Authentication: 100 requests, 0 pending, 0 retransmits
                 100 accepts, 0 rejects, 0 challenges
                 0 timeouts, 0 bad responses, 0 bad authenticators
                 0 unknown types, 0 dropped, 0 ms latest rtt
                 Throttled: 0 transactions, 0 timeout, 0 failures
                 Estimated Throttled Access Transactions: 0
```
Maximum Throttled Access Transactions: 0
Automated TEST Stats:
  0 requests, 0 timeouts, 0 response, 0 pending

This table describes the significant fields shown in the display.

### Table 2: show radius Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server</td>
<td>Server IP address/UDP destination port for authentication requests/UDP destination port for accounting requests.</td>
</tr>
<tr>
<td>Deadtime</td>
<td>Length of time in minutes for a RADIUS server to remain marked dead.</td>
</tr>
<tr>
<td>Authentication</td>
<td>Specifies the authentication details.</td>
</tr>
<tr>
<td>Automated TEST Stats</td>
<td>Specifies the total time taken for sending requests, total timeouts, and the response time.</td>
</tr>
</tbody>
</table>
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.

- ipv4 access-group (BNG), page 54
- ipv4 access-list (BNG), page 57
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]\}
```

```
no 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**

Interface configuration (applicable only for BNG)
Dynamic template configuration (applicable only for BNG)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.1.1</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>acl</td>
<td>read, write</td>
</tr>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

---

### Examples

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 pl
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
no 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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>This command was supported in BNG.</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>acl</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

```
RP/0/RSP0/CPU0:router(config)# ipv4 access-list Internetfilter
RP/0/RSP0/CPU0:router(config-ipv4-acl)# 10 permit 192.168.34.0 0.0.0.255
```
20 permit 172.16.0.0 0.0.255.255
30 permit 10.0.0.0 0.255.255.255
39 remark Block BGP traffic from 172.16 net.
40 deny tcp host 172.16.0.0 eq bgp host 192.168.202.203 range 1300 1400
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.

- address-range, page 60
- exclude, page 62
- network (BNG), page 64
- pool vrf, page 66
- pool ipv4, page 68
- show pool ipv4 name, page 70
- show pool vrf, page 74
address-range

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

**address-range first_range last_range**

**no address-range first_range last_range**

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>first_range</td>
<td>Specifies the first address in range from which the IP addresses can be assigned to clients.</td>
</tr>
<tr>
<td>last_range</td>
<td>Specifies the last address in range until which the IP addresses can be assigned to clients.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Pool IPv4 configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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.

Multiple address-ranges are allowed within a pool.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool ipv4</td>
<td>Enables distributed address pool service on ipv4.</td>
</tr>
<tr>
<td>pool vrf</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
<tr>
<td>exclude</td>
<td>Specifies a range of IP addresses that distributed address pool service should not assign to clients.</td>
</tr>
</tbody>
</table>
exclude

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

```
exclude {first_address| last_address}
no exclude {first_address| last_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

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `pool ipv4` command to enter IPv4 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

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

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
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool ipv4, on page 68</td>
<td>Enables distributed address pool service on IPv4.</td>
</tr>
<tr>
<td>pool vrf, on page 66</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
<tr>
<td>network (BNG), on page 64</td>
<td>Specifies a set of addresses or prefixes inside a subnet.</td>
</tr>
</tbody>
</table>
network (BNG)

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

```
network  {IPv4_subnet/length }
network  {IPv4_subnet/length }
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>IPv4_subnet</code></td>
<td>Specifies the decimal representation of the IPv4 subnet mask.</td>
</tr>
<tr>
<td><code>length</code></td>
<td>Specifies the length of the prefix.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>The prefix length must be a maximum of 16 bit more than the subnet mask.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Pool IPv4 configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>Support for IPv6 was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 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.

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 $2^{32}$ 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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool ipv4, on page 68</td>
<td>Enables distributed address pool service on ipv4.</td>
</tr>
<tr>
<td>pool vrf, on page 66</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
</tbody>
</table>
### 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}
no pool vrf {vrf_name| all} {ipv4| pool_name}
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vrf_name</code></td>
<td>Specifies the name of the vrf.</td>
</tr>
<tr>
<td><code>ipv4</code></td>
<td>Specifies IPv4 pool name. Each pool must have a unique name across all VRFs.</td>
</tr>
<tr>
<td><code>pool_name</code></td>
<td>Specifies the name of the pool for IPv4.</td>
</tr>
<tr>
<td><code>all</code></td>
<td>Specifies the global pool.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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

**Note**

Each pool must have a unique name across all VRFs. For example, pool1 cannot 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.
**Examples**

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)#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool ipv4, on page 68</td>
<td>Enables distributed address pool service on IPv4.</td>
</tr>
</tbody>
</table>
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
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool vrf, on page 66</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
<tr>
<td>exclude, on page 62</td>
<td>Specifies a range of IP addresses that distributed address pool service should not assign to clients.</td>
</tr>
<tr>
<td>address-range, on page 60</td>
<td>Specifies a range of IP addresses.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>Support for IPv6 was added.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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
show pool ipv4 name

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 3: show pool ipv4 name Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRF</td>
<td>Specifies the VRF the pool is associated with.</td>
</tr>
<tr>
<td>Pool ID</td>
<td>The unique pool ID of a specific pool.</td>
</tr>
<tr>
<td>Pool Scope</td>
<td>Pool scope belongs to the VRF specific pool.</td>
</tr>
<tr>
<td>Prefix Length</td>
<td>Length of the prefix specified.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool vrf, on page 66</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
<tr>
<td>pool ipv4, on page 68</td>
<td>Enables distributed address pool service on ipv4.</td>
</tr>
<tr>
<td>exclude, on page 62</td>
<td>Specifies a range of IP addresses that distributed address pool service should not assign to clients.</td>
</tr>
<tr>
<td>address-range, on page 60</td>
<td>Specifies a range of IP addresses.</td>
</tr>
</tbody>
</table>
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
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf_name</td>
<td>Specifies the vrf name.</td>
</tr>
<tr>
<td>all</td>
<td>Displays all vrfs.</td>
</tr>
<tr>
<td>ipv4</td>
<td>Specifies the IPv4 pool.</td>
</tr>
<tr>
<td></td>
<td>Specifies the output modifiers.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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%

<table>
<thead>
<tr>
<th>Pool Name</th>
<th>Pool ID</th>
<th>VRF</th>
<th>Used</th>
<th>Excl</th>
<th>Free</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>test1</td>
<td>4</td>
<td>vrf2</td>
<td>0</td>
<td>0</td>
<td>254</td>
<td>254</td>
</tr>
</tbody>
</table>

This table describes the significant fields shown in the display.

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRF</td>
<td>Specifies the VRF the pool is associated with.</td>
</tr>
<tr>
<td>Pool ID</td>
<td>The unique pool ID of a specific pool.</td>
</tr>
<tr>
<td>Pool Name</td>
<td>The name of the IPv6 pool.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool vrf, on page 66</td>
<td>Enables distributed address pool service on vrf.</td>
</tr>
<tr>
<td>pool ipv4, on page 68</td>
<td>Enables distributed address pool service on ipv4.</td>
</tr>
<tr>
<td>exclude, on page 62</td>
<td>Specifies a range of IP addresses that distributed address pool service should not assign to clients.</td>
</tr>
<tr>
<td>address-range, on page 60</td>
<td>Specifies a range of IP addresses.</td>
</tr>
</tbody>
</table>
show pool vrf
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.

- activate, page 78
- authenticate (BNG), page 80
- authorize, page 82
- class-map type control subscriber, page 84
- deactivate, page 86
- event, page 88
- match (class-map), page 90
- policy-map type control subscriber, page 92
- service-policy type control subscriber, page 94
- show class-map, page 96
- show policy-map, page 98
activate

To activate the dynamic template mode in the class map sub-configuration mode, use the `activate` command in the Global Configuration mode. To disable this feature, use the `no` form of this command.

```
activate dynamic-template name aaa list {list_name|default}
no activate
```

**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.

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>deactivate, on page 86</td>
<td>Deactivates the dynamic template mode in the class map sub-configuration mode.</td>
</tr>
</tbody>
</table>
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}
no authenticate
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>Specifies the AAA parameters.</td>
</tr>
<tr>
<td>list</td>
<td>Specifies AAA method list that authentication should be made with.</td>
</tr>
<tr>
<td>default</td>
<td>Specifies the default AAA method list.</td>
</tr>
<tr>
<td>list_name</td>
<td>Specifies the name of the AAA method list.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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 PLL
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}}

no authorize

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>Specifies the AAA parameters.</td>
</tr>
<tr>
<td>list</td>
<td>Specifies AAA method list that authorization should be made with.</td>
</tr>
<tr>
<td>default</td>
<td>Specifies the default AAA method list.</td>
</tr>
<tr>
<td>list_name</td>
<td>Specifies the name of the AAA method list.</td>
</tr>
<tr>
<td>format</td>
<td>Specifies an authorize format name.</td>
</tr>
<tr>
<td>format_name</td>
<td>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.</td>
</tr>
<tr>
<td>password</td>
<td>Specifies a password to be used for AAA request.</td>
</tr>
<tr>
<td>use-from-line</td>
<td>Specifies the line from which the password needs to be used.</td>
</tr>
<tr>
<td>password</td>
<td>Specifies a clear text password.</td>
</tr>
<tr>
<td>identifier</td>
<td>Specifies an authorize identifier.</td>
</tr>
<tr>
<td>circuit-id</td>
<td>Specifies to use circuit-id as the username in authorize request.</td>
</tr>
<tr>
<td>remote-id</td>
<td>Specifies to use remote-id as the username in authorize request.</td>
</tr>
<tr>
<td>source-address-ipv4</td>
<td>Specifies to use source-address-ipv4 as the username in authorize request.</td>
</tr>
<tr>
<td>source-address-mac</td>
<td>Specifies to use source-address-mac as the username in authorize request.</td>
</tr>
<tr>
<td>username</td>
<td>Specifies an authorize username.</td>
</tr>
</tbody>
</table>

Command Default

None

Command Modes

Global Configuration mode


**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```
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
no class-map type control subscriber { match-all | match-any } class-map name
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>class-map name</code></td>
<td>Specifies the class map name.</td>
</tr>
<tr>
<td><code>match-all</code></td>
<td>Configures the match all criteria for this class.</td>
</tr>
<tr>
<td><code>match-any</code></td>
<td>Configures the match any criteria for this class.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>policy-map type control subscriber</code>, <a href="#">on page 92</a></td>
<td>Enables the policy-map.</td>
</tr>
<tr>
<td><code>event</code>, <a href="#">on page 88</a></td>
<td>Enables the event in a policy-map.</td>
</tr>
</tbody>
</table>
**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}
no deactivate
```

### Syntax Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dynamic-template</code></td>
<td>Specifies the actions related to dynamic templates.</td>
</tr>
<tr>
<td><code>name</code></td>
<td>Specifies the name of the dynamic template.</td>
</tr>
<tr>
<td><code>aaa</code></td>
<td>Specifies the AAA parameters.</td>
</tr>
<tr>
<td><code>list</code></td>
<td>Specifies AAA method list that authentication should be made with.</td>
</tr>
<tr>
<td><code>default</code></td>
<td>Specifies the default AAA method list.</td>
</tr>
<tr>
<td><code>list_name</code></td>
<td>Specifies the name of the AAA method list.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Global Configuration mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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)# deactivate dynamic-template DL1 aaa list default
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>activate, on page 78</td>
<td>Activates the dynamic template mode in the class map sub-configuration mode.</td>
</tr>
</tbody>
</table>
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 | authentication-failure | authentication-no-response |
authorization-failure | authorization-no-response | service-start | service-stop | session-activate |
session-start | session-stop | timer-expiry }
no event { account-logoff | account-logon | authentication-failure | authentication-no-response |
authorization-failure | authorization-no-response | service-start | service-stop | session-activate |
session-start | session-stop | timer-expiry }
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>account-logoff</code></td>
<td>Specifies an account logoff event.</td>
</tr>
<tr>
<td><code>account-logon</code></td>
<td>Specifies an account logon event.</td>
</tr>
<tr>
<td><code>authentication-failure</code></td>
<td>Specifies an authentication failure event.</td>
</tr>
<tr>
<td><code>authentication-no-response</code></td>
<td>Specifies an authentication no response event.</td>
</tr>
<tr>
<td><code>authorization-failure</code></td>
<td>Specifies an authorization failure event.</td>
</tr>
<tr>
<td><code>authorization-no-response</code></td>
<td>Specifies an authorization no response event.</td>
</tr>
<tr>
<td><code>service-start</code></td>
<td>Specifies a service start event.</td>
</tr>
<tr>
<td><code>service-stop</code></td>
<td>Specifies a service stop event.</td>
</tr>
<tr>
<td><code>session-activate</code></td>
<td>Specifies session activate event.</td>
</tr>
<tr>
<td><code>session-start</code></td>
<td>Specifies session start event.</td>
</tr>
<tr>
<td><code>session-stop</code></td>
<td>Specifies session start event.</td>
</tr>
<tr>
<td><code>timer-expiry</code></td>
<td>Specifies the timer expiry event.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Policy-map configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

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

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

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

```
RP/0/RSP0/CPU0:router(config)# policy-map type control subscriber poll
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
dhcp_id_format password xya
RP/0/RSP0/CPU0:router(config-cmap-c)# 10 authorize aaa list default Identifier format
dhcp_id_format password xya
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>class-map type control subscriber</code>, on page 84</td>
<td>Enables the class-map.</td>
</tr>
<tr>
<td><code>policy-map type control subscriber</code>, on page 92</td>
<td>Enables the policy-map.</td>
</tr>
</tbody>
</table>
**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.

```plaintext
match {authen-status \{authenticated|unauthenticated\}|domain \{domain_name|regexp string\} format format_name|not |protocol \{dhcpv4|dhcpv6\}|source-address \{ipv4|mac\}|timer \{string|regexp string\}|username \{string|regexp string\}
no match {authen-status \{authenticated|unauthenticated\}|domain \{domain_name|regexp string\} format format_name|not |protocol \{dhcpv4|dhcpv6\}|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.
- **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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

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

Examples

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
```
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`
`no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-map type control subscriber, on page 84</td>
<td>Enables the class-map.</td>
</tr>
<tr>
<td>event, on page 88</td>
<td>Enables the event in the policy-map.</td>
</tr>
</tbody>
</table>
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
no service-policy type control subscriber name
```

### Syntax Description

| name | Represents the policy map name. |

### Command Default

None

### Command Modes

Interface configuration mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-map type control subscriber, on page 84</td>
<td>Enables the class-map.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>event, on page 88</td>
<td>Enables the event in the policy-map.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Displays the type of classmap.</td>
</tr>
<tr>
<td>control</td>
<td>Displays all the control class maps.</td>
</tr>
<tr>
<td>subscriber</td>
<td>Displays all the subscriber control class maps.</td>
</tr>
<tr>
<td>name</td>
<td>Displays the class map name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClassMap</td>
<td>Specifies the class map name.</td>
</tr>
<tr>
<td>Type</td>
<td>Specifies the type of the class map.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-map type control subscriber, on page 84</td>
<td>Determines the list of actions to be executed for the class and enters the class-map configuration mode.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Displays the type of policy-map.</td>
</tr>
<tr>
<td>control</td>
<td>Displays the control type policy-map.</td>
</tr>
<tr>
<td>subscriber</td>
<td>Displays the subscriber control type policy-map.</td>
</tr>
<tr>
<td>pmap_name</td>
<td>Specifies the policy-map name.</td>
</tr>
<tr>
<td>name</td>
<td>Displays the policy map name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>policy-map</td>
<td>Specifies the policy map name.</td>
</tr>
<tr>
<td>Type</td>
<td>Specifies the type of the class type control subscriber.</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>policy-map type control subscriber, on page 92</td>
<td>Determines the list of events that are applicable to the subscriber lifecycle and to enter the policy-map configuration mode.</td>
</tr>
</tbody>
</table>
show policy-map
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.

- broadcast-flag policy check (BNG), page 103
- class, page 105
- dhcp ipv4 (BNG), page 107
- duplicate-mac-allowed, page 108
- helper-address (BNG), page 110
- interface (DHCP-BNG), page 112
- lease proxy client-lease-time, page 114
- limit lease per-circuit-id, page 116
- limit lease per-interface, page 118
- limit lease per-remote-id, page 120
- match option, page 122
- match vrf, page 124
- profile (BNG), page 125
- rapid commit, page 126
- relay information check (BNG), page 127
- relay information option (BNG), page 129
- relay information option allow-untrusted (BNG), page 131
- relay information policy (BNG), page 133
- show dhcp ipv4 proxy binding, page 135
- show dhcp ipv4 proxy interface (BNG), page 139
- show dhcp ipv4 proxy profile, page 141
• show dhcp ipv4 proxy statistics, page 143
broadcast-flag policy check (BNG)

To configure Dynamic Host Configuration Protocol (DHCP) IPv4 Relay to broadcast only BOOTREPLY packets if the DHCP IPv4 broadcast 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 }
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
<tr>
<td>Release 5.1</td>
<td>The unicast-always keyword was added.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```
RP/0/RSP0/CPU0:router# config
```
This an example of the `broadcast-flag policy` command:

```
RP/0/RSP0/CPU0:router# config
dhcp ipv4
RP/0/RSP0/CPU0:router(config)## profile TEST server
RP/0/RSP0/CPU0:router(config-dhcpv4-server-profile)## broadcast-flag policy unicast-always
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), <a href="#">on page 107</a></td>
<td>Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode.</td>
</tr>
<tr>
<td>helper-address (BNG), <a href="#">on page 110</a></td>
<td>Configures the DHCP relay agent to relay packets to a specific DHCP server.</td>
</tr>
<tr>
<td>relay information check (BNG), <a href="#">on page 127</a></td>
<td>Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.</td>
</tr>
<tr>
<td>relay information option (BNG), <a href="#">on page 129</a></td>
<td>Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.</td>
</tr>
<tr>
<td>relay information option allow-untrusted (BNG), <a href="#">on page 131</a></td>
<td>Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero.</td>
</tr>
<tr>
<td>relay information policy (BNG), <a href="#">on page 133</a></td>
<td>Configures how a relay agent processes BOOTREQUEST messages that already contain a relay information option.</td>
</tr>
</tbody>
</table>
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}
no class class_name
```

### Syntax Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>class_name</code></td>
<td>Specifies the class name.</td>
</tr>
<tr>
<td><code>helper-address</code></td>
<td>Specifies the server address to relay packets.</td>
</tr>
<tr>
<td><code>match</code></td>
<td>Inserts a match keyword.</td>
</tr>
<tr>
<td><code>address-pool</code></td>
<td>Specifies the name of the address pool</td>
</tr>
<tr>
<td><code>dns-server</code></td>
<td>Specifies the name of a dns server.</td>
</tr>
<tr>
<td><code>domain-name</code></td>
<td>Specifies the name of a domain.</td>
</tr>
<tr>
<td><code>prefix-pool</code></td>
<td>Specifies the name of the prefix pool.</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The support for IPv6 was added.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.
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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-map type control subscriber, on page 84</td>
<td>This topic describes the class-map type control subscriber command.</td>
</tr>
</tbody>
</table>
**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
no dhcp ipv4
```

**Syntax Description**

This command has no keywords or arguments.

