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Brocade 5600 vRouter High Availability

Reference Guide

Supporting Brocade 5600 vRouter 3.5R6

BROCADE

Contents

Preface

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.

Format	Description
bold text	Identifies command names
	Identifies keywords and operands
	Identifies the names of user-manipulated GUI elements
	Identifies text to enter at the GUI
italic text	Identifies emphasis
	Identifies variables
	Identifies document titles
`Courier font`	Identifies CLI output
	Identifies command syntax examples

Command syntax conventions

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

Convention	Description
bold text	Identifies command names, keywords, and command options.
italic text	Identifies a variable.
value	In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, **--show** WWN.

Convention	Description
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options. In Fibre Channel products, square brackets may be used instead for this purpose.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

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.

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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.

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- 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 Brocade 5600 vRouter (referred to as a virtual router, vRouter, or router in the guide) to provide high availability.

VRRP

VRRP overview

This section presents the following topics with regard to using Virtual Router Redundancy Protocol (VRRP) on the Brocade vRouter:

- VRRP protocol
- VRRP group
- Virtual IP address
- VIP Address owner
- Virtual MAC address
- VRRP interface
- VRRP advertisements
- Election of the master router
- Preemption
- VRRP authentication
- VRRP synchronization group
- State-specific filtering
- SNMP support for VRRP
- VRRP version 2 IPv6 support
- VRRP version 3 IPv6 support
- High Availability VPN with VRRP
- Tracking interfaces

VRRP protocol

VRRP is a protocol that allows a cluster of routers to act as one virtual router. VRRP, as specified by RFC 2338, RFC 3768 and RFC 5798, provides router failover services during an interface failure.

On the Brocade vRouter, VRRP is supported on a physical Ethernet interface and a VLAN interface (vif). On the Brocade vRouter, VRRP version 2 supports IPv4 addresses along with a proprietary mode of VRRP version 2 that supports IPv6 addresses. VRRP version 3 supports IPv4 and IPv6 addresses.

VRRP group

A VRRP group consists of a cluster of interfaces or virtual interfaces that provide redundancy for a primary, or “master,” interface in the group. Each interface in the group is typically on a separate router. Redundancy is managed by the VRRP process on each system.

The VRRP group has a unique numeric identifier and can be assigned up to 20 virtual IP addresses. All interfaces in the group must be assigned the same VRRP group identifier and virtual address; otherwise, they cannot provide redundancy for one another. Interfaces that are being mapped to a

virtual address cannot have the same address as the virtual address. VRRP version 3 provides owner mode, which allows interfaces to have the same address as the virtual address.

The addresses of the interfaces that participate in the VRRP group must be on the same subnet for the protocol to work. While it is common for the virtual IP address to be on this subnet, it does not have to be on the subnet. An interface supports multiple VRRP groups.

Virtual IP address

Routers in a VRRP cluster share a virtual IP, or VIP. This sharing provides alternate paths through the network for hosts without explicitly configuring them, and creates redundancy that eliminates any individual router as a single point of failure in the network. This redundancy is particularly important for default routes, the failure of which could otherwise be a catastrophic event on a network.

A virtual router is an abstract object, managed by the VRRP process, that is defined by its virtual router ID (the group identifier of the set of routers that forms the virtual router). The virtual router presents its VIP to the network. Hosts on the network are configured with a route to direct packets to the VIP rather than to the IP addresses of the real interfaces.

The virtual router uses the group identifier to construct a virtual MAC address from a standard MAC prefix (specified in the VRRP standard) plus the group identifier. ARP or Neighbor Discovery requests for the VIP are resolved to the virtual MAC address, which “floats” from real router to real router, depending on which router is acting as the master router for the virtual router. If the master router fails, the backup router is brought into service by using the virtual MAC address and VIP of the virtual router. In this way, service can transparently continue around a failed gateway to hosts on the LAN, which means that the host default route does not change.

