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Preface

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Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Brocade technical documentation.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used in the flow of the text to highlight specific words or phrases.

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bold text</td>
<td>Identifies command names</td>
</tr>
<tr>
<td></td>
<td>Identifies keywords and operands</td>
</tr>
<tr>
<td></td>
<td>Identifies the names of user-manipulated GUI elements</td>
</tr>
<tr>
<td></td>
<td>Identifies text to enter at the GUI</td>
</tr>
<tr>
<td>italic text</td>
<td>Identifies emphasis</td>
</tr>
<tr>
<td></td>
<td>Identifies variables</td>
</tr>
<tr>
<td></td>
<td>Identifies document titles</td>
</tr>
<tr>
<td>Courier font</td>
<td>Identifies CLI output</td>
</tr>
<tr>
<td></td>
<td>Identifies command syntax examples</td>
</tr>
</tbody>
</table>

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bold text</td>
<td>Identifies command names, keywords, and command options.</td>
</tr>
<tr>
<td>italic text</td>
<td>Identifies a variable.</td>
</tr>
<tr>
<td>value</td>
<td>In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, --show WWN.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Syntax components displayed within square brackets are optional.</td>
</tr>
<tr>
<td>{ x</td>
<td>y</td>
</tr>
<tr>
<td>x</td>
<td>y</td>
</tr>
</tbody>
</table>
Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

CAUTION
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER
A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Brocade resources

Visit the Brocade website to locate related documentation for your product and additional Brocade resources.

You can download additional publications supporting your product at www.brocade.com. Select the Brocade Products tab to locate your product, then click the Brocade product name or image to open the individual product page. The user manuals are available in the resources module at the bottom of the page under the Documentation category.

To get up-to-the-minute information on Brocade products and resources, go to MyBrocade. You can register at no cost to obtain a user ID and password.

Release notes are available on MyBrocade under Product Downloads.

White papers, online demonstrations, and data sheets are available through the Brocade website.

Contacting Brocade Technical Support

As a Brocade customer, you can contact Brocade Technical Support 24x7 online, by telephone, or by e-mail. Brocade OEM customers contact their OEM/Solutions provider.

Brocade customers

For product support information and the latest information on contacting the Technical Assistance Center, go to http://www.brocade.com/services-support/index.html.

If you have purchased Brocade product support directly from Brocade, use one of the following methods to contact the Brocade Technical Assistance Center 24x7.
Preferred method of contact for non-urgent issues:
- My Cases through MyBrocade
- Software downloads and licensing tools
- Knowledge Base

Required for Sev 1-Critical and Sev 2-High issues:
- Continental US: 1-800-752-8061
- Europe, Middle East, Africa, and Asia Pacific: +800-AT FIBREE (+800 28 34 27 33)
- For areas unable to access toll free number: +1-408-333-6061
- Toll-free numbers are available in many countries.

support@brocade.com

Please include:
- Problem summary
- Serial number
- Installation details
- Environment description

Brocade OEM customers
If you have purchased Brocade product support from a Brocade OEM/Solution Provider, contact your OEM/Solution Provider for all of your product support needs.
- OEM/Solution Providers are trained and certified by Brocade to support Brocade® products.
- Brocade provides backline support for issues that cannot be resolved by the OEM/Solution Provider.
- Brocade Supplemental Support augments your existing OEM support contract, providing direct access to Brocade expertise. For more information, contact Brocade or your OEM.
- For questions regarding service levels and response times, contact your OEM/Solution Provider.

Document feedback
To send feedback and report errors in the documentation you can use the feedback form posted with the document or you can e-mail the documentation team.

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. You can provide feedback in two ways:
- Through the online feedback form in the HTML documents posted on www.brocade.com.
- By sending your feedback to documentation@brocade.com.

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.
About This Guide

This guide describes how to configure the DHCP, DHCPv6, DNS, flow monitoring, NHRP, sFlow, TWAMP, and port monitoring services on the Brocade 5600 vRouter (referred to as a virtual router, vRouter, or router in the guide).
DHCP overview

DHCP allows dynamic assignment of reusable IP addresses and other configuration information to DHCP clients. This assignment reduces costs, configuration effort, and management burden associated with Internet access. On the other hand, it also increases network and service overhead.

In DHCP, the server assigns an IP address and other configuration parameters to a client for a limited period of time. This period of time is called the lease. The lease is valid for the period you configure on the Brocade vRouter or until the client explicitly relinquishes the address.

To use the DHCP service, you define a pool of IP addresses for each subnet assigned by the DHCP server. Each DHCP address pool is mapped to a subnet associated with the system. For each address pool, you can specify the length of time an address is valid (its lease duration). The default lease duration is 24 hours. You can also specify a number of different servers (for example DNS, WINS, SMTP, and others) that are available to clients on the subnet.

To create an IP address pool for clients on a subnet to which the router is not directly connected (that is, without having an interface into that network), you can use service dhcp-server listen to interface <dp-interface> on page 49. See Configuring for networks indirectly connected to the system on page 22.

You can statically map an IP address to the MAC address of a device. The DHCP service listens on UDP port 67 for lease requests from DHCP clients. The request packet allows the system to determine the interface on which the client is located. It then assigns an IP address from the appropriate pool and binds it to the client.

In addition to providing a DHCP server, individual interfaces on the Brocade vRouter can be configured as DHCP clients. For details, see the Brocade 5600 vRouter documentation for the interface you are interested in configuring as a DHCP client.

The Brocade vRouter also supports DHCP relay.

A DHCP relay agent receives DHCP packets from DHCP clients and forwards them to a DHCP server. This allows you to place DHCP clients and DHCP servers on different networks; that is, across router interfaces.

The relay agent is configured with addresses of DHCP servers to which they should relay client DHCP message. The relay agent intercepts the broadcast, sets the gateway address (the giaddr field of the DHCP packet) and, if configured, inserts the Relay Agent Information option (option 82) in the packet and forwards it to the DHCP server.

The DHCP server echoes the option back verbatim to the relay agent in server-to-client replies, and the relay agent strips the option before forwarding the reply to the client.

DHCP classless static routes

By default, the Brocade vRouter enables classless static routes through DHCP using option 121. For more information about classless static routes and option 121, refer to RFC 3442 at https://tools.ietf.org/html/rfc3442.

DHCP packets from the vRouter include the classless static option in the parameter request list. When replies from a DHCP server include this option, the default router (option 3) route is ignored per the RFC. Classless static routes may include a default route that is installed similar to other option 121 routes.
NOTE
The classless static route option is only available on the Brocade vRouter IPv4 DHCP client. A Brocade vRouter DHCP server does not support the classless static routes option.

For the occasion when you must disable the classless static route option on the vRouter DHCP client, use the following commands

- `interfaces bridge <brx> dhcp-options no-rfc3442` on page 31—Disables support for the DHCP classless static route option for a bridge group.
- `interfaces dataplane interface-name dhcp-options no-rfc3442` —Disables support for the classless static route option for DHCP on a data plane interface.
- `interfaces dataplane interface-name vif vif-id dhcp-options no-rfc3442` —Disables support for the classless static route option for DHCP on a virtual interface.

For information on data plane and virtual interfaces, refer to *Brocade 5600 vRouter LAN Interfaces Reference Guide*.

NOTE
Before using these commands, configure the respective bridge or data plane address for the DHCP client.

**DHCP configuration**

DHCP configuration includes enabling the DHCP server, setting up the DHCP servers for failover, configuring DHCP address pools, setting up DHCP relay, and setting up additional DHCP configuration parameters.

**Enabling the DHCP server**

To use the DHCP server on the Brocade vRouter, you must enable the DHCP service.

To enable the DHCP service, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable DHCP.</td>
<td><code>vyatta@R1# set service dhcp-server</code></td>
</tr>
</tbody>
</table>

In addition, at least one DHCP shared network (address pool) must be configured.

**Creating a static mapping**

Situations exist in which it makes sense to map a specific IP address to a specific host rather than dynamically assign an IP address from a pool of addresses. This mapping is known as a ‘static mapping.’

A static mapping is defined by using the `static-mapping` option of the service dhcp-server configuration node. The following example shows how to create a static mapping by associating the 172.16.0.101 IP address to the device with a MAC address of 00:15:c5:b3:2e:65.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a static mapping called <code>lab</code> and specify the static IP address.</td>
<td><code>vyatta@R1# set service dhcp-server static-mapping lab ip-address 172.16.0.101</code></td>
</tr>
<tr>
<td>Specify the associated MAC address within the <code>lab</code> static mapping.</td>
<td><code>vyatta@R1# set service dhcp-server static-mapping lab mac-address 00:15:c5:b3:2e:65</code></td>
</tr>
</tbody>
</table>
Commit the changes.
vyatta@R1# commit

Show the configuration.
vyatta@R1# show service dhcp-server
  static-mapping lab {
    ip-address 172.16.0.101
    mac-address 00:15:c5:b3:2e:65
  }

Configuring DHCP address pools

Configure DHCP address pools for the system to act as a DHCP server for the network.

Configuring for networks directly connected to the system

Table 3 shows how to create three address pools:

- dp0p1p1_POOL. This address pool serves the 172.16.0.0/24 subnet, which is connected to the dp0p1p1 interface. The lease time remains at the default, 24 hours (86,400 seconds). This address pool uses the DNS name server at 172.16.0.34.
- dp0p1p2_30_POOL. This address pool serves the 10.10.30.0/24 subnet, which is connected directly to the dp0p1p2 interface. The lease time remains at the default, 24 hours (86,400 seconds). This address pool uses the DNS name server at 10.10.40.34, which is connected to dp0p1p2 virtual interface [vif] 40.
- dp0p1p2_40_POOL. This address pool serves the 10.10.40.0/24 subnet, which is connected to the dp0p1p2.40 interface. The lease time remains at the default, 24 hours (86,400 seconds). This address pool uses the DNS name server at 10.10.40.34, which is connected to dp0p1p2.40.

In all these pools, the range of addresses is configured for .100 through .199.

The following figure shows the sample address pool configuration.
FIGURE 1 DHCP address pool configuration

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the configuration node for dp0p1p1_POOL on the 172.16.0.0/24 subnet. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p1_POOL subnet 172.16.0.0/24 start 172.16.0.100 stop 172.16.0.199</td>
</tr>
<tr>
<td>Specify the default router for dp0p1p1_POOL</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p1_POOL subnet 172.16.0.0/24 default-router 172.16.0.65</td>
</tr>
<tr>
<td>Specify a DNS server for dp0p1p1_POOL</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p1_POOL subnet 172.16.0.0/24 dns-server 172.16.0.34</td>
</tr>
<tr>
<td>Create the configuration node for dp0p1p2_30_POOL on the 10.10.30.0/24 subnet. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_30_POOL subnet 10.10.30.0/24 start 10.10.30.100 stop 10.10.30.199</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Specify the default router for dp0p1p2_30_POOL.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_30_POOL subnet 10.10.30.0/24 default-router 10.10.30.65</td>
</tr>
<tr>
<td>Specify a DNS server for dp0p1p2_30_POOL.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_30_POOL subnet 10.10.30.0/24 dns-server 10.10.40.34</td>
</tr>
<tr>
<td>Create the configuration node for dp0p1p2_40_POOL on the 10.10.40.0/24 subnet. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_40_POOL subnet 10.10.40.0/24 start 10.10.40.100 stop 10.10.40.199</td>
</tr>
<tr>
<td>Specify the default router for dp0p1p2_40_POOL.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_40_POOL subnet 10.10.40.0/24 default-router 10.10.40.65</td>
</tr>
<tr>
<td>Specify a DNS server for dp0p1p2_40_POOL.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2_40_POOL subnet 10.10.40.0/24 dns-server 10.10.40.34</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit</td>
</tr>
</tbody>
</table>
| Show the configuration. | vyatta@R1# show service dhcp-server  
shared-network-name dp0p1p1_POOL {  
subnet 172.16.0.0/24 {  
default-router 172.16.0.65  
dns-server 172.16.0.34  
start 172.16.0.100 {  
  stop 172.16.0.199  
  }  
}  
}  
shared-network-name dp0p1p2_30_POOL {  
subnet 10.10.30.0/24 {  
default-router 10.10.30.65  
dns-server 10.10.40.34  
start 10.10.30.100 {  
  stop 10.10.30.199  
  }  
}  
}  
shared-network-name dp0p1p2_40_POOL {  
subnet 10.10.40.0/24 {  
default-router 10.10.40.65  
dns-server 10.10.40.34  
start 10.10.40.100 {  
  stop 10.10.40.199  
  }  
}  
} |
| Show the interface configuration. | vyatta@R1# show interfaces  
dataplane dp0p1p1 {  
address 172.16.0.65/24  
hw-id 00:0c:29:42:05:2b  
}  
dataplane dp0p1p2 {  
address 10.10.30.65/24  
} |
Configuring for networks indirectly connected to the system

Table 4 shows how to create an address pool (dp0p1p1_POOL2) for clients that are indirectly connected to the R1 vRouter, as shown below.

The dp0p1p1_POOL2 address pool serves the 192.168.1.0/24 subnet, which is on a different subnet than the subnet to which the dp0p1p1 data plane interface is connected.

The lease time remains at the default, 24 hours (86,400 seconds). This address pool uses the DNS name server at 172.16.0.34.

The following figure shows the sample address pool configuration.

FIGURE 2 DHCP address pool configuration for clients indirectly connected to the DHCP server host

To configure the dp0p1p1_POOL2 DHCP address pool, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the router interface to listen to DHCP messages.</td>
<td>vyatta@R1# set service dhcp-server listento interface dp0p1p1</td>
</tr>
<tr>
<td>Create a shared network and associate it with the 192.168.10/24 subnet.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p1_POOL2 subnet 192.168.1.0/24</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R1# show service dhcp-server dhcp-server {  listento {   interface dp0p1p1  }  shared-network-name dp0p1p1_POOL2 }</td>
</tr>
</tbody>
</table>
setting up dhcp servers for failover

the brocade vrouter also provides a failover feature to allow for dhcp redundancy on a given subnet.

in a failover configuration, two dhcp servers act as failover peers, with one of the peers designated as the primary and the other as the secondary. for dhcp failover to work, the following conditions must be met.

- both peers must be brocade vrouters and must be running the same version of vyatta software.
- each server must be configured to point to the other as the failover peer.
- the time on the servers must be exactly synchronized.
- the start-stop range must have at least one ip address for each subnet that has not been either excluded (by using service dhcp-server shared-network-name name subnet ipv4net exclude ipv4 on page 65) or statically mapped (by using service dhcp-server static-mapping mapname on page 89).

the system times should be synchronized before configuring dhcp failover. use of ntp time synchronization is highly recommended. however, if difficulties arise because of incorrect system times, disable ntp, reset the times correctly, and then re-enable ntp.

note that dhcp leases are assigned only in failover configurations if proper communication is established between the two failover peers. if the configuration is incorrect (if, for example, one failover peer is configured but the other is not), dhcp leases are not dispersed.

also note that statically mapped addresses are not renewed by a failover server unless they are explicitly defined on that server by using service dhcp-server static-mapping mapname on page 89.

the following figure shows the sample dhcp server failover configuration.
To configure R1 as the primary DHCP server in this failover scenario, perform the following steps in configuration mode on R1.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the configuration node for DHCP1 on the 192.168.42.0/24 subnet. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 start 192.168.42.100 stop 192.168.42.199</td>
</tr>
<tr>
<td>Specify the default router for DHCP1.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 default-router 192.168.42.254</td>
</tr>
<tr>
<td>Specify a DNS server for DHCP1.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 dns-server 192.168.42.253</td>
</tr>
<tr>
<td>Specify the local IP address for the DHCP server for failover.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover local-address 192.168.42.1</td>
</tr>
<tr>
<td>Specify the IP address of the peer DHCP server for failover.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover peer-address 192.168.42.2</td>
</tr>
<tr>
<td>Specify the role that the DHCP server plays in the failover group.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover status primary</td>
</tr>
<tr>
<td>Specify the name of the failover group.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover name FAILOVER</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R1# show service dhcp-server shared-network-name DHCP1 shared-network-name DHCP1 { subnet 192.168.42.0/24 {</td>
</tr>
</tbody>
</table>
To configure R2 as the secondary DHCP server in this failover scenario, perform the following steps in configuration mode on R2.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the configuration node for DHCP1 on the 192.168.42.0/24 subnet. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 start 192.168.42.100 stop 192.168.42.199</td>
</tr>
<tr>
<td>Specify the default router for DHCP1.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 default-router 192.168.42.254</td>
</tr>
<tr>
<td>Specify a DNS server for DHCP1.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 dns-server 192.168.42.253</td>
</tr>
<tr>
<td>Specify the local IP address for the DHCP server for failover.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover local-address 192.168.42.2</td>
</tr>
<tr>
<td>Specify the IP address of the peer DHCP server for failover.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover peer-address 192.168.42.1</td>
</tr>
<tr>
<td>Specify the role that the DHCP server plays in the failover group.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover status secondary</td>
</tr>
<tr>
<td>Specify the name of the failover group.</td>
<td>vyatta@R2# set service dhcp-server shared-network-name DHCP1 subnet 192.168.42.0/24 failover name FAILOVER</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R2# commit</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R2# show service dhcp-server shared-network-name DHCP1</td>
</tr>
</tbody>
</table>

```
default-router 192.168.42.254
dns-server 192.168.42.253
failover {
    local-address 192.168.42.1
    name FAILOVER
    peer-address 192.168.42.2
    status primary
}
start 192.168.42.100 {
    stop 192.168.42.199
}
```
Setting up DHCP relay

Configure DHCP relay if you want the Brocade vRouter to forward DHCP requests to another DHCP server.

Every interface involved in the DHCP relay must be configured and must be capable of broadcasting. So, for example, if requests are coming in on the dp0p1p1 interface and the DHCP server specified in the configuration is reached through the dp0p1p2 interface, both dp0p1p1 and dp0p1p2 must be configured for DHCP.

Table 7 shows how to accomplish the following tasks:

- Configures both dp0p1p1 and dp0p1p2 for DHCP. The router is expected to receive client requests for the DHCP server through the dp0p1p1 interface. It forwards client-to-server DHCP messages to the DHCP server at 172.16.1.52 out through the dp0p1p2 interface.
- Enables relay options. This directs the system to add the Relay Agent Information option (option 82) to the DHCP message before forwarding, as specified by RFC 3046.
- Does not permit reformatting of DHCP messages by this system. If a packet is received that already contains relay information, the packet is discarded.
- Leaves other relay option parameters at default values. This means that the router uses port 67 for DHCP messaging, allows a maximum DHCP packet size of at most 576 bytes, and has a maximum hop count of 10 hops.

Figure 4 shows the sample DHCP relay configuration.

To configure DHCP relay, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable DHCP relay on the dp0p1p1 interface on which client requests are received.</td>
<td>vyatta@R1# set service dhcp-relay listen-interface dp0p1p1</td>
</tr>
</tbody>
</table>
Enable DHCP relay on the dp0p1p2 interface on which client messages are forwarded to the DHCP server.
vyatta@R1# set service dhcp-relay upstream-interface dp0p1p2

Specify the IP address of the DHCP server.
vyatta@R1# set service dhcp-relay server 172.16.1.52

Set the router to discard messages containing relay information. Leave other parameters at default values.
vyatta@R1# set service dhcp-relay relay-options relay-agents-packets discard

Commit the changes.
vyatta@R1# commit

Show the configuration.
vyatta@R1# show service dhcp-relay

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>vyatta@R1# set service dhcp-relay upstream-interface dp0p1p2</td>
<td>vyatta@R1# set service dhcp-relay server 172.16.1.52</td>
</tr>
<tr>
<td>vyatta@R1# set service dhcp-relay relay-options relay-agents-packets discard</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>vyatta@R1# show service dhcp-relay listen-interface dp0p1p1 upstream-interface dp0p1p2 server 172.16.1.52 relay-options { relay-agents-packets discard }</td>
<td></td>
</tr>
</tbody>
</table>

Setting additional DHCP configuration parameters

**CAUTION**
This feature is advanced and should be used only by expert users in special situations.

The Brocade vRouter DHCP server commands provide a set of commonly used DHCP server features. However, many additional features are available. Information regarding the available DHCP server features are located on the dhcpcd.conf man page. To access it, type the following at the Vyatta command prompt:

```
man dhcpcd.conf
```

To access these additional features, use one of the following commands, depending on the required scope of the feature. The commands are listed from widest to narrowest scope.

- `service dhcp-server global-parameters params` on page 47
- `service dhcp-server static-mapping mapname static-mapping-parameters params` on page 93
- `service dhcp-server shared-network-name name shared-network-parameters params` on page 54
- `service dhcp-server shared-network-name name subnet ipv4net subnet-parameters params` on page 82

The precedence of scope of these commands is from narrowest to widest. That is, if more than one command is specified and a given host address falls within the scope of both, it is governed by parameters specified in the command with the narrowest scope.

Multiple parameter strings can be specified. Each parameter string that is specified adds a separate line to the dhcpcd.conf file.

Note that no validation is done by the Brocade vRouter before passing the parameter string from these commands to the DHCP server process (dhcpcd). Because of this lack of validation, it is imperative that the syntax described in the dhcpcd.conf documentation be strictly followed. Failure to do so could result in a failure of the DHCP server. It is advisable to check the system log for errors when using these parameter strings. In addition, the `show system processes` command can be used to determine if the dhcpcd process is still running.

The following example shows how the additional DHCP server parameters can be accessed. To configure additional DHCP server parameters, perform the following steps in configuration mode.
Enable the DHCP server and define an option that does not already have a keyword defined in the dhcpd process. See the dhcpd man page for further information.

| vyatta@R1# set service dhcp-server global-parameters 'option rfc3442-static-route code 121 = string;' |

Specify the value to be used for the option for all shared networks, subnets, and static mappings defined in the DHCP server configuration.

| vyatta@R1# set service dhcp-server global-parameters 'option rfc3442-static-route 01:01:01:01:01:01:01:01;' |

Specify an IP address to statically map to a host with a specific MAC address.

| vyatta@R1# set service dhcp-server static-mapping MAP1 ip-address 172.16.117.15 |

Specify the MAC address of a host to be statically mapped to an IP address.

| vyatta@R1# set service dhcp-server static-mapping MAP1 mac-address 09:09:09:09:09:09 |

Override the global value of the parameter defined previously for a specific host.

| vyatta@R1# set service dhcp-server static-mapping MAP1 static-mapping-parameters 'option rfc3442-static-route 01:01:01:01:01:01:01:02' |

Specify that the DHCP server is authoritative for the specified shared network.

| vyatta@R1# set service dhcp-server shared-network-name NET1 authoritative enable |

Specify the subnet and address pool to use.

| vyatta@R1# set service dhcp-server shared-network-name NET1 subnet 172.16.117.0/24 start 172.16.117.10 stop 172.16.117.20 |

Commit the changes.

| vyatta@R1# commit |

Show the configuration.

| vyatta@R1# show service dhcp-server  
  global-parameters "option rfc3442-static-route code 121 = string;"  
  global-parameters "option rfc3442-static-route 01:01:01:01:01:01:01:01;"  
  shared-network-name NET1 {authoritative enable  
    subnet 172.16.117.0/24 {start 172.16.117.10 {stop 172.16.117.20  
    }  
  }  
  static-mapping MAP1 {ip-address 172.16.117.15  
    mac-address 09:09:09:09:09:09  
    static-mapping-parameters "option-rfc3422-static-route 01:01:01:01:01:01:01:02;"  
  } |
DHCP Commands

- interfaces bridge <brx> dhcp-options no-rfc3442
- release dhcp interface <interface>
- renew dhcp interface <interface>
- reset dhcp server lease ip <address>
- reset dhcp server leases
- restart dhcp relay-agent
- restart dhcp server
- service dhcp-relay
- service dhcp-relay listen-interface <interface>
- service dhcp-relay relay-options
- service dhcp-relay server <ipv4>
- service dhcp-relay upstream-interface <interface>
- service dhcp-server
- service dhcp-server disabled <state>
- service dhcp-server dynamic-dns-update enable <state>
- service dhcp-server global-parameters <params>
- service dhcp-server listento interface <dp-interface>
- service dhcp-server listento dhcp-options no-rfc3442
- service dhcp-server listento service dhcp-server shared-network-name <name> description <desc>
- service dhcp-server listento service dhcp-server shared-network-name <name> authoritative <state>
- service dhcp-server listento service dhcp-server shared-network-name <name> description <desc>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> exclude <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> default-router <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> failover peer-address <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> failover status <status>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> ip-forwarding enable <state>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> lease <seconds>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> ntp-server <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> pop-server <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> server-identifier <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> smtp-server <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> start <ipv4> stop <ipv4>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> static-route destination-subnet <ipv4net>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> static-route destination subnet <ipv4net>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> subnet-parameters <params>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> tftp-server-name <servername>
- service dhcp-server listento service dhcp-server shared-network-name <name> subnet <ipv4net> time-offset <seconds>
- service dhcp-server shared-network-name <name> subnet <ipv4net> time-server <ipv4>
- service dhcp-server shared-network-name <name> subnet <ipv4net> wins-server <ipv4>
- service dhcp-server shared-network-name <name> subnet <ipv4net> wpad-url <url>
- service dhcp-server static-mapping <mapname>
- service dhcp-server static-mapping <mapname> disable
- service dhcp-server static-mapping <mapname> ip-address <ipv4>
- service dhcp-server static-mapping <mapname> mac-address <mac>
- service dhcp-server static-mapping <mapname> static-mapping-parameters <params>
- show dhcp client leases
- show dhcp server leases
- show dhcp server statistics
- Related commands
**interfaces bridge <brx> dhcp-options no-rfc3442**

Disables support for the DHCP classless static route option for a bridge group.

**Syntax**

- `set interfaces bridge brx dhcp-options no-rfc3442`
- `delete interfaces bridge brx dhcp-options no-rfc3442`
- `show interfaces bridge brx dhcp-options`

**Command Default**

The classless static route option for DHCP is enabled.

**Parameters**

- **brx**
  The identifier for a bridge group. The identifier ranges from br0 through br999.

- **no-rfc3442**
  Removes the classless static route option (121) from the parameter request list that a DHCP client sends to the DHCP server. For further information, refer to RFC 3442 at https://tools.ietf.org/html/rfc3442.

**Modes**

Configuration mode

**Configuration Statement**

```
interfaces {
  bridge brx {
    dhcp-options {
      no-rfc3442
    }
  }
}
```

**Usage Guidelines**

**NOTE**

This command is relevant only if the `dhcp` option has been set by using the `interfaces bridge brx address address` command.

**NOTE**

Normally, this command is not required. It would be used only if the remote DHCP server is configured to provide classless static routes, but these routes are not required on the router that is configured to use the DHCP address.

Use the `set` form of this command to disable DHCP classless static route option support for a bridge group.

Use the `delete` form of this command to re-enable DHCP classless static route option support for a bridge group.

Use the `show` form of this command to display the status of the DHCP classless static route option for a bridge group.
release dhcp interface <interface>

Releases the current DHCP client lease from an interface.

Syntax

release dhcp interface interface

Parameters

interface

An interface that uses DHCP to obtain an IP address.

Modes

Operational mode

Usage Guidelines

Use this command to release the current DHCP client lease from an interface. The interface must be a DHCP client that obtained an IP address from a DHCP server.
renew dhcp interface <interface>
Renews the current DHCP client lease on an interface.

Syntax
renew dhcp interface interface

Parameters
interface
An interface that uses DHCP to obtain an IP address.

Modes
Operational mode

Usage Guidelines
Use this command to renew the current DHCP client lease on an interface. The interface must be a DHCP client that obtained an IP address from a DHCP server.
reset dhcp server lease ip <address>
Removes the DHCP lease for an IP address.

Syntax
reset dhcp server lease ip [ipv4-address | ipv6-address]

Parameters
ipv4
An IPv4 address.
ipv6
An IPv6 address.

Modes
Operational mode

Usage Guidelines
Use this command to remove the DHCP lease for an IP address. The command applies to leases provided by the DHCP server. The server is configured by using service dhcp-server on page 44.
reset dhcp server leases

Removes all DHCP leases.

Syntax

    reset dhcp server leases

Modes

    Operational mode

Usage Guidelines

service dhcp-server

    Use this command to remove all DHCP leases. The command applies to leases provided by the DHCP server. The server is configured by using service dhcp-server on page 44.
restart dhcp relay-agent

Restarts the DHCP relay agent.

Syntax

restart dhcp relay-agent

Modes

Operational mode

Usage Guidelines

Use this command to stop the DHCP relay agent if it is running, then start it if it is configured. This command can be used if the DHCP relay agent is not operating properly.
restart dhcp server
   Restarts the DHCP server.

Syntax
   restart dhcp server

Modes
   Operational mode

Usage Guidelines
   Use this command to stop and restart the DHCP server. This command can be used if the DHCP relay agent is not operating properly.
**service dhcp-relay**

Configures the system to relay DHCP client messages to an off-network DHCP server.

**Syntax**

```plaintext
set service dhcp-relay
delete service dhcp-relay
show service dhcp-relay
```

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
  dhcp-relay {
  }
}
```

**Usage Guidelines**

Use this command to configure the system as a DHCP relay agent.

A DHCP relay agent receives DHCP packets from DHCP clients and forwards them to a DHCP server. This allows you to place DHCP clients and DHCP servers on different networks; that is, across router interfaces.

The relay agent is configured with addresses of DHCP servers to which they should relay client DHCP messages. The relay agent intercepts the broadcast, sets the gateway address (the giaddr field of the DHCP packet) and, if configured, inserts the Relay Agent Information option (option 82) in the packet and forwards it to the DHCP server.

The DHCP server echoes the option back verbatim to the relay agent in server-to-client replies, and the relay agent strips the option before forwarding the reply to the client.

All interfaces involved in the DHCP relay for both clients and servers must be explicitly defined by using `service dhcp-relay listen-interface <interface>` on page 39.

Use the `set` form of this command to define DHCP relay configuration.

Use the `delete` form of this command to remove DHCP relay configuration.

Use the `show` form of this command to view DHCP relay configuration.
service dhcp-relay listen-interface <interface>

Enables DHCP relay on an interface for receiving DHCP requests from DHCP clients.

Syntax

```
set service dhcp-relay listen-interface dp-interface
delete service dhcp-relay listen-interface dp-interface
show service [dhcp-relay listen-interface]
```

Parameters

```
interface
```

A data plane interface on the router. At least one interface must be specified.
You can assign multiple interfaces to be used for DHCP by creating multiple `listen-interface` configuration nodes.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-relay {
        listen-interface interface
    }
}
```

Usage Guidelines

Use this command to enable DHCP-relay on an interface to receive DHCP requests from DHCP clients.
At least one DHCP-relay server must be configured.
Use the `set` form of this command to specify the interface.
Use the `delete` form of this command to remove the interface.
Use the `show` form of this command to view the interface.
service dhcp-relay relay-options

Specifies whether to add the Relay Agent Information option (option 82) to the client-to-server packet.

Syntax

```
set service dhcp-relay relay-options [hop-count count | max-size size | port port | relay-agents-packets policy]
delete service dhcp-relay relay-options [hop-count | max-size | port | relay-agents-packets]
show service dhcp-relay relay-options [hop-count | max-size | port | relay-agents-packets]
```

Parameters

- **hop-count count**
  Optional. Sets the hop count for outgoing relayed messages. After the hop count is reached, the packet is discarded. The hop count should be set high enough that relayed packets are able to reach the DHCP server. The count ranges from 0 through 255. The default count is 10.

- **max-size size**
  Optional. Sets the maximum size of the DHCP packet to be created after appending the relay agent information option. If, after appending the information, the packet exceeds this size, the packet is forwarded without appending the information. This size should be set to the lowest MTU size in your network. The size ranges from 64 through 1400. The default size is 576.
  If this option is not configured, the router does not forward DHCP packets that exceed the MTU of the interface on which relaying is configured.

- **port port**
  Optional. Specifies the port on this interface that relays DHCP client messages. This should be done only for debugging because the behavior changes; responses are broadcast rather than being sent to port 68 of the requesting client. The port ranges from 1 through 65535.

- **relay-agents-packets policy**
  Optional. Sets the reforwarding policy for a DHCP relay agent. The router takes this action if the DHCP message already contains relay information. The policy is one of the following:

  - **append**: The DHCP relay agent may append its own set of relay options to the packet, leaving the supplied option field intact.
  - **discard**: If the packet already contains relay information, it is discarded.
  - **forward**: The packet is forwarded regardless of whether it contains relay information.
  - **replace**: The DHCP relay agent may replace the supplied option field with its own set of relay options.

  The default policy is **forward**.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-relay {
        relay-options {
            hop-count count
            max-size size
            port port
        }
    }
}
```
Usage Guidelines

Use this command to configure the Relay Agent Information option (option 82) in the client-to-server packet, as specified by RFC 3046, and configure DHCP relay options.

Setting the port to a value other than 67 should be done only for debugging. When this is done, DHCP requests from clients are still accepted on port 67, but the responses from DHCP servers are forwarded to broadcast address 255.255.255.255 port 0 rather than on port 68, where DHCP clients listen.

Use the set form of this command to set DHCP relay options.

Use the delete form of this command to restore default DHCP relay options.

Use the show form of this command to view DHCP relay option configuration.
service dhcp-relay server <ipv4>

Specifies the IP address of a DHCP server.

Syntax

set service dhcp-relay server ipv4
delete service dhcp-relay server ipv4
show service dhcp-relay server

Parameters

ipv4
Mandatory. Multinode. The IP address of a DHCP server.
You can relay messages to more than one DHCP server by creating multiple server configuration nodes.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-relay {
        server ipv4 {
        }
    }
}
```

Usage Guidelines

Use this command to specify the IP address of a DHCP server.
Use the set form of this command to specify the IP address of a DHCP server in a DHCP relay configuration.
Use the delete form of this command to remove DHCP server configuration in a DHCP relay configuration.
Use the show form of this command to view DHCP server configuration in a DHCP relay configuration.
service dhcp-relay upstream-interface <interface>

Specifies an interface for forwarding DHCP requests to the DHCP server.

Syntax

set service dhcp-relay upstream-interface dp-interface
delete service dhcp-relay upstream-interface interface
show service [dhcp-relay upstream-interface]]

Parameters

interface

A data plane interface to forward DHCP requests. At least one interface must be specified. You can assign multiple interfaces to be used for DHCP forwarding by creating multiple upstream-interface configuration nodes.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-relay {
    upstream-interface interface
  }
}

Usage Guidelines

Use this command to specify an interface for forwarding DHCP requests to the DHCP server. At least one DHCP-relay server must be configured. Use the set form of this command to specify an interface for forwarding DHCP requests to the DHCP server. Use the delete form of this command to remove the interface. Use the show form of this command to view the interface.
service dhcp-server

Enables DHCP server functionality.

Syntax

set service dhcp-server
delete service dhcp-server
show service dhcp-server

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
    }
}

Usage Guidelines

Use this command to configure a pool of addresses the system can use for DHCP.
At least one address pool must be configured for DHCP to be available as a service.
At least one address pool must lie within a configured subnet on any of the broadcast interfaces.
Each subnet that is specified contains a distinct address pool. A given interface can support more than one address pool (that is, more than one subnet).

Use the set form of this command to enable DHCP server functionality.
Use the delete form of this command to remove DHCP server functionality.
Use the show form of this command to view DHCP server configuration.
service dhcp-server disabled <state>
Disables the DHCP server without discarding configuration.

Syntax

set service dhcp-server disabled state
delete service dhcp-server disabled
show service dhcp-server disabled

Command Default
DHCP server functionality is disabled.

Parameters

state
The administrative state of the DHCP server. The state is either of the following:
true: Disables the DHCP server without discarding configuration.
false: Enables the DHCP server.

Modes
Configuration mode

Configuration Statement

service {
  dhcp-server {
    disabled state
  }
}

Usage Guidelines
Use this command to disable the DHCP server without discarding configuration.
Use the set form of this command to specify whether the DHCP server should be disabled.
Use the delete form of this command to restore the default state, that is, DHCP server functionality is disabled.
Use the show form of this command to view DHCP server configuration.
service dhcp-server dynamic-dns-update enable <state>

Specifies whether to dynamically update DNS.

Syntax

- set service dhcp-server dynamic-dns-update enable state
- delete service dhcp-server dynamic-dns-update enable
- show service dhcp-server dynamic-dns-update enable

Command Default

DNS updates are not sent by the DHCP server.