**Command Modes**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This example shows how to enable DHCP for IPv4:

```
RP/0/RSP0/CPU0:router# dhcp ipv4
RP/0/RSP0/CPU0:router(config-dhcpv4)#
```
**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
no duplicate-mac-allowed
```

**Syntax Description**

```
exclude-vlan
```

Excludes VLANs from the client key; only MAC address and interface form the client key.

**Command Default**

By default, duplicate MAC address support is disabled.

**Command Modes**

DHCP IPv4 configuration

**Command History**

```
Release Modification
6.1.1 This command was introduced in BNG, with an addition of exclude-vlan option to exclude VLANs from the client key.
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.

**Task ID**

```
Task ID Operation
ip-services read, write
```
Examples

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
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables Dynamic Host Configuration Protocol (DHCP) for IPv4 and enters DHCP IPv4 configuration mode.</td>
</tr>
</tbody>
</table>
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]
no helper-address [vrf vrf-name ] [address] [giaddr gateway-address]
```

**Syntax Description**

- **vrf-name** (Optional) Specifies the name of a particular VRF.
- **address** IPv4 and IPv6 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The support for IPv6 was added in BNG.</td>
</tr>
<tr>
<td>Release 5.2.2</td>
<td>This command is supported in DHCPv6 profile relay configuration submode.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

A maximum of up to eight helper addresses can be configured.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dhcp ipv4</code> (BNG), on page 107</td>
<td>Enables Dynamic Host Configuration Protocol (DHCP) for IPv4 and enters DHCP IPv4 configuration mode.</td>
</tr>
<tr>
<td><code>relay information check</code> (BNG), on page 127</td>
<td>Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.</td>
</tr>
<tr>
<td><code>relay information option</code> (BNG), on page 129</td>
<td>Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.</td>
</tr>
<tr>
<td><code>relay information option allow-untrusted</code> (BNG), on page 131</td>
<td>Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero.</td>
</tr>
<tr>
<td><code>relay information policy</code> (BNG), on page 133</td>
<td>Configures how a relay agent processes BOOTREQUEST messages that already contain a relay information option.</td>
</tr>
</tbody>
</table>
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
no interface type interface-path-id {base | proxy | relay | server | snoop} [profile profile-name]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>type</code></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><code>interface-path-id</code></td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td><code>server</code></td>
<td>Attaches a server profile for the specified interface.</td>
</tr>
<tr>
<td><code>relay</code></td>
<td>Attaches a relay profile for the specified interface.</td>
</tr>
<tr>
<td><code>snoop</code></td>
<td>Attaches a snoop profile for the specified interface.</td>
</tr>
<tr>
<td><code>proxy</code></td>
<td>Attaches the proxy profile to an interface.</td>
</tr>
<tr>
<td><code>base</code></td>
<td>Attaches a base profile for the specified interface.</td>
</tr>
<tr>
<td><code>profile profile-name</code></td>
<td>Specifies the profile name.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

DHCP IPv6 configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.1.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The support for IPv6 was added in BNG.</td>
</tr>
<tr>
<td>Release 5.1</td>
<td>Support for <code>server</code> profile was added.</td>
</tr>
</tbody>
</table>
Modification

Support for DHCP IPv6 relay was added.

The keyword `base` was added as part of DHCPv4 Service Based Mode Selection feature.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

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

```bash
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:

```bash
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:

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

**Syntax Description**

```
lease proxy client-lease-time value
no lease proxy client-lease-time value
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4.</td>
</tr>
</tbody>
</table>
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`

`no limit lease per-circuit-id value`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>Specifies the limit up to which the lease value can be extended.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

DHCP IPv4 configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dhcp ipv4 (BNG), on page 107</code></td>
<td>Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4.</td>
</tr>
</tbody>
</table>
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
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

To enter DHCP IPv4 configuration mode, use the dhcp ipv4 command.

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dhcp ipv4 (BNG)</code>, on page 107</td>
<td>Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4.</td>
</tr>
</tbody>
</table>
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
no 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
To use this command, 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 a command, contact your AAA administrator for assistance.

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

Task ID
Task ID Operation
ip-services read, write

Examples
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4.</td>
</tr>
</tbody>
</table>
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 \text{hex_string} \text{mask} \text{bit_mask_string}\}
no match option \{124|125|60|77\} \{hex \text{hex_string} \text{mask} \text{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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines
To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class, on page 105</td>
<td>Creates a proxy profile class and enters the proxy profile class sub configuration mode.</td>
</tr>
</tbody>
</table>
**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**  
**no match vrf vrf_name**

**Syntax Description**

<table>
<thead>
<tr>
<th>vrf_name</th>
<th>Specifies the VRF name.</th>
</tr>
</thead>
</table>

**Command Default**

None

**Command Modes**

DHCP IPv4 proxy profile class configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>match option, on page 122</td>
<td>Matches the proxy with the configured pattern.</td>
</tr>
</tbody>
</table>
**profile (BNG)**

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

```
profile profile_name {proxy | server }
no profile profile_name proxy
```

### Syntax Description

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>profile_name</td>
<td>Specifies the name of the profile that uniquely identifies the proxy or server.</td>
</tr>
<tr>
<td>proxy</td>
<td>Creates a DHCP proxy profile.</td>
</tr>
<tr>
<td>server</td>
<td>Creates a DHCP server profile.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

DHCP IPv4 configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### 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)#
```
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
no rapid-commit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

DHCP IPv6 server profile configuration

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 5.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

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 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**
- **no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
<tr>
<td>basic-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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-profile)# relay information check
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), <a href="#">on page 107</a></td>
<td>Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode.</td>
</tr>
<tr>
<td>helper-address (BNG), <a href="#">on page 110</a></td>
<td>Configures the DHCP relay agent to relay packets to a specific DHCP Server.</td>
</tr>
<tr>
<td>profile (BNG)</td>
<td>Configures a relay profile for the DHCP IPv4 component.</td>
</tr>
<tr>
<td>relay information option (BNG), <a href="#">on page 129</a></td>
<td>Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.</td>
</tr>
<tr>
<td>relay information option allow-untrusted (BNG), <a href="#">on page 131</a></td>
<td>Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero.</td>
</tr>
</tbody>
</table>
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
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
<tr>
<td>basic-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```
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
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
<tr>
<td>basic-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode.</td>
</tr>
<tr>
<td>helper-address (BNG), on page 110</td>
<td>Configures the DHCP relay agent to relay packets to a specific DHCP Server.</td>
</tr>
<tr>
<td>relay information check (BNG), on page 127</td>
<td>Configures a DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.</td>
</tr>
<tr>
<td>relay information option (BNG), on page 129</td>
<td>Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.</td>
</tr>
</tbody>
</table>
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.

\[\text{relay information policy \{drop| keep| encapsulate\}}\]

\[\text{no relay information policy \{drop| keep| encapsulate\}}\]

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>drop</td>
<td>Directs the DHCP IPv4 Relay to discard BOOTREQUEST packets with the existing relay information option.</td>
</tr>
<tr>
<td>keep</td>
<td>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.</td>
</tr>
<tr>
<td>encapsulate</td>
<td>Encapsulates the DHCP relay agent information option received from a prior relay agent in forwarded BOOTREQUEST messages.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
<tr>
<td>Release 4.3.1</td>
<td>The encapsulate keyword was added.</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables DHCP for IPv4 and enters DHCP IPv4 configuration mode.</td>
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<td>relay information check (BNG), on page 127</td>
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</tr>
<tr>
<td>relay information option (BNG), on page 129</td>
<td>Enables the system to insert a DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server.</td>
</tr>
<tr>
<td>relay information option allow-untrusted (BNG), on page 131</td>
<td>Configures the DHCP component to not drop BOOTREQUEST messages that have the relay information option set and the giaddr set to zero.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>circuit-id</td>
<td>Displays the DHCP IPv4 proxy client binding based on circuit ID.</td>
</tr>
<tr>
<td>circuit_id_name</td>
<td>Displays the name of the circuit ID.</td>
</tr>
<tr>
<td>detail</td>
<td>Displays detailed binding information for DHCP proxy.</td>
</tr>
<tr>
<td>interface</td>
<td>Specifies the interface based on which the DHCP bindings are filtered.</td>
</tr>
<tr>
<td>ipspecifier</td>
<td>Displays the name of the interface.</td>
</tr>
<tr>
<td>location</td>
<td>Specifies the node location of the DHCP proxy.</td>
</tr>
<tr>
<td>locationspecifier</td>
<td>Displays the name of the location.</td>
</tr>
<tr>
<td>mac-address</td>
<td>Displays detailed client binding information based on mac-address.</td>
</tr>
<tr>
<td>remote-id</td>
<td>Displays the DHCP IPv4 proxy client binding based on remote ID.</td>
</tr>
<tr>
<td>summary</td>
<td>Displays the summary binding information for proxy.</td>
</tr>
<tr>
<td>vrf</td>
<td>Displays the VRF information.</td>
</tr>
<tr>
<td>vrf_name</td>
<td>Displays the name of the VRF.</td>
</tr>
</tbody>
</table>

**Command Default**

Displays brief information about all DHCP proxy client bindings.

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
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.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Sublabel</th>
<th>IP Address</th>
<th>State</th>
<th>Remaining</th>
<th>Interface</th>
<th>VRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000.6602.0102</td>
<td>1.1.1.1</td>
<td>BOUND</td>
<td>3495</td>
<td>Gi0/1/0/0</td>
<td>default</td>
</tr>
</tbody>
</table>

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)
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
```
This is the sample output of the `show dhcp ipv4 proxy binding detail` command, that displays the detailed information of the IPoE 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.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhcp ipv4 (BNG), on page 107</td>
<td>Enables the Dynamic Host Configuration Protocol (DHCP) for IPv4.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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  c2  Count 1
```
This table describes the significant fields shown in the display.

**Table 7: show dhcp ipv4 proxy interface Command Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease Limit</td>
<td>Specifies the lease limit value sent from AAA server.</td>
</tr>
<tr>
<td>Count</td>
<td>Specifies the number of sessions on the router having the specific Circuit-ID received from the AAA server.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Displays the detailed proxy profile information.</td>
</tr>
<tr>
<td>profile_name</td>
<td>Specifies the profile name.</td>
</tr>
<tr>
<td></td>
<td>Displays the output modifiers.</td>
</tr>
</tbody>
</table>

**Command Default**
None

**Command Modes**
EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

This command displays the proxy profiles created for DHCP IPv4.

**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
-----------------------------
```
This table describes the significant fields shown in the display.

Table 8: show dhcp ipv4 proxy profile Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP IPv4 Proxy Profiles</td>
<td>Specifies all the DHCP IPv4 proxy profiles.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-services</td>
<td>read</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>VRF</th>
<th>RX</th>
<th>TX</th>
<th>DR</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>nVSatellite</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
```

Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Command Reference, Release 4.2.x
This table describes the significant fields shown in the display.

*Table 9: show dhcp ipv4 proxy statistics Field Descriptions*

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRF</td>
<td>Specifies the VRF in the DHCP proxy. The default is nVSatellite.</td>
</tr>
</tbody>
</table>
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.

- dynamic-template, page 146
- dynamic-template type ipssubscriber, page 148
- dynamic-template type ppp, page 150
- dynamic-template type service, page 152
- service-policy (BNG), page 154
- vrf (dynamic-template-BNG), page 156
**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}
no dynamic-template
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Specifies the type of templates, for example, ppp or ipsubscriber or service.</td>
</tr>
<tr>
<td>name</td>
<td>Specifies the name of the dynamic template type.</td>
</tr>
<tr>
<td>ipsubscriber</td>
<td>Specifies the ipsubscriber dynamic template type.</td>
</tr>
<tr>
<td>ppp</td>
<td>Specifies the ppp dynamic template type.</td>
</tr>
<tr>
<td>service</td>
<td>Specifies the service dynamic template type.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `dynamic-template` command to enter dynamic template configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `dynamic-template` command in the Global Configuration mode:

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dynamic-template type ppp, on page 150</code></td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td><code>dynamic-template type ipsubscriber, on page 148</code></td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
<tr>
<td><code>dynamic-template type service, on page 152</code></td>
<td>Enables the service dynamic template type.</td>
</tr>
</tbody>
</table>
**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
no dynamic-template type ipsubscriber template-name
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Template Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>template-name</td>
<td>Specifies the dynamic template name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `dynamic-template` command to enter dynamic template configuration mode.

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dynamic-template, on page 146</code></td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
<tr>
<td><code>dynamic-template type ppp, on page 150</code></td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>dynamic-template type service, on page 152</td>
<td>Enables the service dynamic template type.</td>
</tr>
</tbody>
</table>
**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
no dynamic-template type ppp template-name
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Template Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>template-name</code></td>
<td>Specifies the dynamic template name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `dynamic-template` command to enter dynamic template configuration mode.

**Examples**

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
```

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dynamic-template</code>, on page 146</td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
<tr>
<td><code>dynamic-template type ipsubscriber</code>, on page 148</td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>dynamic-template type service, on page 152</td>
<td>Enables the service dynamic template type.</td>
</tr>
</tbody>
</table>
**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`

`no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `dynamic-template` command to enter dynamic template configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dynamic-template, on page 146</td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
</tbody>
</table>
### Dynamic Template Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dynamic-template type ppp, on page 150</code></td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td><code>dynamic-template type ipsubscriber, on page 148</code></td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
</tbody>
</table>
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} service-policy_name
no service-policy
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Configures an ingress service-policy.</td>
</tr>
<tr>
<td>output</td>
<td>Configures an egress service-policy.</td>
</tr>
<tr>
<td>service-policy_name</td>
<td>Name of the service policy.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter the ppp dynamic template type configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dynamic-template, on page 146</td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
<tr>
<td>dynamic-template type ppp, on page 150</td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td>dynamic-template type ipsubscriber, on page 148</td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
</tbody>
</table>
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
no vrf
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf_name</td>
<td>Specifies the name of the vrf.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template type configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the dynamic-template command to enter dynamic template configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dynamic-template, on page 146</td>
<td>Enables the dynamic template configuration mode.</td>
</tr>
<tr>
<td>dynamic-template type ppp, on page 150</td>
<td>Enables the ppp dynamic template type.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>dynamic-template type ipsubscriber, on page 148</td>
<td>Enables the ipsubscriber dynamic template type.</td>
</tr>
</tbody>
</table>
vrf (dynamic-template-BNG)
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*.

- initiator dhcp, page 160
- initiator unclassified-source, page 161
- ipssubscriber l2-connected, page 163
- show ipssubscriber access-interface, page 165
- show ipssubscriber interface, page 168
- show ipssubscriber summary, page 171
**initiator dhcp**

To enable DHCP as first-sign-of-life protocol for IPv4 subscriber, use the `initiator dhcp` command in the appropriate configuration submode. To disable this feature, use the no form of this command.

```
initiator dhcp  
no initiator dhcp
```

**Syntax Description**

This command has no keywords or arguments.

**Command Default**

None

**Command Modes**

IP subscriber IPv4 L2-connected configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ipsubscriber summary, on page 171</td>
<td>Displays the ipsubscriber information.</td>
</tr>
</tbody>
</table>
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
no 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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
To use this command, 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 a command, contact your AAA administrator for assistance.

**Note**
Because packet-triggered L2 sessions are not supported for IPv6, this command is not supported for IPv6.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**
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 12-connected
RP/0/RSP0/CPU0:router(config-if-ipsub-ipv4-12conn)# initiator unclassified-source
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ipsubscriber summary, on page 171</td>
<td>Displays the ipsubscriber information.</td>
</tr>
</tbody>
</table>
ipsubscriber l2-connected

To enable l2-connected IP subscriber for IPv4, use the `ipsubscriber l2-connected` command in the interface configuration mode. To disable this feature, use the `no` form of this command.

```
ipsubscriber {ipv4} l2-connected initiator {dhcp|unclassified-source }
no ipsubscriber {ipv4} l2-connected initiator {dhcp|unclassified-source }
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>Specifies IPv4 address prefixes.</td>
</tr>
<tr>
<td>initiator</td>
<td>Configures the IP subscriber initiator.</td>
</tr>
<tr>
<td>dhcp</td>
<td>Configures DHCP as first-sign-of-life protocol for IPv4 subscriber.</td>
</tr>
<tr>
<td>unclassified-source</td>
<td>Configures unclassified packets as first-sign-of-life for IPv4 subscriber.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Interface configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Note**
Packet-triggered L2 session (`initiator unclassified-source`) is not supported for IPv6.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ipssubscriber summary, on page 171</td>
<td>Displays the ipssubscriber information.</td>
</tr>
</tbody>
</table>
# 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 {type|interface-path-id|brief|location|location}
```

## Syntax Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>type</strong></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><strong>interface-path-id</strong></td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td><strong>brief</strong></td>
<td>Displays the brief summary of IP Subscriber access interface status and configuration.</td>
</tr>
<tr>
<td><strong>location</strong></td>
<td>Specifies the IP subscriber location.</td>
</tr>
<tr>
<td><strong>location</strong></td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

## Command Default

None

## Command Modes

EXEC mode

## Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

## Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

## Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

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

<table>
<thead>
<tr>
<th>Interface</th>
<th>Proto</th>
<th>DHCP</th>
<th>Pkt Trigger</th>
<th>DHCPv6</th>
<th>PktTrigIPv6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi0/0/0/0</td>
<td>DHCP,PKT,PDCHPv6,PKTv6</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>UP</td>
<td>DHCP,PKT</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>BE1.1</td>
<td>UP</td>
<td>DHCP,PKT</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
```

This table describes the significant fields shown in the display.

**Table 10: show ipsubscriber access-interface Field Descriptions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Specifies the access interface type.</td>
</tr>
<tr>
<td>Proto</td>
<td>Specifies the prototype, for instance, DHCP, DHCPv6, PKTv6.</td>
</tr>
<tr>
<td>DHCP</td>
<td>Specifies the DHCP initiation.</td>
</tr>
<tr>
<td>Pkt Trigger</td>
<td>Specifies the packet trigger Initiation.</td>
</tr>
<tr>
<td>DHCPv6</td>
<td>Specifies the packet trigger Initiation for IPv6.</td>
</tr>
<tr>
<td>PktTrigIPv6</td>
<td>Specifies the DHCPv6 initiation.</td>
</tr>
</tbody>
</table>
### Field

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specifies the various states of the access interface, for example, up, down, deleted, and unknown state.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ip subscriber l2-connected, on page 163</code></td>
<td>Displays the subscriber management session information.</td>
</tr>
</tbody>
</table>
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| location node-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.

*Note* Use the `show interfaces` command to see a list of all interfaces currently configured on the router.

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.

**location**

Specifies the IP subscriber location.

**node-id**

Specifies the fully qualified location specification.

**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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

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: 0x2010000c0
  Access Interface: GigabitEthernet0/1/0/0.11 (0x201000080)
  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


<table>
<thead>
<tr>
<th>Interface</th>
<th>Proto</th>
<th>Subscriber IP</th>
<th>MAC Address</th>
<th>Sublabel</th>
<th>VRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>G10/0/0/0.ip1</td>
<td>DHCP</td>
<td>1.10.10.9</td>
<td>0100.0000.0000</td>
<td>0x40</td>
<td>default</td>
</tr>
<tr>
<td>UP</td>
<td>DHCFC</td>
<td>0100.0000.0000</td>
<td>0x40</td>
<td>default</td>
<td></td>
</tr>
<tr>
<td>G10/0/0/0.ip2</td>
<td>PKT</td>
<td>2.20.20.9</td>
<td>0200.0000.0000</td>
<td>0x20</td>
<td>default</td>
</tr>
<tr>
<td>UP</td>
<td>PKTv6</td>
<td>0200.0000.0000</td>
<td>0x20</td>
<td>default</td>
<td></td>
</tr>
</tbody>
</table>
```
This table describes the significant fields shown in the display.