The master router forwards packets for local hosts and responds to ARP requests, neighbor solicitations, ICMP pings, and IP datagrams that are directed to the VIP. Backup routers remain idle, even if healthy. ARP requests, pings, and datagrams that are made to the real IP addresses of interfaces are responded to by the interface in the normal way.

VIP address owner

A router considered the VIP address owner when the primary address that is configured for the interface on which VRRP is running is the VIP. VRRP automatically detects when the router owns the VIP address and advertises the VIP with priority 255.

Versions before release 3.5 IPAO required configuration. From release 3.5 onwards no configuration is required.

Virtual MAC address

RFC 3768 and RFC 5798 define a specific 48-bit MAC address that is to be associated with each VRRP virtual router. The ARP translation for the virtual router IPv4 or IPv6 address points to this MAC address.

The master router uses this well-defined MAC address as the source MAC address of VRRP packets that it sends, in this way teaching switches to send packets for that MAC address to itself. If one master fails and another router takes over as master, it acts in the same way.

Using the well-defined MAC address ensures quick failover of traffic for that MAC address. In addition, the ARP translations of the other hosts and routers on the network do not need to change when a new router takes over as master. This configuration is recommended.

In legacy versions of the Brocade vRouter, the VIP was directly linked with the real MAC address of the master router rather than the well-defined MAC address specified by the RFCs. In that

implementation, if the master router failed and a new master was elected, the VIP assumed the MAC address of the physical interface of the new master router and the new master notified the network of its MAC address by issuing a gratuitous ARP. This behavior is still the default for VRRP.

Configure RFC-compliant MAC address behavior by setting the **rfc-compatibility** option for the VRRP group with interfaces <interface> vrrp vrrp-group <group-id> rfc-compatibility on page 43 when you specify VRRP group information for the interface that you are adding to the VRRP group. Note that a Brocade vRouter in RFC-compliant mode does not interoperate with a Brocade vRouter in noncompliant mode.

NOTE
The default behavior of nonRFC-compliant MACs is necessary for any environment in which VMware provides Layer 2 services because the vSwitch product does not support true MAC learning and blocks traffic when virtual MAC addresses move ports unless the vSwitch is in promiscuous mode. For the latest product support information, refer to VMware documentation.

VRRP interface

When the **rfc-compatibility** option is set, the VRRP process creates a special VRRP interface. The system automatically assigns the VRRP virtual MAC address to this interface. When a new master interface is elected, the system uses the procedure that is described in RFC 3768 to have the new master take over the virtual MAC address.

The VRRP interface that is created by the VRRP process operates in a special pass-through mode. The pass-through mode allows the router to receive packets that are addressed to the well-known VRRP MAC address for a given VRID on the parent interface.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 1 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

The VRRP interface remains on the system as long as the **rfc-compatibility** option is set, and remains on the system independent of the state of the VRRP instance (backup or master).

VRRP advertisements

To signal that it is still in service, the master interface or vif sends “heartbeat” packets called “advertisements” to the LAN segment, using the IANA assigned multicast addresses for VRRP (224.0.0.18 for IPv4 and FF02:0:0:0:0:0:0:12 for IPv6). These advertisements confirm the health of the master router to backup routers and contain other VRRP information, such as the priority of the master.

If the backup routers do not receive advertisements from the VRRP master router for three advertisement intervals, the master is declared out of service and the VRRP protocol triggers the failover process.

Election of the master router

VRRP dynamically elects the router that is to be the master. In most cases, the master router is simply the router with the interface that has the highest configured priority. If two interfaces have identical priorities, the router with the interface that has the higher IP address is elected master.

If the master interface fails, the interface with the next-highest priority is elected master and assumes the virtual address of the group. If the system is configured to comply with RFC 3768 and RFC 5798, the network continues to use the well-defined MAC address to locate the device that is using the VIP. The new master also ensures that all network devices are notified of the change by sending a gratuitous ARP message.