Parameters

- state

  The state of dynamic DNS updates. The state is either of the following:
  - true: Sends updates dynamically.
  - false: Does not send updates.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-server {
        dynamic-dns-update {
            enable state
        }
    }
}
```

Usage Guidelines

- Use this command to control DNS updates from the DHCP server.
- Use the set form of this command to specify whether dynamic DNS updates should be sent.
- Use the delete form of this command to restore the default state, that is, DNS updates are not sent.
- Use the show form of this command to view the dynamic DNS update configuration.
service dhcp-server global-parameters <params>

Specifies additional global DHCP server parameters.

Syntax

set service dhcp-server global-parameters params
delete service dhcp-server global-parameters params
show service dhcp-server global-parameters

Parameters

params

A string of parameters to be used by the DHCP server. The string must be enclosed in single quotation marks (').

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    global-parameters params
  }
}

Usage Guidelines

DANGER

This feature is advanced and should be used by only expert users in special situations.

Use this command to specify additional global DHCP server parameters that are not available with the service dhcp-server commands. The Brocade vRouter DHCP server commands are a subset of those that are available for DHCP server configuration. This command provides access to all DHCP server configuration parameters. More information regarding DHCP server configuration is located on the dhcpd.conf man page. To access the page, type the following at the Vyatta command prompt:

```
man dhcpd.conf
```

The Brocade vRouter does no validation before passing the parameter string to the DHCP server process (dhcpd). Because of this nonvalidation, it is imperative that the syntax described in the dhcpd.conf documentation be strictly followed. Failure to do so could result in a failure of the DHCP server. It is advisable to check the system log for errors when using these parameter strings. In addition, the show system processes command determines if the dhcpd process is still running.

The scope of these parameters is global. They apply to all shared-networks, subnets, and static-mappings unless parameters with a narrower scope are specified by using the shared-network-parameters, subnet-parameters, or static-mapping-parameters version of this command.

Multiple parameter strings can be specified. Each parameter string that is specified adds a separate line to the dhcpd.conf file. Use the set form of this command to specify additional global DHCP server parameters.
Use the **delete** form of this command to remove additional global DHCP server parameters.

Use the **show** form of this command to display additional global DHCP server parameters.
**service dhcp-server listento interface <dp-interface>**

Allows the DHCP server to create address pools for clients that are indirectly connected to a data plane network interface through a DHCP relay server.

**Syntax**

```
set service dhcp-server listento interface dp-interface
delete service dhcp-server listento interface
show service dhcp-server
```

**Parameters**

- **dp-interface**
  
  A data plane interface on the router. It must have a valid IP address.

**Modes**

Configuration mode.

**Configuration Statement**

```
service {
    dhcp-server {
        listento {
            interface dp-interface
        }
    }
}
```

**Usage Guidelines**

Use this command to enable the DHCP server to create IP address pools for clients that are not directly connected to the router. For example, if clients on B subnet connect to the router through a DHCP relay server, the DHCP relay server connects to the router through a data plane interface on the A subnet, and the data plane interface has a valid IP address, using this command allows the DHCP server to create IP address pools for clients that are on the B subnet.

Use the `set` form of this command to create an IP address pool for clients that are indirectly connected to the router through a data plane network interface.

Use the `delete` form of this command to remove a data plane interface from the DHCP server configuration. If no data plane interfaces are configured, the DHCP server cannot create address pools.

Use the `show` form of this command to view the DHCP server configuration.
service dhcp-server shared-network-name <name>
Specifies the name for a DHCP address pool.

Syntax

set service dhcp-server shared-network-name name
delete service dhcp-server shared-network-name name
show service dhcp-server shared-network-name name

Parameters

name
Mandatory. Multinode. The name for a DHCP address pool.
You can define multiple address pools by creating multiple shared-network-name configuration nodes, each with a different name.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
        }
    }
}

Usage Guidelines

Use this command to create a DHCP server address pool with the specified name.
Use the set form of this command to create a DHCP address pool.
Use the delete form of this command to remove a DHCP address pool.
Use the show form of this command to display a DHCP address pool.
service dhcp-server shared-network-name <name> authoritative <state>

Specifies whether the DHCP server is the authoritative server.

Syntax

set service dhcp-server shared-network-name name authoritative state
delete service dhcp-server shared-network-name name authoritative
show service dhcp-server shared-network-name name authoritative

Command Default

The DHCP server is not authoritative.

Parameters

name
Mandatory. A DHCP address pool.

state
Specifies whether the DHCP server is the authoritative server. The state is either of the following:

- enable Enables authoritative state.
- disable Disables authoritative state.

The default state is disable.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            authoritative state
        }
    }
}

Usage Guidelines

Use this command to set the DHCP server as the authoritative server.

Setting the server as authoritative sets the server as a master server and allows it to protect itself from rogue DHCP servers or misconfigured DHCP clients. If the server is authoritative, it sends a DHCPNAK to a misconfigured client; otherwise, the client cannot update its IP address until after the old lease expires.

Use the set form of this command to enable or disable the authoritative state for the DHCP server.

Use the delete form of this command to restore the default authoritative state, which is not authoritative.

Use the show form of this command to display whether the DHCP server is authoritative.
service dhcp-server shared-network-name <name> description <desc>

Provides a description of a shared network.

Syntax

set service dhcp-server shared-network-name name description desc
delete service dhcp-server shared-network-name name description
show service dhcp-server shared-network-name name description

Parameters

name
Mandatory. A DHCP address pool.

desc
A description of a shared network.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            description desc
        }
    }
}

Usage Guidelines

Use this command to provide a description of a shared network.
Use the set form of this command to provide a description of a shared network.
Use the delete form of this command to delete the description of a shared network.
Use the show form of this command to display the description of a shared network.
service dhcp-server shared-network-name <name> disable

Disables DHCP configuration for a shared network.

Syntax

set service dhcp-server shared-network-name name disable
delete service dhcp-server shared-network-name name disable
show service dhcp-server shared-network-name name

Command Default

A shared-network configuration is enabled.

Parameters

name

Mandatory. A DHCP address pool.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      disable
    }
  }
}

Usage Guidelines

Use this command to disable DHCP configuration of a shared network.
Use the set form of this command to disable DHCP configuration of a shared network.
Use the delete form of this command to enable DHCP configuration of a shared network.
Use the show form of this command to display DHCP configuration of a shared network.
service dhcp-server shared-network-name <name> shared-network-parameters <params>

Specifies additional shared-network DHCP server parameters.

Syntax

set service dhcp-server shared-network-name name shared-network-parameters params
delete service dhcp-server shared-network-name name shared-network-parameters params
show service dhcp-server shared-network-name name shared-network-parameters

Parameters

name
Mandatory. A DHCP address pool.

params
A string of parameters to be used by the DHCP server. The string must be enclosed in single quotation marks (').

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      shared-network-parameters params
    }
  }
}

Usage Guidelines

NOTE
This feature is advanced and should be used by only expert users in special situations.

Use this command to specify additional shared-network DHCP server parameters that are not available with the service dhcp-server commands. The Brocade vRouter DHCP server commands are a subset of those that are available for DHCP server configuration. This command provides access to all DHCP server configuration parameters. More information regarding DHCP server configuration is located on the dhcpd.conf man page. To access the page, type the following at the Vyatta command prompt:

man dhcpd.conf

The Brocade vRouter does no validation before passing the parameter string to the DHCP server process (dhcpd). Because of this nonvalidation, it is imperative that the syntax described in the dhcpd.conf documentation be strictly followed. Failure to do so could result in a failure of the DHCP server. It is advisable to check the system log for errors when using these parameter strings. In addition, the show system processes command determines if the dhcpd process is still running.
The scope of these parameters is for the specified shared network. They apply to all subnets, and static-mappings within this scope unless parameters with a narrower scope are specified by using the `subnet-parameters` or `static-mapping-parameters` version of this command.

Multiple parameter strings can be specified. Each parameter string that is specified adds a separate line to the `dhcpd.conf` file.

Use the `set` form of this command to specify additional shared-network DHCP server parameters.

Use the `delete` form of this command to remove additional shared-network DHCP server parameters.

Use the `show` form of this command to display additional shared-network DHCP server parameters.
service dhcp-server shared-network-name <name> subnet <ipv4net>

Specifies the IPv4 network to be served by a DHCP address pool.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net
delete service dhcp-server shared-network-name name subnet ipv4net
show service dhcp-server shared-network-name name subnet ipv4net

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network to be served with the addresses defined in the specified address pool. The format of the network designation is ip-addr/prefix.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
            }
        }
    }
}

Usage Guidelines

Use this command to specify the IPv4 network to be served with the addresses that are defined in this named rule. DHCP requests from devices on this subnet are served static address assignments or an address from the defined range.

Use the set form of this command to specify the DHCP address pool subnet.

Use the delete form of this command to remove DHCP address pool subnet configuration.

Use the show form of this command to view DHCP address pool subnet configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> bootfile-name <bootfile>

Specifies a bootstrap file from which diskless PCs can boot.

Syntax

code

set service dhcp-server shared-network-name name subnet ipv4net bootfile-name bootfile
delete service dhcp-server shared-network-name name subnet ipv4net bootfile-name
show service dhcp-server shared-network-name name subnet ipv4net bootfile-name

describe

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

bootfile
The name of a bootstrap file to be used to boot.

Modes

Configuration mode

Configuration Statement

service {
   dhcp-server {
      shared-network-name name {
         subnet ipv4net {
            bootfile-name bootfile
         }
      }
   }
}

Usage Guidelines

Use this command to specify a bootstrap file from which diskless PCs can boot.
Use the set form of this command to specify a bootstrap file.
Use the delete form of this command to remove boot file configuration.
Use the show form of this command to view boot file configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> bootfile-server <addr>

Specifies a bootstrap server from which diskless PCs can boot.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net bootfile-server addr
delete service dhcp-server shared-network-name name subnet ipv4net bootfile-server
show service dhcp-server shared-network-name name subnet ipv4net bootfile-server

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is /ip-addr prefix.

addr
The IPv4 address or host name of the bootfile server.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        bootfile-server addr
      }
    }
  }
}

Usage Guidelines

Use this command to specify a bootstrap server from which diskless PCs can boot.
Use the set form of this command to specify a bootstrap server.
Use the delete form of this command to remove boot server configuration.
Use the show form of this command to view boot server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> client-prefix-length <prefix>
   Specifies the length of a subnet prefix to be assigned to clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net client-prefix-length prefix
delete service dhcp-server shared-network-name name subnet ipv4net client-prefix-length
show service dhcp-server shared-network-name name subnet ipv4net client-prefix-length

Parameters

name
   Mandatory. A DHCP address pool.

ipv4net
   Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

prefix
   Optional. The length of a subnet prefix that is assigned to each client. By default, the prefix length defined in the
   subnet parameter is assigned. The prefix length ranges from 0 through 32.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                client-prefix-length prefix
            }
        }
    }
}

Usage Guidelines

Use this command to specify the length of a subnet prefix that is assigned to each client.
Use the set form of this command to specify the length of a prefix subnet that is assigned to each client.
Use the delete form of this command to delete the length of a subnet prefix.
Use the show form of this command to display the length of a subnet prefix.
**service dhcp-server shared-network-name <name> subnet <ipv4net> ping-check**

Pings the IP address of the shared network subnet to confirm if the address is not configured on another node. Ping-check is valid only for IPv4.

**Syntax**

- `set service dhcp-server shared-network-name name subnet ipv4net ping-check`
- `delete service dhcp-server shared-network-name name subnet ipv4net ping-check`
- `show service dhcp-server shared-network-name name subnet ipv4net ping-check`

**Parameters**

- **name**
  Mandatory. A DHCP address pool. You can define multiple address pools by creating multiple `shared-network-name` configuration nodes, each with a different name.

- **ipv4net**
  Mandatory. Multinode. The IPv4 network to be served with the addresses defined in the specified address pool. The format of the network designation is `ip-addr/prefix`.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                ping-check {
                }
            }
        }
    }
}
```

**Usage Guidelines**

Use this command to ping the IP address of the shared network subnet to confirm if the address is not configured on another node. Ping-check is valid only for IPv4.

Use the `set` form of this command to specify the IPv4 subnet for ping-check.

Use the `delete` form of this command to remove the IPv4 subnet for ping-check.

Use the `show` form of this command to view the IPv4 subnet for ping-check.
Examples

The following example shows how to use the ping-check option for a shared network called *foo* and the IPv4 subnet address of 12.1.1.0/24. This option generates an ICMP echo request before offering an address to the client.

```
vyatta@vyatta# set service dhcp-server shared-network-name foo subnet 12.1.1.0/24 ping-check
```
service dhcp-server shared-network-name <name> subnet <ipv4net> default-router <ipv4>

Specifies the address of the default router for DHCP clients on a subnet.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net default-router ipv4
delete service dhcp-server shared-network-name name subnet ipv4net default-router
show service dhcp-server shared-network-name name subnet ipv4net default-router

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

ipv4
Optional. The address of the default router for DHCP clients on this subnet. The default router should be on the same subnet as the client. The format is an IP address.

Modes

Configuration mode

Configuration Statement

service {
dhcp-server {
    shared-network-name name {
        subnet ipv4net {
            default-router ipv4
        }
    }
}
}

Usage Guidelines

Use this command to specify the address of the default router for DHCP clients on a subnet.
Use the set form of this command to specify the address of the default router for DHCP clients on a subnet.
Use the delete form of this command to remove the default-router configuration.
Use the show form of this command to view the default-router configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> dns-server <ipv4>

Specifies the address of a DNS server for DHCP clients.

**Syntax**

```plaintext
set service dhcp-server shared-network-name name subnet ipv4net dns-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net dns-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net dns-server
```

**Parameters**

- **name**
  Mandatory. A DHCP address pool.

- **ipv4net**
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is `ip-addr/prefix`.

- **ipv4**
  Optional. Multinode. The IPv4 address of a DNS server.
  You can specify more than one DNS server by entering this command multiple times.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        dns-server ipv4
      }
    }
  }
}
```

**Usage Guidelines**

Use this command to specify the address of a DNS server that is available to DHCP clients.

Use the `set` form of this command to specify the address of a DNS server.

Use the `delete` form of this command to remove DNS server configuration.

Use the `show` form of this command to view DNS server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> domain-name <domain-name>

Provides the domain name for DHCP clients on a subnet.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net domain-name domain-name
delete service dhcp-server shared-network-name name subnet ipv4net domain-name
show service dhcp-server shared-network-name name subnet ipv4net domain-name

Parameters

name
  Mandatory. A DHCP address pool.

ipv4net
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

domain-name
  Optional. The domain name to be given to DHCP clients on this subnet. A domain name can include letters, numbers, hyphens (-), and one period (.). For example, brocade.com.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        domain-name domain-name
      }
    }
  }
}

Usage Guidelines

Use this command to specify the domain name for DHCP clients on a subnet.
Use the set form of this command to specify the client domain name.
Use the delete form of this command to remove client domain name configuration.
Use the show form of this command to view client domain name configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> exclude <ipv4>
   Excludes an IP address from a DHCP address pool.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net exclude ipv4
delete service dhcp-server shared-network-name name subnet ipv4net exclude ipv4
show service dhcp-server shared-network-name name subnet ipv4net exclude

Parameters

name
   Mandatory. A DHCP address pool.
ipv4net
   Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.
ipv4
   Optional. Multinode. An IP address to exclude from the lease range.
   You can exclude more than one IP address by creating multiple exclude configuration nodes.

Modes

Configuration mode

Configuration Statement

```
service {
   dhcp-server {
      shared-network-name name {
         subnet ipv4net {
            exclude ipv4
         }
      }
   }
}
```

Usage Guidelines

Use this command to exclude an IP address from a DHCP address pool. An excluded address is never leased to DHCP clients.
The exception is an IP address that is statically mapped by using service dhcp-server static-mapping mapname on page 89.
This address is not excluded.

Use the set form of this command to exclude an IP address from the lease range.
Use the delete form of this command to delete an IP address from the list of excluded addresses.
Use the show form of this command to display excluded IP addresses.
service dhcp-server shared-network-name <name> subnet <ipv4net> failover

Enables DHCP failover functionality for a DHCP address pool on a subnet.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net failover
delete service dhcp-server shared-network-name name subnet ipv4net failover
show service dhcp-server shared-network-name name subnet ipv4net failover

Parameters

name
  Mandatory. A DHCP address pool.

ipv4net
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        failover {
        }
      }
    }
  }
}

Usage Guidelines

Use this command to enable DHCP failover for an address pool on a given network, allowing two DHCP servers to share an address pool.

In a failover configuration, two DHCP servers act as failover peers, with one of the peers designated as the primary and the other as the secondary. For DHCP failover to work, the following conditions must be met.

- Both peers must be Brocade vRouters and must be running the same version of Brocade vRouter software.
- Each server must be configured to point to the other as the failover peer.
- The time on the servers must be exactly synchronized.
- At least one IP address must exist in the start-stop range for each subnet that has not been either excluded (by using service dhcp-server shared-network-name name subnet ipv4net exclude ipv4 on page 65) or statically mapped (by using service dhcp-server static-mapping mapname on page 89).
The system times should be synchronized before configuring DHCP failover. Use of NTP time synchronization is highly recommended. However, if difficulties arise because of incorrect system times, then disable NTP, reset the times correctly, and re-enable NTP.

Note that DHCP leases are assigned only in failover configurations if proper communication is established between the two failover peers. If the configuration is incorrect (if, for example, one failover peer is configured but the other is not), DHCP leases are not dispersed.

Note also that statically mapped addresses are not renewed by a failover server unless they are explicitly defined on that server by using `service dhcp-server static-mapping mapname` on page 89.

Use the `set` form of this command to define DHCP failover configuration.

Use the `delete` form of this command to remove DHCP failover configuration.

Use the `show` form of this command to view DHCP failover configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> failover local-address <ipv4>
Specifies the IP address of the local failover peer.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net failover local-address ipv4
delete service dhcp-server shared-network-name name subnet ipv4net failover local-address
show service dhcp-server shared-network-name name subnet ipv4net failover local-address

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

ipv4
The IP address of the local failover peer.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                failover {
                    local-address ipv4
                }
            }
        }
    }
}

Usage Guidelines

Use this command to specify the IP address of the local failover peer.
Use the set form of this command to specify the IP address of the local failover peer.
Use the delete form of this command to remove local failover IP address configuration.
Use the show form of this command to view local failover IP address configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> failover name <peer-name>

Specifies the DHCP failover IP address for the local peer.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net failover name peer-name
delete service dhcp-server shared-network-name name subnet ipv4net failover name
show service dhcp-server shared-network-name name subnet ipv4net failover name

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

peer-name
The DHCP failover peer name for the local peer.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                failover {
                    name peer-name
                }
            }
        }
    }
}

Usage Guidelines

Use this command to specify a name for the local peer in a DHCP failover pair.
Use the set form of this command to specify the DHCP failover peer name.
Use the delete form of this command to remove the local peer name configuration.
Use the show form of this command to view local peer name configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> failover peer-address <ipv4>
    Specifies the IP address of the local failover peer.

Syntax
    set service dhcp-server shared-network-name name subnet ipv4net failover peer-address ipv4
    delete service dhcp-server shared-network-name name subnet ipv4net failover peer-address
    show service dhcp-server shared-network-name name subnet ipv4net failover peer-address

Parameters
    name          Mandatory. A DHCP address pool.
    ipv4net       Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.
    ipv4          The IP address of the local failover peer.

Modes
    Configuration mode

Configuration Statement
    service {
        dhcp-server {
            shared-network-name name {
                subnet ipv4net {
                    failover {
                        peer-address ipv4
                    }
                }
            }
        }
    }

Usage Guidelines
    Use this command to specify the IP address of the local failover peer.
    Use the set form of this command to specify the IP address of the local failover peer.
    Use the delete form of this command to remove the IP address configuration.
    Use the show form of this command to view the IP address configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> failover status <status>

Specifies the DHCP failover status of the local system.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net failover status status

delete service dhcp-server shared-network-name name subnet ipv4net failover status

tshow service dhcp-server shared-network-name name subnet ipv4net failover status

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

status
The DHCP failover status of a peer in the failover configuration. The status is either of the following:

primary—Indicates the local system is the primary peer.
secondary—Indicates the local system is the secondary peer.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                failover {
                    status status
                }
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify the DHCP failover status of the local system.

Use the set form of this command to specify the DHCP failover status as primary or secondary.

Use the delete form of this command to remove failover status configuration.

Use the show form of this command to view failover status configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> ip-forwarding enable <state>

Specifies whether a client configures its IP layer for packet forwarding.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net ip-forwarding enable state
delete service dhcp-server shared-network-name name subnet ipv4net ip-forwarding enable
show service dhcp-server shared-network-name name subnet ipv4net ip-forwarding enable

Command Default

The DHCP server does not direct a client to configure its IP layer for packet forwarding.

Parameters

name

Mandatory. A DHCP address pool.

ipv4net

Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

state

Whether a client configures its IP layer for packet forwarding. The state is either of the following:

true — Indicates that a client does configure its IP layer for packet forwarding.
false — Indicates that a client does not configure its IP layer for packet forwarding.

The default state is false.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                ip-forwarding {
                    enable state
                }
            }
        }
    }
}

Usage Guidelines

Use this command to specify whether the DHCP server directs a client to configure its IP layer for packet forwarding.
Use the set form of this command to specify whether a client configures its IP layer for packet forwarding.
Use the **delete** form of this command to restore the default configuration.

Use the **show** form of this command to view IP forwarding configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> lease <seconds>

Specifies how long the address assigned by the DHCP server is valid.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net lease seconds
delete service dhcp-server shared-network-name name subnet ipv4net lease
show service dhcp-server shared-network-name name subnet ipv4net lease

Command Default

The default number of seconds is 86,400 (24 hours).

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

seconds
Optional. The number of seconds the address that is assigned by the DHCP server is valid. The number of seconds ranges from 120 through 4294967296.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        lease seconds
      }
    }
  }
}

Usage Guidelines

Use this command to specify how long the address assigned by the DHCP server is valid.
Use the set form of this command to specify how long the address assigned by the DHCP server is valid.
Use the delete form of this command to remove the lease configuration.
Use the show form of this command to view the lease configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> ntp-server <ipv4>

Specifies the address of a Network Time Protocol (NTP) server that is available to clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net ntp-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net ntp-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net ntp-server

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

ipv4
Optional. The IP address of an NTP server. Multiple NTP server addresses can be specified in separate commands. The NTP servers should be specified in a preferred order.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
            ntp-server ipv4
            }
        }
    }
}

Usage Guidelines

Use this command to specify the address of an NTP server that is available to clients.
Use the set form of this command to specify the address of an NTP server.
Use the delete form of this command to remove the NTP server configuration.
Use the show form of this command to view the NTP server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> pop-server <ipv4>

Specifies the address of a Post Office Protocol 3 (POP3) server that is available to clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net pop-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net pop-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net pop-server

Parameters

name
  Mandatory. A DHCP address pool.
ipv4net
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.
ipv4
  Optional. The IP address of a POP3 server. Multiple POP3 server addresses can be specified in separate commands. The POP3 servers should be specified in a preferred order.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        pop-server ipv4
      }
    }
  }
}

Usage Guidelines

Use this command to specify the address of a POP3 server that is available to clients.
Use the set form of this command to specify the address of a POP3 server.
Use the delete form of this command to remove the POP3 server configuration.
Use the show form of this command to view the POP3 server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> server-identifier <ipv4>

Specifies the address for the DHCP server identifier.

Syntax

```plaintext
set service dhcp-server shared-network-name name subnet ipv4net server-identifier ipv4
delete service dhcp-server shared-network-name name subnet ipv4net server-identifier
show service dhcp-server shared-network-name name subnet ipv4net server-identifier
```

Parameters

- `name` Mandatory. A DHCP address pool.
- `ipv4net` Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is `ip-addr prefix`.
- `ipv4` Optional. The address for the DHCP server identifier.

Modes

- Configuration mode

Configuration Statement

```plaintext
service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                server-identifier ipv4
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify the address for the DHCP server identifier.

The server identifier is a field in a DHCP message that identifies the DHCP server as the destination address from clients to servers. When the DHCP server includes this field in a DHCPOffer, a client uses it to distinguish between multiple lease offers. The server identifier must be an address that can be reached from the client.

Use the `set` form of this command to specify the address for the DHCP server identifier.

Use the `delete` form of this command to remove the address for the DHCP server identifier.

Use the `show` form of this command to view the DHCP server identifier configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> smtp-server <ipv4>

Specifies the address of a Simple Mail Transfer Protocol (SMTP) server that is available to clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net smtp-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net smtp-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net smtp-server

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

ipv4
Optional. The IP address of an SMTP server. Multiple SMTP server addresses can be specified in separate commands. The SMTP servers should be specified in a preferred order.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        smtp-server ipv4
      }
    }
  }
}

Usage Guidelines

Use this command to specify the address of an SMTP server that is available to clients.
Use the set form of this command to specify the address of an SMTP server.
Use the delete form of this command to remove the SMTP server configuration.
Use the show form of this command to view the SMTP server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> start <ipv4> stop <ipv4>

Specifies the range of addresses that are assigned to DHCP clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net start ipv4 stop ipv4
delete service dhcp-server shared-network-name name subnet ipv4net start [ipv4 [stop]]
show service dhcp-server shared-network-name name subnet ipv4net start [ipv4]

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

start
Optional. Multinode. The beginning address in a range of addresses. This address is the first address in the range that can be assigned.
You can define multiple address ranges within an address pool by creating multiple start configuration nodes.

stop
Mandatory. The ending address in this range of addresses. This address is the last address in the range that can be assigned.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                start ipv4 {
                    stop ipv4
                }
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify the range of addresses that are assigned to DHCP clients.
Use the set form of this command to specify the range of addresses that are assigned to DHCP clients.
Use the delete form of this command to remove the address range configuration.
Use the show form of this command to view the address range configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> static-route destination-subnet <ipv4net>

Specifies the destination subnet of a static route for clients to store in their routing cache.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net static-route destination-subnet ipv4net2
delete service dhcp-server shared-network-name name subnet ipv4net static-route destination-subnet
show service dhcp-server shared-network-name name subnet ipv4net static-route destination-subnet

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is /ip-addr prefix.

ipv4net2
The destination IP subnet of a static route for clients to store in their routing table.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                static-route {
                    destination-subnet ipv4net2
                }
            }
        }
    }
}

Usage Guidelines

Use this command to specify the destination subnet of a static route for clients to store in their routing cache. The other part of the static route is defined by using service dhcp-server shared-network-name name subnet ipv4net static-route router ipv4 on page 81. Only one static route can be defined for a given subnet.

Use the set form of this command to specify the destination subnet of a static route for clients to store in their routing cache.

Use the delete form of this command to remove the destination subnet configuration.

Use the show form of this command to view the destination subnet configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> static-route router <ipv4>

Specifies the router for the destination of a static route that clients can store in their routing cache.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net static-route router ipv4
delete service dhcp-server shared-network-name name subnet ipv4net static-route router
show service dhcp-server shared-network-name name subnet ipv4net static-route router

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

ipv4
The IP address of the router for the destination of a static route for clients to store in their routing cache.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        static-route {
          router ipv4
        }
      }
    }
  }
}

Usage Guidelines

Use this command to specify the router for the destination of a static route that clients can store in their routing cache. The other part of the static route is defined by using service dhcp-server shared-network-name <name> subnet <ipv4net> static-route destination-subnet <ipv4net> on page 80.

Use the set form of this command to specify the router for the destination of a static route that clients can store in their routing cache.

Use the delete form of this command to remove the router configuration.

Use the show form of this command to view the router configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> subnet-parameters <params>

Specifies additional subnet parameters for a DHCP server.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net subnet-parameters params
delete service dhcp-server shared-network-name name subnet ipv4net subnet-parameters params
show service dhcp-server shared-network-name name subnet ipv4net subnet-parameters

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

params
A string of parameters to be used by the DHCP server. The string must be enclosed in single quotation marks (').

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                subnet-parameters params
            }
        }
    }
}

Usage Guidelines

DANGER

This feature is advanced and should be used by only expert users in special situations.

Use this command to specify additional subnet parameters for a DHCP server that are not available with the service dhcp-server commands. The Brocade vRouter DHCP server commands are a subset of those that are available for DHCP server configuration. This command provides access to all DHCP server configuration parameters. More information regarding DHCP server configuration is located on the dhcpd.conf man page. To access the page, type the following at the Vyatta command prompt:

man dhcpd.conf

The Brocade vRouter does no validation before passing the parameter string to the DHCP server process (dhcpd). Because of this nonvalidation, it is imperative that the syntax described in the dhcpd.conf documentation be strictly followed. Failure to do
so could result in a failure of the DHCP server. It is advisable to check the system log for errors when using these parameter strings. In addition, the `show system processes` command determines if the dhcpd process is still running.

The scope of these parameters is for the specified subnet. They apply to all `static-mappings` within this scope unless parameters with a narrower scope are specified by using the `static-mapping-parameters` version of this command.

Double quotation marks (`"`) cannot be used within a string enclosed in single quotation marks (`'`). Instead, replace all double quotation marks with `\"`.

Multiple parameter strings can be specified. Each parameter string that is specified adds a separate line to the `dhcpd.conf` file.

Use the `set` form of this command to specify additional subnet parameters for a DHCP server.

Use the `delete` form of this command to delete additional subnet parameters from a DHCP server.

Use the `show` form of this command to display additional subnet parameters for a DHCP server.
service dhcp-server shared-network-name <name> subnet <ipv4net> tftp-server-name <servername>

Specifies the name of a Trivial File Transfer Protocol (TFTP) server that is available to clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net tftp-server-name servername
delete service dhcp-server shared-network-name name subnet ipv4net tftp-server-name
show service dhcp-server shared-network-name name subnet ipv4net tftp-server-name

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is \textit{ip-addr prefix}.

servername
The name of a TFTP server that is available to clients.

Modes

Configuration mode

Configuration Statement

\begin{verbatim}
service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                tftp-server-name servername
            }
        }
    }
}
\end{verbatim}

Usage Guidelines

Use this command to specify the name of a TFTP server that is available to clients.
Use the \texttt{set} form of this command to specify the name of a TFTP server.
Use the \texttt{delete} form of this command to remove the TFTP server configuration.
Use the \texttt{show} form of this command to view the TFTP server configuration.
service dhcp-server shared-network-name <name> subnet <ipv4net> time-offset <seconds>

Specifies a time offset in seconds from Universal Time Coordinated (UTC) of the subnet of a client.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net time-offset seconds
delete service dhcp-server shared-network-name name subnet ipv4net time-offset
show service dhcp-server shared-network-name name subnet ipv4net time-offset

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

seconds
Time offset in seconds from UTC of the subnet of a client.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        time-offset seconds
      }
    }
  }
}

Usage Guidelines

Use this command to specify a time offset in seconds from UTC of the subnet of a client.
Use the set form of this command to specify a time offset.
Use the delete form of this command to remove a time offset.
Use the show form of this command to display a time offset.
service dhcp-server shared-network-name <name> subnet <ipv4net> time-server <ipv4>

Specifies the address of an RFC868 time server that is available to clients.

Syntax

```plaintext
set service dhcp-server shared-network-name name subnet ipv4net time-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net time-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net time-server
```

Parameters

- **name**
  Mandatory. A DHCP address pool.

- **ipv4net**
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

- **ipv4**
  Optional. The IP address of an RFC868 time server. Multiple time server addresses can be specified in separate commands. The time servers should be specified in a preferred order.

Modes

- Configuration mode

Configuration Statement

```plaintext
service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        time-server ipv4
      }
    }
  }
}
```

Usage Guidelines

Use this command to specify the address of an RFC 868 time server that is available to clients.

Use the `set` form of this command to specify the address of a time server.

Use the `delete` form of this command to delete the address of a time server.

Use the `show` form of this command to display the address of a time server.
service dhcp-server shared-network-name <name> subnet <ipv4net> wins-server <ipv4>

Specifies the address of a Windows Internet Naming Server (WINS) that is available to DHCP clients.

Syntax

set service dhcp-server shared-network-name name subnet ipv4net wins-server ipv4
delete service dhcp-server shared-network-name name subnet ipv4net wins-server ipv4
show service dhcp-server shared-network-name name subnet ipv4net wins-server

Parameters

name
  Mandatory. A DHCP address pool.

ipv4net
  Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr/prefix.

ipv4
  Optional. Multinode. The address of a WINS. The WINS provides name-resolution services that Microsoft DHCP clients can use to correlate host names to IP addresses.
  You can specify more than one WINS by entering this command multiple times. The format is an IP address.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    shared-network-name name {
      subnet ipv4net {
        wins-server ipv4
      }
    }
  }
}

Usage Guidelines

Use this command to specify the address of a WINS that is available to DHCP clients.
Use the **set** form of this command to specify the address of a WINS server.
Use the **delete** form of this command to delete the configuration of a WINS.
Use the **show** form of this command to display the configuration of a WINS.
service dhcp-server shared-network-name <name> subnet <ipv4net> wpad-url <url>

Specifies the Web Proxy Autodiscovery (WPAD) URL

Syntax

set service dhcp-server shared-network-name name subnet ipv4net wpad-url url
delete service dhcp-server shared-network-name name subnet ipv4net wpad-url
show service dhcp-server shared-network-name name subnet ipv4net wpad-url

Parameters

name
Mandatory. A DHCP address pool.

ipv4net
Mandatory. Multinode. The IPv4 network served by the DHCP address pool. The format is ip-addr prefix.

url
Optional. The WPAD URL.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        shared-network-name name {
            subnet ipv4net {
                wpad-url url
            }
        }
    }
}

Usage Guidelines

Use this command to specify the WPAD URL.
Use the set form of this command to specify the WPAD URL.
Use the delete form of this command to delete the WPAD URL.
Use the show form of this command to display the WPAD URL.
service dhcp-server static-mapping <mapname>

Statically maps a DHCP client, based on its MAC address, to an IP address.

Syntax

set service dhcp-server static-mapping mapname
delete service dhcp-server static-mapping mapname
show service dhcp-server static-mapping mapname

Parameters

mapname

Optional. Multinode. Allows you to statically map an IP address within an address pool to the MAC address of a device on the network.
You can define multiple static mappings of this type by creating multiple static-mapping configuration nodes.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        static-mapping mapname {
        }
    }
}

Usage Guidelines

Use this command to statically map a DHCP client, based on its MAC address, to an IP address.
Use the set form of this command to statically map a DHCP client, based on its MAC address, to an IP address.
Use the delete form of this command to remove the static mapping configuration.
Use the show form of this command to view the static mapping configuration.
service dhcp-server static-mapping <mapname> disable

Disables DHCP configuration for a static mapping.

Syntax

set service dhcp-server static-mapping mapname disable
delete service dhcp-server static-mapping mapname disable
show service dhcp-server static-mapping mapname

Command Default

The static-mapping configuration is enabled.

Parameters

mapname

Optional. Multinode. Allows you to statically map an IP address within an address pool to the MAC address of a device on the network.
You can define multiple static mappings of this type by creating multiple static-mapping configuration nodes.

Modes

Configuration mode

Configuration Statement

service {
  dhcp-server {
    static-mapping mapname {
      disable
    }
  }
}

Usage Guidelines

Use this command to disable DHCP configuration of a static mapping.
Use the set form of this command to disable DHCP configuration of a static mapping.
Use the delete form of this command to enable configuration of a static mapping.
Use the show form of this command to display the configuration of a static mapping.
service dhcp-server static-mapping <mapname> ip-address <ipv4>

Specifies a static IP address for a DHCP client.

Syntax

set service dhcp-server static-mapping mapname ip-address ipv4

delete service dhcp-server static-mapping mapname ip-address

show service dhcp-server static-mapping mapname ip-address

Parameters

mapname
Multinode. Allows you to statically map an IP address within an address pool to the MAC address of a device on the network.
You can define multiple static mappings of this type by creating multiple static-mapping configuration nodes.
ipv4
Mandatory. The IP address to be statically assigned to the device.

Modes

Configuration mode

Configuration Statement

service {
    dhcp-server {
        static-mapping mapname {
            ip-address ipv4
        }
    }
}

Usage Guidelines

Use this command to specify a static IP address for a DHCP client, based on its MAC address.
Use the set form of this command to specify a static IP address for a DHCP client, based on its MAC address.
Use the delete form of this command to remove the static mapping configuration.
Use the show form of this command to view the static mapping configuration.
service dhcp-server static-mapping <mapname> mac-address <mac>

Specifies the MAC address of a DHCP client to which an IP address is assigned.

Syntax

set service dhcp-server static-mapping mapname mac-address mac
delete service dhcp-server static-mapping mapname mac-address
show service dhcp-server static-mapping mapname mac-address

Parameters

mapname
Multinode. Allows you to statically map an IP address within an address pool to the MAC address of a device on the network.
You can define multiple static mappings of this type by creating multiple static-mapping configuration nodes.

mac
Mandatory. The MAC address to be statically mapped to the specified IP address.

Modes
Configuration mode

Configuration Statement

service {
    dhcp-server {
        static-mapping mapname {
            mac-address mac
        }
    }
}

Usage Guidelines

Use this command to specify the MAC address of a DHCP client to which an IP address is assigned.
Use the set form of this command to specify the MAC address of the DHCP client to which an IP address is assigned.
Use the delete form of this command to remove the static mapping configuration.
Use the show form of this command to view the static mapping configuration.
service dhcp-server static-mapping <mapname> static-mapping-parameters <params>

Specifies additional static-mapping parameters for a DHCP server.

Syntax

set service dhcp-server static-mapping mapname static-mapping-parameters params
delete service dhcp-server static-mapping mapname static-mapping-parameters params
show service dhcp-server static-mapping mapname static-mapping-parameters

Parameters

mapname
Optional. Multinode. Allows you to statically map an IP address within an address pool to the MAC address of a device
on the network.
You can define multiple static mappings of this type by creating multiple static-mapping configuration nodes.

params
A string of parameters to be used by the DHCP server. The string must be enclosed in single quotation marks (').

Modes

Configuration mode

Configuration Statement

service {
dhcp-server {
    static-mapping mapname {
        static-mapping-parameters params
    }
}
}

Usage Guidelines

NOTE
This feature is advanced and should be used by only expert users in special situations.

Use this command to specify additional static-mapping parameters for a DHCP server that are not available with the service
dhcp-server commands. The Vyatta DHCP server commands are a subset of those that are available for DHCP server
configuration. This command provides access to all DHCP server configuration parameters. More information regarding DHCP
server configuration is located on the dhcpd.conf man page. To access the page, type the following at the Vyatta command
prompt:

man dhcpd.conf

The Brocade vRouter does no validation before passing the parameter string to the DHCP server process (dhcpd). Because of
this nonvalidation, it is imperative that the syntax described in the dhcpd.conf documentation be strictly followed. Failure to do
so could result in a failure of the DHCP server. It is advisable to check the system log for errors when using these parameter
strings. In addition, the show system processes command determines if the dhcpd process is still running.
The scope of these parameters is for the specified map name. They apply to all static-mappings within this scope unless parameters with a narrower scope are specified by using the static-mapping-parameters version of this command.

Multiple parameter strings can be specified. Each parameter string that is specified adds a separate line to the dhcpd.conf file.

Use the set form of this command to specify additional static-mapping parameters for a DHCP server.

Use the delete form of this command to remove additional static-mapping parameters from a DHCP server.

Use the show form of this command to display the additional static-mapping parameters for a DHCP server.
show dhcp client leases
Displays DHCP information for an interface that is configured as a DHCP client.

Syntax
show dhcp client leases [interface interface]

Parameters
interface
The identifier of an interface. Supported interface types are the following:
• lo: A loopback interface.
• dp%x%yp%z—The name of a data plane interface, where
  — dp specifies the data plane identifier (ID). Currently, only dp0 is supported.
  — py specifies a physical or virtual PCI slot index (for example, p129).
  — pz specifies a port index (for example, p1). For example, dp0p1p2, dp0p160p1, and dp0p192p1.
• dp%em%y—The name of a data plane interface on a LAN-on-motherboard (LOM) device that does not have a PCI slot, where em specifies an embedded network interface number (typically, a small number). For example, dp0em3.
• dp%sy—The name of a data plane interface on a device that is installed on a virtual PCI slot, where xsy specifies an embedded network interface number (typically, a small number). For example, dp0s2.
• dp%xP%yp%z—The name of a data plane interface on a device that is installed on a secondary PCI bus, where Pn specifies the bus number. You can use this format to name data plane interfaces on large physical devices with multiple PCI buses. For these devices, it is possible to have network interface cards installed on different buses with these cards having the same slot ID. The value of n must be an integer greater than 0. For example, dp0P1p162p1 and dp0P2p162p1.