### Table 11: show ipssubscriber interface Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Specifies the access interface type.</td>
</tr>
<tr>
<td>Proto</td>
<td>Specifies the prototype, for instance, DHCP, DHCPv6, PKTv6.</td>
</tr>
<tr>
<td>Subscriber IP</td>
<td>Specifies the IP address of the subscriber interface.</td>
</tr>
<tr>
<td>MAC Address</td>
<td>Specifies the MAC address for each interface type.</td>
</tr>
<tr>
<td>Sublabel</td>
<td>Specifies the sub label type for each interface.</td>
</tr>
<tr>
<td>VRF</td>
<td>Specifies the default VRF type.</td>
</tr>
<tr>
<td>State</td>
<td>Specifies the various states of the access interface, for example, up, down, deleted, and unknown state.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipssubscriber l2-connected, on page 163</td>
<td>Displays the subscriber management session information.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>location</td>
<td>Specifies the IP subscriber location.</td>
</tr>
<tr>
<td>location</td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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):

<table>
<thead>
<tr>
<th>Count</th>
</tr>
</thead>
</table>

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 12: show ipsubscriber summary Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invalid</td>
<td>Specifies the number of invalid packets for DHCP and Packet Trigger.</td>
</tr>
<tr>
<td>Initialized</td>
<td>Specifies the number of packets that were initialized for DHCP and Packet Trigger.</td>
</tr>
<tr>
<td>Session creation started</td>
<td>Specifies the total number of session initiation that was created.</td>
</tr>
<tr>
<td>Control-policy executing</td>
<td>Specifies the control policies that are executing for DHCP and Packet Trigger.</td>
</tr>
</tbody>
</table>
### Field

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control-policy executed</td>
<td>Specifies the control policies that were executed for DHCP and Packet Trigger.</td>
</tr>
<tr>
<td>Session features applied</td>
<td>Specifies the number of session features that were applied for DHCP and Packet Trigger.</td>
</tr>
<tr>
<td>VRF configured</td>
<td>Specifies the VRFs configured.</td>
</tr>
<tr>
<td>Up</td>
<td>Specifies the number of packets that are in the UP state.</td>
</tr>
<tr>
<td>Down</td>
<td>Specifies the number of packets that are in the DOWN state.</td>
</tr>
<tr>
<td>Disconnecting</td>
<td>Specifies the number of packets that are disconnecting.</td>
</tr>
<tr>
<td>Disconnected</td>
<td>Specifies the number of packets that are disconnected.</td>
</tr>
<tr>
<td>Unknown State</td>
<td>Specifies the packets that are in the unknown state.</td>
</tr>
<tr>
<td>Error</td>
<td>Specifies the number of packets that are errored out.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipssubscriber l2-connected, on page 163</td>
<td>Displays the subscriber management session information.</td>
</tr>
</tbody>
</table>
show ipsubscriber summary
IPv4 and IPv6 Commands

This module describes the Cisco IOS XR software commands used to configure the IPv4 and IPv6 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.

- ipv4 mtu (BNG), page 176
- ipv4 unnumbered (point-to-point -BNG), page 178
- ipv4 unreachable disable (BNG), page 180
- ipv4 verify unicast source reachable-via (BNG), page 182
- show ipv4 interface (BNG), page 184
- show ipv4 traffic (BNG), page 187
**ipv4 mtu (BNG)**

To set the maximum transmission unit (MTU) size of IPv4 packets sent on an interface, use the `ipv4 mtu` command in an appropriate configuration mode. To restore the default MTU size, use the `no` form of this command.

```
ipv4 mtu bytes

no ipv4 mtu
```

### Syntax Description

| bytes | MTU in bytes. Range is 68 to 65535 bytes for IPv4 packets. The maximum MTU size that can be set on an interface depends on the interface medium. |

### Command Default

If no MTU size is configured for IPv4 packets sent on an interface, the interface derives the MTU from the Layer 2 MTU.

### Command Modes

- Interface configuration (for releases prior to R4.2.0)
- Dynamic template configuration (for releases R4.2.0 onward)

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

The router punts the packets that needs fragmentation; whereas the software path drops the subscriber traffic that needs fragmentation.

The maximum MTU size that can be set on an interface depends on the interface medium. If the Layer 2 MTU is smaller than the Layer 3 MTU, the Cisco IOS XR software uses the Layer 2 MTU value for the Layer 3 MTU. Conversely, if the Layer 3 MTU is smaller than the Layer 2 MTU, the software uses Layer 3 MTU value. In other words the Cisco IOS XR software uses the lower of the two values for the MTU.

All devices on a physical medium must have the same protocol MTU to operate.

For releases R4.2.0 onward, to enter the dynamic template configuration mode, run the `dynamic-template` command in the Global Configuration mode.
Changing the MTU value (with the `mtu` interface configuration command) can affect the IPv4 MTU value. If the current IPv4 MTU value is the same as the MTU value, and you change the MTU value, the IPv4 MTU value will be modified automatically to match the new MTU. However, the reverse is not true; changing the IPv4 MTU value has no effect on the value for the `mtu` command.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read, write</td>
</tr>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

For releases prior to R4.2.0, this example shows how to set the maximum IPv4 packet size for GigabitEthernet interface 0/1/1/0 to 300 bytes:

```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/1/0
RP/0/RSP0/CPU0:router(config-if)# ipv4 mtu 300
```

For releases R4.2.0 onward, this example shows how to set the maximum IPv4 packet size to 300 bytes in dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp pl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv4 mtu 300
```

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show ipv4 interface (BNG), on page 184</code></td>
<td>Displays the MTU status of interfaces configured for IPv4.</td>
</tr>
</tbody>
</table>
ipv4 unnumbered (point-to-point -BNG)

To enable IPv4 processing on a point-to-point interface without assigning an explicit IPv4 address to that interface, use the `ipv4 unnumbered` command in an appropriate configuration mode. To disable this feature, use the `no` form of this command.

```
ipv4 unnumbered interface-type interface-instance
no ipv4 unnumbered interface-type interface-instance
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>interface-type</code></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><code>interface-instance</code></td>
<td>Either a physical interface instance or a virtual interface instance as follows:</td>
</tr>
<tr>
<td></td>
<td>• Physical interface instance. Naming notation is <code>rack/slot/module/port</code> and a slash between values is required as part of the notation.</td>
</tr>
<tr>
<td></td>
<td>* <code>rack</code>: Chassis number of the rack.</td>
</tr>
<tr>
<td></td>
<td>* <code>slot</code>: Physical slot number of the modular services card or line card.</td>
</tr>
<tr>
<td></td>
<td>* <code>module</code>: Module number. A physical layer interface module (PLIM) is always 0.</td>
</tr>
<tr>
<td></td>
<td>* <code>port</code>: Physical port number of the interface.</td>
</tr>
</tbody>
</table>

**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`.

• Virtual interface instance. Number range varies depending on interface type.

For more information about the syntax for the router, use the question mark (?) online help function.

**Command Default**

IPv4 processing on a point-to-point interface is disabled unless an IPv4 address is assigned explicitly to that interface.

**Command Modes**

Interface configuration (for releases prior to R4.2.0)
Dynamic template configuration (for releases R4.2.0 onward)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>
Usage Guidelines

For releases R4.2.0 onward, to enter the dynamic template configuration mode, run the `dynamic-template` command in the Global Configuration mode.

Whenever the unnumbered interface generates a packet (for example, for a routing update), it uses the address of the specified interface as the source address of the IPv4 packet. It also uses the IPv4 address of the specified interface in determining which routing processes are sending updates over the unnumbered interface.

Restrictions include the following:

- You cannot use the `ping` EXEC command to determine whether the interface is up because the interface has no address. Simple Network Management Protocol (SNMP) can be used to remotely monitor interface status.

The interface you specify by the `interface-type` and `interface-number` arguments must be enabled (listed as "up" in the `show interfaces` command display).

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read, write</td>
</tr>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

For releases prior to R4.2.0, this example shows how the GigabitEthernet interface 0/1/1/0 is assigned the loopback interface address 5:

```plaintext
RP/0/RSP0/CPU0:router(config)# interface loopback 5
RP/0/RSP0/CPU0:router(config-if)# ipv4 address 192.168.6.6 255.255.255.0
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/1/0
RP/0/RSP0/CPU0:router(config-if)# ipv4 unnumbered loopback 5
```

For releases R4.2.0 onward, this example shows how the Bundle-Ether interface is assigned address 100.10 in the dynamic template configuration mode:

```plaintext
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 unnumbered Bundle-Ether100.10
```
ipv4 unreachable disable (BNG)

To disable the generation of IPv4 Internet Control Message Protocol (ICMP) unreachable messages, use the `ipv4 unreachable disable` command in an appropriate configuration mode. To re-enable the generation of ICMP unreachable messages, use the `no` form of this command.

- `ipv4 unreachable disable`
- `no ipv4 unreachable disable`

**Syntax Description**
This command has no keywords or arguments.

**Command Default**
IPv4 ICMP unreachable messages are generated.

**Command Modes**
- Interface configuration (for releases prior to R4.2.0)
- Dynamic template configuration (for releases R4.2.0 onward)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
If the software receives a nonbroadcast packet destined for itself that uses a protocol it does not recognize, it sends an ICMP protocol unreachable message to the source.

If the software receives a datagram that it cannot deliver to its ultimate destination because it knows of no route to the destination address, it replies to the originator of that datagram with an ICMP host unreachable message.

This command affects a number of ICMP unreachable messages.

For releases R4.2.0 onward, to enter the dynamic template configuration mode, run the `dynamic-template` command in the Global Configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read, write</td>
</tr>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

For releases prior to R4.2.0, this example shows how to disable the generation of ICMP unreachable messages on GigabitEthernet interface 0/1/1/0:

```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/1/0
RP/0/RSP0/CPU0:router(config-if)# ipv4 unreachables disable
```

For releases R4.2.0 onward, this example shows how to disable the generation of ICMP unreachable messages on dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ipv4 unreachables disable
```
ipv4 verify unicast source reachable-via (BNG)

To enable IPv4 unicast Reverse Path Forwarding (RPF) checking, use the `ipv4 verify unicast source reachable-via` command in an appropriate configuration mode. To disable unicast RPF, use the `no` form of this command.

`ipv4 verify unicast source reachable-via {any| rx} [allow-default] [allow-self-ping]`

`no ipv4 verify unicast source reachable-via {any| rx} [allow-default] [allow-self-ping]`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>any</code></td>
<td>Enables loose unicast RPF checking. If loose unicast RPF is enabled, a packet is not forwarded unless its source prefix exists in the routing table.</td>
</tr>
<tr>
<td><code>rx</code></td>
<td>Enables strict unicast RPF checking. If strict unicast RPF is enabled, a packet is not forwarded unless its source prefix exists in the routing table and the output interface matches the interface on which the packet was received.</td>
</tr>
<tr>
<td><code>allow-default</code></td>
<td>(Optional) Enables the matching of default routes. This option applies to both loose and strict RPF.</td>
</tr>
<tr>
<td><code>allow-self-ping</code></td>
<td>(Optional) Enables the router to ping out an interface. This option applies to both loose and strict RPF.</td>
</tr>
</tbody>
</table>

**Command Default**

IPv4 unicast RPF is disabled.

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

Use the `ipv4 verify unicast source reachable-via` interface command to mitigate problems caused by malformed or forged (spoofed) IP source addresses that pass through a router. Malformed or forged source addresses can indicate denial-of-service (DoS) attacks based on source IP address spoofing.
When strict unicast RPF is enabled on an interface, the router examines all packets received on that interface. The router checks to make sure that the source address appears in the routing table and matches the interface on which the packet was received.

When loose unicast RPF is enabled on an interface, the router examines all packets received on that interface. The router checks to make sure that the source address can be reached through any of the router interfaces.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read, write</td>
</tr>
<tr>
<td>network</td>
<td>read, write</td>
</tr>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This example shows how to configure strict RPF on 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 verify unicast source reachable-via rx
```
**show ipv4 interface (BNG)**

To display the usability status of interfaces configured for IPv4, use the `show ipv4 interface` command in the EXEC mode.

```
show ipv4 [vrf vrf-name] interface [type interface-path-id] brief | summary
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf</td>
<td>(Optional) Displays VPN routing and forwarding (VRF) instance information.</td>
</tr>
<tr>
<td>vrf-name</td>
<td>(Optional) Name of a VRF.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Either a physical interface instance or a virtual interface instance as follows:</td>
</tr>
<tr>
<td></td>
<td>- Physical interface instance. Naming notation is rack/slot/module/port and a slash between values is required as part of the notation.</td>
</tr>
<tr>
<td></td>
<td>* rack: Chassis number of the rack.</td>
</tr>
<tr>
<td></td>
<td>* slot: Physical slot number of the modular services card or line card.</td>
</tr>
<tr>
<td></td>
<td>* module: Module number. A physical layer interface module (PLIM) is always 0.</td>
</tr>
<tr>
<td></td>
<td>* port: Physical port number of the interface.</td>
</tr>
<tr>
<td>Note</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>- Virtual interface instance. Number range varies depending on interface type.</td>
</tr>
<tr>
<td>brief</td>
<td>(Optional) Displays the primary IPv4 addresses configured on the router’s interfaces and their protocol and line states.</td>
</tr>
<tr>
<td>summary</td>
<td>(Optional) Displays the number of interfaces on the router that are assigned, unassigned, or unnumbered.</td>
</tr>
</tbody>
</table>

**Command Default**

If VRF is not specified, the software displays the default VRF.

**Command Modes**

EXEC mode
Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

Usage Guidelines

The `show ipv4 interface` command provides output similar to the `show ipv6 interface` command, except that it is IPv4-specific.

The interface name will be displayed only if the name belongs to the VRF instance. If the `vrf-name` is not specified then the interface instance will be displayed only if the interface belongs to the default VRF.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read</td>
</tr>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

This is the sample output of the `show ipv4 interface` command:

```
RP/0/RSP0/CPU0:router# show ipv4 interface
Loopback0 is Up, line protocol is Up
   Internet address is 10.0.0.1/8
   Secondary address 10.0.0.2/8
   MTU is 1514 (1514 is available to IP)
   Multicast reserved groups joined: 10.0.0.1
   Directed broadcast forwarding is disabled
   Outgoing access list is not set
   Inbound access list is not set
   Proxy ARP is enabled
   ICMP redirects are always sent
   ICMP unreachables are always sent
   Redirects sent is 0
   Redirects received is 0
   Vrf is default (vrfid 0x60000000)
gigabitethernet0/0/0/0 is Up, line protocol is Up
   Internet address is 10.25.58.1/16
   MTU is 1514 (1500 is available to IP)
   Multicast reserved groups joined: 10.0.224.1
   Directed broadcast forwarding is disabled
   Outgoing access list is not set
   Inbound access list is not set
   Proxy ARP is enabled
   ICMP redirects are always sent
   ICMP unreachables are always sent
   Redirects sent is 0
   Redirects received is 0
   Vrf is default (vrfid 0x60000000)
gigabitethernet0/0/0/0 is Shutdown, line protocol is Down
   Vrf is default (vrfid 0x60000000)
```

This table describes the significant fields shown in the display.
### Table 13: show ipv4 interface Command Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loopback0 is Up</td>
<td>If the interface hardware is usable, the interface is marked &quot;Up.&quot; For an interface to be usable, both the interface hardware and line protocol must be up.</td>
</tr>
<tr>
<td>line protocol is Up</td>
<td>If the interface can provide two-way communication, the line protocol is marked &quot;Up.&quot; For an interface to be usable, both the interface hardware and line protocol must be up.</td>
</tr>
<tr>
<td>Internet address</td>
<td>IPv4 Internet address and subnet mask of the interface.</td>
</tr>
<tr>
<td>Secondary address</td>
<td>Displays a secondary address, if one has been set.</td>
</tr>
<tr>
<td>Multicast reserved groups joined</td>
<td>Indicates the multicast groups this interface belongs to.</td>
</tr>
<tr>
<td>Directed broadcast forwarding</td>
<td>Indicates whether directed broadcast forwarding is enabled or disabled.</td>
</tr>
<tr>
<td>Outgoing access list</td>
<td>Indicates whether the interface has an outgoing access list set.</td>
</tr>
<tr>
<td>Inbound access list</td>
<td>Indicates whether the interface has an incoming access list set.</td>
</tr>
<tr>
<td>Proxy ARP</td>
<td>Indicates whether proxy ARP[^2] is enabled or disabled on an interface.</td>
</tr>
<tr>
<td>ICMP redirects</td>
<td>Specifies whether ICMPv4[^3] redirects are sent on this interface.</td>
</tr>
<tr>
<td>ICMP unreachable</td>
<td>Specifies whether unreachable messages are sent on this interface.</td>
</tr>
<tr>
<td>Internet protocol processing disabled</td>
<td>Indicates an IPv4 address has not been configured on the interface.</td>
</tr>
</tbody>
</table>

[^1]: MTU = maximum transmission unit  
[^2]: ARP = Address Resolution Protocol address resolution protocol  
[^3]: ICMPv4 = Internet Control Message Protocol internet control message protocol version 4
show ipv4 traffic (BNG)

To display the IPv4 traffic statistics, use the **show ipv4 traffic** command in the EXEC mode.

**show ipv4 traffic [brief]**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>brief</th>
<th>(Optional) Displays only IPv4 and Internet Control Message Protocol version 4 (ICMPv4) traffic.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Default</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Command History</td>
<td></td>
</tr>
<tr>
<td>Release</td>
<td>Modification</td>
</tr>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported for BNG.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage Guidelines</th>
<th></th>
</tr>
</thead>
</table>

The **show ipv4 traffic** command provides output similar to the **show ipv6 traffic** command, except that it is IPv4-specific.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ipv4</td>
<td>read</td>
</tr>
<tr>
<td></td>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

This is the sample output of the **show ipv4 traffic** command:

```
RP/0/RSP0/CPU0:router# show ipv4 traffic
IP statistics:
    Rcvd: 16372 total, 16372 local destination
    0 format errors, 0 bad hop count
    0 unknown protocol, 0 not a gateway
    0 security failures, 0 bad source, 0 bad header
    0 with options, 0 bad, 0 unknown
    Opts: 0 end, 0 nop, 0 basic security, 0 extended security
    0 strict source rt, 0 loose source rt, 0 record rt
    0 stream ID, 0 timestamp, 0 alert, 0 cipso
    Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble
    0 fragmented, 0 fragment count
```
Bcast: 0 sent, 0 received  
Mcast: 0 sent, 0 received  
Drop: 0 encapsulation failed, 0 no route, 0 too big, 0 sanity address check  
Sent: 16372 total

ICMP statistics:
  Sent: 0 admin unreachable, 0 network unreachable  
  0 host unreachable, 0 protocol unreachable  
  0 port unreachable, 0 fragment unreachable  
  0 time to live exceeded, 0 reassembly ttl exceeded  
  5 echo request, 0 echo reply  
  0 mask request, 0 mask reply  
  0 parameter error, 0 redirects  
  5 total  
Rcvd: 0 admin unreachable, 0 network unreachable  
  2 host unreachable, 0 protocol unreachable  
  0 port unreachable, 0 fragment unreachable  
  0 time to live exceeded, 0 reassembly ttl exceeded  
  0 echo request, 5 echo reply  
  0 mask request, 0 mask reply  
  0 redirect, 0 parameter error  
  0 source quench, 0 timestamp, 0 timestamp reply  
  0 router advertisement, 0 router solicitation  
  7 total, 0 checksum errors, 0 unknown

UDP statistics:  
  16365 packets input, 16367 packets output  
  0 checksum errors, 0 no port  
  0 forwarded broadcasts

TCP statistics:  
  0 packets input, 0 packets output  
  0 checksum errors, 0 no port

This table describes the significant fields shown in the display.

Table 14: show ipv4 traffic Command Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bad hop count</td>
<td>Occurs when a packet is discarded because its TTL(^4) field was decremented to zero.</td>
</tr>
<tr>
<td>encapsulation failed</td>
<td>Usually indicates that the router had no ARP request entry and therefore did not send a datagram.</td>
</tr>
<tr>
<td>format errors</td>
<td>Indicates a gross error in the packet format, such as an impossible Internet header length.</td>
</tr>
<tr>
<td>IP statistics Rcvd total</td>
<td>Indicates the total number of local destination and other packets received in the software plane. It does not account for the IP packets forwarded or discarded in hardware.</td>
</tr>
<tr>
<td>no route</td>
<td>Counted when the Cisco IOS XR software discards a datagram it did not know how to route.</td>
</tr>
</tbody>
</table>

\(^4\) TTL = time-to-live
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*.

- router igmp vrf, page 190
- igmp accounting, page 191
- igmp explicit-tracking, page 192
- igmp query-interval, page 194
- igmp query-max-response-time, page 196
- multicast (BNG), page 198
- unicast-qos-adjust, page 200
- show igmp unicast-qos-adjust statistics, page 202
- show igmp vrf (BNG), page 205
- clear igmp unicast-qos-adjust, page 207
**router igmp vrf**

To configure route-policy to be used to map the bandwidth profile, use the `router igmp vrf` command in the Global Configuration mode. To disable this feature, use the `no` form of this command.

```
router igmp vrf vrf_name {traffic|profile|profile_name}
no router igmp vrf vrf_name {traffic|profile|profile_name}
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrf_name</td>
<td>Specifies the VRF name.</td>
</tr>
<tr>
<td>traffic</td>
<td>Configures IGMP traffic variables.</td>
</tr>
<tr>
<td>profile</td>
<td>Configures route-policy to be used to map the bandwidth profile.</td>
</tr>
<tr>
<td>profile_name</td>
<td>Specifies the profile name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `router igmp vrf` command in the Global Configuration mode:

```
RP/0/RSP0/CPU0:router # configure
RP/0/RSP0/CPU0:router(config)# router igmp vrf vrf1
RP/0/RSP0/CPU0:router(config)# router igmp vrf vrf1 traffic profile prof-name
```
igmp accounting

To enable accounting feature under igmp, use the **igmp accounting** command in the Global Configuration mode. To disable this feature, use the **no** form of this command.

```plaintext
igmp accounting{ max-history number_of_days }
no igmp accounting{ max-history number_of_days }
```

**Syntax Description**

- `max-history`  
  Sets the maximum history for the accounting in days.

- `number_of_days`  
  Specifies the number of days the history has to be retained. This value ranged from 1 to 365.

**Command Default**

If `max-history` is not specified, then the default is 0 days, which indicates that there was no history saved.

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

```plaintext
RP/0/RSP0/CPU0:router # configure
RP/0/RSP0/CPU0:router(config)# router igmp accounting max-history 67
```
**igmp explicit-tracking**

To configure explicit host tracking under Internet Group Management Protocol (IGMP) Version 3, use the `igmp explicit-tracking` command in the dynamic-template configuration mode. To disable explicit host tracking, use the `no` form of this command.

```
igmp explicit-tracking access_list_name
no igmp explicit-tracking
```

**Syntax Description**

`access_list_name` Specifies the access list tracking group range.

**Command Default**

None

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter dynamic template type ppp configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `igmp explicit-tracking` command in the dynamic-template 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 ppp foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# igmp explicit-tracking igmp1
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>igmp query-interval</code>, <em>on page 194</em></td>
<td>Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages.</td>
</tr>
<tr>
<td><code>unicast-qos-adjust</code>, <em>on page 200</em></td>
<td>Configures the IGMP QOS Shaper for subscriber unicast traffic.</td>
</tr>
<tr>
<td><code>show igmp unicast-qos-adjust statistics</code>, <em>on page 202</em></td>
<td>Displays the internal statistics of the unicast-qos-adjusted feature.</td>
</tr>
<tr>
<td><code>igmp query-max-response-time</code>, <em>on page 196</em></td>
<td>Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) queries.</td>
</tr>
<tr>
<td><code>multicast (BNG)</code>, <em>on page 198</em></td>
<td>Configures the mode in which the multicast components will work for subscriber sessions associated with a dynamic template.</td>
</tr>
</tbody>
</table>
igmp query-interval

To configure the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages, use the `igmp query-interval` command in the dynamic-template configuration mode. To disable this feature, use the `no` form of this command.

`igmp query-interval seconds`

`no igmp query-interval`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>seconds</td>
<td>Specifies the frequency used to send IGMP host-query messages and ranges between 1 to 3600.</td>
</tr>
</tbody>
</table>

**Command Default**

The default query-interval value is 60s.

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter dynamic template type ppp configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is the example of configuring the `igmp query-interval` command in the dynamic-template 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 ppp foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# igmp query-interval 60
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>unicast-qos-adjust</code>, on page 200</td>
<td>Configures the IGMP QOS Shaper for subscriber unicast traffic.</td>
</tr>
<tr>
<td><code>igmp explicit-tracking</code>, on page 192</td>
<td>Configures explicit host tracking under Internet Group Management Protocol (IGMP) Version 3</td>
</tr>
<tr>
<td><code>igmp query-max-response-time</code>, on page 196</td>
<td>Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) queries</td>
</tr>
<tr>
<td><code>multicast (BNG)</code>, on page 198</td>
<td>Configures the mode in which the multicast components will work for subscriber sessions associated with a dynamic template.</td>
</tr>
<tr>
<td><code>show igmp unicast-qos-adjust statistics</code>, on page 202</td>
<td>Displays the internal statistics of the unicast-qos-adjusted feature.</td>
</tr>
</tbody>
</table>
**igmp query-max-response-time**

To configure the maximum response time advertised in Internet Group Management Protocol (IGMP) queries, use the `igmp query-max-response-time` command in the dynamic-template configuration mode. To disable this feature, use the `no` form of this command.

`igmp query-max-response-time seconds`

`no igmp query-max-response-time`

**Syntax Description**

- `seconds` Specifies the maximum response time, in seconds, advertised in IGMP queries, and ranges between 1 to 12.

**Command Default**

The default query-max-response-time is 10 seconds.

**Command Modes**

Dynamic template configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter dynamic template type ppp configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is the example of configuring the `igmp query-max-response-time` command in the dynamic-template 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 ppp foo
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# igmp query-max-response-time 12
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>igmp query-interval</code>, on page 194</td>
<td>Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages.</td>
</tr>
<tr>
<td><code>igmp explicit-tracking</code>, on page 192</td>
<td>Configures explicit host tracking under Internet Group Management Protocol (IGMP) Version 3</td>
</tr>
<tr>
<td><code>show igmp unicast-qos-adjust statistics</code>, on page 202</td>
<td>Displays the internal statistics of the unicast-qos-adjusted feature.</td>
</tr>
<tr>
<td><code>unicast-qos-adjust</code>, on page 200</td>
<td>Configures the IGMP QOS Shaper for subscriber unicast traffic.</td>
</tr>
<tr>
<td><code>multicast (BNG)</code>, on page 198</td>
<td>Configures the mode in which the multicast components will work for subscriber sessions associated with a dynamic template.</td>
</tr>
</tbody>
</table>
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}
no multicast[ipv4]{qos-correlation| passive}
```

<table>
<thead>
<tr>
<th>qos-correlation</th>
<th>Configures multicast in a IGMP-HQOS correlation mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>passive</td>
<td>Configures multicast is an passive mode.</td>
</tr>
<tr>
<td>ipv4</td>
<td>Optional. Specifies configuration for IPv4 address family.</td>
</tr>
</tbody>
</table>

**Command Default**  
None

**Command Modes**  
Dynamic template configuration

**Command History**  
```
Release   Modification
---------  ----------------
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 appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter dynamic template type ppp configuration mode.

**Task ID**  
```
Task ID   Operation
---------  ----------------
multicast  read, write
```

**Examples**  
This is an example of configuring the `multicast` command in the dynamic-template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>igmp query-interval</code>, on page 194</td>
<td>Configures the frequency at which the Cisco IOS XR Software sends IGMP host-query messages.</td>
</tr>
<tr>
<td><code>unicast-qos-adjust</code>, on page 200</td>
<td>Configures the IGMP QOS Shaper for subscriber unicast traffic.</td>
</tr>
<tr>
<td><code>igmp explicit-tracking</code>, on page 192</td>
<td>Configures explicit host tracking under IGMP Version 3</td>
</tr>
<tr>
<td><code>igmp query-max-response-time</code>, on page 196</td>
<td>Configures the maximum response time advertised in IGMP queries</td>
</tr>
<tr>
<td><code>show igmp unicast-qos-adjust statistics</code>, on page 202</td>
<td>Displays the internal statistics of the unicast-qos-adjusted feature.</td>
</tr>
</tbody>
</table>
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}
no unicast-qos-adjust
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the **dynamic-template type ppp** command to enter dynamic template type ppp configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```
## Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>igmp query-interval, on page 194</td>
<td>Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages.</td>
</tr>
<tr>
<td>igmp explicit-tracking, on page 192</td>
<td>Configures explicit host tracking under Internet Group Management Protocol (IGMP) Version 3.</td>
</tr>
<tr>
<td>show igmp unicast-qos-adjust statistics, on page 202</td>
<td>Displays the internal statistics of the unicast-qos-adjusted feature.</td>
</tr>
<tr>
<td>igmp query-max-response-time, on page 196</td>
<td>Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) queries.</td>
</tr>
<tr>
<td>multicast (BNG), on page 198</td>
<td>Configures the mode in which the multicast components will work for subscriber sessions associated with a dynamic template.</td>
</tr>
</tbody>
</table>
show igmp unicast-qos-adjust statistics

To show the statistics of the unicast-qos-adjusted feature, use the `show igmp unicast-qos-adjust statistics` command in the EXEC mode.

```
show igmp unicast-qos-adjust statistics [ interface type interface-path-id ]
```

**Syntax Description**

- **interface** (Optional). Displays the interface specific information such as name of the interface, number of flows adjusted, total rate adjusted, and uptime after first adjustment, in a tabular format. If the interface is specified, then the interface specific statistics are displayed with table of 5 latest updates.

  | Specifies the output modifiers.

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task IDs**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

This is the sample output of the `show igmp unicast-qos-adjust statistics` command:

```
RP/0/RSP0/CPU0:router# show igmp unicast-qos-adjust statistics
The show igmp unicast-qos-adjust statistics output is as follows:

Mon Feb 4 08:47:01.640 GMT
IGMP to QoS Batch stats
Current Queue count : 0
```

Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Command Reference, Release 4.2.x
Last IGMP-to-QoS Batch count : 0
Last IGMP-to-QoS Batch errors : 0
Interfaces added to queue(all batches) : 0
Interfaces removed from queue(all batches) : 0

IGMP to QoS message send stats
Number of Send Success : 1
Number of Send Error COMMS : 0
Number of Send Error Partial : 0
Time elapsed since last download : 3w0d

Resync stats
Is RESYNC required : No
Is RESYNC REQUEST received : No
Is RESYNC START message sent : No
Has Mark&Sweep happened anytime : Yes
Time elapsed since last mark and sweep : 3w0d

This table describes the significant fields shown in the display.

Table 15: show igmp unicast-qos-adjust statistics Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGMP to QoS Batch stats</td>
<td>Specifies the batch statistics details for IGMP to QoS, such as current queue count, batch counter, batch errors, number of interfaces added to the queue, and the number of interfaces removed from the queue.</td>
</tr>
<tr>
<td>IGMP to QoS message send stats</td>
<td>Specifies the send statistics details for IGMP to QoS, such as number of send messages that was successful, number of send messages that had errored, number of send messages that had partially errored, and time elapsed since the last download.</td>
</tr>
<tr>
<td>Resync stats</td>
<td>Specifies the detailed information on the resynchronization statistics, such as whether resync is required, if the resync request was received, if the resync start message was sent, if mark and sweep for the resync has taken place, and time elapsed since the last mark and sweep.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>igmp query-interval, on page 194</td>
<td>Configures the frequency at which the Cisco IOS XR Software sends Internet Group Management Protocol (IGMP) host-query messages.</td>
</tr>
<tr>
<td>unicast-qos-adjust, on page 200</td>
<td>Configures the IGMP QoS Shaper for subscriber unicast traffic.</td>
</tr>
<tr>
<td>igmp explicit-tracking, on page 192</td>
<td>Configures explicit host tracking under Internet Group Management Protocol (IGMP) Version 3</td>
</tr>
</tbody>
</table>
### Multicast Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>igmp query-max-response-time</code>, on page 196</td>
<td>Configures the maximum response time advertised in Internet Group Management Protocol (IGMP) queries.</td>
</tr>
<tr>
<td><code>multicast (BNG)</code>, on page 198</td>
<td>Configures the mode in which the multicast components will work for subscriber sessions associated with a dynamic template.</td>
</tr>
</tbody>
</table>
show igmp vrf (BNG)

To show the igmp vrf specific information, use the `show igmp vrf` command in the EXEC mode.

```
show igmp vrf vrf_name [groups | interface | nsf | ranges | ssm | summary | traffic | unicast-qos-adjusted]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vrf</code></td>
<td>Shows the vrf information for igmp unicast qos shaper.</td>
</tr>
<tr>
<td><code>vrf_name</code></td>
<td>Specifies the vrf name.</td>
</tr>
<tr>
<td><code>groups</code></td>
<td>Shows the igmp group membership information.</td>
</tr>
<tr>
<td><code>interface</code></td>
<td>Shows igmp interface information.</td>
</tr>
<tr>
<td><code>nsf</code></td>
<td>Shows igmp nsf status.</td>
</tr>
<tr>
<td><code>ranges</code></td>
<td>Shows igmp group-map ranges.</td>
</tr>
<tr>
<td><code>ssm</code></td>
<td>Shows ssm related information.</td>
</tr>
<tr>
<td><code>summary</code></td>
<td>Shows igmp summary information.</td>
</tr>
<tr>
<td><code>traffic</code></td>
<td>Show igmp traffic counters.</td>
</tr>
<tr>
<td><code>unicast-qos-adjusted</code></td>
<td>Shows igmp unicast qos shaper.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

This is the sample output of the `show igmp vrf` command:

```
RP/0/RSP0/CPU0:router#show igmp vrf vrf1 summary
The show igmp vrf vrf1 summary output is as follows:

Thu Feb 7 10:02:24.457 GMT
Robustness Value 2
No. of Group x Interfaces 10
Maximum number of Group x Interfaces 50000

Supported Interfaces : 2
Unsupported Interfaces : 0
Enabled Interfaces : 2
Disabled Interfaces : 0
MTE tuple count : 0

<table>
<thead>
<tr>
<th>Interface</th>
<th>Number</th>
<th>Max #</th>
<th>Groups</th>
<th>Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>BVI1</td>
<td>7</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loopback1001</td>
<td>3</td>
<td>25000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

```
RP/0/RSP0/CPU0:router#show igmp vrf vrf1 interface bvi1
Thu Feb 7 10:02:48.231 GMT

BVI1 is up, line protocol is up
Internet address is 172.16.251.1/30
IGMP is enabled on interface
Current IGMP version is 3
IGMP query interval is 60 seconds
IGMP querier timeout is 125 seconds
IGMP max query response time is 10 seconds
 Last member query response interval is 1 seconds
IGMP activity: 26 joins, 19 leaves
IGMP querying router is 172.16.251.1 (this system)
Time elapsed since last query sent 00:00:41
Time elapsed since IGMP router enabled 3w3d
Time elapsed since last report received 00:00:32

This table describes the significant fields shown in the display.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Interfaces</td>
<td>Specifies the number of supported interfaces.</td>
</tr>
<tr>
<td>Unsupported Interfaces</td>
<td>Specifies the number of unsupported interfaces.</td>
</tr>
<tr>
<td>Enabled Interfaces</td>
<td>Specifies the number of interfaces that are enabled.</td>
</tr>
<tr>
<td>Disabled Interfaces</td>
<td>Specifies the number of interfaces that are disabled.</td>
</tr>
</tbody>
</table>
clear igmp unicast-qos-adjust

To clear IGMP unicast rate adjustment database, use the `clear igmp unicast-qos-adjust` command in the EXEC mode.

**clear igmp unicast-qos-adjust {rate | statistics} interface {type | interface_path_id}**

**Syntax Description**

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>rate</td>
<td>Specifies the rate programmed in QoS.</td>
</tr>
<tr>
<td>statistics</td>
<td>Specifies the unicast rate adjustment statistics.</td>
</tr>
<tr>
<td>interface</td>
<td>Specifies the interface specific rate.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Either a physical interface instance or a virtual interface instance as follows:</td>
</tr>
<tr>
<td></td>
<td>• Physical interface instance. Naming notation is <code>rack/slot/module/port</code> and a slash between values is required as part of the notation.</td>
</tr>
<tr>
<td></td>
<td>• <em>rack</em>: Chassis number of the rack.</td>
</tr>
<tr>
<td></td>
<td>• <em>slot</em>: Physical slot number of the modular services card or line card.</td>
</tr>
<tr>
<td></td>
<td>• <em>module</em>: Module number. A physical layer interface module (PLIM) is always 0.</td>
</tr>
<tr>
<td></td>
<td>• <em>port</em>: Physical port number of the interface.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>• Virtual interface instance. Number range varies depending on interface type.</td>
</tr>
</tbody>
</table>

For more information about the syntax for the router, use the question mark (?) online help function.

**Command Default**

Clears all unicast qos adjust parameters.

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>multicast</td>
<td>exec</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of using the `clear igmp unicast-qos-adjust` command:

```
RP/0/RSP0/CPU0:router# clear igmp unicast-qos-adjust rate interface Loopback 1
```
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*.

- ppp authentication (BNG), page 210
- ppp chap, page 213
- ppp ipcp, page 215
- ppp lcp, page 217
- ppp max-bad-auth (BNG), page 219
- ppp max-configure (BNG), page 221
- ppp max-failure (BNG), page 223
- ppp ms-chap, page 225
- ppp timeout, page 227
- show ppp interfaces (BNG), page 229
- show ppp statistics, page 237
- show ppp summary, page 240
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 an appropriate configuration mode. To disable PPP authentication, use the `no` form of this command.