The priority of the master interface is typically set to 50 greater than the other routers in the set. The backup interface can be left with the default priority; however, if more than one interface is acting as a backup, they could be configured with different priorities.

Preemption

If preemption is enabled, a backup router with a priority that is higher than the current master "preempts" the master and becomes the master itself. The backup router preempts the master by beginning to send its own VRRP advertisements. The master router examines these advertisements and discovers that the backup router has a higher priority than itself. The master then stops sending advertisements, while the backup continues to send, thus, making itself the new master.

Preemption is useful in situations in which a lower-performance backup router becomes the master when a higher-performance router fails. In this case, a new higher-performance router can be brought online, and it automatically preempts the lower-performance backup.

VRRP authentication

If a password is set for VRRP authentication, the authentication type must also be defined. If the password is set and the authentication type is not defined, the system generates an error when you try to commit the configuration.

Similarly, you cannot delete the VRRP password without also deleting the VRRP authentication type. If you do, the system generates an error when you try to commit the configuration.

If you delete both the VRRP authentication password and authentication type, VRRP authentication is disabled.

The IETF decided that authentication is not to be used for VRRP version 3. For more information, refer to RFC 5798.

VRRP synchronization group

Interfaces in a VRRP synchronization group ("sync group") are synchronized such that, if one of the interfaces in the group fails over to backup, all interfaces in the group fail over to backup. For example, in many cases, if one interface on a master router fails, the whole router fails over to a backup router. By assigning all the interfaces in a set of VRRP routers to a sync group, the failure of one interface triggers a failover of all the interfaces in the sync group to the backups that are configured for each interface in the sync group.

If you manually disable an interface that belongs in a VRRP sync group, whether the group is acting as the master or backup router, the state of the VRRP Finite State Machine (FSM) for each of the interfaces within the group changes to the fault state. A transition to the fault state is triggered by one of the following reasons:

- An interface has been administratively shut down.
- A media link failure has been detected.
- An interface hardware failure has been detected.

If the interfaces in the fault state remain in this state because they are not enabled, these interfaces remain in the fault state, thereby, terminating the router failover services that are available through the VRRP feature. For VRRP to function, you must have both master and backup VRRP routers.

NOTE
If you have to disable an interface that belongs to a VRRP sync group, first create a new sync group that consists of the given interface and the other interface that is paired with it (master or backup) by using the **interfaces** *interface* **vrrp vrrp-group** *group-id* **sync-group** *group* command. With this step, you are essentially moving the set of interfaces to a new sync group when you create a new sync group because interfaces can belong only to one sync group at any given time. After creating the new sync group, you can proceed with the disabling of the given interface without terminating the router failover services on the sync group in which the interface initially resided.

State-specific filtering

The VRRP specifications require that all packets with a destination MAC address of the virtual MAC address be dropped when the VRRP process is in the backup state. The Brocade vRouter implementation of VRRP complies with the specification in this regard.

SNMP support for VRRP

For remote management of VRRP, the Brocade vRouter supports the vrrpTrapNewMaster object of RFC 2787 VRRP-MIB and supports the KEEPALIVED-MIB, authored by Vincent Bernat. The KEEPALIVED-MIB extends the keepalived daemon to support the Net-SNMP agentx protocol and provides additional information that is specific to the Brocade vRouter implementation, such as state information, sync group state information, and so on.

For a full description of Brocade vRouter support for SNMP, refer to the “SNMP” chapter of *Brocade 5600 vRouter Remote Management Reference Guide*.

VRRP version 2 IPv6 support

The Brocade vRouter supports VRRPv2 with IPV6 addresses. VRRP IPv6 uses link local addresses and supports neighbor-discovery messages between master and backup routers.

NOTE
Do not configure any IPv4 address on the interface when configuring VRRP IPv6.