Modes
Operational mode

Usage Guidelines
Use this command to display DHCP information for an interface that is configured as a DHCP client.
When used with no option, this command displays DHCP information for all interfaces that are configured as DHCP clients.
When an interface is specified, this command displays DHCP information for that interface.
To configure an interface as a DHCP client, refer to documentation for that interface.
Examples

The following example shows how to display DHCP information for all interfaces that are configured as DHCP clients.

vyatta@R1> show dhcp client leases
interface : dp0p1p1
ip address : 192.168.1.157  [Active]
subnet mask: 255.255.255.0
router     : 192.168.1.254
name server: 192.168.1.254  74.150.163.68  74.150.163.100
dhcp server: 192.168.1.254
lease time : 86400
last update: Wed Feb 17 02:18:20 GMT 2010
expiry     : Thu Feb 18 02:18:18 GMT 2010
reason     : BOUND
vyatta@R1>
show dhcp server leases

Displays current DHCP lease information.

Syntax

show dhcp server leases [expired | pool pool-name]

Parameters

expired
Displays expired leases.

pool pool-name
Displays lease information for the specified address pool.

Modes

Operational mode

Usage Guidelines

Use this command to display current DHCP lease information for subscribers or expired leases.

When used with no option, this command displays all current lease information. When an address pool is specified, this command displays lease information for that address pool. When the expired option is specified, only expired leases are displayed.

DHCP is configured by using service dhcp-server on page 44.

Examples

The following example shows how to display all current DHCP lease information.

vyatta@R1> show dhcp server leases
IP address      Hardware Address   Lease expiration     Pool     Client Name
----------      ----------------   ----------------     ----     -----------

vyatta@R1>
show dhcp server statistics
  Displays DHCP server statistics.

Syntax
  show dhcp server statistics [pool pool-name]

Parameters
  pool pool-name
    Displays DHCP statistics for the specified address pool

Modes
  Operational mode

Usage Guidelines
  Use this command to see current lease information for DHCP subscribers.

  When used with no option, this command displays all current lease information. When address pool is provided, this command
displays lease information for the specified address pool.

  DHCP is configured by using service dhcp-server on page 44.

Examples
  The following example shows how to display all DHCP server statistics.

  vyatta@vyatta:~$ show dhcp server statistics
  Start time:                             Thu Sep  3 13:29:36 2015
  Up time:                                01:19:44
  Message Received
  DHCPDISCOVER 1
  DHCPREQUEST 1
  DHCPDECLINE 0
  DHCPRELEASE 1
  DHCPINFORM 0
  Message Sent
  DHCPOFFER 1
  DHCPACK 1
  DHCPNAK 0
  pool pool size # leased # avail
  ---- --------- -------- -------
  myserver102 21       0       21
  myredding100 21

Related commands
  The following table lists related commands that are documented elsewhere.
### DHCP Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>set interfaces dataplane interface-name address dhcp</code></td>
<td>Configure a data plane interface as a DHCP client. (Refer to <em>Brocade 5600 vRouter LAN Interfaces Reference Guide.</em>)</td>
<td></td>
</tr>
<tr>
<td><code>set interfaces dataplane interface-name dhcp-options no-rfc3442</code></td>
<td>Disables support for the classless static route option for DHCP on a data plane interface. (Refer to <em>Brocade 5600 vRouter LAN Interfaces Reference Guide.</em>)</td>
<td></td>
</tr>
<tr>
<td><code>set interfaces dataplane interface-name vif vif-id dhcp-options no-rfc3442</code></td>
<td>Disables support for the classless static route option for DHCP on a virtual interface. (Refer to <em>Brocade 5600 vRouter LAN Interfaces Reference Guide.</em>)</td>
<td></td>
</tr>
</tbody>
</table>
DHCPv6 overview

In general, Dynamic Host Configuration Protocol (DHCP) allows dynamic assignment of reusable IP addresses and other configuration information to DHCP clients. DHCP is described in DNS on page 147. DHCPv6 provides a stateful address auto-configuration service and a stateful auto-configuration protocol for the IPv6 suite of protocols.

Although it bears many features in common with DHCP and shares a common architectural model, DHCPv6 is a separate protocol and is configured independently of DHCP. It is defined in separate protocol specification documents and the functions it provides differ in significant ways from those provided by DHCP. For example, DHCP and DHCPv6 use different UDP port numbers and they provide different sets of configuration parameters.

The Brocade vRouter provides DHCPv6 server functionality, DHCPv6 client-side functionality (currently only available on data plane interfaces), and a DHCPv6 relay function.

There are two common usage scenarios for DHCPv6 server. The first is one in which addresses are assigned by using SLAAC and the DHCPv6 server is used only to assign parameters to the clients. The second is one in which both addresses and parameters are supplied by the DHCPv6 server. In either case, default router discovery is provided by the Neighbor Discovery (ND) protocol and so the DHCPv6 server does not need to provide that parameter.

DHCPv6 configuration

DHCPv6 configuration includes enabling the DHCPv6 server, creating a static mapping, configuring a DHCPv6 address pool, setting up a DHCPv6 relay, and setting up a DHCPv6 client.

Enabling the DHCPv6 server

To use the DHCPv6 server on the Brocade vRouter, you must enable the DHCPv6 service. To enable the DHCPv6 service, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable the DHCPv6 server.</td>
<td>vyatta@R1# set service dhcpv6-server</td>
</tr>
<tr>
<td>Commit the information.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R1# show service dhcv6-server {}</td>
</tr>
</tbody>
</table>

Creating a static mapping

Situations exist in which it makes sense to map a specific IPv6 address to a specific host rather than dynamically assign an IP address from a pool of addresses. This mapping is known as a static mapping.
A static mapping is defined by using the `static-mapping` option of the `service dhcp-server` configuration node.

The following example shows how to map the 2001:db8:100::101 IP address to the device with a MAC address of 00:0c:29:34:91:45.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a static mapping called <code>lab</code> and specify the static IP address.</td>
<td><code>vyatta@R1# set service dhcpv6-server static-mapping lab ipv6-address 2001:db8:100::101</code></td>
</tr>
<tr>
<td>Specify the host identifier string (&quot;00:0c:29:34:91:45&quot; - 6 bytes of host MAC address) within the static mapping called <code>lab</code>.</td>
<td><code>vyatta@R1# set service dhcpv6-server static-mapping lab identifier 00:0c:29:34:91:45</code></td>
</tr>
<tr>
<td>Commit the information.</td>
<td><code>vyatta@R1# commit</code></td>
</tr>
<tr>
<td>Show the configuration.</td>
<td><code>vyatta@R1# show service dhcp-server shared-network-name LAB-NET</code></td>
</tr>
<tr>
<td></td>
<td>static-mapping lab</td>
</tr>
<tr>
<td></td>
<td>{</td>
</tr>
<tr>
<td></td>
<td>ipv6-address 2001:db8:100::101</td>
</tr>
<tr>
<td></td>
<td>identifier 00:0c:29:34:91:45</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
</tbody>
</table>

**Configuring DHCPv6 address pools**

Configure DHCPv6 address pools if you want the system to act as a DHCPv6 server for the network.

**Configuring for networks directly connected to the system**

The following example shows how to create an address pool within the LAB-NET shared network.

LAB-NET: This shared network serves the 2001:db8:100::/64 subnet, which is connected directly to the dp0p1p2 interface. The lease time remains at the default, 24 hours (86,400 seconds). The address pool uses the DNS name server at 2001:db8:111::111, which is on a separate subnet (not shown). The range of addresses is configured for .100 through .199.

Figure 5: shows the sample address pool configuration.

**FIGURE 5 DHCPv6 address pool configuration**

To configure the DHCPv6 address pool, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the configuration node for LAB-NET on the 2001:db8:100::/64 subnet. Specify the start and stop IPv6 addresses for the pool.</td>
<td><code>vyatta@R1# set service dhcpv6-server shared-network-name LAB-NET subnet 2001:db8:100::/64</code></td>
</tr>
</tbody>
</table>
address-range start 2001:db8:100::100 stop 2001:db8:100::199

Specify a DNS server for LAB-NET.

vyatta@R1# set service dhcp-server shared-network-name LAB-NET subnet 2001:db8:100::/64 name-server 2001:db8:111::111

Commit the changes.

vyatta@R1# commit

Show the configuration.

vyatta@R1# show service dhcpv6-server
shared-network-name LAB-NET {
    subnet 2001:db8:100::/64 {
        address-range {
            start 2001:db8:100::100 {
                stop 2001:db8:100::199
            }
        }
        name-server 2001:db8:111::111
    }
}

Show the interface configuration.

vyatta@R1# show interfaces
dataplane dp0p1p2 {
    address 2001:db8:100::10/64
    hw-id 00:0c:29:42:05:35
}

Configuring for networks indirectly connected to the system

The following example shows how to create an address pool within the LAB-NET2 shared network, which is indirectly connected through a DHCP relay server to the DHCP server on the Brocade vRouter.

- LAB-NET2. This shared network serves the 2001:db8:100::/64 subnet, which is connected to a DHCP relay (R2), which is directly connected to the dp0p1p2 interface. The lease time remains at the default, 24 hours (86,400 seconds). The address pool uses the DNS name server at 2001:db8:111::111, which is on a separate subnet (not shown). The range of addresses is configured for .100 through .199.

The following figure shows the sample address pool configuration.
**NOTE**

To configure the DHCPv6 address pool, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the router interface to listen to DHCP messages.</td>
<td>vyatta@R1# set service dhcpv6-server listento interface dp0p1p2</td>
</tr>
<tr>
<td>Create the configuration node for LAB-NET on the 2001:db8:100::/64 subnet. Specify the start and stop IPv6 addresses for the pool.</td>
<td>vyatta@R1# set service dhcpv6-server shared-network-name LAB-NET2 subnet 2001:db8:100::/64 address-range start 2001:db8:100::100 stop 2001:db8:100::199</td>
</tr>
<tr>
<td>Specify a DNS server for LAB-NET.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name LAB-NET subnet 2001:db8:100::/64 name-server 2001:db8:111::111</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R1# show service dhcpv6-server dhcpv6-server { listento { interface dp0p1p2 } } shared-network-name LAB-NET2 { subnet 2001:db8:100::/64 { address-range { start 2001:db8:100::100 { stop 2001:db8:100::199 } } name-server 2001:db8:111::111 lease 86400 } }</td>
</tr>
</tbody>
</table>
Setting up DHCPv6 relay

Configure DHCPv6 relay if you want the Brocade vRouter to forward DHCPv6 requests to another DHCPv6 server.

The DHCPv6 relay agent listens for requests sent by DHCPv6 clients and forwards them on to DHCPv6 servers. Because the client request packets and the relayed requests are often carried in IPv6 multicast packets, you must explicitly specify the interfaces on which the relay agent is to listen for requests and the interfaces on which it is to relay those requests.

Table 13 shows how to accomplish the following tasks:

- Configures both dp0p1p1 and dp0p1p2 for DHCPv6 relay. The system is expected to receive client requests for the DHCPv6 server through the dp0p1p1 interface. It forwards client-to-server DHCPv6 messages to the DHCPv6 server at 2001:db8:200::200 out through the dp0p1p2 interface. The DHCPv6 server refers to the interface on which client requests are received as the “listening interface,” and refers to the interface on which requests are relayed out as the “upstream interface.”
- Leaves other relay option parameters at default values. This means that R1 uses port 547 for DHCP messaging and has a maximum hop count of 10 hops.

Figure 7 shows the sample DHCPv6 relay configuration.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable DHCPv6 relay to listen on the dp0p1p1 interface.</td>
<td>vyatta@R1# set service dhcpv6-relay listen-interface dp0p1p1</td>
</tr>
<tr>
<td>Enable DHCPv6 relay to forward requests on the dp0p1p2 interface specifying the DHCPv6 server address.</td>
<td>vyatta@R1# set service dhcpv6-relay upstream-interface dp0p1p2 address 2001:db8:200::200</td>
</tr>
</tbody>
</table>
Commit the changes.

vyatta@R1# commit

Show the configuration.

vyatta@R1# show service dhcpv6-relay
   listen-interface dp0p1p1 {
   }
   upstream-interface dp0p1p2 {
     address 2001:db8:200:::200
   }

Setting up DHCPv6 client

Configure DHCPv6 client if you want the Brocade vRouter to acquire an IPv6 address, parameters, or both from a DHCPv6 server. Refer to the “Ethernet Interfaces” chapter of the *Brocade 5600 vRouter LAN Interfaces Reference Guide* for more information on configuring a DHCPv6 client.

To configure a DHCPv6 client, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable DHCPv6 client on the dp0p1p1 interface.</td>
<td>vyatta@R1# set interface dataplane dp0p1p1 address dhcpv6</td>
</tr>
<tr>
<td>Commit the change.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the configuration.</td>
<td>vyatta@R1# show interface dataplane dp0p1p1 address dhcpv6 hw-id b6:cc:6a:95:22:b2</td>
</tr>
</tbody>
</table>
DHCPv6 Commands

- interfaces bridge <brx> dhcpv6-options
- release dhcpv6 interface <interface>
- renew dhcpv6 interface <interface>
- reset dhcpv6 server leases
- restart dhcpv6 relay-agent
- restart dhcpv6 server
- service dhcpv6-relay
- service dhcpv6-relay listen-interface <interface>
- service dhcpv6-relay listen-port <port>
- service dhcpv6-relay max-hop-count <count>
- service dhcpv6-relay upstream-interface <interface>
- service dhcpv6-relay use-interface-id-option
- service dhcpv6-server
- service dhcpv6-server shared-network-name <name> subnet <ipv6net>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range start <start-ipv6>
- service dhcpv6-server shared-network-name <name>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range prefix <pool-ipv6net>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range start <start-ipv6> end <end-ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> description <desc>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> domain-search <domain>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> name-server <ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> nis-domain <nis-domain-name>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> lease-time
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> name-server <ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> nis-domain <nis-domain-name>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> nisplus-domain <nisplus-domain-name>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> nisplus-server <ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> nis-server <ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> sip-server-address <ipv6>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> sip-server-name <sip-server-name>
- service dhcpv6-server shared-network-name <name> subnet <ipv6net> sntp-server-address <ipv6>
- service dhcpv6-server static-mapping <mapping-name>
- show dhcpv6 client leases
- show dhcpv6 relay-agent status
- show dhcpv6 server leases
- show dhcpv6 server status
interfaces bridge <brx> dhcpv6-options

Specifies the way in which a DHCPv6 client is to acquire an address and/or parameters from a DHCPv6 server.

Syntax

set interfaces bridge brx dhcpv6-options [ parameters-only | temporary ]
delete interfaces bridge brx dhcpv6-options [ parameters-only | temporary ]
show interfaces bridge brx dhcpv6-options

Parameters

brx
The identifier for the bridge group. Supported identifiers are br0 through br999.

parameters-only
Acquires only configuration parameters (and not an IPv6 address) from the DHCPv6 server.
Only one of the parameters-only and the temporary parameter may be specified.

temporary
Acquires a temporary IPv6 address as described for IPv6 privacy addressing in RFC 4941.
Only one of the parameters-only and the temporary parameter may be specified.

Modes

Configuration mode

Configuration Statement

interfaces {
    bridge brx {
        dhcpv6-options [parameters-only | temporary]
    }
}

Usage Guidelines

Use this command to specify in what way the DHCPv6 client is to acquire an IPv6 address and/or parameters from a DHCPv6 server.

Note that these parameters are only relevant if the dhcpv6 option has been set for the interfaces bridge brx address address command. Otherwise, they are ignored.

The parameters-only option is typically used in conjunction with Stateless Address Autoconfiguration (SLAAC) or static address configuration. It and the temporary parameter are mutually exclusive.

Use the set form of this command to specify the DHCPv6 options.
Use the delete form of this command to remove the DHCPv6 options.
Use the show form of this command to view DHCPv6 option configuration.
release dhcpv6 interface <interface>

Releases the current DHCPv6 client lease on an interface.

Syntax

release dhcpv6 interface interface

Parameters

interface

An interface that uses DHCPv6 to obtain an IP address.

Modes

Operational mode

Usage Guidelines

Use this command to release the DHCPv6 client lease on an interface. The interface must be configured to obtain an address through DHCPv6. If the DHCPv6 client is in the process of acquiring an address, it stops that process. The client does not attempt to acquire a new address through DHCPv6.
renew dhcpv6 interface <interface>

Renews the current DHCPv6 client lease on an interface.

Syntax

```
renew dhcpv6 interface interface
```

Parameters

- `interface`

  An interface that uses DHCPv6 to obtain an IP address.

Modes

- Operational mode

Usage Guidelines

Use this command to renew the DHCPv6 client lease on an interface. The interface must be configured to obtain an address through DHCPv6 server.
reset dhcpv6 server leases

Removes all DHCPv6 leases.

Syntax

reset dhcp server leases [leases | lease ipv6 ipv6-address]

Parameters

ipv6-address
The IPv6 address with leases to be removed.

Modes

Operational mode.

Usage Guidelines

This command applies to leases provided by the DHCPv6 server. The server is configured by using service dhcpv6-server on page 120.

Use the leases command option to remove all DHCPv6 leases.

Use the lease ipv6 command option to remove DHCPv6 leases from a particular IPv6 lease.
**restart dhcpv6 relay-agent**

Restarts the DHCPv6 relay agent.

**Syntax**

```plaintext
restart dhcpv6 relay-agent
```

**Modes**

Operational mode

**Usage Guidelines**

Use this command to stop the DHCPv6 relay agent if it is running, then start it if it is configured. This command can be used if the DHCPv6 relay agent is not operating properly.
restart dhcpv6 server
   Restarts the DHCPv6 server.

Syntax
   restart dhcpv6 server

Modes
   Operational mode

Usage Guidelines
   Use this command to stop and restart the DHCPv6 server. This command can be used if the DHCPv6 relay agent is not operating properly.
service dhcpv6-relay

Configures the system to relay DHCPv6 client messages to a DHCPv6 server.

Syntax

set service dhcpv6-relay
delete service dhcpv6-relay
show service dhcpv6-relay

Modes

Configuration mode

Configuration Statement

```
service {
    dhcpv6-relay {
    }
}
```

Usage Guidelines

Use this command to configure the system as a DHCPv6 relay agent.

You must configure the interfaces on which the system receives requests from DHCPv6 clients and the interfaces that send requests to DHCPv6 servers. The relay agent relays responses sent by the DHCPv6 servers back to the clients that sent the original request.

Use the `set` form of this command to define DHCPv6 relay configuration.

Use the `delete` form of this command to remove DHCPv6 relay configuration.

Use the `show` form of this command to view DHCPv6 relay configuration.
service dhcpv6-relay listen-interface <interface>
  Specifies an interface for accepting DHCPv6 requests.

Syntax
  set service dhcpv6-relay listen-interface interface [address ipv6]
  delete service dhcpv6-relay listen-interface interface [address]
  show service dhcpv6-relay listen-interface interface [address]

Parameters
  interface
    Mandatory. Multinode. An interface to accept DHCPv6 requests. At least one interface must be specified.
    You can assign multiple interfaces to be used for DHCPv6 by creating multiple listen-interface configuration nodes.
  ipv6
    Optional. An IPv6 address on the specified interface on which to listen. If an address is not specified, one of the non-
    link-local addresses configured on the interface is used.

Modes
  Configuration mode

Configuration Statement
  service {
    dhcpv6-relay {
      listen-interface interface {
        address ipv6
      }
    }
  }

Usage Guidelines
  Use this command to specify an interface for accepting DHCPv6 requests.
  Use the set form of this command to specify an interface to accept DHCPv6 requests.
  Use the delete form of this command to remove the specified value.
  Use the show form of this command to view the specified value.
service dhcpv6-relay listen-port <port>
   Specifies a port for accepting DHCPv6 requests.

Syntax
   set service dhcpv6-relay listen-port port
   delete service dhcpv6-relay listen-port port
   show service dhcpv6-relay listen-port port

Command Default
   The DHCPv6 Relay agent listens on port 547.

Parameters
   port
      Optional. The port on which to listen for DHCPv6 requests.

Modes
   Configuration mode

Configuration Statement
   service {
       dhcpv6-relay {
           listen-port port
       }
   }

Usage Guidelines
   Use this command to specify a port for accepting DHCPv6 requests.
   Use the set form of this command to specify a port to use to accept DHCPv6 requests.
   Use the delete form of this command to remove the specified value.
   Use the show form of this command to view the specified value.
service dhcpv6-relay max-hop-count <count>

Specifies the maximum number of hops before discarding DHCPv6 packets.

Syntax

```
set service dhcpv6-relay max-hop-count count
delete service dhcpv6-relay max-hop-count count
show service dhcpv6-relay max-hop-count count
```

Command Default

The maximum hop count is 10.

Parameters

```
count
```

Optional. The maximum hop count before discarding DHCPv6 packets. The default count is 10.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcpv6-relay {
        max-hop-count count
    }
}
```

Usage Guidelines

Use this command to specify the maximum number of hops before discarding DHCPv6 packets. This count is used to prevent loops.

Use the set form of this command to specify the maximum number of hops before discarding DHCPv6 packets.

Use the delete form of this command to remove the specified value.

Use the show form of this command to view the specified value.
service dhcpv6-relay upstream-interface <interface>

Specifies an interface for forwarding DHCPv6 requests.

Syntax

- set service dhcpv6-relay upstream-interface interface [address ipv6]
- delete service dhcpv6-relay upstream-interface interface [address]
- show service dhcpv6-relay upstream-interface interface [address]

Parameters

- interface
  Mandatory. Multinode. An interface to forward DHCPv6 requests. At least one interface must be specified.
  You can assign multiple interfaces to be used for DHCPv6 forwarding by creating multiple upstream-interface configuration nodes.

- ipv6
  Optional. An IPv6 address on the specified interface through which to forward queries. If an address is not specified, the queries are sent to the all DHCP relay agents and servers multicast group.

Modes

Configuration mode

Configuration Statement

```yaml
service {
  dhcpv6-relay {
    upstream-interface interface {
      address ipv6
    }
  }
}
```

Usage Guidelines

Use this command to specify an interface for forwarding DHCPv6 requests.
Use the `set` form of this command to specify an interface to use to forward DHCPv6 requests.
Use the `delete` form of this command to remove the specified value.
Use the `show` form of this command to view the specified value.
service dhcpv6-relay use-interface-id-option

Specifies that the relay agent is to insert the DHCPv6 interface ID option.

Syntax

- `set service dhcpv6-relay use-interface-id-option`
- `delete service dhcpv6-relay use-interface-id-option`
- `show service dhcpv6-relay use-interface-id-option`

Command Default

The DHCPv6 interface ID option is not inserted if a single listening interface is defined, but is inserted automatically if more than one listening interface is defined.

Modes

Configuration mode

Configuration Statement

```plaintext
service {
    dhcpv6-relay {
        use-interface-id-option
    }
}
```

Usage Guidelines

Use this command to specify that DHCPv6 is to insert the interface ID option. Note that this option is automatically inserted when two or more listening interfaces are configured, so this parameter affects just system behavior when only one listening interface is configured.

Use the `set` form of this command to specify that DHCPv6 is to insert the interface ID option.

Use the `delete` form of this command to return the system to its default behavior.

Use the `show` form of this command to view the specified value.
service dhcpv6-server
   Enables DHCPv6 server functionality.

Syntax
   set service dhcpv6-server
   delete service dhcpv6-server
   show service dhcpv6-server

Modes
   Configuration mode

Configuration Statement
   service {
       dhcpv6-server {
       }
   }

Usage Guidelines
   Use the set form of this command to enable DHCPv6 server functionality.
   Use the delete form of this command to remove DHCPv6 server functionality.
   Use the show form of this command to view DHCPv6 server configuration.
service dhcpv6-server listento interface <dp-interface>

Allows the DHCP server to create address pools for clients that are indirectly connected to a data plane network interface through a DHCP relay server.

**Syntax**

```plaintext
set service dhcpv6-server listento interface dp-interface
delete service dhcpv6-server listento interface
show service dhcpv6-server
```

**Parameters**

`dp-interface`  
A data plane interface on the router. It must have a valid IP address.

**Modes**

Configuration mode.

**Configuration Statement**

```plaintext
service {
    dhcpv6-server {
        listento {
            interface dp-interface
        }
    }
}
```

**Usage Guidelines**

Use this command to enable the DHCP server to create IP address pools for clients that are not directly connected to the router. For example, if clients on the B subnet connect to the router through a DHCP relay server, the DHCP relay server connects to the router through a data plane interface on the A subnet, and the data plane interface has a valid IP address, using this command allows the DHCP server to create IP address pools for clients that are on the B subnet.

Use the `set` form of this command to create an IP address pool for clients that are indirectly connected to the router through a data plane network interface.

Use the `delete` form of this command to remove a data-plane interface from the DHCP server configuration. If no data plane interfaces are configured, the DHCP server cannot create address pools.

Use the `show` form of this command to view the DHCP server configuration.
service dhcpv6-server preference <preference>
Specifies the DHCPv6 server preference.

Syntax
set service dhcpv6-server preference preference
delete service dhcpv6-server preference
show service dhcpv6-server preference

Command Default
The DHCPv6 server preference is not set.

Parameters
preference
Optional. The preference for the DHCPv6 server. The preference ranges from 0 through 255.

Modes
Configuration mode

Configuration Statement
service {
  dhcpv6-server {
    preference preference
  }
}

Usage Guidelines
Use this command to specify the DHCPv6 server preference to DHCPv6 clients. When clients receive advertise messages from multiple servers that include preferences, they choose the server with the highest preference.

Use the set form of this command to specify the DHCPv6 server preference.
Use the delete form of this command to restore the default state, that is, the DHCPv6 server preference is not set.
Use the show form of this command to display the DHCPv6 server preference.
service dhcpv6-server shared-network-name <name>

Assigns a name to a physical subnet.

Syntax

set service dhcpv6-server shared-network-name name
delete service dhcpv6-server shared-network-name name
show service dhcpv6-server shared-network-name name

Parameters

name

Multinode. The name for a physical subnet.
You can define multiple subnets by creating multiple shared-network-name configuration nodes, each with a different name.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcpv6-server {
        shared-network-name name {
        }
    }
}
```

Usage Guidelines

Use this command to assign a name to a physical subnet. The subnet created may be directly connected to the system. The name is arbitrary and need not match any name used for this subnet elsewhere within the system.

Use the set form of this command to assign a name to a physical subnet.

Use the delete form of this command to delete the name of a physical subnet.

Use the show form of this command to display the name of a physical subnet.
service dhcpv6-server shared-network-name <name> subnet <ipv6net>

Specifies an IPv6 subnet to which the DHCPv6 server provides access.

Syntax

```plaintext
set service dhcpv6-server shared-network-name name subnet ipv6net
delete service dhcpv6-server shared-network-name name subnet ipv6net
show service dhcpv6-server shared-network-name name subnet ipv6net
```

Parameters

- **name**
  - The name of a physical subnet.

- **ipv6net**
  - Optional. Multinode. An IPv6 subnet to which the DHCPv6 server provides access. The format is `ipv6-addr/prefix`.

Modes

- Configuration mode

Configuration Statement

```plaintext
service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify an IPv6 subnet to which the DHCPv6 server provides access. The DHCPv6 server responds to clients on this subnet by using the parameters and addresses defined in this subtree.

- Use the **set** form of this command to specify the DHCPv6 subnet.
- Use the **delete** form of this command to remove DHCPv6 subnet configuration.
- Use the **show** form of this command to view DHCPv6 subnet configuration.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range

Specifies a range of IPv6 addresses that can be assigned to clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net address-range
delete service dhcpv6-server shared-network-name name subnet ipv6net address-range
show service dhcpv6-server shared-network-name name subnet ipv6net address-range

Parameters

name
   The name of a physical subnet.

ipv6net
   Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

Modes

Configuration mode

Configuration Statement

service {
   dhcpv6-server {
      shared-network-name name {
         subnet ipv6net {
            address-range {
               ...
            }
         }
      }
   }
}

Usage Guidelines

Use this command to specify a range of IPv6 addresses that can be assigned to clients. If no address range is provided, the DHCPv6 server operates in a stateless mode on this subnet, which means that it does not assign dynamic IPv6 addresses and thus does not maintain state information about those assignments.

Use the set form of this command to create the address-range configuration node.

Use the delete form of this command to remove the address-range configuration.

Use the show form of this command to view the address-range configuration.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range prefix <pool-ipv6net>

Specifies a pool of IPv6 addresses that can be assigned to clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net address-range prefix ipv6net [temporary]
delete service dhcpv6-server shared-network-name name subnet ipv6net address-range prefix ipv6net [temporary]
show service dhcpv6-server shared-network-name name subnet ipv6net address-range prefix ipv6net

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

pool-ipv6net
Optional. An IPv6 address prefix that defines a pool of consecutive addresses available for assignment to clients. The specified prefix must be a subset of the subnet prefix.

temporary
Optional. If specified, indicates that the range can be used for assigning privacy addresses (RFC 4941).

Modes

Configuration mode

Configuration Statement

```
service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                address-range {
                    prefix pool-ipv6net {
                        temporary
                    }
                }
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify a pool of IPv6 addresses that can be assigned to clients.
Use the set form of this command to create the address-range prefix configuration.
Use the delete form of this command to remove the address-range prefix configuration.
Use the show form of this command to view the address-range prefix configuration.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> address-range start <start-ipv6>

Specifies the beginning and ending addresses in a range of IPv6 addresses that can be assigned to clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net address-range start start-ipv6 [stop stop-ipv6 | temporary]
delete service dhcpv6-server shared-network-name name subnet ipv6net address-range start start-ipv6 [stop | temporary]
show service dhcpv6-server shared-network-name name subnet ipv6net address-range start start-ipv6 [stop | temporary]

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

start-ipv6
Optional. Multinode. The beginning address in a range of consecutive IPv6 addresses that are available for assignment to clients.

stop-ipv6
Optional. The ending address in a range of consecutive IPv6 addresses that are available for assignment to clients. If not specified, only the beginning address is available for assignment.

temporary
Optional. If specified, indicates that the range can be used for assigning privacy addresses (RFC 4941).

Modes

Configuration mode

Configuration Statement

service {
  dhcpv6-server {
    shared-network-name name {
      subnet ipv6net {
        address-range {
          start start ipv6 {
            stop stop ipv6
            temporary
          }
        }
      }
    }
  }
}
Usage Guidelines

Use this command to specify the beginning and ending addresses in a range of IPv6 addresses that can be assigned to clients.

Use the **set** form of this command to create the address-range configuration.

Use the **delete** form of this command to remove the address-range configuration.

Use the **show** form of this command to view the address-range configuration.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> description <desc>

Provides a description of a subnet.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net description desc
delete service dhcpv6-server shared-network-name name subnet ipv6net description
show service dhcpv6-server shared-network-name name subnet ipv6net description

Parameters

name
   The name of a physical subnet.
ipv6net
   Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.
desc
   A description of the specified subnet.

Modes

Configuration mode

Configuration Statement

service {
   dhcp-server {
      shared-network-name name {
         subnet ipv6net {
            description desc
         }
      }
   }
}

Usage Guidelines

Use this command to provide a description of a subnet.
Use the `set` form of this command to provide a description of a subnet.
Use the `delete` form of this command to delete the description of a subnet.
Use the `show` form of this command to display the description of a subnet.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> domain-search <domain>

Specifies a domain name to include in the domain search list.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net domain-search domain
delete service dhcpv6-server shared-network-name name subnet ipv6net domain-search domain
show service dhcpv6-server shared-network-name name subnet ipv6net domain-search

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

domain
Multinode. A domain name to include in the domain search list.
You can specify more than one domain name by including this parameter multiple times.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                domain-search domain
            }
        }
    }
}

Usage Guidelines

Use this command to specify a domain name to include in the domain search list. Hosts use the domain search list when resolving host names in DNS. Values are listed in the option, and communicated to the client, in the order entered.

Use the set form of this command to specify a domain name.

Use the delete form of this command to delete a domain name.

Use the show form of this command to view the domain name configuration.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> lease-time

Sets the client lease time.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net lease-time {default default-time | maximum max-time | minimum min-time}
delete service dhcpv6-server shared-network-name name subnet ipv6net lease-time {default | maximum | minimum}
show service dhcpv6-server shared-network-name name subnet ipv6net lease-time {default | maximum | minimum}

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

default-time
The default lease time in seconds. The time is assigned to a client if the client does not request a specific lease time.

max-time
The maximum lease time in seconds that is assigned to a lease. If the client requests a time larger than the maximum lease time, the maximum time is used.

min-time
The minimum lease time in seconds that is assigned to a lease. If the client requests a time smaller than the minimum lease time, the minimum time is used.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                lease-time {
                    default default-time
                    maximum max-time
                    minimum min-time
                }
            }
        }
    }
}

Usage Guidelines

Use this command to specify the client lease time.
Use the **set** form of this command to specify the lease time.
Use the **delete** form of this command to delete the lease time.
Use the **show** form of this command to display the lease time.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> name-server <ipv6>

Specifies the address of a recursive DNS server (RDNSS) for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net name-server ipv6
delete service dhcpv6-server shared-network-name name subnet ipv6net name-server ipv6
show service dhcpv6-server shared-network-name name subnet ipv6net name-server

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

ipv6
Multinode. The IPv6 address of an RDNSS.
You can specify more than one server by specifying this parameter multiple times.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                name-server ipv6
            }
        }
    }
}

Usage Guidelines

Use this command to specify the address of an RDNSS that is available to DHCPv6 clients. Addresses are listed in the order they are specified.

Use the set form of this command to specify the address of an RDNSS.
Use the delete form of this command to delete the address of an RDNSS.
Use the show form of this command to display the address of an RDNSS.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> nis-domain <nis-domain-name>

Specifies the Network Information Service (NIS) domain for DHCPv6 clients.

Syntax

gset service dhcpv6-server shared-network-name name subnet ipv6net nis-domain nis-domain-name

delete service dhcpv6-server shared-network-name name subnet ipv6net nis-domain

show service dhcpv6-server shared-network-name name subnet ipv6net nis-domain

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

nis-domain-name
The name of the NIS domain for DHCPv6 clients.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                nis-domain nis-domain-name
            }
        }
    }
}

Usage Guidelines

Use this command to specify an NIS domain for DHCPv6 clients.
Use the set form of this command to specify the NIS domain.
Use the delete form of this command to delete the NIS domain.
Use the show form of this command to display the NIS domain.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> nisplus-domain <nisplus-domain-name>

Specifies the Network Information Service Plus (NIS+) domain for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net nisplus-domain nisplus-domain-name
delete service dhcpv6-server shared-network-name name subnet ipv6net nisplus-domain
show service dhcpv6-server shared-network-name name subnet ipv6net nisplus-domain

Parameters

name

The name of a physical subnet.

ipv6net

Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

nisplus-domain-name

The name of an NIS+ domain for DHCPv6 clients.