```
ppp authentication protocol [protocol [ protocol ]] {list-name} default
no ppp authentication
```

**Syntax Description**

- `protocol`: Name of the authentication protocol used for PPP authentication. See Table 17: PPP Authentication Protocols for Negotiation, on page 211 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**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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 211 lists the protocols used to negotiate PPP authentication.

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>chap</td>
<td>Enables CHAP on an interface.</td>
</tr>
<tr>
<td>ms-chap</td>
<td>Enables Microsoft’s version of CHAP (MS-CHAP) on an interface.</td>
</tr>
<tr>
<td>pap</td>
<td>Enables PAP on an interface.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```
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`

`no ppp chap`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hostname</td>
<td>Sets the CHAP hostname.</td>
</tr>
<tr>
<td><code>chap_hostname</code></td>
<td>Specifies the CHAP hostname.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template type ppp` command to enter the ppp dynamic template type configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ppp</code></td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `ppp chap` command in the dynamic template configuration mode:

```bash
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ppp authentication (BNG)</code>, on page 210</td>
<td>Sets PPP link authentication method.</td>
</tr>
</tbody>
</table>
**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_address | secondary_ip_address } | mask peer_netmask_address | peer-address { default | peer_ipaddress } | pool { pool_name } | renegotiation ignore | wins { primary_ipaddress | secondary_ipaddress } ]
```

```
no ppp ipcp
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dns</code></td>
<td>Configures the dns options.</td>
</tr>
<tr>
<td><code>primary_ip_address</code></td>
<td>Specifies the primary DNS IP addresses.</td>
</tr>
<tr>
<td><code>secondary_ip_address</code></td>
<td>Specifies the secondary DNS IP addresses.</td>
</tr>
<tr>
<td><code>mask</code></td>
<td>Specifies the IPv4 netmask to use for the peer.</td>
</tr>
<tr>
<td><code>peer_netmask_address</code></td>
<td>Specifies the peer netmask address.</td>
</tr>
<tr>
<td><code>peer-address</code></td>
<td>Specifies the change in peer-address configuration.</td>
</tr>
<tr>
<td><code>default</code></td>
<td>Specifies the default peer IP address.</td>
</tr>
<tr>
<td><code>peer_ipaddress</code></td>
<td>Specifies the peer IP address.</td>
</tr>
<tr>
<td><code>pool</code></td>
<td>Configures the pool options.</td>
</tr>
<tr>
<td><code>pool_name</code></td>
<td>Specifies the pool name.</td>
</tr>
<tr>
<td><code>renegotiation</code></td>
<td>Specifies the peer negotiation options.</td>
</tr>
<tr>
<td><code>wins</code></td>
<td>Specifies the WINS options.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
Usage Guidelines

Use the `dynamic-template type ppp` command to enter the ppp dynamic template type configuration mode.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

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 pl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp ipcp
```
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 ]
no ppp lcp
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `dynamic-template type ppp` command to enter the ppp dynamic template type configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp authentication (BNG), on page 210</td>
<td>Sets PPP link authentication method.</td>
</tr>
</tbody>
</table>
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
no ppp max-bad-auth
```

**Syntax Description**

| Syntax Description | 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**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
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
no ppp max-configure
```

**Syntax Description**
- `retries`: Maximum number of retries. Range is 4 through 20. Default is 10.

**Command Default**
- `retries`: 10

**Command Modes**
- Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
**Examples**

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 pl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# ppp ipcp
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp max-failure (BNG), on page 223</td>
<td>Configures the maximum number of consecutive CONFNAKs to permit before terminating a negotiation.</td>
</tr>
</tbody>
</table>
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`

`no ppp max-failure`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>retries</code></td>
<td>Maximum number of CONFNAKs to permit before terminating a negotiation. Range is from 2 to 10. Default is 5.</td>
</tr>
</tbody>
</table>

**Command Default**

`retries: 5`

**Command Modes**

- Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```
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*

**no ppp ms-chap**

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>hostname</strong></td>
<td>Sets the MS-CHAP hostname.</td>
</tr>
<tr>
<td><strong>chap_hostname</strong></td>
<td>Specifies the name of the MS-CHAP hostname.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the **dynamic-template** command to enter the dynamic template configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp authentication (BNG), on page 210</td>
<td>Sets PPP link authentication method.</td>
</tr>
</tbody>
</table>
**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 ]
no ppp timeout
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>absolute</code></td>
<td>Specifies the absolute timeout for a PPP session.</td>
</tr>
<tr>
<td><code>authentication</code></td>
<td>Specifies the maximum wait time to receive an authentication response.</td>
</tr>
<tr>
<td><code>retry</code></td>
<td>Specifies the maximum time to wait for a response during PPP negotiation.</td>
</tr>
<tr>
<td><code>absolute_minutes</code></td>
<td>Specifies the absolute timeout in minutes. This value ranges from 0-70000000.</td>
</tr>
<tr>
<td><code>auth_seconds</code></td>
<td>Specifies the authentication wait time in seconds. This value ranges from 3-30.</td>
</tr>
<tr>
<td><code>retry_seconds</code></td>
<td>Specifies the retry timeout in seconds. This value ranges from 1-10.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Dynamic template configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `dynamic-template` command to enter the dynamic template configuration mode.

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
<tr>
<td>aaa</td>
<td>read, write</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ppp authentication (BNG), on page 210</code></td>
<td>Sets PPP link authentication method.</td>
</tr>
</tbody>
</table>
**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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>brief</td>
<td>(Optional) Displays brief output for all interfaces on the router, for a specific POS interface instance, or for all interfaces on a specific node.</td>
</tr>
<tr>
<td>detail</td>
<td>(Optional) Displays detailed output for all interfaces on the router, for a specific interface instance, or for all interfaces on a specific node.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td>all</td>
<td>(Optional) Displays detailed PPP information for all nodes.</td>
</tr>
<tr>
<td>location node-id</td>
<td>(Optional) Displays detailed PPP information for the designated node. The <code>node-id</code> argument is entered in the rack/slot/module notation.</td>
</tr>
</tbody>
</table>

**Command Default**

No default behavior or values

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.9.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.2.0</td>
<td>This command was supported in the dynamic template configuration mode for BNG.</td>
</tr>
</tbody>
</table>
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.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

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 IPv4 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 MRU: 1500 bytes
Peer Bundle MRU: 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
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ack-Rcvd</td>
<td>Configuration acknowledgment was received; waiting for peer to send configuration request.</td>
</tr>
<tr>
<td>Ack-Sent</td>
<td>Configuration acknowledgment was sent; waiting for peer to respond to configuration request.</td>
</tr>
<tr>
<td>Authentication</td>
<td>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).</td>
</tr>
<tr>
<td>Closed</td>
<td>Lower layer is up, but this layer is not required.</td>
</tr>
<tr>
<td>Closing</td>
<td>Shutting down due to local change.</td>
</tr>
<tr>
<td>Initial</td>
<td>Connection is idle.</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>IPCP</td>
<td>IP Control Protocol (IPCP) state. The seven possible states that may be displayed are as follows:</td>
</tr>
<tr>
<td></td>
<td>• Initial—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• Closed—IPCP is not currently trying to negotiate.</td>
</tr>
<tr>
<td></td>
<td>• Stopped—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• Stopping—A Terminate-Request has been sent and the Restart timer is running, but a IPCP-Ack has not yet been received. Req-Sent.</td>
</tr>
<tr>
<td></td>
<td>• ACKsent—IPCP has received a request and has replied to it.</td>
</tr>
<tr>
<td></td>
<td>• ACKrcvd—IPCP has received a reply to a request it sent.</td>
</tr>
<tr>
<td></td>
<td>• Open—IPCP is functioning properly.</td>
</tr>
<tr>
<td>Keepalive</td>
<td>Keepalive setting and interval in seconds for echo request packets.</td>
</tr>
</tbody>
</table>
Indicates the current state of LCP. The state of the LCP will report the following states:

- Initial—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.

- 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.

- Closed—LCP is not currently trying to negotiate.

- Stopped—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.

- 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.

- Stopping—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Req-Sent.

- ACKsent—LCP has received a request and has replied to it.

- ACKrcvd—LCP has received a reply to a request it sent.

- Open—LCP is functioning properly

### Table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCP</td>
<td>Indicates the current state of LCP. The state of the LCP will report the following states:</td>
</tr>
<tr>
<td>Local IPv4 address</td>
<td>IPv4 address for the local interface.</td>
</tr>
<tr>
<td>Local MRU</td>
<td>Maximum receive unit. The maximum size of the information transported, in bytes, in the PPP packet received by the local equipment.</td>
</tr>
<tr>
<td>Open</td>
<td>Connection open.</td>
</tr>
</tbody>
</table>
Open System Interconnection Control Protocol (OSICP) state. The possible states that may be displayed are as follows:

- **Initial**—Lower layer is unavailable (Down), and no Open has occurred. The Restart timer is not running in the Initial state.
- **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.
- **Closed**—OSICP is not currently trying to negotiate.
- **Stopped**—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received.
- **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.
- **Stopping**—A Terminate-Request has been sent and the Restart timer is running, but a Terminate-Ack has not yet been received. Req-Sent.
- **ACKsent**—OSICP has received a request and has replied to it.
- **ACKrcvd**—OSICP has received a reply to a request it sent.
- **Open**—OSICP is functioning properly.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSICP</td>
<td>Open System Interconnection Control Protocol (OSICP) state. The possible states that may be displayed are as follows:</td>
</tr>
<tr>
<td>Peer IPv4 address</td>
<td>IPv4 address for the peer equipment.</td>
</tr>
<tr>
<td>Peer MRU</td>
<td>Maximum receive unit. The maximum size of the information transported, in bytes, in the PPP packet received by the peer equipment.</td>
</tr>
<tr>
<td>Req-Sent</td>
<td>Configuration request was sent; waiting for peer to respond.</td>
</tr>
</tbody>
</table>
### show ppp interfaces (BNG)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting</td>
<td>This layer is required, but lower layer is down.</td>
</tr>
<tr>
<td>Stopped</td>
<td>Listening for a configuration request.</td>
</tr>
<tr>
<td>Stopping</td>
<td>Shutting down as a result of interactions with peer.</td>
</tr>
</tbody>
</table>
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-type| interface-path-id}| summary| {location location}}
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>extended</td>
<td>Displays the extended PPP statistics across all interfaces.</td>
</tr>
<tr>
<td>interface</td>
<td>Displays the PPP statistics for a single interface.</td>
</tr>
<tr>
<td>summary</td>
<td>Displays aggregated PPP statistics across all interfaces.</td>
</tr>
<tr>
<td>location</td>
<td>Displays the PPP statistics for interfaces at a location.</td>
</tr>
<tr>
<td>location</td>
<td>Specifies the location details.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Physical interface or virtual interface.</td>
</tr>
</tbody>
</table>

**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. 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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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.
show ppp statistics

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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
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
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ppp interfaces (BNG), on page 229</td>
<td>Displays the PPP interfaces.</td>
</tr>
<tr>
<td>show ppp summary, on page 240</td>
<td>Displays the PPP summary.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th><strong>location</strong></th>
<th>Displays the PPP summary for interfaces at a location.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>location</strong></td>
<td>Specifies the location details.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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
```

Cisco ASR 9000 Series Aggregation Services Router Broadband Network Gateway Command Reference, Release 4.2.x
### CP FSM States

<table>
<thead>
<tr>
<th>Name</th>
<th>Total Open</th>
<th>ACK sent</th>
<th>ACK rcvd</th>
<th>REQ sent</th>
<th>Stop- ped</th>
<th>Stop- ping</th>
<th>Clos- ing</th>
<th>Clos- ing</th>
<th>Start- ing</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCP</td>
<td>10300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CDPCP</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IPCP</td>
<td>10000</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IPv6CP</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MPLSCP</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OSICP</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### LCP/Authentication Phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCP Not Negotiated</td>
<td>100</td>
</tr>
<tr>
<td>Authenticating</td>
<td>0</td>
</tr>
<tr>
<td>Line held down</td>
<td>0</td>
</tr>
<tr>
<td>Line Up (Local Termination)</td>
<td>10200</td>
</tr>
<tr>
<td>Line Up (L2 Forwarded)</td>
<td>0</td>
</tr>
<tr>
<td>Line UP (VPDN Tunneled)</td>
<td>100</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ppp statistics, on page 237</td>
<td>Displays the PPP statistics.</td>
</tr>
<tr>
<td>show ppp interfaces (BNG), on page 229</td>
<td>Displays the PPP interfaces.</td>
</tr>
</tbody>
</table>
show ppp summary
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*.

- l2tp-class, page 244
- session-limit (BNG), page 246
- template (BNG), page 248
- tunnel, page 250
- vpdn, page 252
- vpn, page 254
- show l2tpv2, page 256
- show vpdn, page 258
**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 ]
```

```
no l2tp-class
```

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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**
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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel, on page 250</td>
<td>Configures l2tp tunnel.</td>
</tr>
</tbody>
</table>
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
no session-limit
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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}
no template
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vpdn-template_name</code></td>
<td>Specifies the vpdn template name.</td>
</tr>
<tr>
<td><code>description</code></td>
<td>Specifies the description of the vpdn template.</td>
</tr>
<tr>
<td><code>caller-id</code></td>
<td>Specifies the options to apply on calling station id.</td>
</tr>
<tr>
<td><code>ip</code></td>
<td>Specifies the tos ip value.</td>
</tr>
<tr>
<td><code>dsl-line-forwarding</code></td>
<td>Enables dsl line information forwarding.</td>
</tr>
<tr>
<td><code>ipv4</code></td>
<td>Specifies the ipv4 settings for tunnel.</td>
</tr>
<tr>
<td><code>l2tp-class</code></td>
<td>Specifies the l2tp class name.</td>
</tr>
<tr>
<td><code>tunnel</code></td>
<td>Specifies the l2tp tunnel commands.</td>
</tr>
<tr>
<td><code>vpn</code></td>
<td>Specifies the vpn id/vrf name.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

VPDN configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `vpdn` command, to enter vpdn configuration submode.
### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel</td>
<td>read, write</td>
</tr>
</tbody>
</table>

### Examples

This is an example of configuring the `template` command in vpdn configuration mode:

```plaintext
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
no tunnel
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the `vpdn template` command to enter vpdn template configuration submode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vpdn</code> on page 252</td>
<td>Configures VPDN and to enter the VPDN sub-configuration mode.</td>
</tr>
</tbody>
</table>
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}
no vpdn
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>caller-id</td>
<td>Specifies the options to apply on calling station id.</td>
</tr>
<tr>
<td>history</td>
<td>Enables VPDN history logging.</td>
</tr>
<tr>
<td>l2tp</td>
<td>Specifies the l2tpv2 protocol commands.</td>
</tr>
<tr>
<td>logging</td>
<td>Enables logging for VPDN.</td>
</tr>
<tr>
<td>session-limit</td>
<td>Allows to configure maximum simultaneous VPDN sessions.</td>
</tr>
<tr>
<td>softshut</td>
<td>Specifies that a new session is no longer allowed.</td>
</tr>
<tr>
<td>template</td>
<td>Specifies the VPDN template configuration.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Global Configuration mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

Use the vpdn command in Global Configuration mode to enter vpdn sub-configuration mode.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>tunnel</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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
```
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 }
no vpn
```

**Syntax Description**

- `id` Specifies the VPN ID.
- `vrf` Specifies the VRF.
- `vpn_index` Specifies a value between 0-fffff.
- `vrf_name` Specifies the name of the vrf.

**Command Default**

None

**Command Modes**

VPDN template configuration mode

**Command History**

```
Release                     Modification
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 appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the `vpdn template` command to enter vpdn template configuration submode.

**Task ID**

```
Task ID     Operation
  tunnel    read, write
```

**Examples**

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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class</td>
<td>Displays the L2TP class details.</td>
</tr>
<tr>
<td>counters</td>
<td>Displays the L2TP counter information.</td>
</tr>
<tr>
<td>session</td>
<td>Displays the L2TP session information.</td>
</tr>
<tr>
<td>statistics</td>
<td>Displays the L2TP protocol statistics.</td>
</tr>
<tr>
<td>tunnel</td>
<td>Displays the L2TP tunnel information.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read</td>
</tr>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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
```
show l2tpv2 statistics | file tftp: vrf vrf1
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 queue size 0, max 0
Resend queue size 0, max 2
Total resends 0, ZLB ACKs sent 340
Total out-of-order dropped pkts 0
Total out-of-order retransmit 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 0
Control message authentication is disabled

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>l2tp-class, on page 244</td>
<td>Configures the l2tp class.</td>
</tr>
</tbody>
</table>
show vpdn

To display all vpdn-related information, use the `show vpdn` command in the EXEC mode.

```
show vpdn {client| config| history| tunnel destination| session}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>client</td>
<td>Displays VPDN client information.</td>
</tr>
<tr>
<td>config</td>
<td>Displays VPDN configuration information.</td>
</tr>
<tr>
<td>history</td>
<td>Displays the vpdn session history information.</td>
</tr>
<tr>
<td>tunnel destination</td>
<td>Displays the vpdn tunnel destination information.</td>
</tr>
<tr>
<td>session</td>
<td>Displays the vpdn session information.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ipv4</td>
<td>read</td>
</tr>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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 |
```
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, i2tp 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

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>vpdn, on page 252</td>
<td>Configures VPDN and enters the VPDN sub-configuration mode.</td>
</tr>
</tbody>
</table>
show vpdn
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.