When using VRRP IPv6, the primary addresses of the interfaces, virtual IP address, and hosts and server addresses must be configured to be IPv6 addresses. Other interfaces can still have IPv4 VRRP configuration to handle IPv4 traffic.

NOTE
For VRRP IPv6, the minimum advertise interval is 1 second.

NOTE
For master and backup router setup, you must configure the priority of the master router to be higher than that of the backup router.

NOTE
This functionality is not based on standards, and this feature is approaching end of life. We recommend that you move to standards-based VRRP version 3, which has full IPv6 address support.

VRRP version 3 IPv6 support

The Brocade vRouter supports full standards-based VRRP version 3, which supports IPv6 addresses and has none of the restrictions of the VRRP version 2 implementation.

High availability VPN with VRRP

The Brocade vRouter provides the ability to maintain connectivity through one IPsec tunnel by using a pair of Brocade vRouter with VRRP. When one router fails or is brought down for maintenance, the new VRRP master router restores IPsec connectivity between the local and remote networks.

When configuring High Availability VPN with VRRP whenever a VRRP virtual address is added to a Brocade vRouter interface, you must reinitialize the IPsec daemon because the IPsec service listens only for connections to the addresses that are present on the Brocade vRouter when the IKE service daemon is initialized.

For a pair of Brocade vRouter routers with VRRP, the standby router does not have the VRRP virtual address that is present on the device during initialization because the master router may not have that address present. Therefore, to reinitialize the IPsec daemon when a VRRP state transition occurs, run the following command on the master and backup routers:

interfaces dataplane *interface-name* **vrrp vrrp-group** *group-id* **notify**

Tracking interfaces

The Brocade vRouter provides the ability to track whether a logical interface is up, down, or not present, a VRRP group can only detect the status change of the interface on which the VRRP group is configured. VRRP cannot detect faults on the uplink interface or direct uplink of the master router, so services are interrupted if this uplink interface fails.

The Tracking interface functionality is used to mitigate this, by associating a VRRP group with an interface status. When the uplink interface or direct uplink of the master fails, the priority of the VRRP Master router is adjusted. This adjustment can be used to trigger a switchover to a VRRP backup router, ensuring traffic forwarding can continue.

VRRP configuration examples

This section presents the following topics:

- Basic VRRP version 3 IPv4 configuration
- VRRP Configuration with a synchronization group
- Configuring High Availability VPN with VRRP

Basic VRRP version 3 IPv4 configuration

This section presents the following topics:

- Configuring the master system
- Configuring the backup system

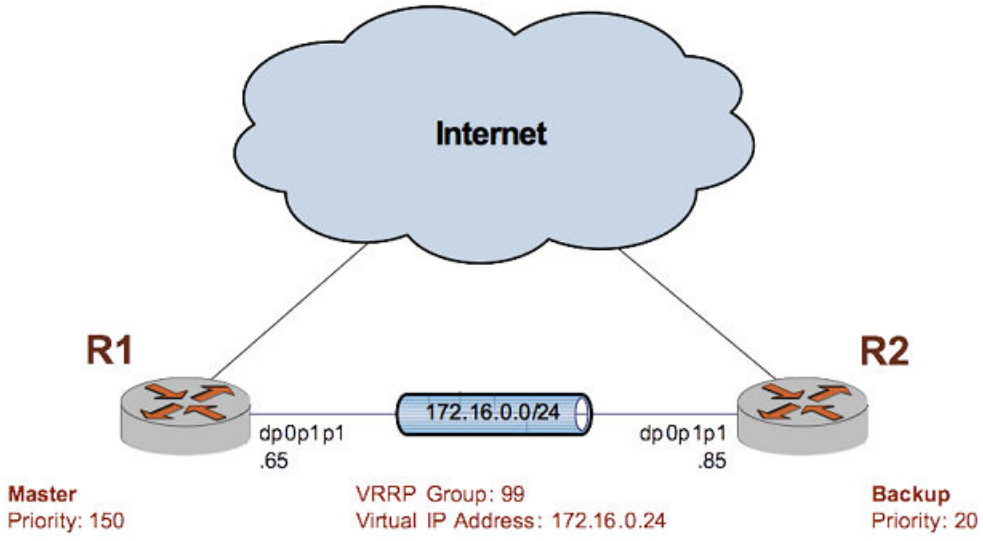
The following sequence sets up a basic VRRP version 3 IPv4 configuration between two Brocade vRouter.