Modes

Configuration mode

Configuration Statement

```
service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                nisplus-domain nisplus-domain-name
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify an NIS+ domain for DHCPv6 clients.
Use the set form of this command to specify the NIS+ domain.
Use the delete form of this command to delete the NIS+ domain.
Use the show form of this command to display the NIS+ domain.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> nisplus-server <ipv6>

Specifies the address of the Network Information Service Plus (NIS+) server for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net nisplus-server ipv6
delete service dhcpv6-server shared-network-name name subnet ipv6net nisplus-server ipv6
show service dhcpv6-server shared-network-name name subnet ipv6net nisplus-server

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

ipv6
Multinode. The address of the NIS+ server for DHCPv6 clients.
You can specify more than one address by issuing this statement multiple times.

Modes

Configuration mode

Configuration Statement

service {
dhcpv6-server {
  shared-network-name name {
    subnet ipv6net {
      nisplus-server ipv6
    }
  }
}
}

Usage Guidelines

Use this command to specify the address of the NIS+ server for DHCPv6 clients. Addresses are listed in the order they are specified.

Use the set form of this command to specify the NIS+ server address.
Use the delete form of this command to delete the address of the NIS+ server.
Use the show form of this command to display the address of the NIS+ server.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> nis-server <ipv6>

Specifies the address of the NIS server for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net nis-server ipv6
delete service dhcpv6-server shared-network-name name subnet ipv6net nis-server ipv6
show service dhcpv6-server shared-network-name name subnet ipv6net nis-server

Parameters

name
  The name of a physical subnet.
ipv6net
  Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.
ipv6
  Multinode. The address of the NIS server for DHCPv6 clients.
  You can specify more than one address by entering this command multiple times.

Modes

Configuration mode

Configuration Statement

service {
  dhcpv6-server {
    shared-network-name name {
      subnet ipv6net {
        nis-server ipv6
      }
    }
  }
}

Usage Guidelines

Use this command to specify the address of the NIS server for DHCPv6 clients. Addresses are listed in the order they are specified.

Use the set form of this command to specify the address of the NIS server.

Use the delete form of this command to delete the address of the NIS server.

Use the show form of this command to display the address of the NIS server.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> sip-server-address <ipv6>

Specifies the address of the Session Initiation Protocol (SIP) server for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net sip-server-address ipv6
delete service dhcpv6-server shared-network-name name subnet ipv6net sip-server-address ipv6
show service dhcpv6-server shared-network-name name subnet ipv6net sip-server-address

Parameters

name
The name of a physical subnet.

ipv6net
Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.

ipv6
Multinode. The address of the SIP server for DHCPv6 clients.
You can specify more than one address by entering this command multiple times.

Modes

Configuration mode

Configuration Statement

service {
  dhcpv6-server {
    shared-network-name name {
      subnet ipv6net {
        sip-server-address ipv6
      }
    }
  }
}

Usage Guidelines

Use this command to specify the address of the SIP server for DHCPv6 clients. Addresses are listed in the order they are specified.

Use the set form of this command to specify the address of the SIP server.

Use the delete form of this command to delete the address of the SIP server.

Use the show form of this command to display the address of the SIP server.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> sip-server-name <sip-server-name>

Specifies the name of the Session Initiation Protocol (SIP) server for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net sip-server-name sip-server-name
delete service dhcpv6-server shared-network-name name subnet ipv6net sip-server-name sip-server-name
show service dhcpv6-server shared-network-name name subnet ipv6net sip-server-name sip-server-name

Parameters

name
    The name of a physical subnet.
ipv6net
    Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.
sip-server-name
    Multinode. The name of the SIP server for DHCPv6 clients. You can specify more than one name by entering this command multiple times.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                sip-server-name sip-server-name
            }
        }
    }
}

Usage Guidelines

Use this command to specify the name of the SIP server for DHCPv6 clients. Addresses are listed in the order they are specified.

Use the set form of this command to specify the SIP server name.
Use the delete form of this command to delete the name of the SIP server.
Use the show form of this command to display the name of the SIP server.
service dhcpv6-server shared-network-name <name> subnet <ipv6net> sntp-server-address <ipv6>

Specifies the address of the Simple Network Time Protocol (SNTP) for DHCPv6 clients.

Syntax

set service dhcpv6-server shared-network-name name subnet ipv6net sntp-server-address ipv6
delete service dhcpv6-server shared-network-name name subnet ipv6net sntp-server-address ipv6
show service dhcpv6-server shared-network-name name subnet ipv6net sntp-server-address

Parameters

name
   The name of a physical subnet.
ipv6net
   Optional. Multinode. An IPv6 subnet served by the DHCPv6 server. The format is ipv6-addr/prefix.
ipv6
   Multinode. The address of the SNTP server for DHCPv6 clients.
   You can specify more than one address by entering this command multiple times.

Modes

Configuration mode

Configuration Statement

service {
    dhcpv6-server {
        shared-network-name name {
            subnet ipv6net {
                sntp-server-address ipv6
            }
        }
    }
}

Usage Guidelines

Use this command to specify the address of the SNTP server for DHCPv6 clients. Addresses are listed in the order they are specified. SNTP is a subset of NTP and includes extensions to operate over IPv6. It is specified in: http://tools.ietf.org/html/rfc4330.

Use the set form of this command to specify the address of the SNTP server.
Use the delete form of this command to delete the address of the SNTP server.
Use the show form of this command to display the address of the SNTP server.
service dhcpv6-server static-mapping <mapping-name>

Specifies the IPv6 address for a client.

Syntax

set service dhcpv6-server static-mapping mapping-name [ipv6-address ipv6 | identifier identifier]
delete service dhcpv6-server static-mapping mapping-name [ipv6-address | identifier ]
show service dhcpv6-server static-mapping mapping-name [ipv6-address | identifier ]

Parameters

mapping-name
   A name to identify the static mapping.

ipv6
   The IPv6 address that is assigned to a client.

identifier
   The character string that identifies a client. It is compared against the ia-na option sent by the client. This value is typically the low-order 4 bytes of the MAC address of the client.

Modes

Configuration mode.

Configuration Statement

```
service {
   dhcpv6-server {
      static-mapping mapping-name {
         ipv6-address ipv6
         identifier identifier
      }
   }
}
```

Usage Guidelines

Use this command to specify the IPv6 address for a client.
Use the `set` form of this command to create the prefix-delegation configuration.
Use the `delete` form of this command to remove the prefix-delegation configuration.
Use the `show` form of this command to view the prefix-delegation configuration.
show dhcpv6 client leases

Displays DHCPv6 information for interfaces that are configured as DHCPv6 clients.

Syntax

show dhcpv6 client leases

Modes

Operational mode

Usage Guidelines

Use this command to display current DHCPv6 client information for interfaces that are configured as DHCPv6 clients. If an address has been acquired, the command shows the lease parameters associated with that address, including the unique ID, assigned IPv6 address, and time remaining on the lease.

To configure an interface as a DHCPv6 client, refer to the documentation for that interface.
show dhcpv6 relay-agent status
Displays the status of the DHCPv6 relay agent.

Syntax
show dhcpv6 relay-agent status

Modes
Operational mode

Usage Guidelines
Use this command to display the status of the DHCPv6 relay agent. This status includes an indication of whether the DHCPv6 relay agent is configured. If it is configured, the command indicates whether the DHCPv6 relay agent is running.
show dhcpv6 server leases

Displays the status of all leases assigned by the DHCPv6 server.

Syntax

show dhcpv6 server leases

Modes

Operational mode

Usage Guidelines

Use this command to display the status of all leases assigned by the DHCPv6 server. For each lease, it shows the unique ID of the client, assigned IPv6 address, and time remaining on the lease.
**show dhcpv6 server status**

Displays the status of the DHCPv6 server.

**Syntax**

```plaintext
show dhcpv6 server status
```

**Modes**

Operational mode

**Usage Guidelines**

Use this command to display the status of the DHCPv6 server. This status includes an indication of whether the DHCPv6 server is configured. If it is configured, the command indicates whether the DHCPv6 server is running. The command notes whether any address ranges are configured. If none are configured, the server can assign only parameters; it cannot assign addresses.
DNS overview

DNS is an Internet directory service that provides mappings between human-readable domain names and numeric IP addresses. DNS mappings are recorded in resource records that are stored on name servers distributed throughout the Internet. A device needing to access a host across the Internet sends a DNS query to a name server. The name server consults its resource records and returns an answer with the IP address of the specified name.

The DNS system has billions of resource records. If the requested record is not local to the consulted name server, the name server consults another name server, and so on, until the requested information is located and returned.

There are billions of resource records in the DNS system. To keep the data manageable, the records are divided into zones, which contain resource records for a DNS domain or subdomain.

The Brocade vRouter supports three main DNS-related features:

- System DNS on page 147
- Dynamic DNS on page 147
- DNS forwarding on page 148

System DNS

In system DNS, you define the list of name servers that the Brocade vRouter can use to resolve host names to IP addresses. This list is created by using the *system name-server* command. (The *system name-server* command is described in *Brocade 5600 vRouter Basic System Reference Guide*; for your convenience, an example of system DNS is provided in Configuring access to a name server on page 148.)

Dynamic DNS

Originally, DNS mappings were statically specified in “zone files,” which were periodically loaded onto DNS servers. These zone files worked reasonably well at a time when most hosts were configured with static IP addresses. However, since the 1990s, many network endpoints have been assigned IP addresses using dynamic protocols such as DHCP. Until 1997, devices with DHCP-assigned IP addresses essentially could not participate in the DNS system.

In 1997, the Internet Engineering Task Force (IETF) published RFC 2136, *Dynamic Updates in the Domain Name System*, describing the dynamic DNS update protocol. Dynamic DNS (DDNS) provides a mechanism for DNS entries to be established and removed dynamically. Devices using dynamic DNS can notify a domain name server in real time of changes to host name, IP address, or other DNS-related information.

This feature is particularly useful for systems in which a dynamic IP address is provided by the ISP. Whenever the IP address changes, the Brocade vRouter updates a DDNS service provider with the change. The DDNS provider is responsible for propagating this change to other DNS servers. The Brocade vRouter supports a number of DDNS providers.
DNS forwarding

In many environments that use consumer-level ISP connections, the ISP both assigns the client router with its IP address and notifies the client router of the DNS server to use. In many cases, the IP address of the DNS server itself is assigned through DHCP and changes periodically; the ISP notifies the client router of the change in DNS server IP address through periodic updates. This makes it problematic to statically configure a DNS server IP address on the DHCP server of the client router for its LAN clients.

In cases like these, the Brocade vRouter can use DNS forwarding (also called DNS relay) to maintain connectivity between hosts on its network and the DNS server of the ISP.

When DNS forwarding is used, the client router offers its own client-side IP address (which is static) as the DNS server address to the hosts on its network, so that all client DNS requests are made to the client-side address of the client router. When DNS requests are made, the client router forwards them to the ISP DNS server; answers are directed back to the client router and forwarded through to the client hosts. If the ISP changes the address of its DNS server, the client router simply records the new address of the server. The server address remains unchanged from the perspective of the LAN clients.

Another advantage to DNS forwarding is that DNS requests are cached in the Brocade vRouter (until either the time-to-live value in the DNS record expires or the cache fills). Subsequent requests for a cached entry are responded to locally, with a corresponding reduction in WAN traffic.

DNS configuration examples

This section presents the following topics:

- Configuring access to a name server on page 148
- Configuring dynamic DNS on page 148
- Configuring DNS forwarding on page 151
- Statically configured entries and DNS forwarding on page 153

Configuring access to a name server

To be able to translate host names (such as www.brocade.com) to IP addresses (such as 69.59.150.141), the system must be able to access a DNS server.

Configuring access to a DNS server is a function of basic system management, and is described in Brocade 5600 vRouter Basic System Reference Guide. For your convenience, the configuration example is repeated here.

Table 15 configures a static IP address for the DNS server at address 12.34.56.100. To configure the Brocade vRouter in this way, perform the following steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify the IP address of the DNS server.</td>
<td>vyatta@R1# set system name-server 12.34.56.100</td>
</tr>
</tbody>
</table>

Configuring dynamic DNS

Figure 8 on page 150 shows a typical DDNS scenario. In this scenario:

- The Brocade vRouter (R1) is connected to an ISP via dp0p1p1.
- The network domain is company.com.
- The Brocade vRouter host name is r1.company.com.
- The web server of the company is located behind the Brocade vRouter. Its host name is www.company.com.
The ISP is providing dynamic IP addresses to its clients through DHCP.

The IP address of the dp0p1p1 interface in the Brocade vRouter changes over time because of the dynamic assignment by the ISP.

The web server of the company is behind a Network Address Translation (NAT) device on the Brocade vRouter, so its IP address (as viewed from the Internet) changes when the ISP assigns a new address to the dp0p1p1 interface.

Because the web address of the server changes, responses to DNS queries for www.company.com must also change to the new IP address. DDNS resolves this problem.

DDNS allows the Brocade vRouter (R1) to update the DNS system with the new IP address information for any local host names (for example, r1.company.com, and www.company.com) whenever the IP address on dp0p1p1 changes. The setup process is as follows:

1. Sign up for DDNS service from one of the supported service providers:
   - DNS Park: www.dnspark.com
   - DSL Reports: www.dslreports.com
   - DynDNS: www.dyndns.com
   - easyDNS: www.easydns.com
   - namecheap: www.namecheap.com
   - Sitelutions: www.sitelutions.com
   - zoneedit: www.zoneedit.com

   The individual providers offer instructions for sign-up.

   **NOTE**
   Depending on the service provider, host names may need to include the domain name (for example, www instead of www.company.com).

2. Configure the Brocade vRouter (R1 in the example) with service provider information such as the service name, a login ID, and a password so that the system can determine how to log on and send updates to the DDNS service provider.

3. Configure the Brocade vRouter with the host names that must be updated in the DNS system when the IP address on dp0p1p1 changes.
The following example shows how to set up DDNS for DDNS service provider DynDNS. It is assumed for this example that you have already signed up with DynDNS. To configure the Brocade vRouter in this way, perform the following steps in configuration mode.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set the service provider.</td>
<td><code>vyatta@R1# set service dns dynamic interface dp0p1p1 service dyndns</code></td>
</tr>
<tr>
<td>Set the DDNS service provider login ID (for example, vtest).</td>
<td><code>vyatta@R1# set service dns dynamic interface dp0p1p1 service dyndns login vtest</code></td>
</tr>
<tr>
<td>Set the DDNS service provider password (for example, testpwd).</td>
<td><code>vyatta@R1# set service dns dynamic interface dp0p1p1 service dyndns password testpwd</code></td>
</tr>
<tr>
<td>Specify R1 as a host name whose DNS entry needs to be updated when the IP address on dp0p1p1 changes.</td>
<td><code>vyatta@R1# set service dns dynamic interface dp0p1p1 service dyndns host-name r1.company.com</code></td>
</tr>
</tbody>
</table>
TABLE 16 Setting up dynamic DNS (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify www as a host name whose DNS entry needs to be updated when the IP address on dp0p1p1 changes.</td>
<td>vyatta@R1# set service dns dynamic interface dp0p1p1 service dyndns host-name <a href="http://www.company.com">www.company.com</a></td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit OK</td>
</tr>
</tbody>
</table>
| Show the dynamic DNS configuration. | vyatta@R1# show service dns dynamic interface dp0p1p1 {  
  service dyndns {  
  host-name r1.company.com  
  host-name www.company.com  
  login vtest  
  password testpwd  
  }  
} |

At this point, whenever the IP address on dp0p1p1 changes, the Brocade vRouter automatically logs onto the DynDNS service by using the vtest login ID and the testpwd password. It sends an update for the r1.company.com and www.company.com host names specifying the new IP address required to reach those hosts on the company.com domain. External users that query DNS for r1.company.com or www.company.com are subsequently answered with the new address from the DNS system.

**NOTE**
Dynamic DNS updates are logged. To see the updates, set up logging by using the system syslog global facility facility level level command, where facility is daemon and level is notice. See *Brocade 5600 vRouter Basic System Reference Guide* for details.

Configuring DNS forwarding

Configuring the Brocade vRouter for DNS forwarding has two main steps:

1. Specifying the DNS name servers to which to forward
2. Specifying the interfaces on which to listen for DNS requests

**Specifying DNS Name Servers**

Name server locations can be obtained in three ways:

- From the system name server list, defined by using the `set system name-server` command
- By DHCP
- By listing additional name servers by using `service dns forwarding dhcp <interface>` on page 165

By default, the Brocade vRouter forwards DNS requests to name servers on the system name server list plus name servers obtained through DHCP. You can override the default behavior by specifying any or all of the following:

- Specifically use system-defined name servers. To do this, use `service dns forwarding system` on page 169.
- Specifically use name servers received for the interface that is using DHCP client to get an IP. To do this, use `service dns forwarding dhcp <interface>` on page 165.
- List additional name servers by using `service dns forwarding name-server <ipv4>` on page 168.

These three options can be used in any combination; however, using any of them eliminates the default DNS forwarding behavior.
When DNS forwarding starts or restarts, it broadcasts a message to all the name servers in the pool and selects the first name server to answer. This name server is used unless it becomes unreachable, in which case the system sends another broadcast message to the remaining name servers in the pool.

**Specifying the Listening Interfaces**
The listening interfaces are the interfaces to which internal clients forward DNS requests. The DNS forwarding service listens for these requests and forwards them to the name server.

To set the listening interface, use `service dns forwarding listen-on <interface>` on page 167. You can specify more than one interface by issuing this command multiple times.

**DNS Forwarding Scenario**
After these steps are completed, DNS forwarding is set up. At this point, the Brocade vRouter DHCP server can be used to distribute the DNS forwarding interface address to DHCP clients. (For information about setting up a DHCP server on the Brocade vRouter, see DHCP on page 17.

Figure 9 shows a typical scenario in which DNS forwarding is deployed. In this scenario:
- The ISP is providing dynamic IP addresses to its customers, including a Brocade vRouter (R1) through DHCP.
- The Brocade vRouter (R1) is providing DHCP service to clients on its local network.
- Local clients send DNS requests to the Brocade vRouter.
- The DNS forwarding service on the Brocade vRouter forwards the requests to the DNS server of the ISP.

**FIGURE 9** Scenario using DNS forwarding

The following example shows how to set up the key parts of the Brocade vRouter for the preceding scenario. To configure the Brocade vRouter in this way, perform the following steps in configuration mode.

**TABLE 17** Setting up DNS forwarding

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set IP address and prefix on dp0p1p2.</td>
<td>vyatta@R1# set interfaces dataplane dp0p1p2 address 192.168.1.254/24</td>
</tr>
</tbody>
</table>
**TABLE 17 Setting up DNS forwarding (continued)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set dp0p1p1 as a DHCP client.</td>
<td>vyatta@R1# set interfaces dataplane dp0p1p1 address dhcp</td>
</tr>
<tr>
<td>Set up the DHCP server on R1 by creating the configuration node for dp0p1p2.POOL on subnet 192.168.1.10/24. Specify the start and stop IP addresses for the pool.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2.POOL subnet 192.168.1.0/24 start 192.168.1.100 stop 192.168.1.199</td>
</tr>
<tr>
<td>Specify the default router for dp0p1p2.POOL.</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2.POOL subnet 192.168.1.0/24 default-router 192.168.1.254</td>
</tr>
<tr>
<td>Create a DNS server list using DNS server information provided by the DHCP server of the ISP (on dp0p1p1).</td>
<td>vyatta@R1# set service dns forwarding dhcp dp0p1p1</td>
</tr>
<tr>
<td>Listen for DNS requests on dp0p1p2.</td>
<td>vyatta@R1# set service dns forwarding listen-on dp0p1p2</td>
</tr>
<tr>
<td>Specify a DNS server for dp0p1p2.POOL (in this case, it acts as a DNS forwarder).</td>
<td>vyatta@R1# set service dhcp-server shared-network-name dp0p1p2.POOL subnet 192.168.1.0/24 dns-server 192.168.1.254</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the DNS-related configuration.</td>
<td>vyatta@R1# show service dns forwarding { dhcp dp0p1p1 listen-on dp0p1p2 }</td>
</tr>
</tbody>
</table>

**Statically configured entries and DNS forwarding**

Because of difficulties interworking with network address translation (NAT) on the corporate gateway, it is sometimes difficult to obtain correct IP addresses for hosts on the corporate network. To work around this problem, you can create static entries on a local Brocade vRouter by using the `system static-host-mapping` command. Any entries configured in this way are compared with incoming DNS queries before the query is passed to DNS forwarding. If a match is found, the corresponding IP address is returned.

The following table shows how to set up the system to return an IP address of 12.34.56.78 if it receives a DNS query for either vyatta.com or v dut1.

**TABLE 18 Setting up static entries**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the static host-mapping configuration node.</td>
<td>vyatta@R1# set system static-host-mapping host-name vyatta.com</td>
</tr>
<tr>
<td>Provide an alias host name (this step is optional).</td>
<td>vyatta@R1# set system static-host-mapping host-name vyatta.com alias v dut1</td>
</tr>
<tr>
<td>Specify the IP address to be returned in response to the DNS query.</td>
<td>vyatta@R1# set system static-host-mapping host-name vyatta.com inet 12.34.56.78</td>
</tr>
<tr>
<td>Commit the changes.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Show the static host-mapping configuration.</td>
<td>vyatta@R1# show system static-host-mapping host-name vyatta.com</td>
</tr>
<tr>
<td>Step</td>
<td>Command</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 18 Setting up static entries (continued)

- alias vdu1
- inet 12.34.56.78
- }

DNS
DNS Commands

- reset dns forwarding all ......................................................................................................................................................... 156
- reset dns forwarding cache .................................................................................................................................................... 157
- service dns dynamic interface <interface> ......................................................................................................................... 158
- service dns dynamic interface <interface> service <service> .......................................................................................... 159
- service dns dynamic interface <interface> service <service> host-name <hostname> ...................................................... 160
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reset dns forwarding all

    Resets all counters related to DNS forwarding and resets the DNS forwarding cache.

Syntax

    reset dns forwarding all

Modes

    Operational mode

Usage Guidelines

    Use this command to reset all counters related to DNS forwarding and remove all entries from the DNS forwarding cache.
reset dns forwarding cache

Removes all entries from the DNS forwarding cache.

Syntax

reset dns forwarding cache

Modes

Operational mode

Usage Guidelines

Use this command to remove all entries from the DNS forwarding cache.
service dns dynamic interface <interface>

Enables support of dynamic DNS (DDNS) on an interface.

Syntax

- set service dns dynamic interface interface
- delete service dns dynamic interface interface
- show service dns dynamic interface interface

Parameters

- interface
  Multinode. An interface that is to support DDNS.
  You can have more than one interface that supports DDNS by creating multiple interface configuration nodes.

Modes

- Configuration mode

Configuration Statement

```
service {
  dns {
    dynamic {
      interface interface {
      }
    }
  }
}
```

Usage Guidelines

Use this command to enable support of DDNS on an interface.

Use the `set` form of this command to enable support of DDNS on an interface.

Use the `delete` form of this command to disable DDNS on an interface and remove all its dynamic DNS configuration.

Use the `show` form of this command to view DDNS configuration.
service dns dynamic interface <interface> service <service>

Specifies a dynamic DNS (DDNS) service provider.

Syntax

set service dns dynamic interface <interface> service <service>
delete service dns dynamic interface <interface> service <service>
show service dns dynamic interface <interface> service <service>

Parameters

interface
Multinode. An interface that supports DDNS.

service
Multinode. The name of a DDNS service provider. The name is one of the following: dnspark, dsreports, dyndns, easydns, namecheap, sitelutions, or zoneedit.
You can specify more than one DDNS provider for each interface by creating multiple service configuration nodes.

Modes

Configuration mode

Configuration Statement

service {
  dns {
    dynamic {
      interface <interface> {
        service <service>
      }
    }
  }
}

Usage Guidelines

Use this command to specify the organizations that provides DDNS service to the Brocade vRouter.

Use the set form of this command to specify a DDNS service provider.

Use the delete form of this command to remove a DDNS service provider.

Use the show form of this command to display information for a DDNS service provider.
service dns dynamic interface <interface> service <service> host-name <hostname>

Specifies the name of a host for which to update the DNS record of the dynamic DNS (DDNS) service provider.

Syntax

```plaintext
set service dns dynamic interface interface service service host-name hostname
delete service dns dynamic interface interface service service host-name hostname
show service dns dynamic interface interface service service host-name
```

Parameters

- `interface`
  - Multinode. An interface that supports DDNS.

- `service`
  - Multinode. The name of a DDNS service provider. The name is one of the following: dnspark, dsreports, dyndns, easydns, namecheap, sitelutions, or zoneedit.

- `hostname`
  - The name of a host.

Modes

Configuration mode

Configuration Statement

```plaintext
service {
    dns {
        dynamic {
            interface interface {
                service service {
                    host-name hostname
                }
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify the name of a host for which to update the DNS record of the DDNS service provider.

Use the `set` form of this command to specify a host name.

Use the `delete` form of this command to remove the host name from the configuration.

Use the `show` form of this command to view host name configuration.
service dns dynamic interface <interface> service <service> login <service-login>

Specifies a login ID to use to log on to a dynamic DNS (DDNS) service provider.

**Syntax**

```plaintext
set service dns dynamic interface interface service service login service-login
delete service dns dynamic interface interface service service login
show service dns dynamic interface interface service service login
```

**Parameters**

- **interface**
  Multinode. An interface that supports DDNS.

- **service**
  Multinode. The name of a DDNS service provider. The name is one of the following: dnspark, dsreports, dyndns, easydns, namecheap, sitelutions, or zoneedit.

- **login**
  A login ID.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
  dns {
    dynamic {
      interface interface {
        service service {
          login service-login
        }
      }
    }
  }
}
```

**Usage Guidelines**

Use this command to specify the login ID to use to log on to a DDNS service provider. Use the `set` form of this command to specify the login ID for a DDNS service provider. Use the `delete` form of this command to remove the login ID for a DDNS service provider. Use the `show` form of this command to display the login ID for a DDNS service provider.
service dns dynamic interface <interface> service <service> password <service-password>

Specifies the password to use to log on to a dynamic DNS (DDNS) service provider.

Syntax

set service dns dynamic interface interface service service password service-password
delete service dns dynamic interface interface service service password
show service dns dynamic interface interface service service password

Parameters

interface
Multinode. An interface that supports DDNS.

service
Multinode. The name of a DDNS service provider. The name is one of the following: dnspark, dsreports, dyndns, easydns, namecheap, sitelutions, or zoneedit.

password
A password.

Modes

Configuration mode

Configuration Statement

```plaintext
service {
  dns {
    dynamic {
      interface interface {
        service service {
          password service-password
        }
      }
    }
  }
}
```

Usage Guidelines

Use this command to specify the password to use to log on to a DDNS service provider.

Use the set form of this command to specify the password for a DDNS service provider.

Use the delete form of this command to remove the password for a DDNS service provider.

Use the show form of this command to display the password for a DDNS service provider.
service dns dynamic interface <interface> service <service> server <addr>

Specifies a server to which to send dynamic DNS (DDNS) updates.

Syntax

set service dns dynamic interface interface service service server addr
delete service dns dynamic interface interface service service server
show service dns dynamic interface interface service service server

Command Default

The default server of the DDNS service provider is used.

Parameters

interface
Multinode. An interface that supports DDNS.

service
Multinode. The name of a DDNS service provider. The name is one of the following: dnspark, dsreports, dyndns, easydns, namecheap, sitelutions, or zoneedit.

addr
An IP address or a host name. Only some DDNS service providers require this address or host name.

Modes

Configuration mode

Configuration Statement

```plaintext
service {
    dns {
        dynamic {
            interface interface {
                service service {
                    server addr
                }
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify the IP address or host name of the DDNS service provider’s server that DDNS updates are sent to. This should be set only if the DDNS service provider requires it.

Use the `set` form of this command to specify the server to send DDNS updates to.

Use the `delete` form of this command to use the default DDNS service provider servers.

Use the `show` form of this command to view DDNS service provider server configuration.
service dns forwarding cache-size <size>

Specifies the size of the DNS forwarding service cache.

Syntax

```
set service dns forwarding cache-size size
delete service dns forwarding cache-size
show service dns forwarding cache-size
```

Command Default

A maximum of 150 DNS entries are stored in the DNS forwarding cache.

Parameters

- `size`
  
  Optional. The maximum number of DNS entries to be held in the DNS forwarding cache. The number ranges 0 through 10000, where 0 means an unlimited number of entries are stored. The default number is 150.

Modes

- Configuration mode

Configuration Statement

```
service {
  dns {
    forwarding {
      cache-size size
    }
  }
}
```

Usage Guidelines

- Use this command to specify the size of the DNS forwarding cache.
- Use the `set` form of this command to specify the size of the DNS forwarding cache.
- Use the `delete` form of this command to restore the default size of the DNS forwarding cache, which is 150 entries.
- Use the `show` form of this command to display the size of the DNS forwarding cache.
service dns forwarding dhcp <interface>

Specifies an interface on which DHCP updates to name server information are received.

**Syntax**

```plaintext
set service dns forwarding dhcp interface
delete service dns forwarding dhcp interface
show service dns forwarding dhcp interface
```

**Command Default**

The system forwards DNS requests to all configured name servers and all name servers specified through DHCP.

**Parameters**

- `interface`

  Multinode. An interface that is to receive name server information updates from a DHCP server.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
  dns {
    forwarding {
      dhcp interface
    }
  }
}
```

**Usage Guidelines**

Use this command to specify an interface that is to act as a DHCP client and receive updates to DNS name server information. The Brocade vRouter uses this information to forward DNS requests from its local clients to the name server.

To be configured to listen for updates to name server information, the interface must be configured to obtain its own IP address through DHCP; that is, it must be configured as a DHCP client. Refer to *Brocade 5600 vRouter LAN Interfaces Reference Guide* for information about configuring the IP address of a physical interface.

By default, the DNS forwarding service creates a pool of name servers to which it forwards DNS requests; this pool comprises any name servers statically configured for the system (by using the `system name-server` command) and those of which it is notified through DHCP. This command overrides the default behavior: when an interface is specified by using this command, the system attends to DHCP name server information updates arriving on the specified interface.

This command can be combined with `service dns forwarding name-server <ipv4>` on page 168, `service dns forwarding system` on page 169, or both commands to provide a larger pool of candidate name servers.

Use the `set` form of this command to specify an interface to be used as the source of updates to the DHCP name server.
Use the `delete` form of this command to restore the default method of receiving updates to the name server, that is, the system forwards DNS requests to all configured name servers and all name servers specified through DHCP.

Use the `show` form of this command to view DNS forwarding DHCP update configuration.
service dns forwarding listen-on <interface>

Specifies an interface on which to listen for client DNS requests.

Syntax

set service dns forwarding listen-on interface
delete service dns forwarding listen-on interface
show service dns forwarding listen-on interface

Parameters

interface
Mandatory. Multinode. An interface on which to listen for client DNS requests.
You can specify more than one interface to receive client DNS requests by creating multiple listen-on configuration nodes.

Modes

Configuration mode

Configuration Statement

```plaintext
service {
  dns {
    forwarding {
      listen-on interface
    }
  }
}
```

Usage Guidelines

Use this command to specify interfaces on which to listen for client DNS requests. Only queries received on interfaces specified with this command receive DNS answers. At least one interface must be specified for DNS forwarding to operate.

Use the **set** form of this command to specify an interface on which to listen for client DNS requests.

Use the **delete** form of this command to stop an interface from listening for client DNS requests.

Use the **show** form of this command to display the configuration of client DNS request listening.
service dns forwarding name-server <ipv4>
  Specifies a name server to which to forward DNS requests.

Syntax

set service dns forwarding name-server ipv4
delete service dns forwarding name-server ipv4
show service dns forwarding name-server ipv4

Parameters

ipv4
  Optional. Multinode. The IPv4 address of a name server to which to forward DNS requests.
  You can forward DNS requests to more than one name server by creating multiple name-server configuration nodes.

Modes

Configuration mode

Configuration Statement

service {
  dns {
    forwarding {
      name-server ipv4
    }
  }
}

Usage Guidelines

Use this command to specify a name server to which client DNS requests are forwarded.

Use of this command is optional. By default, the DNS forwarding service creates a default pool of name servers that comprises those statically configured by using the system name-server command plus those of which it was notified using DHCP. This command overrides the defaults: when this command is used, the system forwards DNS requests to the specified name server or servers.

This command can be combined with service dns forwarding dhcp <interface> on page 165, service dns forwarding system on page 169, or both commands to provide a larger pool of candidate name servers.

Use the set form of this command to specify a name server to which to forward DNS requests.

Use the delete form of this command to remove a name server from the list of name servers to which to forward DNS requests. If the last specified server is removed, the default forwarding behavior is restored.

Use the show form of this command to display the name servers to which DNS requests are forwarded.
service dns forwarding system

Specifies DNS forwarding to system-configured name servers.

Syntax

- set service dns forwarding system
- delete service dns forwarding system
- show service dns forwarding

Modes

Configuration mode

Configuration Statement

```yaml
service {
  dns {
    forwarding {
      system
    }
  }
}
```

Usage Guidelines

Use this command to direct the system to forward DNS requests to name servers that are statically configured by using the `system name-server` command.

By default, the DNS forwarding service forwards DNS requests to a pool of name servers that comprises the statically configured name servers plus those of which it was notified by using DHCP. This command overrides the defaults: when this command is used, DNS requests are forwarded to statically configured name servers.

This command can be combined with `service dns forwarding dhcp <interface>` on page 165, `service dns forwarding name-server <ipv4>` on page 168, or both commands to provide a larger pool of candidate name servers.

Use the `set` form of this command to specify DNS forwarding to system-configured name servers.

Use the `delete` form of this command to restore the default DNS forwarding behavior.

Use the `show` form of this command to display the configuration of DNS forwarding.
**show dns dynamic status**

Displays the update status for all hosts configured for dynamic DNS (DDNS) updates.

**Syntax**

```
show dns dynamic status
```

**Modes**

Operational mode

**Usage Guidelines**

Use this command to display the update status for all host names that are configured for DDNS updates.

**Examples**

The following example shows how to display the update status for hosts that are configured for DDNS updates.

```
vtyatta@R1> show dns dynamic status
show dns dynamic status
interface : dp0p1p3
ip address : 1.2.3.4
host-name : test1.getmyip.com
last update : Thu Sep 11 19:30:43 2008
update-status: good

interface : dp0p1p3
ip address : 1.2.3.5
host-name : test2.getmyip.com
last update : Thu Sep 11 19:30:43 2008
update-status: good

interface : dp0p1p4
ip address : 1.3.4.5
host-name : test4
last update : Thu Sep 11 19:34:16 2008
update-status: good
```

vyatta@R1>
show dns forwarding nameservers

Displays the name servers that are being used for DNS forwarding.

Syntax

show dns forwarding nameservers

Modes

Operational mode

Usage Guidelines

Use this command to display the name servers that are being used for DNS forwarding and those that are available but are not being used for DNS forwarding.

Examples

The following example shows how to display the name servers that are being used for DNS forwarding.

```
vyatta@R1> show dns forwarding nameservers
-----------------------------------------------
Nameservers configured for DNS forwarding
-----------------------------------------------
10.0.0.30 available via 'system'
-----------------------------------------------
Nameservers NOT configured for DNS forwarding
-----------------------------------------------
10.0.0.31 available via 'dhcp dp0p1p4'
vyatta@R1>
```
show dns forwarding statistics

Displays DNS forwarding statistics.

Syntax

show dns forwarding statistics

Modes

Operational mode

Usage Guidelines

Use this command to display statistics related to DNS forwarding. The statistics restart each time a change occurs in name servers from any source (DHCP, system, or statically configured), a change in static host mapping (by using the system static-host-mapping command), or a change made to the DNS forwarding configuration.

Examples

The following example shows how to display DNS forwarding statistics.

vyatta@R1> show dns forwarding statistics
----------------
Cache statistics
----------------
Cache size: 150
Queries forwarded: 5
Queries answered locally: 2
Total DNS entries inserted into cache: 23
DNS entries removed from cache before expiry: 0
-------------------
Nameserver statistics
-------------------
Server: 10.0.0.30
Queries sent: 5
Queries retried or failed: 0
vyatta@R1>
update dns dynamic interface <interface>

Sends a forced update to a dynamic DNS (DDNS) service provider on a specific interface.

Syntax