- pppoe bba-group, page 262
- pppoe enable bba-group, page 265
- pppoe in-flight-window, page 267
- show pppoe interfaces, page 269
- show pppoe limits, page 271
- show pppoe statistics, page 273
- show pppoe summary, page 276
- show pppoe throttles, page 278
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 {ac| name| new_name| control-packets| priority| priority_bits| service| {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}| }
no pppoe bba-group
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>bba-group-name</code></td>
<td>Specifies the bba group name.</td>
</tr>
<tr>
<td><code>ac</code></td>
<td>Enables modification of the access concentrator configuration.</td>
</tr>
<tr>
<td><code>name</code></td>
<td>Indicates the name change to include in the AC tag.</td>
</tr>
<tr>
<td><code>new_name</code></td>
<td>Specifies the new name.</td>
</tr>
<tr>
<td><code>control-packets</code></td>
<td>Enables change of control-packets configuration.</td>
</tr>
<tr>
<td><code>priority</code></td>
<td>Sets the priority to use in PPPoE and PPP control packets.</td>
</tr>
<tr>
<td><code>priority_bits</code></td>
<td>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.</td>
</tr>
<tr>
<td><code>service</code></td>
<td>Enables modification of service configuration.</td>
</tr>
<tr>
<td><code>name</code></td>
<td>Configures the service name.</td>
</tr>
<tr>
<td><code>new_name</code></td>
<td>Specifies the new service name.</td>
</tr>
<tr>
<td><code>selection</code></td>
<td>Specifies the selection of unrequested service names.</td>
</tr>
<tr>
<td><code>disable</code></td>
<td>Disables the advertising of unrequested service names.</td>
</tr>
<tr>
<td><code>sessions</code></td>
<td>Enables modification of sessions configuration.</td>
</tr>
<tr>
<td><code>access-interface</code></td>
<td>Limits PPPoE sessions on any one access interface.</td>
</tr>
<tr>
<td><code>circuit-id</code></td>
<td>Limits PPPoE sessions with any one circuit-id.</td>
</tr>
<tr>
<td><code>mac</code></td>
<td>Limits or throttles PPPoE sessions from any one mac-address.</td>
</tr>
</tbody>
</table>
### PPPoE Commands

#### pppoe bba-group

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mac-iwf</strong></td>
<td>Limits or throttles IWF PPPoE sessions from any one mac-address.</td>
<td></td>
</tr>
<tr>
<td><strong>max</strong></td>
<td>Sets a per-card session limit.</td>
<td></td>
</tr>
<tr>
<td><strong>limit</strong></td>
<td>Specifies the action of limiting the PPPoE sessions for various attributes.</td>
<td></td>
</tr>
<tr>
<td><strong>session_limit</strong></td>
<td>Specifies the access-interface session limit. The value ranges from 1 to 65535.</td>
<td></td>
</tr>
<tr>
<td><strong>tag</strong></td>
<td>Enables modification of tag configuration.</td>
<td></td>
</tr>
<tr>
<td><strong>ppp-max-payload</strong></td>
<td>Modifies the ppp-max-payload configuration and allows to configure minimum and maximum payloads.</td>
<td></td>
</tr>
<tr>
<td><strong>deny</strong></td>
<td>Ignores the ppp-max-payload tag.</td>
<td></td>
</tr>
<tr>
<td><strong>minimum</strong></td>
<td>Configures the minimum payload.</td>
<td></td>
</tr>
<tr>
<td><strong>minimum_payload</strong></td>
<td>Specifies the value of the minimum payload. The value ranges from 500 to 2000.</td>
<td></td>
</tr>
</tbody>
</table>

#### Command Default
None

#### Command Modes
Global Configuration mode

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines
To use this command, 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 a command, contact your AAA administrator for assistance.

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.

#### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
</tbody>
</table>
Examples

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 bb1
RP/0/RSP0/CPU0:router(config-bbagroup)# ac name red
RP/0/RSP0/CPU0:router(config-bbagroup)# service name blue
RP/0/RSP0/CPU0:router(config-bbagroup)# service selection disable
RP/0/RSP0/CPU0:router(config-bbagroup)# sessions max limit 45
RP/0/RSP0/CPU0:router(config-bbagroup)# tag ppp-max-payload minimum 689 maximum 788
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pppoe enable bba-group, on page 265</td>
<td>Enables PPPoE on an interface.</td>
</tr>
</tbody>
</table>
**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
no pppoe enable bba-group
```

**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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

When this configuration changes to use a different BBAGroup, then all existing PPPoE sessions running under the interface are terminated.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pppoe bba-group</code>, on page 262</td>
<td>Enables you to add configuration for a particular bba-group.</td>
</tr>
</tbody>
</table>
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
no pppoe in-flight-window
```

**Syntax Description**

| `size` | Specifies the window-size for the number of PPPoE sessions that are in progression towards established state in BNG. The recommended in-flight-window size for RP-based subscribers is 200, and that for LC-based subscribers is 50. |

**Command Default**

None

**Command Modes**

Global Configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.3.1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pppoe sessions limit</td>
<td>Configures a limit for PPPoE sessions for a PPPoE BBA-Group in BNG.</td>
</tr>
</tbody>
</table>
### Command

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pppoe sessions throttle</code></td>
<td>Configures a throttle value for PPPoE sessions for a PPPoE BBA-Group in BNG.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>circuit-id</code></td>
<td>Shows information for a given circuit-id.</td>
</tr>
<tr>
<td><code>circuit_id</code></td>
<td>Specifies the circuit-id to show data for.</td>
</tr>
<tr>
<td><code>remote-id</code></td>
<td>Show information for a given remote-id.</td>
</tr>
<tr>
<td><code>remote_id</code></td>
<td>Specifies the remote-id to show data for.</td>
</tr>
<tr>
<td><code>access-interface</code></td>
<td>Shows PPPoE status for all sessions on a single access interface.</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><code>interface-path-id</code></td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td><code>location</code></td>
<td>Shows PPPoE status for all sessions at a location.</td>
</tr>
<tr>
<td><code>node</code></td>
<td>Specifies the fully qualified location specification.</td>
</tr>
<tr>
<td><code>all</code></td>
<td>Shows PPPoE status for all sessions.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

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: remotel
```
## 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 type-name] [interface-path-id] | bba-group bba-group-name | location node]
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>active</strong></td>
<td>Shows only those throttles that are currently blocking packets.</td>
</tr>
<tr>
<td><strong>access-interface</strong></td>
<td>Shows PPPoE status for all sessions on a single access interface.</td>
</tr>
<tr>
<td><strong>type</strong></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><strong>interface-path-id</strong></td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td><strong>bba-group</strong></td>
<td>Shows throttles for all interfaces with a given bba-group.</td>
</tr>
<tr>
<td><strong>bba_group_name</strong></td>
<td>Specifies the bba-group to show throttle for.</td>
</tr>
<tr>
<td><strong>location</strong></td>
<td>Shows PPPoE status for all sessions at a location.</td>
</tr>
<tr>
<td><strong>node</strong></td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

EXEC mode

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### 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.
show pppoe limits

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

Examples

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
mac_field_which_can_be_up_to_sixty_four_chars_long Warn 45
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show pppoe throttles, on page 278</td>
<td>Shows the throttle information for the PPPoE sessions.</td>
</tr>
<tr>
<td>show pppoe interfaces, on page 269</td>
<td>Shows a summary of the protocol state for the specified PPPoE interface filtered by circuit-id, remote-id, interface, or location.</td>
</tr>
<tr>
<td>show pppoe statistics, on page 273</td>
<td>Shows the counters for packets received and sent by the PPPoE sessions.</td>
</tr>
<tr>
<td>show pppoe summary, on page 276</td>
<td>Shows summary information of the PPPoE sessions.</td>
</tr>
</tbody>
</table>
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[|type[|interface-path-id]|internal] | { location|node}| location| node}

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>access-interface</td>
<td>Shows PPPoE status for all sessions on a single access interface.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Physical interface or virtual interface.</td>
</tr>
<tr>
<td>Note</td>
<td>Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>internal</td>
<td>Shows internal PPPoE statistics.</td>
</tr>
<tr>
<td>location</td>
<td>Shows PPPoE status for all sessions at a location.</td>
</tr>
<tr>
<td>node</td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

Command Default
None

Command Modes
EXEC mode

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

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.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>
This is the sample output of the `show pppoe statistics` command:

```
RP/0/RSP0/CPU0# 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
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- 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----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>per-access-interface</code></td>
<td>Summarizes PPPoE sessions running on each access-interface.</td>
</tr>
<tr>
<td><code>total</code></td>
<td>Shows the overall summary information of access-interfaces and sessions.</td>
</tr>
<tr>
<td><code>location</code></td>
<td>Shows PPPoE status for all sessions at a location.</td>
</tr>
<tr>
<td><code>node</code></td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ppp</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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
```
show pppoe summary

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.

show pppoe throttles [active] [access-interface type interface-path-id] bba-group bba-group-name | location node

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>active</td>
<td>Shows only those throttles that are currently blocking packets.</td>
</tr>
<tr>
<td>access-interface</td>
<td>Shows PPPoE status for all sessions on a single access interface.</td>
</tr>
<tr>
<td>type</td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>interface-path-id</td>
<td>Physical interface or virtual interface. Note: Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.</td>
</tr>
<tr>
<td>bba-group</td>
<td>Shows throttles for all interfaces with a given bba-group.</td>
</tr>
<tr>
<td>bba_group_name</td>
<td>Specifies the bba-group name.</td>
</tr>
<tr>
<td>location</td>
<td>Shows PPPoE status for all sessions at a location.</td>
</tr>
<tr>
<td>node</td>
<td>Specifies the fully qualified location specification.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.
Examples

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 Monitor 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.

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show pppoe limits, on page 271</td>
<td>Shows the PPPoE session limit information.</td>
</tr>
<tr>
<td>show pppoe interfaces, on page 269</td>
<td>Shows a summary of the protocol state for the specified PPPoE interface filtered by circuit-id, remote-id, interface, or location.</td>
</tr>
<tr>
<td>show pppoe statistics, on page 273</td>
<td>Shows the counters for packets received and sent by the PPPoE sessions.</td>
</tr>
<tr>
<td>show pppoe summary, on page 276</td>
<td>Shows summary information of the PPPoE sessions.</td>
</tr>
</tbody>
</table>
show pppoe throttles
QoS Commands

This module describes the Cisco IOS XR software commands used to configure the QoS 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.

- qos account, page 282
- qos output minimum-bandwidth, page 284
- service-policy (QoS-BNG), page 286
- service-policy (interface BNG), page 288
- show qos inconsistency (BNG), page 291
- show qos interface (BNG), page 293
- show qos summary BNG, page 303
qos account

To enable QoS Layer 2 overhead accounting, use the `qos account` command in dynamic template configuration mode. To disable this qos account, use the `no` form of this command.

```
qos account[ AAL5|user-defined offset atm ] [ mux-1483 routed|mux-dot1q-rbe|mux-pppoa|mux-rbe|snap-1483routed|snap-dot1q-rbe|snap-pppoa|snap-rbe ]
no qos account
```

### Syntax Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAL5</td>
<td>Specifies AAL5 for qos.</td>
</tr>
<tr>
<td>user-defined</td>
<td>Specifies the user-defined keyword.</td>
</tr>
<tr>
<td>offset</td>
<td>Specifies the user-defined offset size.</td>
</tr>
<tr>
<td>atm</td>
<td>Adds ATM cell tax to the L2 overhead.</td>
</tr>
<tr>
<td>mux-1483 routed</td>
<td>Specifies the mux-1483 routed.</td>
</tr>
<tr>
<td>mux-dot1q-rbe</td>
<td>Specifies the mux-dot1q-rbe.</td>
</tr>
<tr>
<td>mux-pppoa</td>
<td>Specifies the mux-pppoa.</td>
</tr>
<tr>
<td>mux-rbe</td>
<td>Specifies the mux-rbe.</td>
</tr>
<tr>
<td>snap-1483routed</td>
<td>Specifies the snap-1483routed.</td>
</tr>
<tr>
<td>snap-dot1q-rbe</td>
<td>Specifies the snap-dot1q-rbe.</td>
</tr>
<tr>
<td>snap-pppoa</td>
<td>Specifies the snap-pppoa.</td>
</tr>
<tr>
<td>snap-rbe</td>
<td>Specifies the snap-rbe.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Dynamic template configuration

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
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.

This command is available only in the dynamic template type ppp submode.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This is an example of configuring the `qos account` command in dynamic template configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp pl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# qos account AAL5 snap-rbe
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>qos output minimum-bandwidth</code>, on page 284</td>
<td>Sets the minimum guaranteed output bandwidth for a subscriber.</td>
</tr>
</tbody>
</table>
**qos output minimum-bandwidth**

To set the minimum guaranteed output bandwidth for a subscriber, use the `qos output minimum-bandwidth` command in dynamic template configuration mode.

`qos output minimum-bandwidth range`

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>range</code></td>
<td>Specifies the minimum bandwidth range (1-4294967295 kpbs).</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Dynamic template configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

This command is available only in the dynamic template type ppp submode. The value specified in this command is used only if IGMP HQoS correlation is configured. This is to ensure that the resultant bandwidth does not go below the specified value.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>vrrp</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

This is an example of configuring the `qos output minimum-bandwidth` command in dynamic template configuration mode:

```bash
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp pl
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# qos output minimum-bandwidth 10
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>qos account</code>, on page 282</td>
<td>Enables QoS Layer 2 overhead accounting.</td>
</tr>
</tbody>
</table>
service-policy (QoS-BNG)

To enable the QoS policy on a parent S-VLAN, use the `service-policy` command in the interface configuration mode. To disable this feature, use the `no` form of this command.

**Egress S-VLAN Policy:**

```
service-policy output service_policy_name subscriber-parent [resource-id value ]
no service-policy output service_policy_name subscriber-parent [resource-id value ]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>output</code></td>
<td>Attaches the specified service-policy to the egress direction.</td>
</tr>
<tr>
<td><code>service_policy_name</code></td>
<td>Name of the input or output service-policy.</td>
</tr>
<tr>
<td><code>subscriber-parent</code></td>
<td>Configures an S-VLAN policy.</td>
</tr>
<tr>
<td><code>resource-id value</code></td>
<td>The resource ID value that ranges from 0-3.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Interface configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>Support for the <code>resource-id</code> keyword was added.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>
This example shows how to configure an egress S-VLAN policy using the `service-policy` command, with `subscriber-parent` keyword, in the interface configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface bundle-ether 18.12
RP/0/RSP0/CPU0:router(config-subif)# service-policy output svlan-policy subscriber-parent resource-id 1
```
### service-policy (interface BNG)

To attach a policy map to an input interface or output interface to be used as the service policy for that interface, and optionally multiple subinterfaces, use the `service-policy` command in the appropriate configuration mode. To remove a service policy from an input or output interface, use the `no` form of the command.

```plaintext
service-policy {input|output} policy-map [shared-policy-instance instance-name]
no service-policy {input|output} policy-map [shared-policy-instance instance-name]
```

#### Syntax Description

- **input**: Attaches the specified policy map to the input interface.
- **output**: Attaches the specified policy map to the output interface.
- **policy-map**: Name of a service policy map (created using the `policy-map` command) to be attached.
- **shared-policy-instance**: (Optional) Allows sharing of QoS resources across multiple subinterfaces.  
  **Note**: Sharing across multiple physical interfaces is not supported.
- **instance-name**: (Optional) String of up to 32 characters to identify the shared policy instance.

#### Command Default

No service policy is specified.

#### Command Modes

- Interface configuration. This does not apply to BNG.
- Layer 2 transport configuration. This does not apply to BNG.
- Subinterface configuration. This does not apply to BNG.
- Dynamic template configuration

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 3.9.0</td>
<td>This command was updated to support shared policy instance over bundle interfaces.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The command was supported in dynamic template configuration mode in BNG.</td>
</tr>
</tbody>
</table>
Usage Guidelines

You can attach a single policy map to one or more interfaces to specify the service policy for those interfaces. The class policies composing the policy map are then applied to packets that satisfy the class map match criteria for the class. To apply a new policy to an interface, you must remove the previous policy. A new policy cannot replace an existing policy.

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

### Examples

This example shows policy map policy1 applied to Packet-over-SONET/SDH (POS) interface 0/2/0/0:

```
RP/0/RSP0/CPU0/router(config)# class-map class1
RP/0/RSP0/CPU0-router(config-cmap)# match precedence ipv4 1
RP/0/RSP0/CPU0-router(config-cmap)# exit
RP/0/RSP0/CPU0-router(config)# policy-map policy1
RP/0/RSP0/CPU0-router(config-pmap)# class class1
RP/0/RSP0/CPU0-router(config-pmap-c)# set precedence 2
RP/0/RSP0/CPU0-router(config-pmap)# exit
RP/0/RSP0/CPU0-router(config)# interface POS 0/2/0/0
RP/0/RSP0/CPU0-router(config-if)# service-policy output policy1
```

This example shows policy map policy2 applied to GigabitEthernet subinterface 0/1/0/0.1.

```
RP/0/RSP0/CPU0-router(config)# class-map class2
RP/0/RSP0/CPU0-router(config-cmap)# exit
RP/0/RSP0/CPU0-router(config)# policy-map policy2
RP/0/RSP0/CPU0-router(config-pmap)# class-map class2
RP/0/RSP0/CPU0-router(config-pmap-c)# set precedence 3
RP/0/RSP0/CPU0-router(config-pmap)# exit
RP/0/RSP0/CPU0-router(config)# interface gigabitethernet 0/1/0/0.1
RP/0/RSP0/CPU0-router(config-subif)# service-policy input policy2 shared-policy-instance ethernet101
```

### Note

This example does not apply to BNG.

This example shows policy map policy 1 applied to Bundle-Ether interfaces 100.1 and 100.2

```
RP/0/RSP0/CPU0-router(config)# interface Bundle-Ether 100.1
RP/0/RSP0/CPU0-router(config-if)# service-policy policy1 shared-policy-instance subscriber1
RP/0/RSP0/CPU0-router(config-if)# exit
RP/0/RSP0/CPU0-router(config)# interface Bundle-Ether 100.2
RP/0/RSP0/CPU0-router(config-if)# service-policy output policy1 shared-policy-instance subscriber1
```
This example does not apply to BNG.