In VRRP, consider the following behavior.

- The system that is configured with the highest priority is initially elected the master router. If more than one system has the highest priority, then the system with the highest IP address is elected the master router.
- Enabling preemption allows a higher-priority neighbor to preempt the current master and become master itself.

In this section, a sample configuration is presented for VRRP. When you finish the steps, the system is configured as shown in the following figure.

FIGURE 1 VRRP sample configuration



Configuring the master system

The following table shows how to enable VRRP version 3 on the dp0p1p1 interface of the master system (R1) and assign it to the 99 VRRP group. The virtual address is 172.16.0.24/24. Preemption is enabled, and R1 is assigned a priority of 150. The VRRP interface is defined to enable RFC-compliant MAC address handling.

To configure the master system for VRRP, perform the following steps in configuration mode.

TABLE 2 Configuring the master system for VRRP version 3

Step	Command
Create the VRRP configuration node for dp0p1p1 on R1. This configuration enables VRRP on that interface. Assign the VRRP group and protocol version.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99` `vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 virtual-address 172.16.0.24`
Enable RFC-compliant MAC address handling and create the VRRP interface.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 virtual-address 172.16.0.24`
Enable preemption.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 rfc-compatibility`
Set the priority of this system to 150.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 priority 150`
Commit the configuration.	`vyatta@R1# commit`

Display the configuration.	`vyatta@R1# show interfaces dataplane dp0p1p1 vrrp`
	
	`vrrp {`
	`  vrrp-group 99 {`
	`  priority 150`
	`  rfc-compatibility`
	`  version 3`
	`  virtual-address 172.16.0.24`
	`  }`
	`}`

Configuring the backup system

The following table shows how to enable VRRP version 3 on the dp0p1p1 interface of the backup system (R2), and assign it to the 99 VRRP group. The virtual address is the same as that for R1: 172.16.0.24/24. Preemption is enabled, and R2 is assigned a priority of 20. This priority is lower than the priority of R1, so R1 is the master and R2 is the backup under ordinary circumstances.

To configure the backup system for VRRP, perform the following steps in configuration mode.

TABLE 3 Configuring the backup system for VRRP version 3

Step	Command
Create the VRRP configuration node for dp0p1p1 of R2. This configuration enables VRRP on that interface. Assign the VRRP group and protocol version.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99` `vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 virtual-address 172.16.0.24`
Enable preemption.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 preempt true`

TABLE 3 Configuring the backup system for VRRP version 3 (Continued)

Step	Command
Enable RFC-compliant MAC address handling and create the VRRP interface.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 rfc-compatibility`
Set the priority of this system to 20. This priority is lower than that set for R1, so R1 becomes the master.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 priority 20`
Commit the configuration.	`vyatta@R2# commit`

Display the configuration.	`vyatta@R2# show interfaces dataplane dp0p1p1 vrrp`
	
	`vrrp {`
	`  vrrp-group 99 {`
	`  priority 20`
	`  rfc-compatibility`
	`  version 3`
	`  virtual-address 172.16.0.24`
	`  }`
	`}`

Basic VRRP version 3 IPv6 configuration

This section presents the following topics:

- Configuring the master system
- Configuring the backup system

NOTE
We strongly recommend the use of VRRP version 3 for IPv6 functionality.