```
update dns dynamic interface text
```

Parameters

- `interface`
  
  An interface from which to send the forced update.

Modes

- Operational mode

Usage Guidelines

Use this command to manually initiate a forced update to a DDNS service provider. The forced update provides the DDNS service provider with the status of the specified interface.

Note that this command should be used sparingly because frequent unnecessary updates could cause the host name to be blocked by the DDNS service provider.
Flow Monitoring overview

The Flow Monitoring service allows network administrators to collect IP flow information from Brocade vRouter.

Brocade vRouters support the NetFlow Version 9 and IP Flow Information Export (IPFIX), which is based on the Internet Engineering Task Force (IETF) standard. This standard defines how IP flow information is formatted and transferred from an exporter (in this case, a Brocade vRouter) to a NetFlow collector, a system that collects IPv4 and IPv6 flow information, as shown in the following figure.

The exporter periodically collects information about packets that flow through the router into a flow record. Then, the exporter packs the record into a UDP packet and sends it to the collector. For more information about the NetFlow Version 9, refer to RFC 3954 and for more information about the IPFIX, refer to RFC 7011 export format.

The user can also choose the packet and information fields to aggregate and export.

NOTE
You can configure Flow Monitoring only for ingress traffic that is flowing through a data plane interface.

The NetFlow Version 9 and IPFIX export format is based on templates, which allows for an extensible design of the record format. This means that future enhancements of the Flow Monitoring service do not require changes to the export protocol.

The following tables describe the data that is extracted by the Flow Monitoring service from the sampled packets and exported to the NetFlow collector.
### TABLE 19 Exported NetFlow Version 9 and IPFIX IPv4 data

<table>
<thead>
<tr>
<th>Field</th>
<th>Field ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>sourceIPv4Address</td>
<td>8</td>
</tr>
<tr>
<td>destinationIPv4Address</td>
<td>12</td>
</tr>
<tr>
<td>protocolIdentifier</td>
<td>4</td>
</tr>
<tr>
<td>ipClassOfService</td>
<td>5</td>
</tr>
<tr>
<td>sourceTransportPort</td>
<td>7</td>
</tr>
<tr>
<td>destinationTransportPort</td>
<td>11</td>
</tr>
<tr>
<td>ingressInterface</td>
<td>10</td>
</tr>
<tr>
<td>ipNextHopIPv4Address</td>
<td>15</td>
</tr>
<tr>
<td>tcpControlBits</td>
<td>6</td>
</tr>
<tr>
<td>egressInterface</td>
<td>14</td>
</tr>
<tr>
<td>packetDeltaCount</td>
<td>2</td>
</tr>
<tr>
<td>octetDeltaCount</td>
<td>1</td>
</tr>
<tr>
<td>flowStartMilliseconds</td>
<td>152</td>
</tr>
<tr>
<td>flowEndMilliseconds</td>
<td>153</td>
</tr>
<tr>
<td>sourceIPv4PrefixLength</td>
<td>9</td>
</tr>
<tr>
<td>destinationIPv4PrefixLength</td>
<td>13</td>
</tr>
<tr>
<td>bgpNextHopIPv4Address</td>
<td>18</td>
</tr>
<tr>
<td>bgpSourceAsNumber</td>
<td>16</td>
</tr>
<tr>
<td>bgpDestinationAsNumber</td>
<td>17</td>
</tr>
<tr>
<td>bgpPrevAdjacentAsNumber</td>
<td>129</td>
</tr>
<tr>
<td>bgpNextAdjacentAsNumber</td>
<td>128</td>
</tr>
</tbody>
</table>

### TABLE 20 Exported NetFlow Version 9 and IPFIX IPv6 data

<table>
<thead>
<tr>
<th>Field</th>
<th>Field ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>sourceIPv6Address</td>
<td>27</td>
</tr>
<tr>
<td>destinationIPv6Address</td>
<td>28</td>
</tr>
<tr>
<td>protocolIdentifier</td>
<td>4</td>
</tr>
<tr>
<td>ipClassOfService</td>
<td>5</td>
</tr>
<tr>
<td>sourceTransportPort</td>
<td>7</td>
</tr>
<tr>
<td>destinationTransportPort</td>
<td>11</td>
</tr>
<tr>
<td>ingressInterface</td>
<td>10</td>
</tr>
<tr>
<td>ipNextHopIPv6Address</td>
<td>62</td>
</tr>
<tr>
<td>tcpControlBits</td>
<td>6</td>
</tr>
<tr>
<td>egressInterface</td>
<td>14</td>
</tr>
<tr>
<td>packetDeltaCount</td>
<td>2</td>
</tr>
<tr>
<td>octetDeltaCount</td>
<td>1</td>
</tr>
<tr>
<td>flowStartMilliseconds</td>
<td>152</td>
</tr>
<tr>
<td>flowEndMilliseconds</td>
<td>153</td>
</tr>
<tr>
<td>sourceIPv6PrefixLength</td>
<td>29</td>
</tr>
<tr>
<td>destinationIPv6PrefixLength</td>
<td>30</td>
</tr>
<tr>
<td>bgpNextHopIPv6Address</td>
<td>63</td>
</tr>
</tbody>
</table>
### Flow Monitoring configuration

The Flow Monitoring service consists of aggregators and exporters that accept flows and pass flows to other connected modules. Aggregator and exporter modules may be configured on an interface. The interface selectors generate defined fixed single-packet flows. For more information about the fields in these flows, refer to Table 19 on page 176 and Table 20 on page 0. Aggregator modules can connect with other aggregator and exporter modules by using a next statement. You can configure multiple such connections.

You can define a rule for the aggregator. Each rule is a list of key or nonkey fields. A key field identifies a unique entry in the cache functionality provided by the aggregator module. Nonkey fields are aggregated: for example, if packetDeltaCount is added as a nonkey field, the collected values are aggregated and summed before exporting the values to the flow report. An aggregator must have a rule, and a rule must have at least one key field.

Exporter modules do not pass flows to other modules.

**NOTE**

The flexible key feature works only if the key and nonkey fields that are specified in an aggregator rule are present in flows entering that aggregator; otherwise, the flows are ignored. Therefore in the following example, the fields that are specified in the foo aggregator are a subset of the fields generated by the interface.

Table 21 shows how to configure the Flow Monitoring service on the R1 Brocade vRouter, as shown in the example in the following figure.

**FIGURE 11** Brocade vRouter flow-monitoring configuration example

![Flow Monitoring configuration diagram](image-url)

### Table 20 Exported NetFlow Version 9 and IPFIX IPv6 data (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Field ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgpSourceAsNumber</td>
<td>16</td>
</tr>
<tr>
<td>bgpDestinationAsNumber</td>
<td>17</td>
</tr>
<tr>
<td>bgpNextAdjacentAsNumber</td>
<td>128</td>
</tr>
<tr>
<td>bgpPrevAdjacentAsNumber</td>
<td>129</td>
</tr>
</tbody>
</table>

**TABLE 20 Exported NetFlow Version 9 and IPFIX IPv6 data (continued)**
To configure the Flow Monitoring service on R1, perform the following steps in configuration mode.

**TABLE 21 Configuring the flow-monitoring service**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
</table>
| Create a flow-monitoring exporter and specify the IP address and UDP port of the NetFlow collector. | vyatta@R1# set service flow-monitoring exporter foo udp-collector address 10.10.1.2  
vyatta@R1# set service flow-monitoring exporter foo udp-collector port 9995 |
| Create a packet selector named foo and specify a sampling size of 10 packets. The sampling rate in this case is 1:10, which means that the router randomly selects one packet from every 10 packets that flow through any data plane interface with which the selector is associated. | vyatta@R1# set service flow-monitoring selector foo randomly out-of 10 |
| Create a packet aggregator named foo and specify an expiration time of 1,800 seconds for active flows and 15 seconds for inactive flows. | vyatta@R1# set service flow-monitoring aggregator foo expiration inactive-timeout 15  
vatta@R1# set service flow-monitoring aggregator foo expiration active-timeout 1800 |
| Connect the aggregator to the exporter.                             | vyatta@R1# set service flow-monitoring aggregator foo next exporter foo |
TABLE 21 Configuring the flow-monitoring service (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the aggregation rule for the foo aggregator.</td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key destinationIPv4Address</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key destinationTransportPort</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key ipClassOfService</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key protocolIdentifier</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key sourceIPv4Address</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo key sourceTransportPort</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key bgpDestinationAsNumber</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key bgpSourceAsNumber</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key destinationIPv4PrefixLength</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key egressInterface</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key flowEndMilliseconds</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key flowStartMilliseconds</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key ipNextHopIPv4Address</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key octetDeltaCount</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key packetDeltaCount</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key sourceIPv4PrefixLength</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set service flow-monitoring aggregator foo non-key tcpControlBits</code></td>
</tr>
<tr>
<td>Apply the foo selector and foo aggregator to the dp0p1s1 data plane interface.</td>
<td><code>vyatta@R1# set interfaces dataplane dp0p1s1 flow-monitoring selector foo</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# set interfaces dataplane dp0p1s1 flow-monitoring aggregator foo</code></td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td><code>vyatta@R1# commit</code></td>
</tr>
<tr>
<td>Save the configuration.</td>
<td><code>vyatta@R1# save</code></td>
</tr>
<tr>
<td>Verify the configuration.</td>
<td><code>vyatta@R1# show interfaces interfaces {</code></td>
</tr>
<tr>
<td></td>
<td><code>dataplane dp0p1s1 {</code></td>
</tr>
<tr>
<td></td>
<td><code>address 10.10.1.1/24</code></td>
</tr>
<tr>
<td></td>
<td><code>flow-monitoring {</code></td>
</tr>
<tr>
<td></td>
<td><code>aggregator foo</code></td>
</tr>
<tr>
<td></td>
<td><code>selector foo</code></td>
</tr>
<tr>
<td></td>
<td><code>} </code></td>
</tr>
<tr>
<td></td>
<td><code>}</code></td>
</tr>
<tr>
<td></td>
<td><code>vyatta@R1# show services service {</code></td>
</tr>
<tr>
<td></td>
<td><code>flow-monitoring {</code></td>
</tr>
<tr>
<td></td>
<td><code>exporter foo {</code></td>
</tr>
<tr>
<td></td>
<td><code>udp-collector {</code></td>
</tr>
<tr>
<td></td>
<td><code>address 10.10.1.2</code></td>
</tr>
<tr>
<td></td>
<td><code>port 9995</code></td>
</tr>
<tr>
<td></td>
<td><code>} </code></td>
</tr>
<tr>
<td></td>
<td><code>}</code></td>
</tr>
</tbody>
</table>
TABLE 21 Configuring the flow-monitoring service (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>selector foo {</td>
</tr>
<tr>
<td></td>
<td>randomly {</td>
</tr>
<tr>
<td></td>
<td>out-of 10</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
<tr>
<td></td>
<td>aggregator foo {</td>
</tr>
<tr>
<td></td>
<td>aggregator statistics: {</td>
</tr>
<tr>
<td></td>
<td>flows in cache: 18</td>
</tr>
<tr>
<td></td>
<td>expired flows: 180</td>
</tr>
<tr>
<td></td>
<td>expiration {</td>
</tr>
<tr>
<td></td>
<td>active-timeout 1800</td>
</tr>
<tr>
<td></td>
<td>inactive-timeout 15</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
<tr>
<td></td>
<td>next {</td>
</tr>
<tr>
<td></td>
<td>exporter foo</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
<tr>
<td></td>
<td>rule {</td>
</tr>
<tr>
<td></td>
<td>key destinationIPv4Address</td>
</tr>
<tr>
<td></td>
<td>key destinationTransportPort</td>
</tr>
<tr>
<td></td>
<td>key ingressInterface</td>
</tr>
<tr>
<td></td>
<td>key ipClassOfService</td>
</tr>
<tr>
<td></td>
<td>key protocolIdentifier</td>
</tr>
<tr>
<td></td>
<td>key sourceIPv4Address</td>
</tr>
<tr>
<td></td>
<td>key sourceTransportPort</td>
</tr>
<tr>
<td></td>
<td>non-key bgpDestinationAsNumber</td>
</tr>
<tr>
<td></td>
<td>non-key bgpSourceAsNumber</td>
</tr>
<tr>
<td></td>
<td>non-key destinationIPv4PrefixLength</td>
</tr>
<tr>
<td></td>
<td>non-key egressInterface</td>
</tr>
<tr>
<td></td>
<td>non-key flowEndMilliseconds</td>
</tr>
<tr>
<td></td>
<td>non-key flowStartMilliseconds</td>
</tr>
<tr>
<td></td>
<td>non-key ipNextHopIPv4Address</td>
</tr>
<tr>
<td></td>
<td>non-key octetDeltaCount</td>
</tr>
<tr>
<td></td>
<td>non-key packetDeltaCount</td>
</tr>
<tr>
<td></td>
<td>non-key sourceIPv4PrefixLength</td>
</tr>
<tr>
<td></td>
<td>non-key tcpControlBits</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
</tbody>
</table>

Exit the configuration mode.

vyatta@R1# exit

Show exporter statistics.

vyatta@R1:~$ show flow-monitoring
dataplane statistics:
  interface dp0p1s1:
    monitor default:
      packets observed: 884
      samples taken: 88

export daemon statistics:
  /exporter/default:
    /monitor/mon1/ipv4:
      reports received: 88
    reports exported: 88
  /monitor/mon1/ipv6:
    reports received: 0
    reports exported: 0

NOTE
If a data plane interface fails to gather samples because of resource constraints, show flow-monitoring on page 197 displays the number of lost samples in the samples lost field (under the samples taken field) in the output.
Flow Monitoring Commands

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- interfaces dataplane <interface> flow-monitoring exporter <exporter-name> ................................................................. 183
- interfaces dataplane <interface> flow-monitoring selector <selector-name> ................................................................. 184
- service flow-monitoring aggregator <aggregator-name> expiration <active-timeout | inactive-timeout> .......................... 185
- service flow-monitoring aggregator <aggregator-name> hashtable-bits ................................................................. 186
- service flow-monitoring aggregator <aggregator-name> next <aggregator | exporter> ........................................... 187
- service flow-monitoring aggregator <aggregator-name> rule <key | non-key> ............................................................. 188
- service flow-monitoring exporter <exporter-name> udp-collector address <ip-address> .......................................... 189
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- show flow-monitoring .................................................................................................................................................. 197
interfaces dataplane <interface> flow-monitoring aggregator <aggregator-name>

Defines flow-monitoring aggregator on a data plane interface.

Syntax

set interfaces dataplane interface flow-monitoring aggregator aggregator-name
delete interfaces dataplane interface flow-monitoring aggregator aggregator-name
show interfaces dataplane interface flow-monitoring aggregator aggregator-name

Command Default
None

Parameters

interface
Data plane interface. For more information about data plane interfaces, refer to Brocade 5600 vRouter LAN Interfaces Reference Guide.

aggregator-name
Name of a flow-aggregator.

Modes
Configuration mode

Configuration Statement

```
interfaces {
  dataplane interface {
    flow-monitoring {
      aggregator aggregator-name
    }
  }
}
```

Usage Guidelines
Use the set form of this command to define a flow-monitoring aggregator on a data plane interface.
Use the delete form of this command to remove a flow-monitoring aggregator from the data plane interface.
Use the show form of this command to display the name of flow-monitoring aggregator for a data plane interface.
interfaces dataplane <interface> flow-monitoring exporter <exporter-name>

Defines flow-monitoring exporter on a data plane interface.

Syntax

set interfaces dataplane interface flow-monitoring exporter exporter-name
delete interfaces dataplane interface flow-monitoring exporter exporter-name
show interfaces dataplane interface flow-monitoring exporter exporter-name

Command Default

None

Parameters

interface
    A data plane interface. For more information about data plane interfaces, refer to Brocade 5600 vRouter LAN Interfaces Reference Guide.

exporter-name
    Name of a flow exporter.

Modes

Configuration mode

Configuration Statement

interfaces {
  dataplane interface {
    flow-monitoring {
      exporter exporter-name
    }
  }
}

Usage Guidelines

Use the set form of this command to define a flow-monitoring exporter on a data plane interface.
Use the delete form of this command to remove a configured flow-monitoring exporter from the data plane interface.
Use the show form of this command to display the name of a configured exporter for a data plane interface.
interfaces dataplane <interface> flow-monitoring selector <selector-name>

Associates a packet selector with a data plane interface through which the traffic to be monitored flows.

Syntax

set interfaces dataplane interface flow-monitoring selector selector-name
delete interfaces dataplane interface flow-monitoring selector selector-name
show interfaces dataplane interface flow-monitoring

Parameters

interface
A data plane interface. For more information about data plane interfaces, refer to Brocade 5600 vRouter LAN Interfaces Reference Guide.

selector-name
The name of a packet selector.

Modes

Configuration mode

Configuration Statement

interfaces {
  dataplane interface {
    flow-monitoring {
      selector selector-name
    }
  }
}

Usage Guidelines

Use the set form of this command to associate a packet selector with a data plane interface through which the traffic to be monitored flows.

Use the delete form of this command to disassociate a packet selector from a data plane interface.

Use the show form of this command to display the name of the configured selector for a data plane interface.
**service flow-monitoring aggregator <aggregator-name> expiration <active-time-out | inactive-timeout>**

Specifies the aggregator expiration of a Netflow collector.

**Syntax**

```plaintext
set service flow-monitoring aggregator aggregator-name expiration { active-timeout timeout-seconds | inactive-timeout timeout-seconds }

delete service flow-monitoring exporter exporter-name expiration

show service flow-monitoring exporter exporter-name
```

**Command Default**

The default timeout value is 0 seconds. The default values of 0 means that flows are expired immediately.

**Parameters**

- **aggregator-name**
  Name of the flow-aggregator.
- **active-timeout timeout-seconds**
  Expiration timeout in seconds for long-lasting flows.
- **inactive-timeout timeout-seconds**
  Expiration timeout in seconds for idle or inactive flows.

**NOTE**
Typically, you can use 15 for the inactive-timeout and 3600 for the active-timeout. Ensure that the active-timeout is greater than the inactive-timeout.

**Configuration mode**

**Configuration Statement**

```plaintext
service {
  flow-monitoring {
    exporter aggregator-name{
      expiration {
        active-timeout timeout-seconds
        inactive-timeout timeout-seconds
      }
    }
  }
}
```

**Usage Guidelines**

Use the `set` form of this command to specify the aggregator expiration to a Netflow collector.

Use the `delete` form of this command to remove the aggregator expiration from a NetFlow collector.

Use the `show` form of this command to display the aggregator expiration configuration of a NetFlow collector.
service flow-monitoring aggregator <aggregator-name> hashtable-bits

Specifies the length of hashtable used for aggregation in bits for the Netflow collector.

Syntax

set service flow-monitoring aggregator aggregator-name hashtable-bits bit-length
delete service flow-monitoring aggregator aggregator-name hashtable-bits
show service flow-monitoring aggregator aggregator-name

Command Default

The default hashtable-bits size is 17.

Parameters

aggregator-name
The name of the flow-aggregator.

bit-length
Length of the hashtable used for aggregation in bits. The number ranges from 1 through 32.

Modes

Configuration mode

Configuration Statement

service {
  flow-monitoring {
    exporter aggregator-name{
      hashtable-bits {
        bit-length
      }
    }
  }
}

Usage Guidelines

Use the set form of this command to specify the length of the hashtable used for aggregation
Use the delete form of this command to remove the hashtable-bit length.
Use the show form of this command to display the aggregator configuration
service flow-monitoring aggregator <aggregator-name> next <aggregator | exporter>

Specifies the next flow-monitoring module for a Netflow collector.

Syntax

set service flow-monitoring aggregator aggregator-name next { aggregator aggregator-name | exporter exporter-name
delete service flow-monitoring aggregator aggregator-name next { aggregator aggregator-name | exporter exporter-name
show service flow-monitoring aggregator aggregator-name

Command Default

None

Parameters

aggregator-name
Name of a flow-aggregator.

aggregator aggregator-name
Name of an aggregator for the next flow-monitoring module.

exporter exporter-name
Name of an exporter for the next flow-monitoring module.

Modes

Configuration mode

Configuration Statement

```
service {
  flow-monitoring {
    exporter aggregator-name{
      next {
        aggregator aggregator-name
        exporter exporter-name
      }
    }
  }
}
```

Usage Guidelines

Use the set form of this command to specify the next flow-monitoring module for a Netflow collector.

Use the delete form of this command to remove the next flow-monitoring module of a Netflow collector.

Use the show form of this command to display the aggregator of a Netflow collector.
service flow-monitoring aggregator <aggregator-name> rule <key | non-key>

Defines an aggregator rule of a Netflow collector.

Syntax

set service flow-monitoring aggregator aggregator-name rule { key key-value | non-key key-value }
delete service flow-monitoring aggregator aggregator-name rule { key key-value | non-key key-value }
show service flow-monitoring aggregator aggregator-name

Command Default

None

Parameters

aggregator-name
Name of the flow-aggregator.

key key-value
Specifies a key field on which to aggregate.

non-key key-value
Specifies a nonkey field to collect

NOTE
For more information about key values, refer to Exported NetFlow Version 9 and IPFIX (RFC 7011) tables for IPv4 and IPv6 data in Flow Monitoring overview on page 175.

Modes

Configuration mode

Configuration Statement

service {
  flow-monitoring {
    exporter aggregator-name{
      rule {
        key key-field
        non-key key-field
      }
    }
  }
}

Usage Guidelines

Use the set form of this command to specify the aggregator rule of a Netflow collector.

Use the delete form of this command to remove the aggregator rule from a NetFlow collector.

Use the show form of this command to display the aggregator rule of a Netflow collector.
service flow-monitoring exporter <exporter-name> udp-collector address <ip-address>

Specifies the IPv4 or IPv6 address of the NetFlow collector.

Syntax

set service flow-monitoring exporter udp-collector address ip-address
delete service flow-monitoring exporter udp-collector address ip-address
show service flow-monitoring exporter udp-collector

Parameters

exporter-name
   Specifies the name of the exporter.

ip-address
   IPv4 or IPv6 address of the collector.

Modes

Configuration mode

Configuration Statement

```
service {
   flow-monitoring {
      exporter {
         udp-collector {
            address ip-address
         }
      }
   }
}
```

Usage Guidelines

Use the set form of this command to specify the IPv4 or IPv6 address of the NetFlow collector.
Use the delete form of this command to remove the IP address form the NetFlow collector.
Use the show form of this command to display the configured IP address of the NetFlow collector.
service flow-monitoring exporter <exporter-name> max-record-rate
   Specifies the maximum number of flow records that are sent each second to a Netflow collector.

Syntax
   set service flow-monitoring exporter exporter-name max-record-rate record-per-second
   delete service flow-monitoring exporter exporter-name max-record-rate
   show service flow-monitoring exporter exporter-name

Command Default
   The default number of records is zero, which means that there is no limit and as many records as are available are sent without delay.

Parameters
   exporter-name
      Name of the flow-exporter.
   record-per-second
      Maximum number of flow records that are sent each second to the Netflow collector. The number ranges from 0 through 4294967295.

Modes
   Configuration mode

Configuration Statement
   service {
      flow-monitoring {
         exporter exporter-name{
            max-record-rate {
               record-per-second
            }
         }
      }
   }

Usage Guidelines
   Use the set form of this command to specify the maximum number of flow records that are sent each second to a Netflow collector.
   Use the delete form of this command to remove the number of flow records that are sent each second to a NetFlow collector.
   Use the show form of this command to display the number of flow records that are sent each second to a NetFlow collector.
service flow-monitoring exporter <exporter-name> protocol-version NFV9 | IPFIX

Specifies the protocol version of the Netflow collector.

Syntax

set service flow-monitoring exporter exporter-name protocol-version { NFV9 | IPFIX }
delete service flow-monitoring exporter exporter-name protocol-version { NFV9 | IPFIX }
show service flow-monitoring exporter exporter-name

Command Default

The default protocol version is NFV9.

Parameters

exporter-name

Name of the flow-exporter.

IPFIX

Specifies IPFIX flow-monitoring export control.

NFV9

Specifies NFV9 flow-monitoring export control.

Modes

Configuration mode

Configuration Statement

```
service {
  flow-monitoring {
    exporter exporter-name{
      protocol-version {
        IPFIX
        NFV9
      }
    }
  }
}
```

Usage Guidelines

Use the set form of this command to specify the protocol version of a NetFlow collector.

Use the delete form of this command to remove the protocol version from a NetFlow collector.

Use the show form of this command to display the configured protocol version of a NetFlow collector.
service flow-monitoring exporter <exporter-name> template-refresh-interval

Specifies the interval for sending the templates periodically.

Syntax

set service flow-monitoring exporter exporter-name template-refresh-interval interval
delete service flow-monitoring exporter exporter-name template-refresh-interval interval
show service flow-monitoring exporter exporter-name

Command Default

The default template-refresh-interval is 20 seconds.

Parameters

exporter-name

The name of the flow-exporter.

interval

Interval time for sending the templates periodically. The time interval ranges from 1 through 3600 seconds.

Modes

Configuration mode

Configuration Statement

```
service {
    flow-monitoring {
        exporter exporter-name{
            template-refresh-interval {
                interval
            }
        }
    }
}
```

Usage Guidelines

Use the set form of this command to specify the interval for sending the templates periodically.
Use the delete form of this command to remove the protocol-version of the NetFlow collector.
Use the show form of this command to display the configured interval for sending the templates periodically.
service flow-monitoring exporter <exporter-name> udp-collector mtu <udp-mtu>

  Specifies the UDP MTU size of a Netflow collector.

Syntax

set service flow-monitoring exporter exporter-name udp-collector mtu udp-mtu
delete service flow-monitoring exporter exporter-name udp-collector mtu udp-mtu
show service flow-monitoring exporter exporter-name

Command Default

  The default size is 1400.

Parameters

  exporter-name
  
  Name of the flow exporter.

  udp-mtu
  
  UDP MTU size of the collector. The size ranges from 92 through 65535.

Modes

  Configuration mode

Configuration Statement

  service {
    flow-monitoring {
      exporter exporter-name{
        udp-collector {
          mtu udp-mtu
        }
      }
    }
  }

Usage Guidelines

  Use the **set** form of this command to specify the UDP MTU size of a NetFlow collector.
  
  Use the **delete** form of this command to specify the default MTU size, which is 1400.
  
  Use the **show** form of this command to display the UDP MTU size of the NetFlow collector.
service flow-monitoring exporter <exporter-name> udp-collector port <udp-port>

Specifies UDP port for the NetFlow collector.

Syntax

- set service flow-monitoring exporter udp-collector port <udp-port>
- delete service flow-monitoring exporter udp-collector port <udp-port>
- show service flow-monitoring exporter udp-collector

Command Default

None

Parameters

- exporter-name
  Specifies the name of the exporter.
- udp-port
  UDP port number of the collector. The number ranges from 0 through 65535.

Modes

Configuration mode

Configuration Statement

```
service {
  flow-monitoring {
    exporter {
      udp-collector {
        port udp-port
      }
    }
  }
}
```

Usage Guidelines

- Use the `set` form of this command to specify a UDP port of the NetFlow collector.
- Use the `delete` form of this command to delete the UDP port number.
- Use the `show` form of this command to display the UDP port for the NetFlow collector.
service flow-monitoring selector <selector-name> randomly out-of <num-of-packets>

Creates a random-packet selector and specifies the size of the packet sample window from which to select a packet.

Syntax

set service flow-monitoring selector selector-name randomly out-of num-of-packets
delete service flow-monitoring selector selector-name randomly out-of num-of-packets
show service flow-monitoring selector

Command Default

The default size of the packet sample is 1000.

Parameters

selector-name

The name of the packet selector.

num-of-packets

The size of the packet sample window from which to select a packet. The size ranges from 10 through 10000.

Modes

Configuration mode

Configuration Statement

```
service {
  flow-monitoring {
    selector selector-name {
      randomly {
        out-of num-of-packets
      }
    }
  }
}
```

Usage Guidelines

This command randomly samples packets. For example, for a 1:100 sampling, the Brocade vRouter randomly calculates a number from 1 through 100, say 63. When the sixty-third packet arrives at the data plane interface that is being monitored, the router extracts the NetFlow packet details and sends them to the NetFlow collector. The router ignores the remaining 37 packets of the sampling window (packets 64 through 100), then the router repeats the process of sampling packets.

Use the set form of this command to create a random-packet selector and specify the sample size.

Use the delete form of this command to delete the random-packet selector.

Use the show form of this command to display the details of the configured random-packet selector.
clear flow-monitoring

Clears the flow-monitoring statistics.

Syntax

clear flow-monitoring

Modes

Operational mode

Usage Guidelines

Use this command to clear the flow-monitoring statistics that have been gathered by the Flow Monitoring service.
show flow-monitoring
Displays the flow-monitoring statistics.

Syntax
show flow-monitoring

Modes
Operational mode

Usage Guidelines
Use this command to display the flow-monitoring statistics that have been gathered by the Flow Monitoring service.

Examples
The following example shows how to display flow-monitoring configuration information and usage statistics.

vyatta@vyatta:$ show flow-monitoring
dataplane statistics:
    interface dp0s3:
        monitor default:
            packets observed: 128352
            samples taken: 1283
    interface dp0s4:
        monitor default:
            packets observed: 2243
            samples taken: 224

aggregator statistics:
    aggregator foo:
        flows in cache: 18
        expired flows: 180
    aggregator bar:
        flows in cache: 6
        expired flows: 46

exporter statistics:
    exporter alice:
        samples exported: 1097
        flows exported: 180
        flow packets sent: 180
    exporter bob:
        samples exported: 192
        flows exported: 46
        flow packets sent: 46
    exporter fred:
        samples exported: 1289
        flows exported: 226
        flow packets sent: 180
LLDP overview

LLDP is an open standard for network devices to communicate link-layer topology and connection endpoint information on IEEE 802 (Ethernet) LANs and MANs. LLDP is described in the IEEE standards document 802.1AB, *Station and Media Access Control Connectivity Discovery*. It allows a station on the network to advertise information about its capabilities, configuration, and identity to other LLDP-enabled stations on the same physical network. This information is stored in the device as a standard management information base (MIB) as specified in RFC 2922. A network management system can query these MIBs using SNMP to model the topology of the network.

Configuring LLDP

To enable LLDP on a Brocade vRouter, you must enable the service by setting its configuration node, as in the following example.

**TABLE 22** Enabling LLDP on a system

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create the LLDP service configuration node.</td>
<td>vyatta@vyatta# set service lldp</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@vyatta# commit</td>
</tr>
</tbody>
</table>

After the service is enabled, you can record information about the location, management address, and port of the device and the legacy protocols it supports. Additional information, including the configured capabilities and neighbors of the system, is extracted automatically from the system and stored in a MIB.

The following example shows how to configure a civic-based location for the system, as follows:

Suite 200 - 1301 Shoreway Road
Belmont, CA, USA
94002-4157

**TABLE 23** Configuring a civic-based location for LLDP

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the language.</td>
<td>vyatta@vyatta# set service lldp interface dp0plp1 location civic-based ca-type 0 ca-value English</td>
</tr>
<tr>
<td>Configure the occupant.</td>
<td>vyatta@vyatta# set service lldp interface dp0plp1 location civic-based ca-type 23 ca-value &quot;Vyatta, Inc. Corporate Headquarters&quot;</td>
</tr>
<tr>
<td>Configure the suite number.</td>
<td>vyatta@vyatta# set service lldp interface dp0plp1 location civic-based ca-type 26 ca-value &quot;Suite 200&quot;</td>
</tr>
</tbody>
</table>
### TABLE 23 Configuring a civic-based location for LLDP (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the floor number.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p1 location civic-based ca-type 27 ca-value 2nd</code></td>
</tr>
<tr>
<td>Configure the street address.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p1 location civic-based ca-type 6 ca-value “1301 Shoreway Road”</code></td>
</tr>
<tr>
<td>Configure the city.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p1 location civic-based ca-type 3 ca-value Belmont</code></td>
</tr>
<tr>
<td>Configure the country.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p1 location country-code US</code></td>
</tr>
<tr>
<td>Configure the ZIP code.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p1 location civic-based ca-type 24 ca-value 94002-4157</code></td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td><code>vyatta@vyatta#commit</code></td>
</tr>
<tr>
<td>Show the LLDP configuration.</td>
<td><code>vyatta@vyatta#show service lldp</code></td>
</tr>
</tbody>
</table>

```plaintext
interface dp0p1p1 {
    location {
        civic-based {
            ca-type 0 {
                ca-value English
            }
            ca-type 3 {
                ca-value Belmont
            }
            ca-type 6 {
                ca-value “1301 Shoreway Road”
            }
            ca-type 23 {
                ca-value “Vyatta, Inc. Corporate Headquarters”
            }
            ca-type 24 {
                ca-value 94002-4157
            }
            ca-type 26 {
                ca-value “Suite 200”
            }
            ca-type 27 {
                ca-value 2nd
            }
        }
        country-code US
    }
}
```

The location can be coordinate-based rather than civic-based, as shown in the following example.

### TABLE 24 Configuring the physical coordinates of a system

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the latitude coordinate.</td>
<td><code>vyatta@vyatta#set service lldp interface dp0p1p4 location coordinate-based latitude 37.524449N</code></td>
</tr>
</tbody>
</table>
### Configuring the physical coordinates of a system (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure the longitude coordinate.</td>
<td>vyatta@vyatta#set service lldp interface dp0p1p4 location coordinate-based longitude 122.267255W</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@vyatta#commit</td>
</tr>
<tr>
<td>Show the LLDP configuration for the dp0p1p4 interface.</td>
<td>vyatta@vyatta#show service lldp interface dp0p1p4 location { coordinate-based { latitude 37.524449N longitude 122.267255W } }</td>
</tr>
</tbody>
</table>

### Displaying LLDP information

When the system is enabled for LLDP, it can gather and display information about link-layer neighbors, as shown below.

#### Showing LLDP neighbors

```
vyatta@vyatta:~$show lldp neighbors
Capability Codes: R - Router, B - Bridge, W - Wlan r - Repeater, S - Station
                 D - Docsis, T - Telephone, O - Other
Device ID        Local     Proto  Cap   Platform             Port ID
---------        -----     -----  ---   --------             -------
R1               dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
R2               dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
HNF-BFD2         dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
HNF-BF           dp0p192p1 LLDP   RS    Vyatta Router      dp0p192p1
HNF-BFD2         dp0p224p1 LLDP   RS    Vyatta Router      dp0p224p1
```

The following example shows detailed information on LLDP neighbors.

#### Showing detailed information on LLDP neighbors

```
vyatta@vyatta:~$show lldp neighbors detail
-------------------------------------------------------------------
LLDP neighbors:                                                                                                           
-------------------------------------------------------------------
.Interface: dp0p160p1, via: LLDP, RID: 1, Time: 0 day, 01:12:52   
Chassis:                                                                                                                  
   ChassisID: mac 00:0c:29:e6:b1:7d                                 
   SysName: R1                                                     
   SysDescr: Vyatta Router running on Brocade 5600 vRouter 3.5 R5 
   MgmtIP: 10.37.108.1                                            
   MgmtIP: 3000:1:2::1                                            
   Capability: Bridge, off                                       
   Capability: Router, on                                        
   Capability: Wlan, off                                         
   Capability: Station, on                                       
Port:                                                                                                                     
   PortID: mac 00:0c:29:e6:b1:7d                                 
   PortDescr: dp0p160p1                                           
   PMD autoneg: supported: no, enabled: yes                      
   MAU oper type: 10GigBaseR - R PCS/PMA, unknown PMD.            
LLDP-MED:                                                                                                                 
```
Device Type: Network Connectivity Device
Capability: Capabilities
Capability: Policy
Capability: Location
Capability: MDI/PSE
Capability: MDI/PD
Capability: Inventory
Inventory:
  Hardware Revision: None
  Software Revision: 3.14.48-1-amd64-vyatta
  Firmware Revision: 6.00
  Serial Number: VMware-56 4d 2d b2 65 00 db-1
  Manufacturer: VMware, Inc.
  Model: VMware Virtual Platform
  Asset ID: No Asset Tag
-------------------------------------------------------------------
Interface: dp0p160p1, via: LLDP, RID: 2, Time: 0 day, 01:12:52
Chassis:
  ChassisID: mac 00:0c:29:44:dc:65
  SysName: R2
  SysDescr: Vyatta Router running on Brocade 5600 vRouter 3.5 R5
  MgmtIP: 10.37.108.3
  MgmtIP: 3000:2:4::1
  Capability: Bridge, off
  Capability: Router, on
  Capability: Wlan, off
  Capability: Station, on
Port:
  PortID: mac 00:0c:29:44:dc:65
  PortDescr: dp0p160p1
  PMD autoneg: supported: no, enabled: yes
  MAU oper type: 10GigBaseR - R PCS/PMA, unknown PMD.
LLDP-MED:
Device Type: Network Connectivity Device
Capability: Capabilities
Capability: Policy
Capability: Location
Capability: MDI/PSE
Capability: MDI/PD
Capability: Inventory
Inventory:
  Hardware Revision: None
  Software Revision: 3.14.48-1-amd64-vyatta
  Firmware Revision: 6.00
  Serial Number: VMware-56 4d 2d b2 65 00 db-1
  Manufacturer: VMware, Inc.
  Model: VMware Virtual Platform
  Asset ID: No Asset Tag
-------------------------------------------------------------------
LLDP Commands

- service lldp.................................................................................................................................................................................................................................204
- service lldp interface <interface> location civic-based.........................................................................................................................................................205
- service lldp interface <interface> location coordinate-based........................................................................................................................................................................207
- service lldp interface <interface> location elin <phone-num>........................................................................................................................................................................209
- service lldp legacy-protocols <protocol>.............................................................................................................................................................................210
- service lldp management-address <ipv4>.............................................................................................................................................................................211
- show lldp neighbors.......................................................................................................................................................................................................212
service lldp
   Enables the LLDP service.

Syntax
   set service lldp
   delete service lldp
   show service lldp

Modes
   Configuration mode

Configuration Statement
   service {
      lldp {}
   }

Usage Guidelines
   Use this command to enable LLDP on the system.
   Use the set form of this command to enable the LLDP service.
   Use the delete form of this command to disable the LLDP service.
   Use the show form of this command to display configuration of the LLDP service.
service lldp interface <interface> location civic-based

Records a civic-based location for an LLDP-enabled device.

Syntax

set service lldp interface interface location civic-based [ ca-type type ca-value value | country-code code ]
delete service lldp interface interface location civic-based ca-type type ca-value
show service lldp interface interface location civic-based ca-type type ca-value

Parameters

interface
An interface to which the configured information applies. The name of any IEEE 802.1-compatible interface or the all keyword, where all refers to all 802.1-compatible interfaces.

cia-type type
Multinode. Records a civic address type as defined in the ANSI document. The type is one of the following:

- 0 — Language
- 1 — National subdivisions
- 2 — County, parish, district
- 3 — City, township
- 4 — City division, borough, ward
- 5 — Neighborhood, block
- 6 — Street
- 16 — Leading street direction
- 17 — Trailing street suffix
- 18 — Street suffix
- 19 — House number
- 20 — House number suffix
- 21 — Landmark or vanity address
- 22 — Additional location info
- 23 — Name
- 24 — Postal or ZIP code
- 25 — Building
- 26 — Unit
- 27 — Floor
- 28 — Room number
- 29 — Place type
- 128 — Script

You can record multiple civic address components by creating multiple ca-type and ca-value pairs, where each pair represents a different component.

cia-value value
The value for the specified civic address type.

**country-code code**
A two-letter code, as defined in ISO 3166, representing the country in which the device is located.

**Modes**
Configuration mode

**Configuration Statement**
```
service {
  lldp {
    interface interface {
      location {
        civic-based {
          ca-type type {
            ca-value value
          }
          country-code code
        }
      }
    }
  }
}
```

**Usage Guidelines**
Use this command to record the components of a civic address identifying the location of the device. A civic address-based location requires a country code and at least one **ca-type** and **ca-value** pair.

Use the **set** form of this command to specify a component of a civic address.

Use the **delete** form of this command to remove civic address configuration.

Use the **show** form of this command to show civic address component configuration.
service lldp interface <interface> location coordinate-based

Records a coordinate-based location for an LLDP-enabled device.

Syntax

set service lldp interface interface location coordinate-based [ altitude altitude | datum datum | latitude latitude | longitude longitude ]

delete service lldp interface interface location coordinate-based [ altitude | datum | latitude | longitude ]

show service lldp interface interface location coordinate-based [ altitude | datum | latitude | longitude ]

Command Default

No location is configured.

Parameters

interface
An interface to which the configured information applies. The name of any IEEE 802.1-compatible interface can be specified or the all keyword, where all refers to all 802.1-compatible interfaces.

altitude altitude
Specifies the altitude, in meters, of the device. The default altitude is 0.

datum datum
Specifies the reference datum for the coordinate system. The datum is WGS84, NAD83, or MLLW. The default datum is WGS84.

latitude latitude
Specifies the latitude of the device. The format for the latitude is deg.minD where deg is degrees, min is minutes to any level of precision, and D is N or S, representing North or South, respectively; for example 37.524449N.

longitude longitude
The longitude of the device. The format is deg.minD, where deg is degrees, min is minutes to any level of precision, and D is E or W, representing East or West, respectively; for example, 122.267255W.

Modes

Configuration mode

Configuration Statement

service {
  lldp {
    interface interface {
      location {
        coordinate-based {
          altitude altitude
          datum datum
          latitude latitude
          longitude longitude
        }
      }
    }
  }
}
Usage Guidelines

Use this command to specify a location for a device based on its coordinates.

When a coordinate-based location is used, both the latitude and longitude must be configured; other values are optional.

Use the **set** form of this command to specify a coordinate-based location.

Use the **delete** form of this command to remove a coordinate-based location and restore any default values.

Use the **show** form of this command to show coordinate-based configuration.
service lldp interface <interface> location elin <phone-num>

Records an emergency line identification number (ELIN) for an LLDP-enabled device.

Syntax

- set service lldp interface interface location elin phone-num
- delete service lldp interface interface location elin
- show service lldp interface interface location elin

Parameters

- **interface**
  An interface to which the configured information applies. The name of any IEEE 802.1-compatible interface or the `all` keyword, where `all` refers to all 802.1-compatible interfaces.

- **phone-num**
  An emergency line identification number. The number is a 10-to-25-digit phone number. A phone number with fewer than 10 digits must be padded with zeros; for example, 911 must be represented as 0000000911.

Modes

- Configuration mode

Configuration Statement

```plaintext
service {
  lldp {
    interface interface {
      location {
        elin phone-num
      }
    }
  }
}
```

Usage Guidelines

- Use this command to specify an emergency call service ELIN.
- Use the **set** form of this command to record an ELIN.
- Use the **delete** form of this command to remove the ELIN.
- Use the **show** form of this command to display the ELIN.
service lldp legacy-protocols <protocol>
   Specifies which legacy (proprietary) link-layer discovery protocols to support in addition to LLDP.

Syntax
   set service lldp legacy-protocol protocol
   delete service lldp legacy-protocol protocol
   show service lldp legacy-protocol

Parameters
   protocol
      Multinode. A proprietary link-layer discovery protocol. The protocol is one of the following:
      cdp —Cisco Discovery Protocol
      edp —Extreme Discovery Protocol
      fdp —Foundry Discovery Protocol
      sonmp —Nortel Discovery Protocol
      You can enable support for multiple legacy protocols by creating multiple legacy-protocol configuration nodes.

Modes
   Configuration mode

Configuration Statement
   service {
      lldp {
         legacy-protocol protocol
      }
   }

Usage Guidelines
   Use this command to specify a legacy (proprietary) link-layer discovery protocol to support in addition to LLDP.
   If a frame from one of the specified protocols is received on an interface, the system begins to send frames for that protocol on
   the interface.
   Use the set form of this command to enable support for a legacy protocol.
   Use the delete form of this command to disable support for a legacy protocol.
   Use the show form of this command to show legacy protocol configuration.
service lldp management-address <ipv4>
Records the management address of the system.

Syntax

set service lldp management-address ipv4
delete service lldp management-address
show service lldp management-address

Command Default
The system automatically determines which address to advertise as the management address.

Parameters

ipv4
The IP address of the management system. The address must be an IPv4 address.

Modes
Configuration mode

Configuration Statement

service {
  lldp {
    management-address ipv4
  }
}

Usage Guidelines
Use this command to specify the IP address to be advertised as the management address by LLDP.
Use the set form of this command to set the management address.
Use the delete form of this command to restore the default behavior, that is, the system automatically determines which address to advertise as the management address.
Use the show form of this command to show LLDP management address configuration.
show lldp neighbors

Displays a summary of link layer neighbors that are running LLDP.

Syntax

```plaintext
show lldp neighbors [ detail ]
```

Command Default

When used with no option, this command displays a summary of information about link layer neighbors.

Parameters

- **detail**
  Optional. Displays detailed information about link layer neighbors.

Modes

Operational mode

Usage Guidelines

Use this command to display information about link layer neighbors that are running LLDP.

If support for any legacy link-layer discovery protocol has been enabled (using `service lldp legacy-protocols <protocol>` on page 210), the system also displays neighbors discovered using that protocol.

Examples

The following example shows how to display a summary of link layer neighbors.