This example is specific to BNG. It shows policy map policy 1 applied in the dynamic template configuration mode.

```
RP/0/RSP0/CPU0:router(config)# dynamic-template type ppp p1
shared-policy-instance subscriber1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy policy1
exit

RP/0/RSP0/CPU0:router(config)# dynamic-template type ipsubscriber ipsub1
shared-policy-instance subscriber1
RP/0/RSP0/CPU0:router(config-dynamic-template-type)# service-policy output policy1
```
show qos inconsistency (BNG)

To display inconsistency information for the QoS policy on an interface, use the `show qos inconsistency` command in EXEC mode.

```
show qos inconsistency {detail warning-type {file filename| location node-id}| summary {file filename| location node-id}}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>detail</code></td>
<td>Displays interface and policy name details of the inconsistency.</td>
</tr>
<tr>
<td><code>warning-type</code></td>
<td>Selects the warning types to display:</td>
</tr>
<tr>
<td></td>
<td>• 0—All warning types</td>
</tr>
<tr>
<td></td>
<td>• 1—ANCP - No shaper at top policy map</td>
</tr>
<tr>
<td></td>
<td>• 2—ANCP - Multiple classes at top policy map</td>
</tr>
<tr>
<td></td>
<td>• 3—ANCP - Downstream rate less than shaper rate</td>
</tr>
<tr>
<td></td>
<td>• 4—ANCP - Downstream rate more than port speed</td>
</tr>
<tr>
<td></td>
<td>• 5—ANCP - Policy resolution failure</td>
</tr>
<tr>
<td></td>
<td>• 6—ANCP - Traffic manager program failure</td>
</tr>
<tr>
<td></td>
<td>• 7—Port speed - Policy resolution failure</td>
</tr>
<tr>
<td></td>
<td>• 8—Port speed - Traffic manager program failure</td>
</tr>
<tr>
<td></td>
<td>• 9—Bundle member addition failure</td>
</tr>
<tr>
<td></td>
<td>• 10—Interface state not matching system configuration</td>
</tr>
<tr>
<td><code>file filename</code></td>
<td>Specify a file name, such as disk0:tmp.log or bootflash:.</td>
</tr>
<tr>
<td><code>location node-id</code></td>
<td>Displays detailed QoS information for the designated node. The <code>node-id</code> argument is entered in the rack/slot/module notation.</td>
</tr>
<tr>
<td><code>summary</code></td>
<td>Displays summary counts of QoS inconsistency warnings.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>
Modification

Release 4.3.0
The command was supported in dynamic template configuration mode in BNG.

Usage Guidelines

Examples

This example provides detail about QoS policy inconsistency, for all warning types:

```
RP/0/RSP0/CPU0:router# show qos inconsistency detail 0 location 0/7/CPU0
Interface Lists with QoS Inconsistency Warning:
------------------------------------------------------------------------
Node 0/7/CPU0
------------------------------------------------------------------------
Interfaces with QoS Inconsistency: ANCP - No Shaper at top policymap
------------------------------------------------------------------------
Interface  Direction  Policy Name  SPI Name
--------------------------------------------------------------
GigabitEthernet0/7/0/1.5  output  parent-none
------------------------------------------------------------------------
Interfaces with QoS Inconsistency: ANCP - Downstream Rate less than Shaper Rate
------------------------------------------------------------------------
Interface  Direction  Policy Name  SPI Name
--------------------------------------------------------------
GigabitEthernet0/7/0/1  output  parent  SPI1
GigabitEthernet0/7/0/1.2  output  parent
GigabitEthernet0/7/0/1  output  normal-policy-name  normal-spi-name
```

This example displays summary counts of inconsistency warnings:

```
RP/0/RSP0/CPU0:router#
RP/0/RSP0/CPU0:router# show qos inconsistency summary location 0/7/CPU0
Summary Counts of QoS Inconsistency Warnings:
------------------------------------------------------------------------
Node 0/7/CPU0
Inconsistency Warning Type   Count
------------------------------------------------------------------------
ANCP - No Shaper at top policymap:  1
ANCP - Downstream Rate less than Shaper Rate:  4
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show qos interface (BNG), on page 293</td>
<td>Displays QoS information for a specific interface.</td>
</tr>
</tbody>
</table>
show qos interface (BNG)

To display QoS information for a specific interface, use the `show qos interface` command in the EXEC mode.

```
show qos interface type interface-path-id {input| output} {member type interface-path-id} [host-link interface-path-id] location node-id
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>type</code></td>
<td>Interface type. For more information, use the question mark (?) online help function.</td>
</tr>
<tr>
<td><code>interface-path-id</code></td>
<td>Either a physical interface instance or a virtual interface instance as follows:</td>
</tr>
<tr>
<td></td>
<td>• Physical interface instance. Naming notation is <code>rack/slot/module/port</code> and a slash between values is required as part of the notation.</td>
</tr>
<tr>
<td></td>
<td>* <code>rack</code> : Chassis number of the rack.</td>
</tr>
<tr>
<td></td>
<td>* <code>slot</code> : Physical slot number of the modular services card or line card.</td>
</tr>
<tr>
<td></td>
<td>* <code>module</code> : Module number. A physical layer interface module (PLIM) is always 0.</td>
</tr>
<tr>
<td></td>
<td>* <code>port</code> : Physical port number of the interface.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric ( RSP0 RP0 or RP1 ) and the module is CPU0. Example: interface MgmtEth0/ RSP0 RP1/CPU0/0.</td>
</tr>
<tr>
<td></td>
<td>• Virtual interface instance. Number range varies depending on interface type.</td>
</tr>
<tr>
<td><code>input</code></td>
<td>Attaches the specified policy map to the input interface.</td>
</tr>
<tr>
<td><code>output</code></td>
<td>Attaches the specified policy map to the output interface.</td>
</tr>
</tbody>
</table>
Specifies member of bundle interface or pin-down (generic list) interface of PWHE interface.

**Note** This keyword is applicable only for bundle and PWHE interface.

**host-link**

(Optional) Specifies the host-link.

**Note** This keyword is applicable only for satellite information.

**location node-id**

(Optional) Displays detailed QoS 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

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The command was supported in dynamic template configuration mode in BNG.</td>
</tr>
</tbody>
</table>
| Release 5.1.1 | The **show qos interface** command output was updated to display Flow Aware call admission control (CAC) and user based rate limiting (UBRL) information.  
These parameters are used for satellite information.  
The **show qos interface** command output was updated to display QoS Offload on satellite information.  
PWHE interface type **PW-Ether** and **PW-IW** were added.  
The show output was updated for PWHE interface details. |

### Usage Guidelines

The **show qos interface** command displays configuration for all classes in the service policy that is attached to an interface.

Use this command to check the actual values programmed in the hardware from the action keywords in the **police rate** command.

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

### Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

This is the sample output which shows the QoS information on a Ten Gigabit Ethernet interface, applicable for the releases 5.3.2 onwards:

```
RP/0/RSP0/CPU0: tardis1-pwhe-spe# show qos interface tenGigE 0/0/0/0/0 output
Interface: TenGigE0_0_0_0_0 output
Bandwidth configured: 10000000 kbps Bandwidth programed: 10000000 kbps
ANCP user configured: 0 kbps ANCP programed in HW: 0 kbps
Port Shaper programed in HW: 0 kbps
Policy: EGRESS_CHILD_POLICY Total number of classes: 8

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp1
QueueID: 525248 (Priority 1)       
Queue Limit: 126976 kbytes Abs-Index: 179 Template: 0 Curve: 7
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp2
QueueID: 525249 (Priority 2)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 6
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp3
QueueID: 525251 (Priority 3)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 5
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp4
QueueID: 525252 (Priority 4)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 0
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp5
QueueID: 525253 (Priority 5)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 0
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp6
QueueID: 525254 (Priority 6)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 0
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: cp7
QueueID: 525255 (Priority 7)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 0
Shape CIR Profile: INVALID

Level: 0 Policy: EGRESS_CHILD_POLICY Class: class-default
QueueID: 525250 (Priority Normal)
Queue Limit: 13824 kbytes (54443 packets) Abs-Index: 129 Template: 0 Curve: 0
Shape CIR Profile: INVALID

WFQ Profile: 0/206 Committed Weight: 906 Excess Weight: 906
Bandwidth: 200000 kbps, BW sum for Level 0: 200000 kbps, Excess Ratio: 100
```

This is the sample output shows the QoS information on a GigabitEthernet interface:

```
RP/0/RSP0/CPU0:router# show qos interface gig0/0/0/11.1 output

Wed Mar 18 18:25:20.140 UTC
Interface: GigabitEthernet0_0_0_11.1 output Bandwidth: 1000000 kbps ANCP: 999936 kbps
Policy: parent-3play-subscriber-line Total number of classes: 5

Level: 0 Policy: parent-3play-subscriber-line Class: class-default
QueueID: N/A
Shape Profile: 1 CIR: 200000 kbps (200 mbps)
CBS: 100352 bytes PIR: 999936 kbps PBS: 12517376 bytes
WFQ Profile: 0/206 Committed Weight: 906 Excess Weight: 906
Bandwidth: 200000 kbps, BW sum for Level 0: 200000 kbps, Excess Ratio: 100

Level: 1 Policy: child-3play Class: 3play-voip
Parent Policy: parent-3play-subscriber-line Class: class-default
QueueID: 136 (Priority 1)
Queue Limit: 16 kbytes Profile: 3 Scale Profile: 0
```
Policer Profile: 0 (Single)
Conform: 65 kbps (65 kbps) Burst: 1598 bytes (0 Default)
Child Policer Conform: TX
Child Policer Exceed: DROP
Child Policer Violate: DROP

Level: 1 Policy: child-3play Class: 3play-video
Parent Policy: parent-3play-subscriber-line Class: class-default
QueueID: 137 (Priority 2)
Queue Limit: 8 kbytes (11 Unknown) Profile: 4 Scale Profile: 0
Policer Profile: 24 (Single)
Conform: 128 kbps (128 kbps) Burst: 1598 bytes (0 Default)
Child Policer Conform: TX
Child Policer Exceed: DROP
Child Policer Violate: DROP

WRED Type: COS based Table: 0 Profile: 4 Scale Profile: 0 Curves: 3
Default RED Curve Thresholds Min : 8 kbytes Max: 8 kbytes
WRED Curve: 1 Thresholds Min : 8 kbytes Max: 8 kbytes
Match: 3
WRED Curve: 2 Thresholds Min : 8 kbytes Max: 8 kbytes
Match: 4

Level: 1 Policy: child-3play Class: 3play-premium
Parent Policy: parent-3play-subscriber-line Class: class-default
QueueID: 138 (Priority Normal)
Queue Limit: 2097 kbytes Profile: 2 Scale Profile: 0
WFQ Profile: 6 Committed Weight: 1020 Excess Weight: 1020
Bandwidth: 200000 kbps, BW sum for Level 1: 200000 kbps, Excess Ratio: 1

This example shows the L2VPN QoS information on TenGigE 0/4/0/0/7 interface:

```
RP/0/RSP0/CPU0:router# show qos interface TenGigE 0/4/0/0/7 output
Thu Sep 5 10:02:14.217 UTC
NOTE:- Configured values are displayed within parentheses
Interface TenGigE0/4/0/0/7 ifh 0x2000048 -- output policy
NPU Id: 0
Total number of classes:  8
Interface Bandwidth: 10000000 kbps
Accounting Type: Layer2 (Include Layer 2 encapsulation and above)
----------------------------------------
Level1 Class = prec-1
Schedule entry ID = 0x32 (0x10001)
Egressq Queue ID = 0 (LP queue)
Queue Max. BW. = 100000 kbps (1 %)
Queue Min. BW. = 0 kbps (default)
Weight = 25 (BWR not configured)
Guaranteed service rate = 100000 kbps
TailDrop Threshold = 1250000 bytes / 100 ms (default)
Policer not configured for this class
WRED not configured for this class

Level1 Class (HP2) = prec-2
Schedule entry ID = 0x33 (0x10002)
Egressq Queue ID = 51 (HP2 queue)
Guaranteed service rate = 10000000 kbps
TailDrop Threshold = 12500000 bytes / 10 ms (default)
Policer Bucket Id = 0x900000000
Policer committed rate = 99968 kbps (1 %)
Policer conform burst = 124928 bytes (default)
Policer conform action = Just TX
Policer exceed action = DROP PKT
WRED not configured for this class
```
Level1 Class = prec-3
Schedule entry ID = 0x36 (0x10003)
Egressq Queue ID = 54 (LP queue)
Queue Max. BW. = 100000 kbps (1 %)
Queue Min. BW. = 100000 kbps (1 %)
Weight = 25 (BWR not configured)
Guaranteed service rate = 100000 kbps
TailDrop Threshold = 13750 bytes / 1 ms (1100 us)
Policer not configured for this class
WRED not configured for this class

Level1 Class = prec-5
Schedule entry ID = 0x37 (0x10004)
Egressq Queue ID = 55 (LP queue)
Queue Max. BW. = 100000 kbps (1 %)
Queue Min. BW. = 0 kbps (default)
Weight = 25 (BWR not configured)
Guaranteed service rate = 100000 kbps
TailDrop Threshold = 1250000 bytes / 100 ms (default)
Policer not configured for this class

WRED table handle = 0x0
RED profile
WRED Min. Threshold = 249856 bytes (20 ms)
WRED Max. Threshold = 374784 bytes (30 ms)
WRED First Segment = 1314
WRED Segment Size = 11

Level1 Class (HP1) = prec-6
Schedule entry ID = 0x3a (0x10005)
Egressq Queue ID = 58 (HP queue)
Guaranteed service rate = 10000000 kbps
TailDrop Threshold = 12500000 bytes / 10 ms (default)
Policer Bucket Id = 0x90001000a5103
Policer committed rate = 99968 kbps (1 %)
Policer conform burst = 124928 bytes (default)
Policer conform action = Just TX
Policer exceed action = DROP PKT
WRED not configured for this class

Level1 Class (HP1) = prec-7
Schedule entry ID = 0x3b (0x10006)
Egressq Queue ID = 59 (HP queue)
Guaranteed service rate = 10000000 kbps
TailDrop Threshold = 12500000 bytes / 10 ms (default)
Policer Bucket Id = 0x90001000b5103
Policer committed rate = 99968 kbps (1 %)
Policer conform burst = 124928 bytes (default)
Policer conform action = Just TX
Policer exceed action = DROP PKT
WRED not configured for this class

Level1 Class = prec-0
Egressq Queue ID = 62 (Default LP queue)
Policer Bucket Id = 0x90001000c5103
Policer committed rate = 99968 kbps (1 %)
Policer conform burst = 1245184 bytes (default)
Policer conform action = Just TX
Policer exceed action = DROP PKT
WRED not configured for this class

Level1 Class = class-default
Schedule entry ID = 0x3e (0x10008)
Egressq Queue ID = 62 (Default LP queue)
Queue Max. BW. = 100000 kbps (1 %)
Queue Min. BW. = 0 kbps (default)
Weight = 25 (BWR not configured)
Guaranteed service rate = 100000 kbps
TailDrop Threshold = 1250000 bytes / 100 ms (default)
Policer not configured for this class
WRED not configured for this class

Use the **host-link** option to display the output for the desired Bundle ICL. In cases when the Satellite is hosted on a redundant (Bundle ICL), the qos command to check for the qos programming also needs to include the host-link option.

The host-link is the underlying ICL Bundle member, this output can be executed for all the members belonging to the ICL Bundle via the host-link option.

For eg, Bundle ICL, Bundle-ether 2, hosting the sat-ether interface gig 100/0/0/34 has a member tengige 0/3/0/7. The qos command to check for the qos programming would be:

```
RP/0/RSP0/CP00:router # sh qos inter gigabitEthernet 100/0/0/34 output host-link tengige 0/3/0/7 location 0/3/CP00
```

```
Interface: GigabitEthernet100_0_0_34 output
Bandwidth configured: 500000 kbps Bandwidth programed: 500000 kbps
ANCP user configured: 0 kbps ANCP programed in HW: 0 kbps
Port Shaper programed in HW: 500000 kbps
Policy: grand Total number of classes: 10
```

```
Level: 0 Policy: grand Class: class-default
QueueID: N/A
Shape CIR : ALL
Shape PIR Profile : 2/4(S) Scale: 488 PIR: 499712 kbps PBS: 6246400 bytes
WFQ Profile: 2/9 Committed Weight: 10 Excess Weight: 10
Bandwidth: 0 kbps, BW sum for Level 0: 0 kbps, Excess Ratio: 1
```

```
Level: 1 Policy: parent Class: class-default
Parent Policy: grand Class: class-default
QueueID: N/A
Shape CIR : NONE
Shape PIR Profile : 2/4(S) Scale: 244 PIR: 249856 kbps PBS: 3123200 bytes
WFQ Profile: 2/9 Committed Weight: 10 Excess Weight: 10
Bandwidth: 0 kbps, BW sum for Level 1: 0 kbps, Excess Ratio: 1
```

```
Level: 2 Policy: child Class: prec1
Parent Policy: parent Class: class-default
QueueID: 131264 (Priority 1)
Queue Limit: 2496 kbytes Abs-Index: 89 Template: 0 Curve: 6
Shape CIR Profile: INVALID
Policer Profile: 54 (Single)
Conform: 50000 kbps (20 percent) Burst: 625000 bytes (0 Default)
Child Policer Conform: set dscp 46 set cos 7
Child Policer Exceed: DROP
Child Policer Violate: DROP
```

```
Level: 2 Policy: child Class: prec2
Parent Policy: parent Class: class-default
QueueID: 131265 (Priority 2)
Queue Limit: 624 kbytes (100 ms) Abs-Index: 59 Template: 0 Curve: 6
Shape CIR Profile: INVALID
Shape PIR Profile : 2/0(E) PIR: 50000 kbps PBS: 624992 bytes
Child Mark: set dscp 46 set cos 7
```

```
Level: 2 Policy: child Class: prec3
Parent Policy: parent Class: class-default
QueueID: 131267 (Priority 3)
Queue Limit: 472 kbytes (100 ms) Abs-Index: 53 Template: 0 Curve: 6
Shape CIR Profile: INVALID
Shape PIR Profile : 2/1(E) PIR: 37496 kbps PBS: 468736 bytes
Child Mark: set dscp 46 set cos 7
```

```
Level: 2 Policy: child Class: prec4
Parent Policy: parent Class: class-default
QueueID: 131266 (Priority Normal)
Queue Limit: 60 kbytes Abs-Index: 18 Template: 0 Curve: 0
Shape CIR Profile: INVALID
Child Mark: set dscp 46 set cos 7
WFQ Profile: 2/39 Committed Weight: 40 Excess Weight: 40
```
<table>
<thead>
<tr>
<th>Level</th>
<th>Policy</th>
<th>Class</th>
<th>QueueID</th>
<th>Queue Limit</th>
<th>Abs-Index</th>
<th>Template</th>
<th>Curve</th>
<th>Shape CIR Profile</th>
<th>WFQ Profile</th>
<th>Committed Weight</th>
<th>Excess Weight</th>
<th>Bandwidth</th>
<th>BW sum for Level 2</th>
<th>Excess Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>child</td>
<td>prec5</td>
<td>131268</td>
<td>44 kbytes</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>INVALID</td>
<td>2/29</td>
<td>30</td>
<td>30</td>
<td>0 kbps</td>
<td>0 kbps</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>child</td>
<td>prec6</td>
<td>131269</td>
<td>28 kbytes</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>INVALID</td>
<td>2/19</td>
<td>20</td>
<td>20</td>
<td>0 kbps</td>
<td>0 kbps</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>child</td>
<td>prec7</td>
<td>131270</td>
<td>16 kbytes</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>INVALID</td>
<td>2/9</td>
<td>10</td>
<td>10</td>
<td>0 kbps</td>
<td>0 kbps</td>
<td>1</td>
</tr>
</tbody>
</table>

This is the sample output of the `show qos interface` command for CAC:

```plaintext
RP/0/RSP0/CP00# show qos interface gigabitEthernet 0/1/0/0 input
```

```
Interface: GigabitEthernet0_1_0_0 input
Bandwidth configured: 1000000 kbps  Bandwidth programed: 1000000 kbps
ANCP user configured: 0 kbps  ANCP programed in HW: 0 kbps
Port Shaper programed in HW: 0 kbps
Policy: premium_services (Flow Aware Policy) Total number of classes: 5

Level: 0 Policy: premium_services Class: dscp_cs5
QueueID: 98 (Port Default)
Policer Profile: 56 (Single)
Conform: 100000 kbps (100 mbps)  Burst: 1250000 bytes (0 Default)
Child Policer Conform: TX
Child Policer Exceed: DROP
Child Policer Violate: DROP

Level: 0 Policy: premium_services Class: dscp_cs6
Flow QoS Info: CAC  Cac Action
CAC Flow Mask Mode: 5-Tuple (0x20)
CAC Flow Rate: 128 kbps
CAC Rate: 896 kbps
CAC Max Flow Count: 7
CAC Flow Age: 20 Seconds
QueueID: N/A

Level: 1 Policy: video_flows Class: video_admitted
Flow QoS Info: CAC Admit Class
CAC Flow Mask Mode: 5-Tuple (0x20)
CAC Max Flow Count: 7
CAC Flow Age: 20 Seconds
CAC Reject Action: Redirect
Number of CAC flows admitted: 0
Parent Policy: premium_services Class: dscp_cs6
QueueID: 98 (Port Default)
Child Mark: set disc 1

Level: 1 Policy: video_flows Class: class-default
```
This is the sample output of the show qos interface command for UBRL:

```
RP/0/RSP0/CPU0#show qos interface gigabitEthernet 0/1/0/0 input
Interface: GigabitEthernet0_1_0_0 input
    Bandwidth configured: 1000000 kbps
    Bandwidth programed: 1000000 kbps
    ANCP user configured: 0 kbps
    ANCP programed in HW: 0 kbps
    Port Shaper programed in HW: 0 kbps
    Policy: voice_flow (Flow Aware Policy) Total number of classes: 3

Level: 0 Policy: voice_flow Class: voice_prec6
    QueueID: 98 (Port Default)
    Policer Profile: 56 (Single)
    Conform: 5000 kbps
    Burst: 62500 bytes (0 Default)
    Child Policer Conform: set dscp 34
    Child Policer Exceed: DROP
    Child Policer Violate: DROP

Level: 0 Policy: voice_flow Class: ubrl1
    QueueID: 98 (Port Default)
    Policer Profile: 58 (Single)
    Conform: 100000 kbps
    Burst: 1250000 bytes (0 Default)
    Catch-all Policer Profile: 57 (Single)
    Conform: 100000000 kbps
    Burst: 12500000 bytes

Level: 0 Policy: voice_flow Class: class-default
    QueueID: 98 (Port Default)
    Policer Profile: 54 (Single)
    Conform: 30000 kbps
    Burst: 375000 bytes (0 Default)
    Child Policer Conform: TX
    Child Policer Exceed: DROP
    Child Policer Violate: DROP
```

This is the sample output of the show qos interface command for PW-HE subinterfaces.

```
RP/0/RSP0/CPU0# show qos interface pw-ether1.1 input member tengige0/2/0/5
Interface: TenGigE0_2_0_5 input
    Bandwidth configured: 10000000 kbps
    Bandwidth programed: 10000000 kbps
    ANCP user configured: 0 kbps
    ANCP programed in HW: 0 kbps
    Port Shaper programed in HW: 0 kbps
    Policy: PW-HE-Ingress Total number of classes: 9

Level: 0 Policy: PW-HE-Ingress Class: class-default
    QueueID: N/A
    Policer Profile: 55 (Single)
    Conform: 2000000 kbps
    Burst: 25000000 bytes (0 Default)

Level: 1 Policy: DSCP_CE-PE_ETM Class: 3play-voip
    Parent Policy: PW-HE-Ingress Class: class-default
    QueueID: 160 (Port Priority 1)
```
<table>
<thead>
<tr>
<th>Policer Profile: 56 (Single)</th>
<th>Conform: 20000 kbps (1 percent) Burst: 125000 bytes (50 ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Policier Conform: TX</td>
<td>Child Policier Exceed: DROP</td>
</tr>
<tr>
<td>Child Policier Violate: DROP</td>
<td></td>
</tr>
<tr>
<td>Level: 1 Policy: DSCP_CE-PE_ETM Class: multicast_limit</td>
<td>QueueID: 161 (Port Priority 2)</td>
</tr>
<tr>
<td>Policer Profile: 57 (SrTCM)</td>
<td>Conform: 40000 kbps (2 percent) Burst: 256000 bytes (128000 bytes)</td>
</tr>
<tr>
<td>Peak Burst: 128000 bytes (256000 bytes)</td>
<td>Child Policier Conform: set exp-imp 5</td>
</tr>
<tr>
<td>Child Policier Exceed: set prec 4</td>
<td>Child Policier Violate: DROP</td>
</tr>
<tr>
<td>Child Policier Violate: DROP</td>
<td></td>
</tr>
</tbody>
</table>

This table describes the significant fields shown in the display.
### Table 19: show QoS interface Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0 class</td>
<td>Level 0 class identifier in hexadecimal format.</td>
</tr>
<tr>
<td>Level 1 class</td>
<td>Level 1 class identifier in hexadecimal format.</td>
</tr>
<tr>
<td>class name</td>
<td>Name that was assigned to this class with the <code>class</code> command.</td>
</tr>
<tr>
<td>Conform</td>
<td>Number of conform packets transmitted.</td>
</tr>
<tr>
<td>Burst</td>
<td>Configured burst size, expressed in bytes, gigabytes (GB), kilobytes (KB), megabytes (MB), milliseconds (ms), or microseconds (us).</td>
</tr>
<tr>
<td>Queue ID</td>
<td>Queue identifier.</td>
</tr>
<tr>
<td>Child Policer Conform</td>
<td>Child Policer conform action (transmitted or dropped).</td>
</tr>
<tr>
<td>Child Policer Exceed</td>
<td>Child Policer exceed action (transmitted or dropped).</td>
</tr>
<tr>
<td>Child Policer Violate</td>
<td>Child Policer violate action (transmitted or dropped).</td>
</tr>
<tr>
<td>Flow QoS Info</td>
<td>Information pertaining to CAC actions, and UBRL.</td>
</tr>
<tr>
<td>CAC Flow Mask Mode</td>
<td>Configured flow mask for CAC actions.</td>
</tr>
<tr>
<td>CAC Flow Rate</td>
<td>Configured rate for CAC actions.</td>
</tr>
<tr>
<td>CAC Rate</td>
<td>Configured total bandwidth for CAC admitted flows.</td>
</tr>
<tr>
<td>UBRL Flow Mask Mode</td>
<td>Configured flow mask for UBRL.</td>
</tr>
<tr>
<td>Flow Age</td>
<td>Configured expiry time to purge out stale flow records set in the flow cache.</td>
</tr>
</tbody>
</table>

#### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show qos inconsistency (BNG), on page 291</td>
<td>Displays inconsistency information for the QoS policy on an interface.</td>
</tr>
</tbody>
</table>
show qos summary BNG

To view the QoS summary, use the `show qos summary` command in EXEC mode.

```
show qos summary [shared-policy-instance instance-name location node-id] police [interface type instance] location node-location | policy policy-name [interface type instance] location node-location | queue [interface type instance] location node-location | {input output} | member type instance | [host-link type instance] | [location node-location] | np np-location
```

**Syntax Description**

- **shared-policy-instance instance-name**
  String of up to 32 characters to identify the shared policy instance.

- **police**
  Show policer interface statistics.

- **policy policy-name**
  String to identify the policy.

- **queue**
  Show queue statistics.

- **interface type instance**
  Interface type and instance. For more information, use the question mark (?) online help function.

- **location node-location**
  Identifies fully qualified location specification.

- **input**
  Shows the specified policy map to the input interface.

- **output**
  Shows the specified policy map to the output interface.

- **np np-location**
  (Optional) Node processor location. The node processor location is np0, np1, np2, or np3.

  The `np` keyword is available only for BVI interface type.

- **member**
  Specifies member's interface name.

  The `member` keyword is available only for bundle-ether, PW-Ether and PW-IW interface types.

- **host-link**
  (Optional) Specifies the host-link.

  This keyword is applicable only for satellite interfaces.

**Command Default**

None

**Command Modes**

EXEC mode
Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 3.7.2</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>Release 4.3.0</td>
<td>The command was supported in dynamic template configuration mode in BNG. The np keyword was introduced.</td>
</tr>
<tr>
<td>Release 5.1.1</td>
<td>PWHE interface type PW-Ether and PW-IW were added.</td>
</tr>
</tbody>
</table>

Usage Guidelines

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

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>qos</td>
<td>read, write</td>
</tr>
</tbody>
</table>

Examples

This example shows the results of the command to show interfaces at location 0/1/CPU0 for a shared-policy-instance:

```
RP/0/RSP0/CPU0:router# show qos summary shared-policy-instance bundlespi location 0/1/CPU0 output
List of interfaces/NPs retrieved
GigabitEthernet0/1/1/1 (member of Bundle-Ether1.1)
GigabitEthernet0/1/1/2 (member of Bundle-Ether1.1)
```

This example shows policer interface statistics of BVI interface at location 0/5/cpu0:

```
RP/0/RSP0/CPU0:router# show qos summary police interface bvi 1 output location 0/5/cpu0 np np1
Legend:
=======
1. Policer ID is displayed in HEX.
2. A '*' against the counter means the action is drop.
3. Conform displays match counter for non-policer leaf.
Policy:Class  | PoliceID | Conform | Exceed | Violate |
-------------|----------|---------|--------|---------|
BVI1 NP1     | foo:dsrp48 | 6145    | 0      | 0*      | 0*      |
             | foo:default| 6146    | 0      | 0*      | 0*      |
Subscriber Commands

This module describes the Cisco IOS XR software commands used to configure the subscriber 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.

- peer (subscriber redundancy), page 306
- show subscriber database, page 307
- show subscriber manager statistics, page 312
- show subscriber running-config, page 315
- show subscriber session, page 317
- clear subscriber session, page 322
peer (subscriber redundancy)

To configure the peer router for a subscriber redundancy group (SRG) in BNG, use the `peer` command in subscriber redundancy group configuration mode. To remove the peer router configuration, use the `no` form of this command.

```
peer peer-ip
no peer peer-ip
```

**Syntax Description**

- `peer-ip` The peer IPv4 or IPv6 address that is used to establish channel to the peer BNG.

**Command Default**

None

**Command Modes**

Subscriber redundancy group configuration

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 5.2.2</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

To use this command, 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 a command, contact your AAA administrator for assistance.

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**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>config-services</td>
<td>read, write</td>
</tr>
</tbody>
</table>

**Examples**

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
```
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**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

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/unnunbered
    reference count : 1
    sysDb pathname : /cfg/gl/dynamic-templates/ipssubscriber/TEMPL1/ipv4/unnunbered
    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/ipssubscriber/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/ipssubscriber/ss/qos/service_policy_in/:qos_policy
    datatype : packed
    length : 20
    value : packed
      AB CD 43 21 02 00 04 00

Feature Name: 'RSI'
  Attribute Name: rsi/vrf
    reference count : 1
    sysDb pathname : /cfg/gl/dynamic-templates/ipssubscriber/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
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_queue_full_count = 0
notify_data_waiting_count = 1
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

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_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

show subscriber database
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
reg_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_ALL
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 06:49:40.125 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'
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

show subscriber manager statistics {AAA COA| HA| PPSM| PRE| SVM| debug| performance| summary}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Displays the Authentication, Authorization, Accounting Coordinator statistics.</td>
</tr>
<tr>
<td>HA</td>
<td>Displays the High Availability statistics.</td>
</tr>
<tr>
<td>PPSM</td>
<td>Displays the Policy Plane Session Manager statistics.</td>
</tr>
<tr>
<td>PRE</td>
<td>Displays the Policy Rule Engine statistics.</td>
</tr>
<tr>
<td>SVM</td>
<td>Displays the Service Manager statistics.</td>
</tr>
<tr>
<td>debug</td>
<td>Displays the debug statistics.</td>
</tr>
<tr>
<td>performance</td>
<td>Displays the performance statistics.</td>
</tr>
<tr>
<td>summary</td>
<td>Displays the summary statistics.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

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

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 20: show subscriber manager statistics Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Policy errors</td>
<td>Specifies the errors in the control policy.</td>
</tr>
<tr>
<td>Attribute format warnings</td>
<td>Specifies the attribute format warnings.</td>
</tr>
<tr>
<td>User Profile Statistics</td>
<td>Specifies the user profile statistics.</td>
</tr>
<tr>
<td>Session Disconnect Flow Control</td>
<td>Specifies the session disconnect flow control.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>location</strong></td>
<td>Displays subscriber database running configuration information for all sessions at specified location.</td>
</tr>
<tr>
<td><strong>subscriber-label</strong></td>
<td>Allows to enter a hex value subscriber-value that ranges between 0X0-0xffffffff.</td>
</tr>
<tr>
<td>**</td>
<td>Specifies the output modifiers.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
</tbody>
</table>

**Examples**

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 ipssubscriber TEMPL1
ipv4 unnumbered Loopback0
```
show subscriber running-config

!  
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] [location node-id] debug|filter|subscriber-label session-id}
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Displays all subscriber sessions.</td>
</tr>
<tr>
<td>debug</td>
<td>Displays unique subscriber session selected for debugging.</td>
</tr>
<tr>
<td>filter</td>
<td>Displays the search results of the subscriber session database based on the filter criteria.</td>
</tr>
<tr>
<td>subscriber-label</td>
<td>Displays the unique ID of the subscriber session.</td>
</tr>
<tr>
<td>session-id</td>
<td>Hex value of subscriber session ID. The range is from 0 to ffffffff.</td>
</tr>
</tbody>
</table>

**Command Default**
None

**Command Modes**
EXEC mode

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**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.

**Task ID**

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>read</td>
</tr>
<tr>
<td>config-services</td>
<td>read</td>
</tr>
</tbody>
</table>
Examples

These are some of the options for the **show subscriber session** command in the EXEC mode:

```plaintext
RP/0/RSP0/CPU0# show subscriber session all
RP/0/RSP0/CPU0# show subscriber session all summary location 0/1/CPU0
RP/0/RSP0/CPU0# show subscriber session filter vrf vrf1 location 0/1/CPU0
RP/0/RSP0/CPU0# 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Interface</th>
<th>State</th>
<th>Subscriber IP Addr / Prefix LNS Address (Vrf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.1.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.1.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.1.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.2.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.2.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.2.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.3.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.3.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.3.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.4.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.4.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.4.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.5.pppoe1</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.5.pppoe2</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
<tr>
<td>PPPoE:PTA</td>
<td>Gi0/1/0/0.5.pppoe3</td>
<td>AC</td>
<td>100.0.0.1 (default)</td>
</tr>
</tbody>
</table>
```
This table describes the significant fields shown in the display.

### Table 21: show subscriber session Field Descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Specifies the subscriber session type.</td>
</tr>
<tr>
<td>Interface</td>
<td>Specifies the interface type.</td>
</tr>
<tr>
<td>State</td>
<td>Specifies the states of the subscriber session such as initiate, connecting, connected, activated, disconnected, idle, end.</td>
</tr>
<tr>
<td>Subscriber IP Addr / Prefix</td>
<td>Specifies the IP address of the subscriber interface.</td>
</tr>
</tbody>
</table>

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# show subscriber session all
Tue Jan 29 12:4:25.2 UTC
Codes: IN - Initialize, CN - Connecting, CD - Connected, AC - Activated, ID - Idle, DN - Disconnecting, ED - End

<table>
<thead>
<tr>
<th>Type</th>
<th>Interface</th>
<th>State</th>
<th>Subscriber IP Addr / Prefix</th>
<th>LNS Address (Vrf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP:DHCP</td>
<td>BE1.10.ip22</td>
<td>AC</td>
<td>10.10.10.10 (default)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2001::2 (default)</td>
</tr>
</tbody>
</table>
```
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 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
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 | interface interface-type interface-instance } } [location node-id]

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Clears all subscriber sessions.</td>
</tr>
<tr>
<td>debug subscriber-label</td>
<td>Clears debug tracking of unique subscriber session.</td>
</tr>
<tr>
<td>identifier</td>
<td>Clears the subscriber session information based on the identifier(s) you select.</td>
</tr>
<tr>
<td>access-interface</td>
<td>Clears the subscriber session based on the access interface name.</td>
</tr>
<tr>
<td>interface-type</td>
<td>Specifies the interface type whose subscriber sessions you want to delete.</td>
</tr>
<tr>
<td>interface-instance</td>
<td>Specifies either a physical interface instance or a virtual interface instance that you want to delete. The details of the interface instance are as follows:</td>
</tr>
<tr>
<td></td>
<td>• Physical interface instance. Naming notation is rack/slot/module/port and a slash between values is required as part of the notation.</td>
</tr>
<tr>
<td></td>
<td>• rack: Chassis number of the rack.</td>
</tr>
<tr>
<td></td>
<td>• slot: Physical slot number of the modular services card or line card.</td>
</tr>
<tr>
<td></td>
<td>• module: Module number. A physical layer interface module (PLIM) is always 0.</td>
</tr>
<tr>
<td></td>
<td>• port: Physical port number of the interface.</td>
</tr>
<tr>
<td>location</td>
<td>Clears the subscriber session information of a specific location.</td>
</tr>
</tbody>
</table>

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.

• Virtual interface instance. Number range varies depending on interface type.
clear subscriber session

[node-id] Specify the node whose subscribersessions you want to delete. The node-idargument is entered in the rack/slot/module notation.

Command Default None

Command Modes Release 5.2.0

Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 4.2.0</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

Usage Guidelines

To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>execute</td>
</tr>
</tbody>
</table>

Examples

This example shows how to clear all the subscriber sessions in a particular node location:

```
RP/0/RSP0/CP00:router# clear subscriber session all location 0/RSP0/CP00
```

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show subscriber session, on page 317</td>
<td>Displays the subscriber management session information.</td>
</tr>
</tbody>
</table>
clear subscriber session