The following is assumed for the examples in these topics:

- IPv6 address of master system (R1): 3003::300:1/64
- IPv6 address of backup system (R2): 3003::300:3/64
- Virtual IP address: 3003::300:2/64

Configuring the master system

The following table shows how to enable VRRP version 3 on the dp0p1p1 interface of R1 and assign the interface to VRRP group 41. R1 is assigned a priority of 150. The VRRP interface is defined to enable RFC 3768-compliant MAC address handling.

To configure the master system for VRRP version 3, perform the following steps in configuration mode.

TABLE 4 Configuring the master system for VRRP version 3

Step	Command
Set the IPv6 address of the dp0p1p1 interface for R1.	`vyatta@R1# set interfaces dataplane dp0p1p1 address 3003::300:1/64`

TABLE 4 Configuring the master system for VRRP version 3 (Continued)

Step	Command
Create the VRRP configuration node for dp0p1p1 on R1. Enable VRRP on dp0p1p1. Assign the VRRP group and protocol version.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41` `vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 virtual-address 3003::300:2`
Enable RFC 3768-compliant MAC address handling and create the VRRP interface.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 rfc-compatibility`
Set the priority of this system to 150.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 priority 150`
Commit the configuration.	`vyatta@R1# commit`

Display the configuration.	`vyatta@R1# show interfaces dataplane dp0p1p1 vrrp`
	`vrrp {`
	`  vrrp-group 41 {`
	`  priority 150`
	`  rfc-compatibility`
	`  version 3`
	`  virtual-address 3003::300:2`
	`  }`
	`}`

Configuring the backup system

The following table shows how to enable VRRP version 3 on the dp0p1p1 interface of R2 and assigns dp0p1p1 to VRRP group 41. The virtual address is the same as that for R1: 3003::300:2/64. R2 has the default priority (100), which is lower than the priority of R1 (150), so R1 is the master and R2 is the backup under ordinary circumstances.

To configure the backup system for VRRP version 3, perform the following steps in configuration mode.

TABLE 5 Configuring the backup system for VRRP version 3

Step	Command
Set the IPv6 address of the dp0p1p1 interface for R2.	`vyatta@R2# set interfaces dataplane dp0p1p1 address 3003::300:3/64`
Create the VRRP configuration node for dp0p1p1 of R2. This command enables VRRP on that interface. Assign the VRRP group and protocol version.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41` `vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 virtual-address 3003::300:2`
Enable RFC 3768-compliant MAC address handling and create the VRRP interface.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 41 rfc-compatibility`

TABLE 5 Configuring the backup system for VRRP version 3 (Continued)

Step	Command
Commit the configuration.	`vyatta@R2# commit`

Display the configuration.	`vyatta@R2# show interfaces dataplane dp0p1p1 vrrp`
	
	`vrrp {`
	`  vrrp-group 41 {`
	`  rfc-compatibility`
	`  version 3`
	`  virtual-address 3003::300:2`
	`  }`
	`}`

VRRP configuration with a synchronization group

This section presents the following topics:

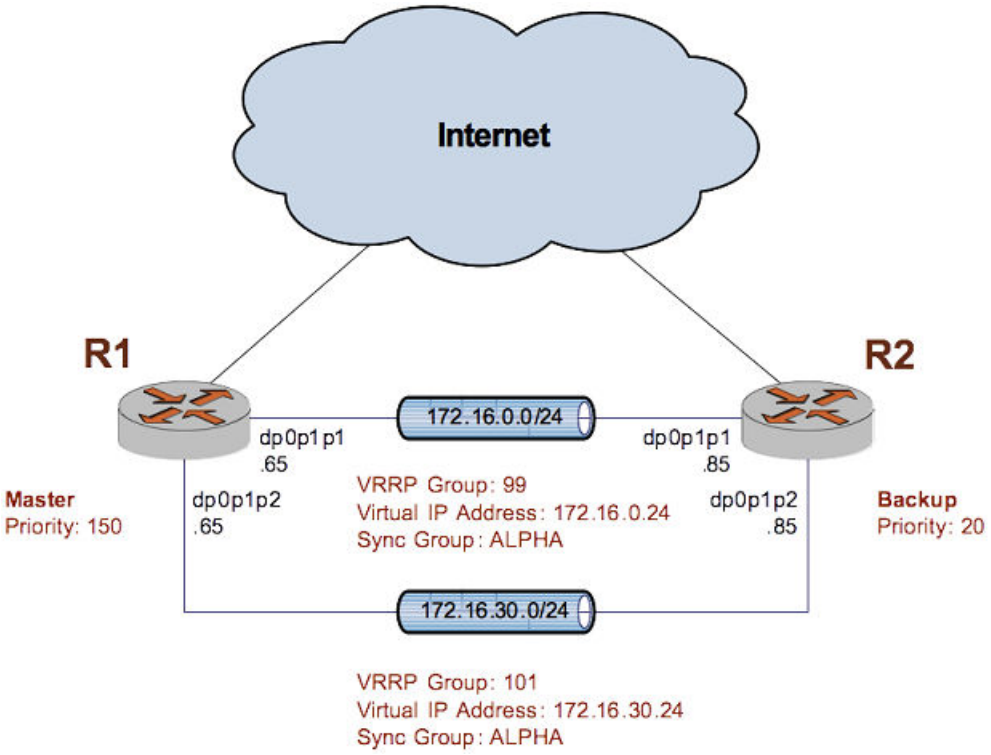
- Configuring the master system
- Configuring the backup system

This example builds on the previous example by adding an interface to each system, specifying a VRRP group and virtual IP address for these interfaces, and then including all interfaces in a sync group so that if one of the interfaces on the master fails, all interfaces on the master pass control to interfaces on the backup system.

NOTE
The outcome of the disabling of an interface that belongs to a VRRP sync group is that router failover services that are available through the VRRP feature are terminated for the given group. For more information on a work-around, refer to VRRP synchronization group on page 16.

When you finish the steps, the system is configured as shown in the following figure.

FIGURE 2 VRRP with a sync group



Configuring the master system

The following table shows how to configure the master system for VRRP with a sync group. To configure the system in this way, perform the following steps in configuration mode.

TABLE 6 Configuring the master system for VRRP with a sync group

Step	Command
Add the sync group configuration to the existing configuration for the 99 VRRP group on dp0p1p1.	`vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 sync-group ALPHA` `vyatta@R1# set interfaces dataplane dp0p1p1 vrrp vrrp-group 99 sync-group ALPHA version 3`

Display the VRRP configuration on dp0p1p1.	`vyatta@R1# show interfaces dataplane dp0p1p1 vrrp`
	
	`vrrp {`
	`  vrrp-group 99 {`
	`  interface {`
	`  }`
	`  priority 150`
	`  sync-group ALPHA`
	`  version 3`
	`  virtual-address 172.16.0.24`
	`  }`
	`}`

TABLE 6 Configuring the master system for VRRP with a sync group (Continued)

Step	Command
Create the VRRP configuration node for dp0p1p2 on R1. This configuration enables VRRP on that interface. Assign the VRRP group.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101` `vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 virtual-address 172.16.30.24`
Enable RFC-compliant MAC address handling and create the VRRP interface.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 rfc-compatibility`
Enable preemption.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 preempt true`
Set the priority of this system to 150.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 priority 150`
Add the VRRP group on dp0p1p2 to the sync group.	`vyatta@R1# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 sync-group ALPHA`
Commit the configuration.	`vyatta@R1# commit`

Display the configuration.	`vyatta@R1# show interfaces dataplane dp0p1p2 vrrp`
	
	`vrrp {`
	`  vrrp-group 101 {`
	`  priority 150`
	`  rfc-compatibility`
	`  sync-group ALPHA`
	`  version 3`
	`  virtual-address 172.16.30.24`
	`  }`
	`}`

Configuring the backup system

The following table shows how to configure the backup system for VRRP with a sync group. To configure the system in this way, perform the following steps in configuration mode.