```
vyatta@vyatta:~$show lldp neighbors

Capability Codes: R - Router, B - Bridge, W - Wlan r - Repeater, S - Station
                  D - Docsis, T - Telephone, O - Other

Device ID        Local     Proto  Cap   Platform             Port ID
---------        -----     -----  ---   --------             -------
R1             dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
R2             dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
HNF-BFD2       dp0p160p1 LLDP   RS    Vyatta Router      dp0p160p1
HNF-BF         dp0p192p1 LLDP   RS    Vyatta Router      dp0p192p1
HNF-BFD2       dp0p224p1 LLDP   RS    Vyatta Router      dp0p224p1
```

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The following example shows how to display details of link layer neighbors.

```
vtyta@vyatta:~$show lldp neighbors detail
-------------------------------------------------------------------------------
LLDP neighbors:                                                                 
-------------------------------------------------------------------------------
Interface:    dp0p1p1, via: CDPv1, RID: 3, Time: 0 day, 00:19:34
Chassis:      
   ChassisID:    local medusa
   SysName:      medusa
   SysDescr:     cisco 2511 running on Cisco Internetwork Operating System Software
   IOS (tm) 2500 Software (C2500-I-L), Version 12.0(14), RELEASE SOFTWARE (fc1)
   Copyright (c) 1986-2000 by cisco Systems, Inc.
   Compiled Tue 31-Oct-00 23:59 by linda
   MgmtIP:       10.1.0.9
   Capability:   Router, on
   Port:         
      PortID:       ifname Ethernet0
      PortDescr:    Ethernet0
-------------------------------------------------------------------------------
Interface:    dp0p1p1, via: LLDP, RID: 4, Time: 0 day, 00:19:28
Chassis:      
   ChassisID:    mac 00:1b:21:44:70:44
   SysName:      tethys
   SysDescr:     Vyatta Series 3500 running on 999.larkspurse.04270036
   MgmtIP:       10.1.0.40
   Capability:   Bridge, off
   Capability:   Router, on
   Capability:   Wlan, off
   Port:         
      PortID:       mac 00:24:e8:7b:ca:6c
      PortDescr:    dp0p1p1
      PortID:       mac 00:24:e8:7b:ca:6c
      PortDescr:    dp0p1p1
      PMD autoneg:  supported: yes, enabled: yes
      Adv:          10Base-T, HD: yes, FD: yes
      Adv:          100Base-T, HD: yes, FD: yes
      Adv:          1000Base-T, HD: no, FD: yes
      MAU oper type: 100BaseTXFD - 2 pair category 5 UTP, full duplex mode
LLDP-MED:     
   Device Type:  Network Connectivity Device
   Capability:   Capabilities
   Capability:   Location
   Capability:   Inventory
   LLDP-MED Location Identification: Type: elin
      ECS ELIN:     0000000911
   Inventory:    
      Software Revision: 2.6.32-1-586-vyatta
      Firmware Revision: 2.0.11
      Serial Number:    JGSM3K1
      Manufacturer:     Vyatta
      Model:            Series 3500
-------------------------------------------------------------------------------
Interface:    dp0p1p4, via: LLDP, RID: 6, Time: 0 day, 00:00:03
Chassis:      
   ChassisID:    mac 00:0c:29:8c:53:7c
   SysName:      R1
   SysDescr:     Vyatta Router running on Vyatta Subscription Edition 6.0 2010.03.22
   MgmtIP:       20.0.0.2
   Capability:   Bridge, off
   Capability:   Router, on
   Capability:   Wlan, off
   Port:         
      PortID:       ifname dp0p1p1
      PortDescr:    bridge
      PortID:       ifname dp0p1p1
      PortDescr:    bridge
      PMD autoneg:  supported: yes, enabled: yes
      Adv:          10Base-T, HD: yes, FD: yes
      Adv:          100Base-T, HD: yes, FD: yes
      Adv:          1000Base-T, HD: no, FD: yes
      MAU oper type: 1000BaseTFD - Four-pair Category 5 UTP, full duplex mode
LLDP-MED:     
   Device Type:  Network Connectivity Device
```
Capability: Capabilities
Capability: Location
Capability: Inventory
LLDP-MED Location Identification: Type: address
  Country: US
  Language: English
  City, township: Belmont
  Street: 1301 Shoreway Road
  Name: Vyatta, Inc. Corporate Headquarters
  Postal/ZIP code: 94002-4157
  Floor: 2nd
  Room number: Suite 200
Inventory:
  Hardware Revision: None
  Software Revision: 2.6.32-1-586-vyatta-virt
  Firmware Revision: 6.00
  Serial Number: VMware-56 4d 6b 88 64 cc 44 27-2
  Manufacturer: VMware, Inc.
  Model: VMware Virtual Platform
  Asset ID: No Asset Tag

--------------------------------------------------------------------------------
NHRP overview

Next Hop Resolution Protocol (NHRP) is a software-addressing service commonly used in nonbroadcast multiaccess (NBMA) networks. In an NBMA network, NHRP provides the mapping between the NBMA next hop and the Layer 3 subnetwork address.

NHRP and NBMA networks

An NBMA network connects multiple hosts, but has no broadcast or multicast capability; data is transmitted only from one device to one other device. For full connectivity in such a network, connections must be meshed in some way.

A full mesh of connections is difficult to scale, so NBMA networks often employ some version of a hub-and-spoke network to reduce the complexity of the network. However, hub-and-spoke networks have challenges of their own.

- The hub becomes a single point of failure for the network.
- All network traffic passes through the hub, which becomes a processing bottleneck.

NHRP allows you to reduce the number of paths through the network and reduces the need for static configuration, helping provide the connectivity of a full mesh but greater scalability.

NHSs and NHCs

In an NHRP-enabled network, a router is configured with NHRP as a next-hop server (NHS). The NHS becomes a kind of route server, maintaining an NHRP database mapping the NBMA next hop to IP addresses.

The NHRP database is dynamically built and kept accurate using an ARP-like query-and-reply mechanism. Devices that need to communicate register dynamically with the NHS as a next-hop client (NHC). Having determined the existence of the NHC, the NHS adds it to the NBMA network without configuration. The NHC dynamically determines the locations of the other devices in the network from the NHS. The first communication of an NHC to a given device in the network initially flows through the NHS. During its first communication to a destination device, the NHC queries for the IP address of the destination device from the NHS and determines it. Thereafter, the NHC initiates a dynamic GRE/IPSec tunnel to the destination device and traffic flows directly from the NHC to the device. The tunnel is torn down when traffic is no longer flowing between the two devices.
**Supported standards**

The Brocade 5600 vRouter implementation of NHRP complies with the RFC 2332: NBMA Next Hop Resolution Protocol (NHRP) standard.

**NHRP configuration**

NHRP is frequently used with multipoint Generic Routing Encapsulation (mGRE) to create networks of dynamically built point-to-point tunnels. When these tunnels are secured with IP Security (IPsec), the result is a dynamic multipoint virtual private network (DMVPN).

- Configuration examples using NHRP with mGRE are provided in *Brocade 5600 vRouter Tunnels Reference Guide*.
- Configuration examples using NHRP in a DMVPN are provided in *Brocade 5600 vRouter DMVPN Reference Guide*.
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interfaces tunnel <tunx> nhrp
   Enables NHRP on a tunnel interface.

Syntax
   set interfaces tunnel tunx nhrp
   delete interfaces tunnel tunx nhrp
   show interfaces tunnel tunx nhrp

Parameters
   tunx
      Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes
   Configuration mode

Configuration Statement
   interfaces {
      tunnel tunx {
         nhrp
      }
   }

Usage Guidelines
   Use this command to enable NHRP on a tunnel interface.
   Use the set form of this command to enable NHRP on a tunnel interface.
   Use the delete form of this command to remove NHRP from a tunnel interface.
   Use the show form of this command to display NHRP configuration on a tunnel interface.
interfaces tunnel <tunx> nhrp authentication <secret>

Specifies a password that authenticates NHRP packets.

Syntax

```
set interfaces tunnel tunx nhrp authentication secret
delete interfaces tunnel tunx nhrp authentication
show interfaces tunnel tunx nhrp authentication
```

Command Default

NHRP packets are not authenticated.

Parameters

- **tunx**
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

- **secret**
  Mandatory. A plain text password that authenticates packets. The password is a maximum of eight characters.

Modes

Configuration mode

Configuration Statement

```
interfaces {
  tunnel tunx {
    nhrp {
      authentication secret
    }
  }
}
```

Usage Guidelines

Use this command to specify a password that authenticates NHRP packets. The password is embedded in all outgoing NHRP packets. All incoming NHRP packets on the interface are discarded unless the password is present.

Use the `set` form of this command to specify a password that authenticates NHRP packets.

Use the `delete` form of this command to delete an authentication password.

Use the `show` form of this command to display an authentication password.
interfaces tunnel <tunx> nhrp dynamic-map nbma-domain <nbma-domain-name>

Specifies that protocol address-to-nonbroadcast multiaccess (NBMA) address mappings are to be determined dynamically by using the next-hop server whose fully qualified domain name (FQDN) is specified.

Syntax

set interfaces tunnel tunx nhrp dynamic-map nbma-domain nbma-domain-name
delete interfaces tunnel tunx nhrp dynamic-map nbma-domain nbma-domain-name
show interfaces tunnel tunx nhrp dynamic-map nbma-domain

Parameters

tunx
Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx where x is a non-negative integer.

nbma-domain-name
Mandatory. The FQDN of the next-hop server.

Modes

Configuration mode

Configuration Statement

interfaces {
    tunnel tunx {
        nhrp {
            dynamic-map {
                nbma-domain nbma-domain-name
            }
        }
    }
}

Usage Guidelines

Use this command to specify that protocol address-to-NBMA address mappings are to be determined dynamically by using the next-hop server whose FQDN is specified.

Use the set form of this command to specify the FQDN of the next-hop server.

Use the delete form of this command to remove the FQDN of the next-hop server.

Use the show form of this command to display the FQDN of the next-hop server.
interfaces tunnel <tunx> nhrp dynamic-map protocol-address <protocol-addr>/<prefix>

Specifies that protocol address-to-NBMA address mappings are to be determined dynamically by using the next-hop server whose protocol address is specified.

Syntax

set interfaces tunnel tunx nhrp dynamic-map protocol-address protocol-addr/prefix
delete interfaces tunnel tunx nhrp dynamic-map protocol-address protocol-addr/prefix
show interfaces tunnel tunx nhrp dynamic-map protocol-address

Parameters

tunx
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx where x is a non-negative integer.

protocol-addr
  Mandatory. The protocol address of the next-hop server. The protocol address is an IPv4 address.

prefix
  Mandatory. The protocol address prefix of the next-hop server. The protocol address prefix is an IPv4 prefix.

Modes
  Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      dynamic-map {
        protocol-address protocol-addr/prefix
      }
    }
  }
}

Usage Guidelines

Use this command to specify that protocol address-to-NBMA address mappings are to be determined dynamically using the next-hop server whose NBMA IP address is specified.

Use the set form of this command to specify the NBMA IP address of the next-hop server.

Use the delete form of this command to remove the NBMA IP address of the next-hop server.

Use the show form of this command to display the NBMA IP address of the next-hop server.
interfaces tunnel <tunx> nhrp holding-time <time>

Specifies the hold time for NHRP Registration requests and Resolution replies sent from an interface or a shortcut target.

Syntax

```
set interfaces tunnel tunx nhrp holding-time time
delete interfaces tunnel tunx nhrp holding-time
show interfaces tunnel tunx nhrp holding-time
```

Command Default

The hold time is 7,200 seconds (two hours).

Parameters

tunx

Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

time

Mandatory. The hold time in seconds. The default time is 7200 seconds (two hours).

Modes

Configuration mode

Configuration Statement

```
interfaces {
    tunnel tunx {
        nhrp {
            holding-time time
        }
    }
}
```

Usage Guidelines

Use this command to specify the hold time for NHRP Registration requests and Resolution replies sent from an interface or a shortcut target. The hold time is the amount of time that the system retains its knowledge of protocol address-to-NBMA address mappings. If not refreshed within the hold time, the mappings are discarded and need to be re-established.

Use the set form of this command to specify the hold time for NHRP Registration requests and Resolution replies sent from an interface or a shortcut target.

Use the delete form of this command to delete the hold time.

Use the show form of this command to display the hold time.
interfaces tunnel <tunx> nhrp map <protocol-addr>/<prefix> nbma-address <nbma-addr>

Statically maps a protocol address or protocol address prefix to the NBMA address of an NBMA peer.

Syntax

set interfaces tunnel tunx nhrp map protocol-addr/prefix nbma-address nbma-addr
delete interfaces tunnel tunx nhrp map protocol-addr/prefix nbma-address nbma-addr
show interfaces tunnel tunx nhrp map protocol-addr/prefix nbma-address

Parameters

  tunx
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx where x is a non-negative integer.

  protocol-addr
  Mandatory. The protocol address of a destination. The protocol address is an IPv4 address.

  prefix
  Mandatory. The protocol address prefix of the destination. The protocol address prefix is an IPv4 prefix.

  nbma-addr
  Mandatory. The IPv4 address of the destination in the NBMA network.

Modes

  Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      map protocol-addr/prefix {
        nbma-address nbma-addr
      }
    }
  }
}

Usage Guidelines

Use this command to statically map a protocol address or protocol address prefix of a destination to an NBMA address in an NBMA network.

Use the set form of this command to map a destination protocol address or protocol address prefix to an NBMA address in an NBMA network.

Use the delete form of this command to remove a protocol address-to-NBMA address mapping.

Use the show form of this command to display a protocol address-to-NBMA address mapping.
interfaces tunnel <tunx> nhrp map <protocol-addr>/<prefix> register

Specifies that an NHRP Registration Request should be sent to the peer when the NHRP process starts.

Syntax

set interfaces tunnel tunx nhrp map protocol-addr/prefix register
delete interfaces tunnel tunx nhrp map protocol-addr/prefix register
show interfaces tunnel tunx nhrp map protocol-addr/prefix

Command Default

Automatic NHRP registration is disabled.

Parameters

tunx
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

protocol-addr
  Mandatory. The protocol address of a destination. The protocol address is an IPv4 address.

prefix
  Mandatory. The protocol address prefix of the destination. The protocol address prefix is an IPv4 prefix.

Modes

Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      map protocol-addr/prefix {
        register
      }
    }
  }
}

Usage Guidelines

Use this command to enable automatic sending of an NHRP Registration request when the NHRP process starts.

Use the set form of this command to enable automatic sending of an NHRP Registration request when the NHRP process starts up.

Use the delete form of this command to reset automatic NHRP registration to its default configuration.

Use the show form of this command to display NHRP address-mapping configuration.
interfaces tunnel <tunx> nhrp map <protocol-addr>/<prefix> register-no-unique

Enables NHRP Registration requests and replies to be sent without the unique flag being set.

Syntax

set interfaces tunnel tunx nhrp map protocol-addr/prefix register-no-unique
delete interfaces tunnel tunx nhrp map protocol-addr/prefix register-no-unique
show interfaces tunnel tunx nhrp map protocol-addr/prefix

Command Default

The unique flag is set in NHRP Registration requests and replies.

Parameters

tunx
Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx where x is a non-negative integer.

protocol-addr
Mandatory. The protocol address of a destination. The protocol address is an IPv4 address.

prefix
Mandatory. The protocol address prefix of the destination. The protocol address prefix is an IPv4 prefix.

Modes

Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      map protocol-addr/prefix {
        register-no-unique
      }
    }
  }
}

Usage Guidelines

Use this command to enable NHRP Registration requests and replies to be sent without the unique flag being set. When the unique flag is set in an NHRP Registration request, a next-hop server rejects the request if the IP address to NBMA address mapping has changed and the request is received before the entry in the next-hop server times out. This rejection is typically the case when the client receives a new IP address, for example, in a DHCP environment.

Use the set form of this command to enable NHRP Registration requests and replies to be sent without the unique flag being set.
Use the `delete` form of this command to enable the default setting of the unique flag in NHRP Registration requests and replies.

Use the `show` form of this command to display NHRP address-mapping configuration.
interfaces tunnel <tunx> nhrp multicast parameters

Specifies how NHRP should soft switch multicast traffic.

Syntax

set interfaces tunnel tunx nhrp multicast parameters {dynamic | nhs}
delete interfaces tunnel tunx nhrp multicast parameters
show interfaces tunnel tunx nhrp multicast parameters

Parameters

tunx
Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

dynamic
Forwards all multicast packets to all directly connected peers.

nhs
Repeats all multicast packets to each statically configured next hop.

Modes

Configuration mode

Configuration Statement

interfaces {
tunnel tunx {
nhrp {
multicast {
parameters {dynamic | nhs}
}
}
}
}

Usage Guidelines

Use this command to specify how NHRP should soft switch multicast traffic. Only one of the two options, dynamic or nhs, can be specified.

NOTE
Take care to avoid multicast repetition when multiple next-hop servers are present.

Use the set form of this command to specify how NHRP should soft switch multicast traffic.
Use the delete form of this command to remove the multicast parameters configuration.
Use the show form of this command to display the multicast parameters configuration.
interfaces tunnel <tunx> nhrp multicast protocol-address <protocol-addr>

Instructs NHRP to forward multicast traffic to a specific protocol address.

Syntax

set interfaces tunnel tunx nhrp multicast protocol-address protocol-addr
delete interfaces tunnel tunx nhrp multicast protocol-address protocol-addr
show interfaces tunnel tunx nhrp multicast protocol-address

Parameters

tunx
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

protocol-addr
  Mandatory. The protocol address of a destination. The protocol address is an IPv4 address.

Modes

Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      multicast {
        protocol-address protocol-addr
      }
    }
  }
}

Usage Guidelines

Use this command to instruct NHRP to forward multicast traffic to the specified protocol address.

NOTE
  Take care to avoid multicast repetition when multiple next-hop servers are present.

Use the set form of this command to instruct NHRP to forward multicast traffic to a specific protocol address.
Use the delete form of this command to remove the multicast protocol-address configuration.
Use the show form of this command to display the multicast protocol-address configuration.
**interfaces tunnel <tunx> nhrp redirect**

Instructs the sender of a forwarding packet to create a direct connection with the destination.

**Syntax**

- `set interfaces tunnel tunx nhrp redirect`
- `delete interfaces tunnel tunx nhrp redirect`
- `show interfaces tunnel tunx nhrp redirect`

**Command Default**

Forwarding packets are forwarded normally.

**Parameters**

- `tunx`
  
  Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

**Modes**

Configuration mode

**Configuration Statement**

```
interfaces {
    tunnel tunx {
        nhrp {
            redirect
        }
    }
}
```

**Usage Guidelines**

Use this command to instruct the sender of a forwarding packet to create a direct connection with the destination. This connection is achieved by sending NHRP Traffic Indication packets back to the sender of the forwarding packet.

Use the `set` form of this command to instruct the sender of a forwarding packet to create a direct connection with the destination.

Use the `delete` form of this command to remove the redirect configuration.

Use the `show` form of this command to display the redirect configuration.
interfaces tunnel <tunx> nhrp shortcut

Enables the creation of a shortcut route.

Syntax

set interfaces tunnel tunx nhrp shortcut
delete interfaces tunnel tunx nhrp shortcut
show interfaces tunnel tunx nhrp shortcut

Command Default

Shortcut routes are not created.

Parameters

tunx

Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes

Configuration mode

Configuration Statement

interfaces {
  tunnel tunx {
    nhrp {
      shortcut
    }
  }
}

Usage Guidelines

Use this command to enable the creation of a shortcut route; the resolution and establishment of a shortcut route is triggered when an NHRP Traffic Indication packet is received.

NOTE
You still need to use routing protocol or have static routes to the hub node in your NBMA network. NHRP does not advertise routes; creates a shortcut route only for an already routable subnet.

Use the set form of this command to enable the creation of a shortcut route.
Use the delete form of this command to remove the shortcut configuration.
Use the show form of this command to display the shortcut configuration.
interfaces tunnel <tunx> nhrp shortcut-destination

Instructs NHRP to create a shortcut route to a subnet located on the interface.

Syntax

```
set interfaces tunnel tunx nhrp shortcut-destination
delete interfaces tunnel tunx nhrp shortcut-destination
show interfaces tunnel tunx nhrp shortcut-destination
```

Parameters

tunx

Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes

Configuration mode

Configuration Statement

```
interfaces {
  tunnel tunx {
    nhrp {
      shortcut-destination
    }
  }
}
```

Usage Guidelines

Use this command to instruct NHRP to create a shortcut route to a subnet located on the interface.

Use the `set` form of this command to instruct NHRP to create a shortcut route to a subnet located on the interface.

Use the `delete` form of this command to remove the shortcut-destination configuration.

Use the `show` form of this command to display the shortcut-destination configuration.
**interfaces tunnel <tunx> nhrp shortcut-target <protocol-addr>/<prefix>**

Defines an off-NBMA network prefix for which the Generic Routing Encapsulation (GRE) interface acts as a gateway.

**Syntax**

```plaintext
set interfaces tunnel tunx nhrp shortcut-target protocol-addr/prefix
delete interfaces tunnel tunx nhrp shortcut-target protocol-addr/prefix
show interfaces tunnel tunx nhrp shortcut-target
```

**Parameters**

- **tunx**
  - Mandatory. The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.
- **protocol-addr**
  - Mandatory. The protocol address of a destination. The protocol address is an IPv4 address.
- **prefix**
  - Mandatory. The protocol address prefix of the destination. The protocol address prefix is an IPv4 prefix.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
interfaces {
  tunnel tunx {
    nhrp {
      shortcut-target protocol-addr/prefix
    }
  }
}
```

**Usage Guidelines**

Use this command to define an off-NBMA network prefix for which the GRE interface acts as a gateway.

Use the `set` form of this command to define an off-NBMA network prefix for which the GRE interface acts as a gateway.

Use the `delete` form of this command to remove the shortcut-target configuration.

Use the `show` form of this command to display the shortcut-target configuration.
interfaces tunnel <tunx> nhrp shortcut-target holding-time <time>

Specifies the hold time for Resolution Requests and Resolution Responses.

Syntax

set interfaces tunnel tunx nhrp shortcut-target holding-time time
delete interfaces tunnel tunx nhrp shortcut-target holding-time
show interfaces tunnel tunx nhrp shortcut-target holding-time

Parameters

tunx
    Mandatory. The identifier for a tunnel interface. The identifier ranges from tunO through tunx where x is a non-negative integer.

time
    Mandatory. The hold time in seconds.

Modes

Configuration mode

Configuration Statement

interfaces {
    tunnel tunx {
        nhrp {
            shortcut-target holding-time time
        }
    }
}

Usage Guidelines

Use this command to specify the hold time for Resolution Requests and Resolution Responses.
Use the set form of this command to specify the hold time for Resolution Requests and Resolution Responses.
Use the delete form of this command to remove the hold time configuration.
Use the show form of this command to display the hold time configuration.
reset ip nhrp flush tunnel
   Removes all non-permanent entries.

Syntax
   reset ip nhrp flush tunnel [tunx]

Command Default
   Non-permanent entries for all tunnel interfaces are removed.

Parameters
   tunx
      The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes
   Operational mode

Usage Guidelines
   Use this command to remove all non-permanent entries for the specified tunnel interface. If no tunnel interface is specified, all non-permanent entries for all tunnel interfaces are removed.

Examples
   The following example shows how to remove all non-permanent entries for the tun0 tunnel.

vyatta@vyatta:~$ reset ip nhrp flush tunnel tun0
vyatta@vyatta:~$
reset ip nhrp purge tunnel

Removes and reregisters all NHRP entries.

Syntax

reset ip nhrp purge tunnel [tunx]

Command Default

NHRP entries for all tunnel interfaces are removed.

Parameters

tunx

The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes

Operational mode

Usage Guidelines

Use this command to remove and reregister all NHRP entries for a specific tunnel interface. If no tunnel interface is specified, all NHRP entries for all tunnel interfaces are removed and reregistered.

Examples

The following example shows how to remove and reregister all NHRP entries for the tun0 tunnel.

vyatta@vyatta:$ reset ip nhrp purge tunnel tun0
vyatta@vyatta:$
show ip nhrp tunnel
Displays NHRP information about a specific tunnel.

Syntax
show ip nhrp tunnel [tunx]

Command Default
NHRP information for all tunnel interfaces is displayed.

Parameters
tunx
The identifier for a tunnel interface. The identifier ranges from tun0 through tunx, where x is a non-negative integer.

Modes
Operational mode

Usage Guidelines
Use this command to display NHRP information about a specific tunnel. If no tunnel interface is specified, NHRP information
about all tunnel interfaces is displayed.

Examples
The following example shows how to display NHRP information about the tun0 tunnel.

vyatta@vyatta:~$ show ip nhrp tunnel tun0
Interface: tun0
Type: static
Protocol-Address: 10.0.0.100/24
NBMA-Address: 172.18.0.1
vyatta@vyatta:~$
sFlow overview

The Brocade vRouter supports sFlow (v5), a high-performance sFlow agent for monitoring traffic in a data network. sFlow, which stands for “sampled flow,” reports packet-flow and port-counter samples from a data plane interface to receiving collectors on a timely basis.

**NOTE**

In a Brocade vRouter, sFlow supports enough functionality and flexibility such that packet-forwarding performance does not drop significantly, yet still delivers enough processing power to provide a significant advantage when processing packets through the data plane pipeline.

You can configure a Brocade vRouter to perform the following tasks:

- Sample packet flows.
- Collect packet headers from sampled packets to gather inbound traffic information on these packets.
- Collect byte and packet port-counter statistics (counter samples).
- Compose flow sample messages from the collected information.
- Relay messages to an external device known as a collector. A Brocade vRouter supports up to four collectors.
NOTE
The Brocade vRouter supports sFlow (v5), which replaces the version outlined in RFC 3176.

Physical interfaces
sFlow is physical-interface-based, which means that you can enable and disable sFlow on only a physical interface. However, all other interface types (for example, VIF and tunnel) are indirectly enabled because all are associated with physical interfaces.

Packet-flow and port-counter sampling
The Brocade vRouter acts as an sFlow agent, which collects inbound packet samples from a data plane interface at the configured sampling rate. The Brocade vRouter also collects sample statistics from ports at the configured polling interval. The Brocade vRouter sends the collected information to the specified collectors.

Packet-flow sampling
The Brocade vRouter, acting as an sFlow agent, samples dropped and nondropped packets. Taking a sample involves extracting information from the packet, including trajectory information (for example, source and destination interface and next hop). For dropped packets, the Brocade vRouter adds the reason for dropping the packet to the extracted information.
Counter-flow sampling
By default, counter-flow sampling is enabled on the Brocade vRouter. The Brocade vRouter, acting as an sFlow agent, sends port statistics with counter sample data in the datagram stream that results from packet-flow sampling.

Communication with collectors
The Brocade vRouter creates one or more samples for each UDP packet. When enough samples are collected to fill a UDP datagram (up to 1,400 bytes), the Brocade vRouter sends the UDP datagram to the collectors.

Supported sFlow types
The Brocade vRouter supports the following sFlow data types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampled header</td>
<td>Includes the protocol type, length, and packet header bytes. Packet header information for each packet must be reported using the sampled header format.</td>
</tr>
<tr>
<td>Sampled IPv4</td>
<td>Includes the source and destination IPv4 addresses, IPv4 packet length, protocol type, and so on.</td>
</tr>
<tr>
<td>Sampled IPv6</td>
<td>Includes the source and destination IPv6 addresses, IPv6 packet length, protocol type, and so on.</td>
</tr>
<tr>
<td>Sampled NAT data</td>
<td>Includes the source and destination IP addresses that are translated by NAT. If an address was not translated, it is equal to the address reported for the sampled header packet length, and protocol type.</td>
</tr>
<tr>
<td>Counter data type</td>
<td>The interface port counters. Only the generic counter is supported.</td>
</tr>
</tbody>
</table>

Extended data types provide additional information about the sampled packet.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended router</td>
<td>Includes the nexthop IP address and the source and destination prefixes.</td>
</tr>
</tbody>
</table>

Configuring sFlow
Table 27 shows how to configure sFlow for the sample Brocade vRouter configuration. Figure 13 on page 238 shows this configuration.

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify the address of the agent. By default, this collector listens for sFlow data on the 6343 UDP port.</td>
<td>vyatta@sflow1# set service sflow agent-address 1.1.1.1</td>
</tr>
<tr>
<td><strong>NOTE</strong></td>
<td>A Brocade vRouter supports up to four collectors.</td>
</tr>
<tr>
<td>Set the polling interval to three seconds. Every three seconds, the sFlow agent that is running on the Brocade vRouter collects port counter data.</td>
<td>vyatta@sflow1# set service sflow polling-interval 3</td>
</tr>
<tr>
<td>Configure the sFlow agent to send the UDP datagrams that contain the collected sFlow information to the default port (6343) of the sFlow collector server at 198.51.100.2.</td>
<td>vyatta@sflow1# set service sflow server-address 198.51.100.2 server-port 6343</td>
</tr>
<tr>
<td>Step</td>
<td>Command</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>Specify 512 as the number of packets from which a sample is taken by the sFlow agent. In other words, for every 512 packets that flow through the interface, the sFlow agent selects one packet for analysis.</td>
<td>vyatta@sflow1# set service sflow sampling-rate 512</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Save the configuration.</td>
<td>vyatta@sflow1# save</td>
</tr>
<tr>
<td>Display the sFlow configuration.</td>
<td>vyatta@sflow1# run show sflow</td>
</tr>
<tr>
<td>The output shows that sFlow was configured, but no statistics were collected. This is because sFlow has not yet been enabled on an interface.</td>
<td></td>
</tr>
<tr>
<td>Enable sFlow on the dp0p192p1 interface (Figure 13 on page 238 indicates it as DP1).</td>
<td>vyatta@sflow1# set interfaces dataplane dp0p192p1 sflow</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Save the configuration.</td>
<td>vyatta@sflow1# save</td>
</tr>
<tr>
<td>The sFlow agent can now start collecting packet samples and port-counter statistics.</td>
<td></td>
</tr>
<tr>
<td>Display the sFlow configuration.</td>
<td>vyatta@sflow1# run show sflow</td>
</tr>
<tr>
<td>The output shows that sFlow is enabled for the dp0p192p1 interface and shows that one sample packet was collected.</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 27 Configuring sFlow (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>},</td>
</tr>
<tr>
<td></td>
<td>&quot;Total sFlow interfaces&quot;: 1</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
<tr>
<td></td>
<td>}</td>
</tr>
</tbody>
</table>
sFlow
sFlow Commands

- interfaces dataplane <dp-port> sflow.................................................................................................................................244
- service sflow agent-address <IPv4-or-IPv6>.......................................................................................................................245
- service sflow server-address <IPv4-or-IPv6> server-port <port>.........................................................................................246
- service sflow sampling-rate <sampling-rate>.....................................................................................................................247
- service sflow polling-interval <polling-rate>.........................................................................................................................248
- show sflow................................................................................................................................................................................249
- clear sflow...............................................................................................................................................................................250
interfaces dataplane <dp-port> sflow

Specifies an interface for which to record inbound sFlow packet statistics and port counters.

Syntax

set interfaces dataplane dp-port sflow
delete interfaces dataplane dp-port sflow

Parameters

dp-port
The name of a data plane interface.

Modes

Configuration mode

Configuration Statement

interfaces {
  dataplane dp-port {
    sflow
  }
}

Usage Guidelines

You can enable multiple interfaces by issuing this command multiple times, once for each interface.
Use the set form of this command to enable sFlow on an interface.
Use the delete form of this command to disable sFlow on an interface.
service sflow agent-address <IPv4-or-IPv6>

Specifies the IPv4 or IPv6 address (of an sFlow agent) to be included in the sFlow packets that are sent to the collectors.

Syntax

```
set service sflow agent-address IPv4-or-IPv6
delete service sflow agent-address IPv4-or-IPv6
```

Command Default

By default, the Brocade vRouter provides an IP address that identifies the agent.

Parameters

`IPv4-or-IPv6`

The IPv4 or IPv6 address of an sFlow agent.

**NOTE**

The address does not have to be active.

Modes

Configuration mode

Configuration Statement

```
service {
    sflow {
        agent-address address
    }
}
```

Usage Guidelines

Use the `set` form of this command to specify the IP address of an sFlow agent.

Use the `delete` form of this command to delete the IP address of an sFlow agent.
service sflow server-address <IPv4-or-IPv6> server-port <port>

Specifies the IPv4 or IPv6 IP address of an sFlow collector and a port to which to send the UDP datagrams that contain the collected sFlow information.

Syntax

set service sflow server-address IPv4-or-IPv6 server-port port
delete service sflow server-address IPv4-or-IPv6

Command Default

The default port is 6343.

Parameters

IPv4-or-IPv6

The IP address of the sFlow collector server.

port

A port of an sFlow collector server to which to send the UDP datagrams that contain the collected sFlow information.

Modes

Configuration mode

Configuration Statement

interfaces {
  sflow {
    server-address IPv4-or-IPv6 {
      server-port port
    }
  }
}

Usage Guidelines

You can specify multiple sFlow collectors by entering this command multiple times. The maximum number of sFlow collectors allowed is four.

Use the set form of this command to specify an sFlow collector and a port to which to send the collected sFlow data.

Use the delete form of this command to remove an sFlow collector from the list of collectors to which to send sFlow data.
service sflow sampling-rate <sampling-rate>
   Specifies the rate at which packets are sampled.

Syntax
   set service sflow sampling-rate sampling-rate
   delete service sflow sampling-rate sampling-rate

Command Default
   The default sampling rate is 2048 packets.

Parameters
   sampling-rate
   The number of packets from which to pick one packet for analysis. The number ranges from 512 through 65535. For example, if a number of 512, it means that the sampling rate is 1 in 512. In other words, the Brocade vRouter selects a packet every other 512 packets.

Modes
   Configuration mode

Configuration Statement
   service {
      sflow {
         sampling-rate sampling-rate
      }
   }

Usage Guidelines
   Use the set form of this command to specify the sampling rate.
   Use the delete form of this command to restore the default sampling rate, which is 2,048 packets.
service sflow polling-interval <polling-rate>

Specifies how often sFlow port-counter statistics are collected.

Syntax

- set service sflow polling-interval polling-rate
- delete service sflow polling-interval polling-rate

Command Default

The default polling rate is 20 seconds.

Parameters

- polling-rate
  
  A polling rate in seconds. The rate ranges from 0 through 65535. A rate of 0 means that counter polling is disabled.

Modes

- Configuration mode

Configuration Statement

```
service {
  sflow {
    polling-interval polling-rate
  }
}
```

Usage Guidelines

Use the `set` form of this command to specify a polling rate.

Use the `delete` form of this command to restore the default polling rate, which is 20 seconds.
**show sflow**

Displays sFlow configuration information and sFlow usage statistics.

**Syntax**

```plaintext
show sflow
```

**Modes**

Operational mode

**Examples**

The following example shows how to display sFlow configuration information and usage statistics.

```plaintext
vyatta@sflow1# run sh sflow
{
   "sFlow information": {
      "sFlow version": 5,
      "sFlow services": "enabled",
      "sFlow agent IP address": "1.1.1.1",
      "Collector destinations configured": 1,
      "Collectors": [{
         "IP address": "50.1.1.2",
         "UDP port number": 6343
      }],
      "Polling interval": 3,
      "Configured default sampling rate": 512,
      "Actual default sampling rate": 512,
      "sFlow max-header size": 128,
      "UDP packets sent": 0,
      "Flow samples collected": 0,
      "sFlow interfaces": [],
      "Total sFlow interfaces": 0
   }
}
```
clear sflow
Clears the collected sFlow statistics.

Syntax

```
clear sflow
```

Modes
Operational mode

Examples
The following example shows how to clear the collected sFlow statistics (the number of UDP packets sent and sFlow flow samples collected).

```
vytta@vyatta# run clear sflow
[edit]
vytta@vyatta# run show sflow
{
  "sFlow information": {
    "sFlow version": 5,
    "sFlow services": "enabled",
    "sFlow agent IP address": "1.1.1.1",
    "Collector destinations configured": 1,
    "Collectors": [{
      "IP address": "198.51.100.2",
      "UDP port number": 6343
    }],
    "Polling interval": 3,
    "Configured default sampling rate": 512,
    "Actual default sampling rate": 512,
    "sFlow max-header size": 128,
    "UDP packets sent": 0,
    "Flow samples collected": 0,
    "sFlow interfaces": [{
      "name": "dp0a160"
    }],
    "Total sFlow interfaces": 1
  }
}
```
TWAMP overview
A Two-Way Active Measurement Protocol (TWAMP) server on a Brocade vRouter measures round-trip IP performance between any two devices in a network that supports the standard. The TWAMP server implementation is based on the specifications outlined in RFC 5357.

The architecture of the Brocade vRouter TWAMP server solution defines the following logical components, as shown in the following figure.

- Session-Reflector—Creates and sends measurement packets when it receives a TWAMP-test packet.
- Server—Manages multiple TWAMP sessions.

The following components are part of the TWAMP client:

- Session-Sender—Creates and sends TWAMP-test packets to Session-Reflector.
- Control-Client—Sends requests to the TWAMP server to measure IP performance.

A Brocade vRouter includes the `twping` command in the `/opt/vyatta/bin/twping` directory, which you can use to send client requests to a TWAMP server.

A Brocade vRouter can be a TWAMP server and client at the same time. However, the client can be another Brocade vRouter or a third-party system, as shown in the following figure.
FIGURE 15  TWAMP server-client interaction

Router acting as a client

Brocade vRouter

twping

Brokerage vRouter

twping

Router configured to provide TWAMP service

Third-party system acting as a client

Third-party system

twping

Brocade vRouter running the TWAMP service can also be used to send client requests by using the twping command

TWAMP configuration

This section includes the following examples:

- Configuring the TWAMP server on page 253
- Using twping to measure IP performance on page 254

Figure 16 shows the TWAMP client/server topology used in the following examples.
FIGURE 16 TWAMP server configuration example

**Brocade vRouter configured to provide TWAMP service**

**R1**

11.1.0.1/8

```
set service twamp server
set service twamp server client-list 11.0.0.0/8
set service twamp server dscp-value 34
set service twamp server maximum-connections 10
set service twamp server maximum-sessions-per-connection 16
set service twamp server mode no-mixed
set service twamp server port 862
set service twamp server server-inactivity-timeout 5
set service twamp server test-inactivity-timeout 10
set service twamp server user test password pass1
```

twping 11.1.0.1 count 10 session-count 2

**R2**

11.0.0.0/8

**Brocade vRouter acting as a client**

**Configuring the TWAMP server**

To use the TWAMP server on a Brocade vRouter, you must first configure the TWAMP service.

To configure the TWAMP service, perform the following steps in configuration mode.

**TABLE 28 Configuring the TWAMP service**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start the TWAMP server. By default, the server accepts any connection request from any client.</td>
<td>vyatta@R1# set service twamp server</td>
</tr>
<tr>
<td>Add the client with the 11.0.0.0/8 IP address to the list of clients that can connect to the TWAMP server in the unauthenticated mode.</td>
<td>vyatta@R1# set service twamp server client-list 11.0.0.0/8</td>
</tr>
<tr>
<td>Specify 34 as the base-10 value of the DSCP byte in the IP header of control packets sent from the server.</td>
<td>vyatta@R1# set service twamp server dscp-value 34</td>
</tr>
<tr>
<td>Specify 10 as the maximum number of control sessions for each TWAMP server.</td>
<td>vyatta@R1# set service twamp server maximum-connections 10</td>
</tr>
</tbody>
</table>
### TABLE 28 Configuring the TWAMP service (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit the number of maximum number of test sessions for each control session to 16.</td>
<td>vyatta@R1# set service twamp server maximum-sessions-per-connection 16</td>
</tr>
<tr>
<td>Disable the mixed client authentication mode.</td>
<td>vyatta@R1# set service twamp server mode no-mixed</td>
</tr>
<tr>
<td>Specify 862 as the TCP port used for control sessions.</td>
<td>vyatta@R1# set service twamp server port 862</td>
</tr>
<tr>
<td>Set the timeout value for control-session inactivity to 5 seconds.</td>
<td>vyatta@R1# set service twamp server server-inactivity-timeout 5</td>
</tr>
<tr>
<td>Set the timeout value for test-session inactivity to 10 seconds.</td>
<td>vyatta@R1# set service twamp server test-inactivity-timeout 10</td>
</tr>
<tr>
<td>Create the test user account and assign a password to it.</td>
<td>vyatta@R1# set service twamp server user test password pass1</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@R1# commit</td>
</tr>
<tr>
<td>Exit the configuration mode.</td>
<td>vyatta@R1# exit</td>
</tr>
<tr>
<td>Show the status of the server.</td>
<td>vyatta@R1# set show service twamp server status</td>
</tr>
</tbody>
</table>

#### Using twping to measure IP performance

To measure round-trip IP Performance, perform the following steps in operational mode.

```bash
vyatta@R1# show service twamp server sessions all
Total number of sessions: 16
Total number of active sessions: 16

--- Control Session initiated by [Rtr2-tap0]:39549 in Authenticated mode
      SENDER               REFLECTOR            STATUS  DSCP
0a00020fd863fa0eeec1444b5000a61 [Rtr2-tap0]:8833 [Rtr1]:56967 ACTIVE 0x0
0a00020fd863fa0eeee08638005774d72 [Rtr2-tap0]:8879 [Rtr1]:38676 ACTIVE 0x0
0a00020fd863fa0eeec9f0a68f69a638 [Rtr2-tap0]:8935 [Rtr1]:46080 ACTIVE 0x0
0a00020fd863fa0eeb22d2ba5175914887 [Rtr2-tap0]:8859 [Rtr1]:60355 ACTIVE 0x0
0a00020fd863fa0ee5a9b06ccf9bacf1 [Rtr2-tap0]:8769 [Rtr1]:56089 ACTIVE 0x0
0a00020fd863fa0ee4b11c71bcbb54af [Rtr2-tap0]:8778 [Rtr1]:48298 ACTIVE 0x0
0a00020fd863fa0ee3f1679e973a4f4 [Rtr2-tap0]:8917 [Rtr1]:36039 ACTIVE 0x0
0a00020fd863fa0ee316e6473f8fca1a74 [Rtr2-tap0]:8845 [Rtr1]:45534 ACTIVE 0x0
<--

--- Control Session initiated by [Rtr2-tap0]:39550 in Authenticated mode
      SENDER               REFLECTOR            STATUS  DSCP
0a00020fd863fa0ee3773be7957d070d7 [Rtr2-tap0]:8958 [Rtr1]:54254 ACTIVE 0x0
0a00020fd863fa0ee54d7fe03660ed58a [Rtr2-tap0]:8817 [Rtr1]:49623 ACTIVE 0x0
0a00020fd863fa0ee118d1f250ed4cc2c23 [Rtr2-tap0]:8863 [Rtr1]:57902 ACTIVE 0x0
0a00020fd863fa0ee31756d14abae0aa0 [Rtr2-tap0]:8831 [Rtr1]:37197 ACTIVE 0x0
0a00020fd863fa0ee1996ded7ba7e0d57b [Rtr2-tap0]:8800 [Rtr1]:54229 ACTIVE 0x0
0a00020fd863fa0ee594751787e08af1 [Rtr2-tap0]:8779 [Rtr1]:53110 ACTIVE 0x0
<--
```
<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
</table>
| Use the `twping` command to send a request to the TWAMP server to measure the round-trip IP performance. | vyatta@R2:~$ twping 11.1.0.1 count 10 session-count 2
   Approximately 4.2 seconds until results available

   --- twping statistics from [11.1.0.1]:8889 to [Rtr2]:55026 ---
   SID: 0b010001d961f8d25daa301413dddec8
   10 sent, 0 lost (0.000%), 0 send duplicates, 0 reflect duplicates
   round-trip time min/median/max = 0.746/1.5/2.39 ms, (err=1.11 ms)
   send time min/median/max = 0.196/0.6/1.54 ms, (err=0.556 ms)
   reflect time min/median/max = 0.543/0.9/1.79 ms, (err=0.556 ms)
   reflector processing time min/max = 0.0129/0.0277 ms
   two-way PDV = 0.9 ms (P95-P50)
   send PDV = 1 ms (P95-P50)
   reflect PDV = 0.9 ms (P95-P50)
   send hops = 0 (consistently)
   reflect hops = 0 (consistently)

   --- twping statistics from [11.1.0.1]:8904 to [Rtr2]:42203 ---
   SID: 0b010001d961f8d25eff1b28f68b20f7
   10 sent, 0 lost (0.000%), 0 send duplicates, 0 reflect duplicates
   round-trip time min/median/max = 1.24/1.6/3.24 ms, (err=1.11 ms)
   send time min/median/max = 0.37/0.7/2.52 ms, (err=0.556 ms)
   reflect time min/median/max = 0.713/0.9/1.51 ms, (err=0.556 ms)
   reflector processing time min/max = 0.0157/0.031 ms
   two-way PDV = 1.7 ms (P95-P50)
   send PDV = 1.9 ms (P95-P50)
### TABLE 29 Measuring round-trip IP performance by using twping (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P50) reflect PDV = 0.7 ms (P95-P50)</td>
</tr>
<tr>
<td></td>
<td>send hops = 0 (consistently)</td>
</tr>
<tr>
<td></td>
<td>reflect hops = 0 (consistently)</td>
</tr>
</tbody>
</table>
TWAMP Commands

- service twamp server
- service twamp server client-list <ip-address>
- service twamp server dscp-value <value>
- service twamp server maximum-connections <count>
- service twamp server maximum-sessions-per-connection <count>
- service twamp server mode <authentication-mode>
- service twamp server port <port-number>
- service twamp server server-inactivity-timeout <seconds>
- service twamp server test-inactivity-timeout <seconds>
- service twamp server user <username> password <pwd>
- show service twamp server session [all | client <ip-address> | summary]
- twping <host-address>
service twamp server
   Starts the TWAMP server.

Syntax
   set service twamp server
   delete service twamp server
   show service twamp server

Modes
   Configuration mode

Configuration Statement
   service {
      twamp {
         server
      }
   }

Usage Guidelines
   If other server parameters are not configured, this command configures the TWAMP server with the default values.
   Use the set form of this command to start the TWAMP server.
   Use the delete form of this command to stop the TWAMP server.
   Use the show form of this command to view the configuration parameters of the TWAMP server.
service twamp server client-list <ip-address>

Adds a client in a specified network to the list of clients that can connect to the TWAMP server in the unauthenticated mode.

Syntax

```
set service twamp server client-list ip-address
delete service twamp server client-list ip-address
```

Parameters

- `ip-address`
  IPv4 or IPv6 IP address of the system to add to the list of clients that can connect to the server. To specify multiple systems, use a subnet range.

Modes

- Configuration mode

Configuration Statement

```
service {
  twamp {
    server {
      client-list ip-address
    }
  }
}
```

Usage Guidelines

By default, any client can connect to the server. However, after you configure a client list, only those clients in the list can connect in the unauthenticated mode. Clients that are not in this list can connect to the server in the authenticated, encrypted, or mixed mode.

Use the `set` form of this command to add a client to the list of clients that can connect to the server in the unauthenticated mode. You can use this form multiple times to add multiple clients to the list.

Use the `delete` form of this command to delete a client from the list.
service twamp server dscp-value <value>
Specifies the base-10 value of the DSCP byte in the IP header of control packets sent from the server.

Syntax

set service twamp server dscp-value value
delete service twamp server dscp-value value

Command Default

0.

Parameters

value
Base-10 value of the DSCP byte.

Modes

Configuration mode

Configuration Statement

service {
  twamp {
    server {
      dscp-value value
    }
  }
}

Usage Guidelines

Use the set form of this command to set the DSCP value.
Use the delete form of this command to set the DSCP value to the default value.
**service twamp server maximum-connections <count>**

Specifies the maximum number of control sessions for each TWAMP server.

**Syntax**

```
set service twamp server maximum-connections count
delete service twamp server maximum-connections count
```

**Command Default**

16.

**Parameters**

`count`

Maximum number of control sessions for each TWAMP server. The count ranges from 1 through 64.

**Modes**

Configuration mode

**Configuration Statement**

```
service {
  twamp {
    server {
      maximum-connections count
    }
  }
}
```

**Usage Guidelines**

Use the **set** form of this command to specify the maximum number of control sessions for each TWAMP server.

Use the **delete** form of this command to reset the maximum number of control sessions to the default count, which is 16.
service twamp server maximum-sessions-per-connection <count>

Specifies the maximum number of test sessions for each control session.

**Syntax**

```
set service twamp server maximum-sessions-per-connection count
delete service twamp server maximum-sessions-per-connection count
```

**Command Default**

8.

**Parameters**

`count`

Maximum number of test sessions for each control session. The count ranges from 1 through 64.

**Modes**

Configuration mode

**Configuration Statement**

```
service {
    twamp {
        server {
            maximum-sessions-per-connection count
        }
    }
}
```

**Usage Guidelines**

Use the `set` form of this command to specify the maximum number of test sessions for each control session.

Use the `delete` form of this command to reset the maximum number of test sessions to the default count, which is 8.
service twamp server mode <authentication-mode>

Disables a client authentication mode.

Syntax

set service twamp server mode authentication-mode
delete service twamp server mode authentication-mode

Command Default

By default, the following modes are enabled: unauthenticated, authenticated, encrypted, and mixed.

Parameters

authentication-mode

One of the following TWAMP authentication modes:

- no-authenticated —Disables support for authenticated sessions.
- no-encrypted —Disables support for encrypted sessions.
- no-mixed —Disables support for mixed mode sessions.
- no-unauthenticated —Disables support for unauthenticated sessions.

Modes

Configuration mode

Configuration Statement

service {
  twamp {
    server {
      mode authentication-mode
    }
  }
}

Usage Guidelines

Use the set form of this command to disable a client-authentication mode.

Use the delete form of this command to enable a client-authentication mode.
service twamp server port <port-number>

Specifies the TCP port for a control session.

Syntax

set service twamp server port port-number
delete service twamp server port port-number

Command Default

862.

Parameters

port-number

A TCP port number. The port number ranges from 1 through 65535.

Modes

Configuration mode

Configuration Statement

service {
  twamp {
    server {
      port port-number
    }
  }
}

Usage Guidelines

Use the set form of this command to specify the TCP port for a control session.

Use the delete form of this command to reset the TCP port number to the default port number, which is 862.
service twamp server server-inactivity-timeout <seconds>

Specifies the timeout value for control-session inactivity.

Syntax

set service twamp server server-inactivity-timeout seconds
delete service twamp server server-inactivity-timeout seconds

Command Default

900.

Parameters

seconds

Number of seconds before a control session times out due to inactivity. The number of seconds ranges from 1 through 3600.

NOTE
The inactivity timer starts only when no test sessions are active on the associated control session.

Modes

Configuration mode

Configuration Statement

service {
    twamp {
        server {
            server-inactivity-timeout seconds
        }
    }
}

Usage Guidelines

Use the set form of this command to specify the control-session timeout value.

Use the delete form of this command to reset the timeout value to the default number of seconds, which is 900.
service twamp server test-inactivity-timeout <seconds>
   Specifies the timeout value for test-session inactivity.

Syntax
   set service twamp server test-inactivity-timeout seconds
   delete service twamp server test-inactivity-timeout seconds

Command Default
   900.

Parameters
   seconds
       Number of seconds before a test session times out due to inactivity. The number of seconds ranges from 1 through 3600.

Modes
   Configuration mode

Configuration Statement
   service {
      twamp {
         server {
            test-inactivity-timeout seconds
         }
      }
   }

Usage Guidelines
   Use the set form of this command to specify the test-session timeout value.
   Use the delete form of this command to reset the timeout value to the default number of seconds, which is 900.
service twamp server user <username> password <pwd>
Configures a username and password for use with authenticated, encrypted, and mixed mode sessions.

Syntax

set service twamp server user username password pwd
delete service twamp server user username

Parameters

username
Specifies the username to create.

pwd
Specifies the user account password.

Modes

Configuration mode

Configuration Statement

```
service {
    twamp {
        server {
            user username {
                password pwd
            }
        }
    }
}
```

Usage Guidelines

Use the set form of this command to create a user account for accessing the TWAMP server.

NOTE
Pressing Return after entering the set service twamp server user username password command, allows you to enter the password without it being shown on the console.

Use the delete form of this command to delete a user account.
show service twamp server session [all | client <ip-address> | summary]

Shows TWAMP session information.

Syntax

```
show service twamp server session [ all | client ip-address | summary ]
```

Command Default

Displays the details of all current TWAMP sessions.

Parameters

- **all**
  - Displays the details of all current TWAMP sessions.
- **client <ip-address>**
  - Displays information for a specific TWAMP session.
- **summary**
  - Displays a summary of current TWAMP sessions.

Modes

- Operational mode

Usage Guidelines

Use this command to display TWAMP session information.
Examples

The following example shows how to display the details of all current TWAMP sessions.

vyatta@R1:~$ show service twamp server session all
Total number of sessions: 20
--> Control Session initiated by [11.2.0.2]:40972 in Open mode

<table>
<thead>
<tr>
<th>SID</th>
<th>SENDER</th>
<th>REFLECTOR</th>
<th>STATUS</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0b020001d86c04daae30446b81fd2db7</td>
<td>[11.2.0.2]:8772</td>
<td>[11.2.0.1]:50150</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da6a6a4ae89bce550</td>
<td>[11.2.0.2]:8955</td>
<td>[11.2.0.1]:53927</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da9e83c6cefa1fadc3</td>
<td>[11.2.0.2]:8864</td>
<td>[11.2.0.1]:53680</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da920535c5ee195b</td>
<td>[11.2.0.2]:8927</td>
<td>[11.2.0.1]:47290</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da8fc01fc9ca93c01</td>
<td>[11.2.0.2]:8928</td>
<td>[11.2.0.1]:53642</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
</tbody>
</table>

<--

--> Control Session initiated by [11:4::2]:36319 in Open mode

<table>
<thead>
<tr>
<th>SID</th>
<th>SENDER</th>
<th>REFLECTOR</th>
<th>STATUS</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000001d86c04f64ad1f1cf230de104</td>
<td>[11:4::2]:8778</td>
<td>[11:4::1]:57929</td>
<td>ACTIVE</td>
<td>0x24</td>
</tr>
<tr>
<td>00000001d86c04f63e8f9e295</td>
<td>[11:4::2]:8767</td>
<td>[11:4::1]:59181</td>
<td>ACTIVE</td>
<td>0x24</td>
</tr>
<tr>
<td>00000001d86c04f6315b53e64f175c</td>
<td>[11:4::2]:8788</td>
<td>[11:4::1]:45432</td>
<td>ACTIVE</td>
<td>0x24</td>
</tr>
<tr>
<td>00000001d86c04f6242f2f982b2b1b9c</td>
<td>[11:4::2]:8817</td>
<td>[11:4::1]:41301</td>
<td>ACTIVE</td>
<td>0x24</td>
</tr>
<tr>
<td>00000001d86c04f6154f5234555722</td>
<td>[11:4::2]:8908</td>
<td>[11:4::1]:60239</td>
<td>ACTIVE</td>
<td>0x24</td>
</tr>
</tbody>
</table>

<--

--> Control Session initiated by [11.1.0.2]:47329 in Open mode

<table>
<thead>
<tr>
<th>SID</th>
<th>SENDER</th>
<th>REFLECTOR</th>
<th>STATUS</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0b010001d86c04fc5fd3b6c3ac57b6b6</td>
<td>[11.1.0.2]:8815</td>
<td>[11.1.0.1]:52183</td>
<td>ACTIVE</td>
<td>0x21</td>
</tr>
<tr>
<td>0b010001d86c04e3e3b647c7f5ee48e5b</td>
<td>[11.1.0.2]:8769</td>
<td>[11.1.0.1]:54913</td>
<td>ACTIVE</td>
<td>0x21</td>
</tr>
<tr>
<td>0b010001d86c04e3b20663c7f80668a</td>
<td>[11.1.0.2]:8847</td>
<td>[11.1.0.1]:33790</td>
<td>ACTIVE</td>
<td>0x21</td>
</tr>
<tr>
<td>0b010001d86c04e3b83b3b84b3d31f</td>
<td>[11.1.0.2]:8819</td>
<td>[11.1.0.1]:40670</td>
<td>ACTIVE</td>
<td>0x21</td>
</tr>
</tbody>
</table>

<--

--> Control Session initiated by [11:3::2]:33644 in Open mode

<table>
<thead>
<tr>
<th>SID</th>
<th>SENDER</th>
<th>REFLECTOR</th>
<th>STATUS</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000001d86c04eb699b6c5e856f53</td>
<td>[11:3::2]:8763</td>
<td>[11:3::1]:57336</td>
<td>ACTIVE</td>
<td>0x23</td>
</tr>
<tr>
<td>00000001d86c04eeb5c679c7b99e8083</td>
<td>[11:3::2]:8835</td>
<td>[11:3::1]:53602</td>
<td>ACTIVE</td>
<td>0x23</td>
</tr>
<tr>
<td>00000001d86c04eb558149325653cb</td>
<td>[11:3::2]:8760</td>
<td>[11:3::1]:52560</td>
<td>ACTIVE</td>
<td>0x23</td>
</tr>
<tr>
<td>00000001d86c04eb18746117e72ea6e0</td>
<td>[11:3::2]:8817</td>
<td>[11:3::1]:42781</td>
<td>ACTIVE</td>
<td>0x23</td>
</tr>
<tr>
<td>00000001d86c04eb0238972b68ae13d</td>
<td>[11:3::2]:8935</td>
<td>[11:3::1]:55790</td>
<td>ACTIVE</td>
<td>0x23</td>
</tr>
</tbody>
</table>

<--

The following example shows how to display the information for the TWAMP session that is associated with the 11.1.0.2 IP address.

vyatta@R1:~$ show service twamp server session client 11.1.0.2

--> Control Session initiated by [11.2.0.2]:40972 in Open mode

<table>
<thead>
<tr>
<th>SID</th>
<th>SENDER</th>
<th>REFLECTOR</th>
<th>STATUS</th>
<th>DSCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0b020001d86c04daae30446b81fd2db7</td>
<td>[11.2.0.2]:8772</td>
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</tr>
<tr>
<td>0b020001d86c04da6a6a4ae89bce550</td>
<td>[11.2.0.2]:8955</td>
<td>[11.2.0.1]:53927</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da9e83c6cefa1fadc3</td>
<td>[11.2.0.2]:8864</td>
<td>[11.2.0.1]:53680</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da920535c5ee195b</td>
<td>[11.2.0.2]:8927</td>
<td>[11.2.0.1]:47290</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
<tr>
<td>0b020001d86c04da8fc01fc9ca93c01</td>
<td>[11.2.0.2]:8928</td>
<td>[11.2.0.1]:53642</td>
<td>ACTIVE</td>
<td>0x22</td>
</tr>
</tbody>
</table>

<--

The following example shows how to display a summary of current TWAMP sessions.

vyatta@R1:~$ show service twamp server session summary

Total connected clients: 4
Total active test sessions: 20
Total inactive test sessions: 0

Client 0: Initiated by [11.2.0.2]:40972 in Open mode
    Active sessions: 5
    Inactive sessions: 0

Client 1: Initiated by [11:4::2]:36319 in Open mode
    Active sessions: 5
    Inactive sessions: 0
Client 2: Initiated by [11.1.0.2]:47329 in Open mode
   Active sessions: 5
   Inactive sessions: 0

Client 3: Initiated by [11:3::2]:33644 in Open mode
   Active sessions: 5
   Inactive sessions: 0
**twping <host-address>**

Measures the round-trip IP performance using the TWAMP server.

**Syntax**

```
twping host-address [ auth-mode { authenticated | encrypted | mixed } user user ] [ control-port port ] [ count count ] [ interval seconds ] [ padding size ] [ port-range port1 - port2 ] [ sample seconds ] [ session-count s-count ] [ test-dscp-value dscp-value ]
```

**Parameters**

- **host-address**
  Host name or IP address (IPv4 or IPv6) of the TWAMP server.

- **auth-mode { authenticated | encrypted | mixed } user user**
  Authentication mode (authenticated, encrypted, or mixed).

- **control-port port**
  Port for server control connection.

- **count count**
  Number of test packets to send (default is 100).

- **interval seconds**
  Number of seconds between test packets.

- **padding size**
  Padding, in bytes, to add to test packets.

- **port-range port1 - port2**
  UDP port range to use for test packets.

- **sample seconds**
  Interval, in seconds, to display statistics during the session.

- **session-count s-count**
  Number of test sessions to create and use.

- **test-dscp-value dscp-value**
  Base-10 DSCP value. The value ranges from 0 through 63; the default value is 0.

**Modes**

Operational mode

**Usage Guidelines**

Use this command to measure round-trip IP performance. If the authentication mode is authenticated, encrypted, or mixed, then this command prompts you to enter the required username and password before continuing.
Overview

The vRouter supports Network Configuration Protocol (NETCONF) Remote Procedure Calls (RPCs), which allow you to remotely run certain vRouter CLI commands. The vRouter supports `twping`, an RPC equivalent of the `twping` operational CLI command. The following sections describe the `twping` RPC call and how to use it.

NOTE
For more information about NETCONF support on the vRouter, refer to Brocade 5600 vRouter Remote Management Reference Guide.

YANG model for the `twping` RPC call

The `twping` RPC call has the following YANG definition.

```yarn
rpc twping {
    description "Measure the round trip time using TWAMP";
    typedef time-interval-ms {
        description "Floating point value representing a time interval";
        type decimal64 {
            fraction-digits 12;
        }
        units "milliseconds";
    }
    grouping min-max-time {
        leaf min {
            description "Minimum time observed during the sample period";
            type time-interval-ms;
        }
        leaf max {
            description "Maximum time observed during the sample period";
            type time-interval-ms;
        }
    }
    grouping addr-port {
        leaf address {
            description "IP address or domain name";
            type union {
                type types:ip-address;
                type types:domain-name;
            }
        }
        leaf port {
            description "Port number";
            type inet:port-number;
        }
    }
    grouping time-stats {
        uses min-max-time;
        leaf median {
            description "Median time observed during the sample period";
            type time-interval-ms;
        }
    }
}
```
grouping hops {
    leaf diff-num-ttl {
        description "A count of how many different hop count values were observed during the test.";
        type uint32;
    }
    leaf min {
        description "Minimum number of hops taken by a test packet";
        type uint32;
    }
    leaf max {
        description "Maximum number of hops taken by a test packet";
        type uint32;
    }
}

input {
    leaf host {
        description "IP address or domain name of the test reflector";
        type union {
            type types:ip-address;
            type types:domain-name;
        }
        mandatory true;
    }
    leaf count {
        description "Number of test packets to send";
        type uint32 {
            range 1..1000;
        }
        default 100;
    }
    leaf padding {
        description "Size of the padding to add to each test packet";
        type uint32 {
            range 0..65000;
        }
        units "bytes";
    }
    leaf session-count {
        description "Number of test sessions to create and use";
        type uint32 {
            range 1..65535;
        }
        default 1;
    }
    leaf test-dscp-value {
        description "RFC 2474 style DSCP value for TOS byte in test packets";
        type uint32 {
            range 0..63;
        }
        default 0;
    }
    leaf control-port {
        description "Port to be used for the server control connection";
        type inet:port-number {
            range 1..65535;
        }
        default 862;
    }
    leaf interval {
        description "Mean average time between each test packet sent";
        type decimal64 {
            range 0.1..10000;
        }
        default 0.5;
    }
}
fraction-digits 12;
range 0.0..max;
}
units "seconds";
}
container port-range {
  must "start <= end" {
    error-message
    "port-range start must be lower than or equal to port-range end";
  }
  must "((end - start + 1)) >= ../session-count" {
    description
    "Each session uses a different port
    number, therefore, there must be
    at least as many available ports
    in the port-range as sessions that
    are going to be opened";
    error-message "Size of the port-range must be at least as large as session-count";
  }
  leaf start {
    description "The lowest port number that can be used during the test";
    type inet:port-number {
      range 1..65535;
    }
    default 8760;
  }
  leaf end {
    description "The highest port number that can be used during the test";
    type inet:port-number {
      range 1..65535;
    }
    default 8960;
  }
}
container authentication {
  presence "Enables authentication";
  leaf mode {
    description "Authentication mode";
    type enumeration {
      enum "authenticate";
      enum "encrypt";
      enum "mixed";
    }
    default "authenticate";
  }
  leaf user {
    description "User name";
    type string {
      length 1..16;
    }
    mandatory true;
  }
  leaf passphrase {
    description "Passphrase for user";
    type string {
      length 1..1024;
    }
    mandatory true;
  }
}
output {
  list results {
    key sid;
    leaf sid {
      description "Session Identifier";
      type string;
    }
    container source {
      description "Source address that test packets originated from";
      uses addr-port;
    }
  }
}
container destination {
    description "Destination address of the test reflector";
    uses addr-port;
}

container packets {
    leaf time-of-first {
        description "Time that the first test packet was sent";
        type ietf:date-and-time;
    }
    leaf time-of-last {
        description "Time that the last test packet was sent";
        type ietf:date-and-time;
    }
    leaf num-pkts-sent {
        description "Number of test packets that were sent";
        type uint32;
    }
    leaf num-pkts-lost {
        description "Number of test packets that were lost";
        type uint32;
    }
    leaf send-duplicates {
        description "Number of duplicate test packets received by the reflector";
        type uint32;
    }
    leaf reflect-duplicates {
        description "Number of duplicate test packets received by the sender";
        type uint32;
    }
}

container round-trip-time {
    description "Total round trip time, from when the test packet is sent from the test
    client, until it is received back from the reflector";
    uses time-stats;
}

container send-time {
    description "Wire time for test packets to go from sender to reflector";
    uses time-stats;
}

container reflect-time {
    description "Wire time for test packets to go from the reflector, back to the sender";
    uses time-stats;
}

container reflector-processing-time {
    description "Time taken to process test packets within the reflector";
    uses min-max-time;
}

container send-hops {
    description "Number of hops taken by the test packets going from the sender to
    the reflector.";
    uses hops;
}

container reflect-hops {
    description "Number of hops taken by the test packets going from the reflector back to
    the sender";
    uses hops;
}
}

configd:call-rpc "twamp-ping-rpc";
count
Number of test packets to send. The number ranges from 1 through 1000. The default is 100.

control-port
Port to be used for the server control connection. The port number ranges from 1 through 65535. The default is 862.

interval
Mean average time in seconds between each test packet sent. The mean ranges from 0.0 through 9223372.036855.

padding
Number of bytes of padding that is added to each test packet. The number ranges from 0 through 65000. If not specified, the vRouter uses an implicit default value.

session-count
Number of test sessions to create and use. The number ranges from 1 through 65535. The default is 1.

test-dscp-value
RFC 2474-style DSCP value for the TOS byte in test packets. The value ranges from 0 through 63. The default is 0.

port-range
Range of allowed port numbers.

authentication
The authentication mode and user credentials.

mode
Authentication mode. The mode can be one of the following modes:
- authenticate
- encrypt
- mixed
The default mode is authenticate.

user
Username. The username is mandatory.

passphrase
Passphrase for the user. The length of the passphrase ranges from 1 through 1024 characters and there are no explicit restrictions on characters. The passphrase is mandatory.

Output parameters
The following table lists the output parameters of the twping RPC call.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sid</td>
<td>Identifier of the session between the client and TWAMP server.</td>
</tr>
<tr>
<td>source</td>
<td>Address of the vRouter from which test packets originate.</td>
</tr>
<tr>
<td>address</td>
<td>IP address or domain name of the source vRouter.</td>
</tr>
<tr>
<td>port</td>
<td>Port number from which the test packets are sent.</td>
</tr>
<tr>
<td>round-trip-time</td>
<td>Length of time it takes for the test packets to be sent from the source vRouter (client) plus the length of time it takes for the response packets to be received from the session reflector of the TWAMP server, which can run on a vRouter or third-party system.</td>
</tr>
<tr>
<td>median</td>
<td>Median round-trip time observed during the sampling period.</td>
</tr>
<tr>
<td>pdv</td>
<td>Packet-delay variation (PDV), measured in milliseconds.</td>
</tr>
<tr>
<td>error</td>
<td>Calculated error for timing values, measured in milliseconds.</td>
</tr>
<tr>
<td>min</td>
<td>Minimum round-trip time observed during the sampling period, measured in milliseconds.</td>
</tr>
<tr>
<td>max</td>
<td>Maximum round-trip time observed during the sampling period, measured in milliseconds.</td>
</tr>
<tr>
<td>destination</td>
<td>Destination address of the session reflector on the TWAMP server.</td>
</tr>
<tr>
<td>address</td>
<td>IP address or domain name of the reflector.</td>
</tr>
<tr>
<td>port</td>
<td>Port number to which the test packets are sent.</td>
</tr>
<tr>
<td>reflect-hops</td>
<td>Number of hops it takes for the response packets to get from the session reflector to the client.</td>
</tr>
<tr>
<td>diff-num-ttl</td>
<td>A count of how many different hop count values were observed during the test.</td>
</tr>
<tr>
<td>min</td>
<td>Minimum number of hops taken by a test packet.</td>
</tr>
<tr>
<td>max</td>
<td>Maximum number of hops taken by a test packet.</td>
</tr>
</tbody>
</table>
### Differences between the `twping` CLI command and the `twping` RPC call

The CLI and RPC versions of `twping` have the same functionality, but they have minor differences that are described in the following sections.

#### Authentication

When using the `twping` CLI command, you must specify the authentication mode. However, when invoking a `twping` RPC call, you do not have to explicitly specify the authentication mode because, by default, the mode is set to `authenticate`. However, you must specify a username and passphrase because RPC calls do not support interactive prompts.

The following example shows how to specify the authentication mode when running the `twping` CLI command. After entering the command, the CLI prompts you for a passphrase. After you enter the passphrase, the vRouter pings the TWAMP server and displays the results.

```bash
v@vyatta:~$ twping localhost auth-mode authenticate user v
Enter passphrase for identity 'v':
Approximately 13.2 seconds until results available
```
The following example shows two twping RPC calls. The first call does not specify the authentication mode, but the second call does. Both calls specify a user and the corresponding passphrase.

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <authentication>
      <user>user1</user>
      <passphrase>example-passphrase</passphrase>
    </authentication>
  </twping>
</rpc>
```

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <authentication>
      <mode>authenticate</mode>
      <user>user1</user>
      <passphrase>example-passphrase</passphrase>
    </authentication>
  </twping>
</rpc>
```

### Port range

Slight differences exist in how you specify port ranges when using the CLI version of the twping command as opposed to the RPC versions.

The twping RPC call has a default port range (8760 through 8960), which is equivalent to twping reflector port-range 8760-8960. The twping CLI command lets you specify the starting and ending port numbers or just a single port number. If you specify a single port number, the twping command uses the same number for the starting and ending port numbers. For example, twping reflector port-range 8000 is equivalent to twping reflector port-range 8000-8000.

When invoking a twping RPC call, the behavior is slightly different. You can specify starting and ending ports for the range, or specify just one port. If you specify only one port, the twping RPC call uses the default port for the other port in the range.

For example, if you specify 9000 as the ending port number, the command sets the starting port number to 8760.

```
<port-range>
  <end>9000</end>
</port-range>
```

```
<port-range>
  <start>8760</start>
  <end>9000</end>
</port-range>
```

If you specify 8800 as the starting port number, the command sets the ending value to 8960.

```
<port-range>
  <start>8800</start>
</port-range>
```

```
<port-range>
  <start>8800</start>
  <end>8960</end>
</port-range>
```
**Time stamps**

The **twping** RPC call supports ISO8601-formatted time stamps, which differ slightly from those that are supported by the **twping** CLI command. The time-of-first and time-of-last time stamps that are supported by the **twping** RPC call include time zone offsets. These offsets are not included by the **twping** CLI command.

The following example shows the time-of-first and time-of-last time stamps that are generated by the **twping** CLI command.

```plaintext
first: 2016-01-08T13:51:41.855
last: 2016-01-08T13:51:52.016
```

The following example shows the RPC-equivalent time stamps when the time zone is set to UTC.

```plaintext
<time-of-first>2016-01-08T13:51:41.855+00:00</time-of-first>
<time-of-last>2016-01-08T13:51:52.016+00:00</time-of-last>
```

**Making twping RPC calls**

The following sections show examples of **twping** RPC calls with their equivalent **twping** CLI commands.

**Making a basic RPC twping call**

The following example shows the RPC equivalent of the **twping localhost** CLI command.

```xml
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1" host=localhost/>
</rpc>
```

```xml
<?xml version="1.0"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <results xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <sid>00000001da3a58d956c9be3a604b90fa</sid>
    <reflector-processing-time>
      <min>0.00191</min>
      <max>0.0181</max>
    </reflector-processing-time>
    <source>
      <address>localhost</address>
      <port>8890</port>
    </source>
    <send-time>
      <min>0.0162</min>
      <pdv>0.0</pdv>
      <max>0.0839</max>
      <median>0.1</median>
      <error>0.0441</error>
    </send-time>
    <reflect-duplicates>0</reflect-duplicates>
    <num-pkts-lost>0</num-pkts-lost>
    <time-of-last>2016-01-08T15:48:49.952+00:00</time-of-last>
    <send-duplicates>0</send-duplicates>
    <time-of-first>2016-01-08T15:48:42.721+00:00</time-of-first>
    <num-pkts-sent>100</num-pkts-sent>
  </results>
  <round-trip-time>
    <error>0.0882</error>
    <min>0.0234</min>
    <pdv>0.0</pdv>
    <median>0.1</median>
    <max>0.108</max>
  </round-trip-time>
  <reflect-time>
    <max>0.0343</max>
  </reflect-time>
</rpc-reply>
```
Initiating multiple twping sessions

The following example shows the RPC equivalent of the `twping localhost session-count 2` CLI command. The RPC call initiates two sessions.

```xml
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <session-count>2</session-count>
  </twping>
</rpc>
```

```xml
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <results xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <reflector-processing-time>
      <max>0.0238</max>
      <min>0.00334</min>
    </reflector-processing-time>
    <send-hops>
      <max>0</max>
      <min>0</min>
      <diff-num-ttl>1</diff-num-ttl>
    </send-hops>
    <round-trip-time>
      <max>0.13</max>
      <pdv>0.1</pdv>
      <min>0.0339</min>
      <median>0.1</median>
      <error>0.000001</error>
    </round-trip-time>
    <packets>
      <time-of-last>2016-01-13T14:51:30.480+00:00</time-of-last>
      <reflect-duplicates>0</reflect-duplicates>
      <num-pkts-lost>0</num-pkts-lost>
      <time-of-first>2016-01-13T14:51:22.587+00:00</time-of-first>
      <num-pkts-sent>100</num-pkts-sent>
      <send-duplicates>0</send-duplicates>
    </packets>
    <destination>
      <address>localhost</address>
      <port>53612</port>
    </destination>
    <source>
      <address>localhost</address>
      <port>8834</port>
    </source>
  </results>
</rpc-reply>
```
Making an RPC twping call with all possible input parameters

The following example shows the RPC equivalent of the `twping localhost session-count 1 padding 1000 interval 2.0 count 10 test-dscp-value 0 auth-mode authenticate user v control-port 862 port-range 6000 CLI command. This RPC call uses all the possible input parameters.

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <count>10</count>
    <control-port>862</control-port>
    <interval>2.0</interval>
    <padding>1000</padding>
    <port-range>
      <start>6000</start>
      <end>6000</end>
    </port-range>
    <session-count>1</session-count>
    <test-dscp-value>0</test-dscp-value>
    <authentication>
      <mode>authenticate</mode>
      <user>v</user>
      <passphrase>v</passphrase>
    </authentication>
  </twping>
</rpc>
```

<?xml version="1.0"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <results xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <source>
      <address>localhost</address>
      <port>6000</port>
    </source>
    <round-trip-time>
      <median>0.1</median>
      <pdv>0.0</pdv>
      <error>8.79</error>
      <min>0.0591</min>
      <max>0.0968</max>
    </round-trip-time>
    <sid>00000001da3a5bac42f2882ee23c8231</sid>
    <destination>
      <port>52123</port>
      <address>localhost</address>
    </destination>
    <reflect-hops>
      <diff-num-ttl>1</diff-num-ttl>
      <min>0</min>
      <max>0</max>
    </reflect-hops>
    <send-time>
      <max>0.0701</max>
      <error>4.39</error>
      <pdv>0.0</pdv>
      <min>0.0467</min>
      <median>0.1</median>
    </send-time>
    <reflector-processing-time>
      <max>0.0401</max>
      <min>0.00906</min>
    </reflector-processing-time>
    <packets>
      <num-pkts-sent>10</num-pkts-sent>
    </packets>
  </results>
</rpc-reply>
Error messages

When a NETCONF RPC fails, it describes the cause of the failure in the error-message field of the reply structure that is returned by the RPC.

If the failure is caused by a twping-related issue, the error messages that are returned by the RPC reply are the same as the error messages that are returned by the twping CLI command.

If the failure is related to the RPC (for example, missing or invalid RPC call parameters), the following error messages are returned.

Invalid port range

When making an RPC call, if, for a range of ports, you specify a starting number that is greater than the ending number, the following error message is returned.

[port-range] port-range start must be lower than or equal to port-range end

The following example shows the XML structure of an RPC call that is equivalent to the twping localhost session-count 1 port-range 6000-5000 CLI command and the error message that is returned in the RPC reply.

```
<?xml version="1.0" encoding="UTF-8"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <session-count>1</session-count>
    <port-range>
      <start>6000</start>
      <end>5000</end>
    </port-range>
  </twping>
</rpc-reply>
```
Invalid port range size

When making a `twping` RPC call, you can specify the number of test sessions to create. However, because each session requires a port, if you specify a port range such that the number of ports is fewer than the number of test sessions, the following error message is returned.

```
[port-range] Size of the port-range must be at least as large as session-count
```

To prevent this error from occurring, make sure that you specify a wide port range in the RPC call. If you do not specify a port range, make sure that you do not specify more than 201 test sessions in the call because the default range (8760 through 8960) accommodates as many as 201 ports.

The following example shows the XML structure of a `twping` RPC call in which the number of test sessions is greater than the number of ports in the port range.

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <host>localhost</host>
    <session-count>100</session-count>
    <port-range>
      <start>8000</start>
      <end>8005</end>
    </port-range>
  </twping>
</rpc>
```

Missing mandatory parameters

When making an RPC call, you must supply the following parameters.

- host (always mandatory)
- user (mandatory when authentication is required)
- passphrase (mandatory when authentication is required)

If any parameter is missing, the following error message is returned.

```
Missing mandatory node
```

The following example shows the XML structure of an RPC call and the returned error message. In this example, the RPC call does not specify a host. In addition, even though the call requires authentication, no user or passphrase is specified.

```
<rpc xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1">
    <authentication>
      <mode>authenticate</mode>
    </authentication>
  </twping>
</rpc>
```

<?xml version="1.0" encoding="UTF-8"?>
```
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="3">
  <rpc-error>
    <error-type>application</error-type>
  </rpc-error>
</rpc-reply>
```
<error-tag>operation-failed</error-tag>
<error-severity>error</error-severity>
<error-message>Failed to parse xml input: Invalid XML - []
Missing mandatory node host
[authentication]
Missing mandatory node user
[authentication]
Missing mandatory node passphrase

```xml
&amp;twping xmlns="urn:vyatta.com:mgmt:vyatta-service-twamp:1"&gt;
  &lt;authentication&gt;
    &lt;mode&gt;authenticate&lt;/mode&gt;
  &lt;/authentication&gt;
&lt;/twping&gt;
```
</error-message>
</rpc-error>
</rpc-reply>
Port Mirroring

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Overview

Switch Port Analyzer (SPAN), Remote SPAN (RSPAN), and Encapsulated RSPAN (ERSPAN) enable you to monitor and troubleshoot network traffic.

SPAN overview

SPAN mirrors traffic on one or more source interfaces on a Brocade vRouter to a destination interface on the same router. Source interfaces can be both physical and VLAN interfaces. Both ingress and egress traffic on source interfaces can be mirrored. For SPAN, the destination interface is a physical port to which a network monitoring tool is connected for capturing and analyzing the traffic.

The following figure shows a SPAN port mirroring session.

FIGURE 17 SPAN port mirroring session

RSPAN overview

RSPAN mirrors traffic to a destination interface on a remote Brocade vRouter. RSPAN mirroring has source and destination Brocade vRouters. On the source router, traffic from source interfaces is mirrored to a VLAN interface (VIF). This RSPAN VLAN is dedicated to transporting mirrored traffic to the remote router. RSPAN on the destination router receives mirrored traffic on this VLAN interface and forwards it to a destination interface on this router.

Source interfaces can be both physical and VLAN interfaces. Both ingress and egress traffic on source interfaces can be mirrored. For an RSPAN destination session, the destination interface is a physical port to which a network monitoring tool is connected for capturing and analyzing the traffic.

The following figure shows an RSPAN port mirroring session on source and destination Brocade vRouters.
ERSPAN overview

ERSPAN mirrors traffic to a destination interface on a remote Brocade vRouter. Similar to RSPAN, ERSPAN mirroring has source and destination Brocade vRouters. However, it uses an ERSPAN tunnel to transmit mirrored packets from the source vRouter to the destination vRouter. The tunnel is configured with local and remote IP addresses and is dedicated to transporting mirrored traffic to the remote vRouter.

On the source vRouter, traffic from source interfaces is mirrored and prepended by Type II or Type III headers. These headers are defined in the following IETF draft proposal.

https://tools.ietf.org/html/draft-foschiano-erspan-00

Then, the ERSPAN on the source vRouter sends the traffic to the tunnel. ERSPAN on the destination router receives the mirrored traffic from the tunnel and forwards it to a destination interface on this router for traffic analysis.

Source interfaces are physical interfaces. Both ingress and egress traffic on source interfaces can be mirrored. For an ERSPAN destination session, the destination interface is a physical port to which a network monitoring tool is connected for capturing and analyzing the traffic.

The following figure shows an ERSPAN port mirroring session on source and destination Brocade vRouters.

Configuration requirements and limits

The Brocade vRouter has the following configuration requirements and limits for SPAN, RSPAN, and ERSPAN.

- A total of eight monitoring sessions is supported.
- By default, a port monitoring session is enabled. When a source interface is configured, packets from the interface are mirrored only when the session type and the destination interface for the session are also configured. For ERSPAN, the identifier (ID) and header also must be specified.
- When a session is configured for port monitoring, the type value must be specified. The value is mandatory.
- The SPAN type supports the following interfaces:
The RSPAN-source type supports the following interfaces:
- Source interface, physical or VLAN
- Destination interface, VLAN only

The RSPAN-destination type supports the following interfaces:
- Source interface, VLAN only
- Destination interface, physical only

The ERSPAN-source type supports the following interfaces:
- Source interface, physical or VLAN
- Destination interface, ERSPAN tunnel only

The ERSPAN-destination type supports the following interfaces:
- Source interface, ERSPAN tunnel only
- Destination interface, physical only

A source interface and a destination interface cannot be same.
A total of eight distinct source interfaces is allowed for all sessions.
The default directions for monitoring on a source interface are both receive (RX) and transmit (TX). The direction can also be configured as RX only or TX only.
Source interfaces cannot be shared between sessions.
The source VIF for the RSPAN-destination type must be part of a bridge group.
A destination interface that is configured for monitoring transmits mirrored packets only. Do not use this interface for other traffic.
The destination interface must be configured in the system, cannot be disabled, and cannot have address, IPv4, and IPv6 attributes.
A physical destination interface cannot have QoS configured on it.
Only one destination interface for each session is allowed and cannot be shared between different sessions.
The destination interface for any session cannot be part of a bridge group.
An RSPAN-destination or ERSPAN-destination type can have only one source interface for a port monitoring session.
The source interface of an RSPAN-destination or ERSPAN-destination type cannot have its direction set.
For port monitoring sessions, you are not allowed to configure a physical interface and VIF from the same physical interface together. For example, both dpOs7 and dpOs7.700 are not allowed.
You cannot change the type of the session after you commit the configuration.
You cannot change the ERSPAN identifier and header properties of an ERSPAN-source or ERSPAN-destination session type after you commit the configuration.

SPAN port mirroring configuration

SPAN port mirroring requires the configuration of a Brocade vRouter as provided in the following example.
### TABLE 30 Configuring SPAN port mirroring

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure a SPAN session.</td>
<td><code>vyatta@vyatta# set service portmonitor session 1 type span</code></td>
</tr>
<tr>
<td>Configure the source interface for the session. By default, the monitoring of the traffic direction is both ingress and egress.</td>
<td><code>vyatta@vyatta# set service portmonitor session 1 source dp0s3</code></td>
</tr>
<tr>
<td>Configure the destination interface for the session.</td>
<td><code>vyatta@vyatta# set service portmonitor session 1 destination dp0s4</code></td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td><code>vyatta@vyatta# commit</code></td>
</tr>
<tr>
<td>Save the configuration. Port monitoring for the session is enabled if the type, source and destination parameters are configured properly.</td>
<td><code>vyatta@vyatta# save</code></td>
</tr>
</tbody>
</table>
| Display the port mirroring configuration. | `vyatta@vyatta:~$ show portmonitor session
Session: 1
  Type: span
  State: enabled
  Source interfaces:
    Name: dp0s3
      Direction: both
  Destination interface: dp0s4` |

### RSPAN port mirroring configuration

RSPAN port mirroring requires the configuration of source and destination Brocade vRouters.
NOTE
For traffic to flow from RSPAN source and destination vRouters running on Citrix XenServer systems, XenServer must use Linux bridge instead of Open vSwitch. Also, aging on the bridge corresponding to the vRouter network must be set to 0. This setting makes the entries in the forwarding table permanent.

1. To check whether XenServer is using Open vSwitch or Linux bridge, use the `cat` command to view the network.conf file.

   ```
   # cat /etc/xensource/network.conf
   ```

2. If Open vSwitch is in use, use the following command to switch to Linux bridge.

   ```
   # xe-switch-network-backend bridge
   ```

3. Use the `xe network-list` command to find the bridge that corresponds to your network, similar to the following example.

   ```
   # xe network-list
   uuid ( RO)                : ...
   name-label ( RW): ...
   name-description ( RW): ...
   bridge ( RO): xapi10
   ```

4. Use the `brctl setageing` command to set the aging for the bridge to 0.

   ```
   # brctl setageing xapi10 0
   ```

   To change back to Open vSwitch, enter the following command.

   ```
   # xe-switch-network-backend openvswitch
   ```

RSPAN-source port mirroring
The following example provides the configuration of RSPAN-source port mirroring on a Brocade vRouter.

<table>
<thead>
<tr>
<th>TABLE 31 Configuring RSPAN-source port mirroring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Configure an RSPAN-source session.</td>
</tr>
<tr>
<td>Configure the source physical interface for the session. By default, the monitoring of the traffic direction is both ingress and egress.</td>
</tr>
<tr>
<td>Configure the destination VLAN interface for the session.</td>
</tr>
<tr>
<td>Commit the configuration.</td>
</tr>
<tr>
<td>Save the configuration.</td>
</tr>
<tr>
<td>Port monitoring for the session is enabled if the type, source and destination parameters are configured properly.</td>
</tr>
<tr>
<td>Display the port mirroring configuration.</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
TABLE 31 Configuring RSPAN-source port mirroring (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Source interfaces: dp0s5</td>
</tr>
<tr>
<td></td>
<td>Name: dp0s5</td>
</tr>
<tr>
<td></td>
<td>Direction: both</td>
</tr>
<tr>
<td></td>
<td>Destination interface: dp0s7.700</td>
</tr>
</tbody>
</table>

**RSPAN-destination port mirroring**

The following example provides the configuration of RSPAN-destination port mirroring on a Brocade vRouter.

TABLE 32 Configuring RSPAN-destination port mirroring

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure an RSPAN-destination session.</td>
<td>vyatta@vyatta# set service portmonitor session 3 type rspan-destination</td>
</tr>
<tr>
<td>Configure the source VLAN interface for the session. You cannot specify a direction for an RSPAN-destination session. The source VIF for the RSPAN-destination type must be part of a bridge group.</td>
<td>vyatta@vyatta# set service portmonitor session 3 source dp0s7.700</td>
</tr>
<tr>
<td>Configure the destination physical interface for the session.</td>
<td>vyatta@vyatta# set service portmonitor session 3 destination dp0s6</td>
</tr>
<tr>
<td>Commit the configuration.</td>
<td>vyatta@vyatta# commit</td>
</tr>
<tr>
<td>Save the configuration.</td>
<td>vyatta@vyatta# save</td>
</tr>
<tr>
<td>Port monitoring for the session is enabled if the type, source and destination parameters are configured properly.</td>
<td>vyatta@vyatta# show portmonitor session 3 Type: rspan-destination State: enabled Source interfaces: Name: dp0s7.700 Direction: both Destination interface: dp0s6</td>
</tr>
</tbody>
</table>

**ERSPAN port mirroring configurations**

ERSPAN port mirroring requires the configuration of source and destination Brocade vRouters.

**ERSPAN-source port mirroring configuration**

The following example provides the configuration of ERSSPAN-source port mirroring on a Brocade vRouter.

TABLE 33 Configuring ERSSPAN-source port mirroring

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure an ERSSPAN GRE tunnel.</td>
<td>vyatta@vyatta# set interfaces dataplane dp0s11 address 15.1.1.1/24 vyatta@vyatta# set interfaces erspan erspan0 local-ip 15.1.1.1</td>
</tr>
</tbody>
</table>
### TABLE 33 Configuring ERSPAN-source port mirroring (continued)

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
</table>
| vyatta@vyatta# set interfaces erspan erspan0 remote-ip 15.1.1.2 | vyatta@vyatta# show interfaces
| vyatta@vyatta# show interfaces { interfaces { dataplane dp0s11 { address 15.1.1.1/24 
| vyatta@vyatta# show interfaces erspan erspan0 { local-ip 15.1.1.1 
| vyatta@vyatta# show interfaces erspan erspan0 { remote-ip 15.1.1.2 
| vyatta@vyatta# show interfaces erspan erspan0 { }
| vyatta@vyatta# set service portmonitor session 22 type erspan-source | vyatta@vyatta# set service portmonitor session 22 type erspan-source
| vyatta@vyatta# set service portmonitor session 22 source dp0s4.100 | vyatta@vyatta# set service portmonitor session 22 destination erspan0
| vyatta@vyatta# set service portmonitor session 22 destination erspan0 | vyatta@vyatta# set service portmonitor session 22 erspan identifier 200
| vyatta@vyatta# set service portmonitor session 22 erspan identifier 200 | vyatta@vyatta# set service portmonitor session 22 erspan header type-II
| vyatta@vyatta# set service portmonitor session 22 erspan header type-II | vyatta@vyatta# commit
| vyatta@vyatta# save | vyatta@vyatta# commit
| vyatta@vyatta# commit | vyatta@vyatta# save
| Port monitoring for the session is enabled if the type, source, destination, ERSPAN identifier, and ERSPAN header type parameters are configured properly. | vyatta@vyatta# show service portmonitor
| vyatta@vyatta# show service portmonitor { portmonitor { session 22 { destination erspan0 erspan { header type-II identifier 200 } source dp0s4.100 type erspan-source } } } | vyatta@vyatta::~$ show portmonitor session
| vyatta@vyatta::~$ show portmonitor session { Session: 22 Type: erspan-source State: enabled erspan Identifier: 200 erspan Header: type-II Source interfaces: Name: dp0s4.100 Destination interface: erspan0 | vyatta@vyatta::~$ show portmonitor session
| vyatta@vyatta::~$ show portmonitor session { Session: 22 Type: erspan-source State: enabled erspan Identifier: 200 erspan Header: type-II Source interfaces: Name: dp0s4.100 Destination interface: erspan0 | vyatta@vyatta::~$ show portmonitor session
| vyatta@vyatta::~$ show portmonitor session { Session: 22 Type: erspan-source State: enabled erspan Identifier: 200 erspan Header: type-II Source interfaces: Name: dp0s4.100 Destination interface: erspan0 | vyatta@vyatta::~$ show portmonitor session
| vyatta@vyatta::~$ show portmonitor session { Session: 22 Type: erspan-source State: enabled erspan Identifier: 200 erspan Header: type-II Source interfaces: Name: dp0s4.100 Destination interface: erspan0 | vyatta@vyatta::~$ show portmonitor session
**TABLE 34**  Configuring ERSPAN-destination port mirroring

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
</table>
| Configure an ERSPAN tunnel.  
The local and remote IP addresses that are configured for the ERSPAN tunnel must be fully routable addresses for each side to ping the other address. | vyatta@vyatta# set interfaces dataplane dp0s11 address 15.1.1.2/24  
vyatta@vyatta# set interfaces erspan erspan0 local-ip 15.1.1.2  
vyatta@vyatta# set interfaces erspan erspan0 remote-ip 15.1.1.1 |
| Display the tunnel configuration. | vyatta@vyatta# show interfaces  
interfaces {  
dataplane dp0s11 {  
    address 15.1.1.2/24  
  }  
erspan erspan0 {  
    local-ip 15.1.1.2  
    remote-ip 15.1.1.1  
  }  
} |
| Configure an ERSPAN-destination session. | vyatta@vyatta# set service portmonitor session 22 type erspan-destination |
| Configure the ERSPAN source tunnel for the session. | vyatta@vyatta# set service portmonitor session 22 source erspan0 |
| Configure the destination interface for the session. | vyatta@vyatta# set service portmonitor session 22 destination dp0s12 |
| Commit the configuration. | vyatta@vyatta# commit |
| Configure the identifier. | vyatta@vyatta# set service portmonitor session 22 erspan identifier 200 |
| Configure the header type. | vyatta@vyatta# set service portmonitor session 22 erspan header type-II |
| Save the configuration. | vyatta@vyatta# save |
| Port monitoring for the session is enabled if the **type**, **source**, **destination**, **ERSPAN** identifier, and **ERSPAN header type** parameters are configured properly. | vyatta@vyatta# show service portmonitor  
portmonitor {  
  session 22 {  
    destination dp0s12  
    erspan {  
      header type-II  
      identifier 200  
    }  
    source erspan0  
    type erspan-source  
  }  
} |
<table>
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| Display the ERSPAN destination session information. | `vyatta@vyatta:$ show portmonitor session`  
  Session: 22  
  Type: erspan-destination  
  State: enabled  
  erspan Identifier: 200  
  erspan Header: type-II  
  Source interfaces: erspan0  
  Destination interface: dp0s12 |
Port Monitoring Commands for Port Mirroring

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interfaces erspan erspan<tunnel-number> ip tos <value>

Specifies the value to write into the Type of Service (ToS) byte of the IP header of an ERSPAN tunnel packet.

Syntax

- `set interfaces erspan erspantunnel-number ip tos value`
- `delete interfaces erspan erspantunnel-number ip tos [ value ]`
- `show interfaces erspan erspantunnel-number ip tos`

Command Default

The default value is inherit.

Parameters

- `erspantunnel-number`
  The identifier of a tunnel interface with an integer for the tunnel-number variable.

- `value`
  Specifies the ToS value to write into the IP header of a tunnel packet. For the value, enter one of the following:
  - `number`—The ToS value to write into the header of the tunnel packet (the carrier packet). Enter a value from 0x00 to 0xFF. The 0x00 value means a tunnel packet copies the ToS value from the packet being encapsulated (the passenger packet).
  - `default`—The Default Class (00000) for best-effort traffic.
  - `afnumber`—The Assured Forwarding Class for assurance of delivery as defined in RFC 2597. Depending on the forwarding class and the drop precedence, the class can be one of the following values: af11 through af13, af21 through af23, af31 through af33, or af41 through af43.
  - `csnumber`—Class Selector for network devices that use the Precedence field in the IPv4 header. The number ranges from 1 to 7 and indicates the precedence, for example cs1.
  - `ef`—Expedited Forwarding, per-hop behavior.
  - `inherit`—Inherit from original IP header.
  - `va`—Voice Admit, Capacity-Admitted Traffic.

Modes

Configuration mode

Configuration Statement

```
interfaces {
  erspan erspantunnel-number {
    ip {
      tos value
    }
  }
}
```
Usage Guidelines

Use this command to specify the value to write into the 8-bit ToS byte of the IP header for a packet that traverses a tunnel interface. The ToS byte of the IP header of a packet specifies the forwarding behavior to be applied to the packet.

Use the set form of this command to specify the ToS value in the IP header.

Use the delete form of this command to reset the ToS value to its default of inherit.

Use the show form of this command to display the ToS value.
interfaces erspan erspan<tunnel-number> ip ttl <value>

Sets the time-to-live (TTL) value in the IP header of a tunnel packet.

Syntax

set interfaces erspan erspantunnel-number ip ttl value
delete interfaces erspan erspantunnel-number ip ttl [ value ]
show interfaces erspan erspantunnel-number ip ttl

Command Default

The default value is 255.

Parameters

erspantunnel-number
The identifier of a tunnel interface with an integer for the tunnel-number variable.

value
The value for the TTL field in the IP header of a tunnel packet (the carrier packet). Enter an integer from 0 through 255. When the TTL value is set to 0, a tunnel packet copies the TTL value from the packet being encapsulated (the passenger packet).

Modes

Configuration mode

Configuration Statement

interfaces {
  erspan erspantunnel-number {
    ip {
      ttl value
    }
  }
}

Usage Guidelines

The TTL field of the IP header of a packet limits the lifetime of an IP packet and prevents indefinite packet looping.

Use the set form of this command to set the TTL value in the TTL field of the IP header for a packet that traverses a tunnel interface.

Use the delete form of this command to reset the TTL value to the default setting of 255.

Use the show form of this command to display the current TTL value in the IP header of a tunnel packet.
interfaces erspan erspan<tunnel-number> local-ip <address>
   Specifies the IPv4 address for the local endpoint of an ERSPAN tunnel.

Syntax
   set interfaces erspan erspantunnel-number local-ip address
   delete interfaces erspan erspantunnel-number local-ip [ address ]
   show interfaces erspan erspantunnel-number local-ip

Parameters
   erspantunnel-number
      The identifier of a tunnel interface with an integer for the tunnel-number variable.
   address
      An IPv4 address to use as the tunnel endpoint on the local vRouter. The IP address must already be configured for
      the interface.

Modes
   Configuration mode

Configuration Statement
   interfaces {
      erspan erspantunnel-number {
         local-ip address
      }
   }

Usage Guidelines
   The tunnel does not function when both the local and remote endpoints are not configured.
   Use the set form of this command to specify the IP address to use as the local endpoint of a tunnel.
   Use the delete form of this command to delete the local endpoint of a tunnel.
   Use the show form of this command to display the IP address for the local endpoint of a tunnel.
interfaces erspan erspan\<tunnel-number> mtu \<bytes>  
Sets the maximum transfer unit (MTU) size for an ERSPAN tunnel interface.

**Syntax**

```plaintext
set interfaces erspan erspantunnel-number mtu bytes
delete interfaces erspan erspantunnel-number mtu \[ bytes \]
show interfaces erspan erspan mtu
```

**Command Default**

The default MTU size of 1500.

**Parameters**

- `erspantunnel-number`  
The identifier of a tunnel interface with an integer for the `tunnel-number` variable.

- `bytes`  
The MTU size in bytes for the ERSPAN tunnel interface. Enter a value from 68 through 8024. The default size is 1500.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
interfaces {
  erspan erspantunnel-number {
    mtu bytes
  }
}
```

**Usage Guidelines**

Use this command to set the size of the maximum transfer unit (MTU) for encapsulated packets that traverse a tunnel.

The vRouter drops ERSPAN encapsulated packets that are larger than the tunnel MTU.

Use the `set` form of this command to set the MTU size for encapsulated packets traversing the tunnel.

Use the `delete` form of this command to reset the MTU size to its default setting of 1500 bytes.

Use the `show` form of this command to display the MTU size for encapsulated packets.
**interfaces erspan erspan\<tunnel-number\> remote-ip \<address\>**

Sets the IPv4 address for the remote endpoint of an ERSpan tunnel.

**Syntax**

```
set interfaces erspan erspantunnel-number remote-ip address
delete interfaces erspan erspantunnel-number remote-ip \[ address \]
show interfaces erspan erspantunnel-number remote-ip
```

**Parameters**

- **erspantunnel-number**
  - The identifier of a tunnel interface with an integer for the `tunnel-number` variable.
- **address**
  - An IPv4 address to use as the tunnel endpoint on the remote vRouter. The IP address must already be configured for the interface.

**Modes**

Configuration mode

**Configuration Statement**

```
interfaces {
  erspan erspantunnel-number {
    remote-ip address
  }
}
```

**Usage Guidelines**

Note that the tunnel cannot be established when both the local and remote endpoints are not configured.

Use the **set** form of this command to set the IP address to use as the remote endpoint of a tunnel.

Use the **delete** form of this command to delete the remote endpoint of a tunnel.

Use the **show** form of this command to display the IP address for the remote endpoint of a tunnel.
service portmonitor session <id> description <string>

Specifies a description for the port-monitoring session.

Syntax

set service portmonitor session id description string
delete service portmonitor session id description
show service portmonitor session id description

Parameters

id

The number of the port-monitoring session.

string

A brief description of the session. If the description contains spaces, it must be enclosed in double quotation marks.

Modes

Configuration mode

Configuration Statement

service {
    portmonitor {
        session id {
            description string
        }
    }
}

Usage Guidelines

Providing a description for a session can help you to quickly determine its purpose when viewing the configuration.

Use the set form of the command to specify a description for the port-monitoring session.

Use the delete form of the command to delete the description for the port-monitoring session.

Use the show form of the command to show the description for the port-monitoring session.
service portmonitor session <id> destination <interface>

Specifies the destination interface or tunnel for a port monitoring session.

Syntax

set service portmonitor session id destination { interface-name | interface-name.vid | erspan-tunnel-number }
del ete service portmonitor session id destination
show service portmonitor session id destination [ interface-name | interface-name.vid | erspan-tunnel-number ]

Parameters

id

The number of a port monitoring session.

interface-name

The name of a data plane interface. Following are the supported formats of the interface name:

- dpxypz—The name of a data plane interface, where
  - dpx specifies the data plane identifier (ID). Currently, only dp0 is supported.
  - py specifies a physical or virtual PCI slot index
  - pz specifies a port index (for example, p1).
  For example, dp0p1p2, dp0p160p1, and dp0p192p1.

- dpxemy—The name of a data plane interface on a LAN-on-motherboard (LOM) device that does not have a PCI slot, where
  - emy specifies an embedded network interface number (typically, a small number). For example, dp0em3.

- dpxsy—The name of a data plane interface on a device that is installed on a virtual PCI slot, where xsy specifies an embedded network interface number (typically, a small number). For example, dp0s2. Currently, this format applies only when using the KVM or Hyper-V platforms.

- dpxPnpypz—The name of a data plane interface on a device that is installed on a secondary PCI bus, where Pn specifies the bus number. You can use this format to name data plane interfaces on large physical devices with multiple PCI buses. For these devices, it is possible to have network interface cards installed on different buses with these cards having the same slot ID. The value of n must be an integer greater than 0. For example, dp0P1p162p1 and dp0P2p162p1.

interface-name.vid

For an RSPAN-source session only, specifies the data plane interface and VLAN number.

erspan-tunnel-number

For ERSPAN-source only, specifies the ERSPAN tunnel number.

Modes

Configuration mode

Configuration Statement

```conf
service {
  portmonitor {
    session id {
      destination interface-name|interface-name.vid|erspan-tunnel-number
    }
  }
}
```
Usage Guidelines

The destination interface for an ERSPAN-source session is an ERSPAN tunnel interface.
The destination interface is dedicated to monitoring and transmits only mirrored packets.
The destination interface for a SPAN, an RSPAN-destination, or an ERSPAN-destination session is a physical interface.
The destination interface for an RSPAN-source session is a data plane interface with a VLAN number.
Only one destination interface can be configured for SPAN, RSPAN-source, RSPAN-destination, ERSPAN-source, and ERSPAN-destination in a monitoring session.
An interface cannot be both the source and destination of a monitoring session.
A destination interfaces cannot be a member of more than one monitoring session.
Use the set form of the command to specify the destination interface for a port monitoring session.
Use the delete form of the command to remove the destination interface for a port monitoring session.
Use the show form of the command to show the destination interface for a port monitoring session.
service portmonitor session <id> disable

Disables the port-monitoring session.

Syntax

set service portmonitor session id disable
delete service portmonitor session id disable
show service portmonitor session id

Parameters

id

The number of the port-monitoring session.

Command Default

By default, the session is enabled if the session type, source interface, and destination interface are configured correctly.

Modes

Configuration mode

Configuration Statement

service {
  portmonitor {
    session id {
      disable
    }
  }
}

Usage Guidelines

Use the **set** form of the command to disable the port-monitoring session.

Use the **delete** form of the command to re-enable the description for the port-monitoring session.

Use the **show** form of the command to show whether the port-monitoring session is disabled.
service portmonitor session <id> erspan header

Defines the ERSPAN header type for a port monitoring session.

Syntax

set service portmonitor session id erspan header { type-II | type-III }
delete service portmonitor session id erspan header
show service portmonitor session id erspan [ header ]

Parameters

id

The number of a session. The maximum number of sessions on the router is eight. Enter an integer from 1 to 31.

type-II

Defines the ERSPAN Type II encapsulation header type that is added to the original frame.

type-III

Defines the ERSPAN Type III encapsulation header type that is added to the original frame. Compared to a TYPE II header, this header is larger and more flexible to support additional fields, including time stamps.

Modes

Configuration mode

Configuration Statement

service {
  portmonitor {
    session id {
      erspan {
        header type-II | type-III
      }
    }
  }
}

Usage Guidelines

On the source vRouter, traffic from source interfaces is mirrored and prepended by Type II or Type III headers. These headers are defined in the IETF draft proposal.

https://tools.ietf.org/html/draft-foschiano-erspan-00

Port mirroring is enabled when the session type and the destination interface for the session are configured. For ERSPAN sessions, the ERSPAN header type and identifier must also be configured.

Use the set form of the command to define the ERSPAN header type.

Use the delete form of the command to delete the ERSPAN header type.

Use the show form of the command to show the ERSPAN header type for a port monitoring session.
service portmonitor session <id> erspan identifier

Defines the ERSPAN identifier for a port monitoring session.

Syntax

```
set service portmonitor session id erspan identifier erspan-id

delete service portmonitor session id erspan identifier erspan-id

show service portmonitor session id erspan identifier erspan-id
```

Parameters

```
id
The number of a session. The maximum number of sessions on the router is eight. Enter an integer from 1 to 31.

erspan-id
The ERSPAN identifier. Enter an integer from 1 to 1023.
```

Modes

Configuration mode

Configuration Statement

```
service {
  portmonitor {
    session id {
      erspan {
        identifier erspan-id
      }
    }
  }
}
```

Usage Guidelines

Port mirroring is enabled when the session type and the destination interface for the session are configured. For ERSPAN sessions, the ERSPAN header type and identifier must also be configured.

Use the `set` form of the command to define the ERSPAN identifier.

Use the `delete` form of the command to delete the ERSPAN identifier.

Use the `show` form of the command to show the ERSPAN identifier for a port monitoring session.
**service portmonitor session <id> source <interface>**

Specifies the source interface for a port monitoring session.

**Syntax**

```plaintext
set service portmonitor session id source { interface-name | interface-name.vid | erspan tunnel-number }
```

```plaintext
delete service portmonitor session id source { interface-name | interface-name.vid | erspan tunnel-number }
```

```plaintext
show service portmonitor session id source
```

**Parameters**

- **id**
  
  The number of a port monitoring session.

- **interface-name**
  
  The name of a data plane interface. Following are the supported formats of the interface name:
  
  - `dpxpypz`—The name of a data plane interface, where
    
    - `dpx` specifies the data plane identifier (ID). Currently, only dp0 is supported.
    
    - `py` specifies a physical or virtual PCI slot index
    
    - `pz` specifies a port index (for example, p1).
    
    For example, dp0p1p2, dp0p160p1, and dp0p192p1.
  
  - `dpxemy`—The name of a data plane interface on a LAN-on-motherboard (LOM) device that does not have a PCI slot, where
    
    - `emy` specifies an embedded network interface number (typically, a small number). For example, dp0em3.
  
  - `dpxsy`—The name of a data plane interface on a device that is installed on a virtual PCI slot, where `xsy` specifies an embedded network interface number (typically, a small number). For example, dp0s2. Currently, this format applies only when using the KVM or Hyper-V platforms.
  
  - `dpxPnpypz`—The name of a data plane interface on a device that is installed on a secondary PCI bus, where `Pn` specifies the bus number. You can use this format to name data plane interfaces on large physical devices with multiple PCI buses. For these devices, it is possible to have network interface cards installed on different buses with these cards having the same slot ID. The value of `n` must be an integer greater than 0. For example, dp0P1p162p1 and dp0P2p162p1.

- **interface-name.vid**
  
  Specifies the data plane interface and VLAN number.

- **erspan tunnel-number**
  
  For ERSPAN-destination only, specifies the ERSPAN tunnel number.

**Modes**

Configuration mode

**Configuration Statement**

```plaintext
service {
    portmonitor {
        session id {
            source interface-name|interface-name.vid|erspan tunnel-number
        }
    }
}
```
Usage Guidelines

For a SPAN or an RSPAN-source session, you can configure more than one source interface for which ingress or egress mirroring is enabled. The source interface can be a physical or VLAN interface.

For an RSPAN-destination session, you can configure one source VLAN interface from which to receive the mirrored packets. The source VIF for the RSPAN-destination type must be part of a bridge group.

The source interface for an ERSPAN-destination is an ERSPAN GRE tunnel.

An interface cannot be both the source and destination of a monitoring session.

A source interface cannot be a member of more than one monitoring session.

Use the set form of the command to specify the source interface for a port monitoring session.

Use the delete form of the command to remove the source interface for a port monitoring session.

Use the show form of the command to show the source interface for a port monitoring session.
service portmonitor session <id> source <interface> direction <direction>

Specifies the direction of a port monitoring for a physical source interface of a SPAN, or an RSPAN-source session.

Syntax

```
set service portmonitor session id source { interface-name | interface-name.vid } direction { both | rx | tx }
```

```
delete service portmonitor session id source { interface-name | interface-name.vid } direction
```

```
show service portmonitor session id source { interface-name | interface-name.vid } direction
```

Parameters

```
id
```

The number of a port monitoring session.

```
interface-name
```

The name of a data plane interface. Following are the supported formats of the interface name:

- `dpxpypz`—The name of a data plane interface, where
  - `dp` specifies the data plane identifier (ID). Currently, only `dp0` is supported.
  - `py` specifies a physical or virtual PCI slot index
  - `pz` specifies a port index (for example, `p1`).
  
  For example, `dp0p1p2`, `dp0p160p1`, and `dp0p192p1`.

- `dpxemy`—The name of a data plane interface on a LAN-on-motherboard (LOM) device that does not have a PCI slot, where
  - `emy` specifies an embedded network interface number (typically, a small number). For example, `dp0em3`.

- `dpxsy`—The name of a data plane interface on a device that is installed on a virtual PCI slot, where `xsy` specifies an embedded network interface number (typically, a small number). For example, `dp0s2`. Currently, this format applies only when using the KVM or Hyper-V platforms.

- `dpxpnpypz`—The name of a data plane interface on a device that is installed on a secondary PCI bus, where `Pn` specifies the bus number. You can use this format to name data plane interfaces on large physical devices with multiple PCI buses. For these devices, it is possible to have network interface cards installed on different buses with these cards having the same slot ID. The value of `n` must be an integer greater than 0. For example, `dp0P1p162p1` and `dp0P2p162p1`.

```
interface-name.vid
```

Specifies the data plane interface and VLAN number.

```
both
```

Specifies that the interface mirrors and monitors the session in both ingress and egress directions.

```
rx
```

Specifies that the interface mirrors packets and monitors the session in the ingress direction.

```
tx
```

Specifies that the interface mirrors packets and monitors the session in the egress direction.

Command Default

The default directions are both ingress and egress.
Modes
Configuration mode

Configuration Statement
```
service {
  portmonitor {
    session id {
      source interface-name|interface-name.vid{
        direction both | rx | tx
      }
    }
  }
}
```

Usage Guidelines
You cannot configure this command for an RSPAN-destination session.

Use the `set` form of the command to specify the direction that the physical source interface monitors a port monitoring session.

Use the `delete` form of the command to remove the direction that the physical source interface monitors a port monitoring session.

Use the `show` form of the command to show the direction that the physical source interface monitors a port monitoring session.
service portmonitor session <id> type <type>

Defines the identifier and type for a port monitoring session.

Syntax

set service portmonitor session id type { span | rspan-source | rspan-destination | erspan-source | erspan-destination }
delete service portmonitor session id [ type { span | rspan-source | rspan-destination | erspan-source | erspan-destination } ]
show service portmonitor session id type

Parameters

id
The number of a session. The maximum number of sessions on the router is eight. Enter an integer from 1 to 31.

span
Specifies a SPAN session type.

rspan-source
Specifies an RSPAN-source session type.

rspan-destination
Specifies an RSPAN-destination session type.

erspan-source
Specifies an ERSPAN-source session type.

erspan-destination
Specifies an ERSPAN-destination session type.

Modes

Configuration mode

Configuration Statement

service {
  portmonitor {
    session id {
      type span|rspan-source|rspan-destination|erspan-source|erspan-destination
    }
  }
}

Usage Guidelines

Port mirroring is enabled when the session type and the destination interface for the session are configured. For ERSPAN sessions, the ERSPAN header type and identifier must also be configured.

Use the set form of the command to define a port monitoring session.

Use the delete form of the command to delete a port monitoring session.

Use the show form of the command to show the identifier and type for a port monitoring session.
show portmonitor session

Displays configuration information for a port monitoring session.

Syntax

    show portmonitor session [ id ]

Parameters

    id

        The number of a port monitoring session.

Modes

    Operational mode

Usage Guidelines

Use this command to display configuration information for a port monitoring session.

Examples

The following example shows the output of this command for a SPAN session.

        vyatta@vyatta:~$ show portmonitor session 1
        Session: 1
            Type: span
            State: enabled
            Source interfaces:
                Name: dp0s3
                Direction: both
            Destination interface: dp0s4

The following example shows the output of this command for an RSPAN-source session.

        vyatta@vyatta:~$ show portmonitor session 2
        Session: 2
            Type: rspan-source
            State: enabled
            Source interfaces:
                Name: dp0s5
                Direction: both
            Destination interface: dp0s7.700

The following example shows the output of this command for an RSPAN-destination session.

        vyatta@vyatta:~$ show portmonitor session 3
        Session: 3
            Type: rspan-destination
            State: enabled
            Source interfaces:
                Name: dp0s7.700
                Direction: both
            Destination interface: dp0s6
The following example shows the output of this command for an ESPAN-source session.

vyatta@vyatta:~$ show portmonitor session 22
Session:                      22
Type:                     erspan-source
State:                    enabled
erspan Identifier:        200
erspan Header:            type-II
Source interfaces:
  Name:                   dp0s4.100
Destination interface:    erspan0

The following example shows the output of this command for an ESPAN-destination session.

vyatta@vyatta:~$ show portmonitor session 22
Session:                      22
Type:                     erspan-destination
State:                    enabled
erspan Identifier:        200
erspan Header:            type-II
Source interfaces:
  Name:                   erspan0
Destination interface:    dp0s12

### Related commands

The following table lists related commands that are documented elsewhere.

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