TABLE 7 Configuring the backup system for VRRP with a sync group

Step	Command
Add the sync group configuration to the existing configuration for the 99 VRRP group on dp0p1p1.	`vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 101 sync-group ALPHA` `vyatta@R2# set interfaces dataplane dp0p1p1 vrrp vrrp-group 101 sync-group ALPHA version 3`

TABLE 7 Configuring the backup system for VRRP with a sync group (Continued)

Step	Command

Display the VRRP configuration on dp0p1p1.	`vyatta@R2# show interfaces dataplane dp0p1p1 vrrp`
	
	`vrrp {`
	`  vrrp-group 101 {`
	`  interface {`
	`  }`
	`  priority 20`
	`  sync-group ALPHA`
	`  version 3`
	`  virtual-address 172.16.0.24`
	`  }`
	`}`

Create the VRRP configuration node for dp0p1p2 on R2. This configuration enables VRRP on that interface. Assign the VRRP group.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101` `vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 version 3`
Specify the virtual address of the VRRP group.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 virtual-address 172.16.30.24`
Enable RFC 3768-compliant MAC address handling and create the VRRP interface.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 rfc-compatibility`
Enable preemption.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 preempt true`
Set the priority of this system to 20.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 priority 20`
Add the VRRP group on dp0p1p2 to the sync group.	`vyatta@R2# set interfaces dataplane dp0p1p2 vrrp vrrp-group 101 sync-group ALPHA`
Commit the configuration.	`vyatta@R2# commit`

Display the configuration.	`vyatta@R2# show interfaces dataplane dp0p1p2 vrrp`
	
	`vrrp {`
	`  vrrp-group 101 {`
	`  priority 20`
	`  rfc-compatibility`
	`  sync-group ALPHA`
	`  version 3`
	`  virtual-address 172.16.30.24`
	`  }`
	`}`

Configuring high availability VPN with VRRP

To configure high availability VPN with VRRP on a Brocade vRouter, perform the following steps in configuration mode.

TABLE 8 Configuring high availability VPN with VRRP

Step	Command
Add an IPsec notify option to the keepalive configuration file.	`vyatta@R1# set interfaces dataplane dp02p2 vrrp vrrp-group 10  notify ipsecvyatta@R1# set interfaces dataplane dp02p2 vrrp vrrp-group 10  notify ipsec`

Display the configuration.	`vyatta@R1# show interfaces dataplane dp02p2 vrrp`
	
	`vrrp {`
	`  vrrp-group 10 {`
	`  notify {`
	`  ipsec`
	`  }`
	`  priority 100`
	`  version 3`
	`  virtual-address 192.168.10.20`
	`  }`
	`  }`

Configuring interface tracking

To configure interface tracking with VRRP on Brocade vRouter, perform the following steps in configuration mode.

TABLE 9 Configuring interface tracking with VRRP

Step	Command
Configure to decrement the priority of the group 10 VRRP on this router when the dp0s10 interface goes down.	`vyatta@R1# set int dataplane dp02p2 vrrp vrrp-group 10 track dp0s10 weight type decrement` `vyatta@R1# set int dataplane dp02p2 vrrp vrrp-group 10 track dp0s10 weight value 100`

Display the configuration.	`vyatta@R1# show interfaces dataplane dp02p2 vrrp`
	
	`vrrp {`
	`  vrrp-group 10 {`
	`  track-interface dp0s10 {`
	`  weight {`
	`  type decrement`
	`  value 100`
	`  }`
	`  }`
	`  version 3`
	`  virtual-address 91.0.0.100`
	`  }`
	`}`

Configuring symmetric routing with VRRP and BGP

To configure symmetric routing refer to *Configuring Symmetric routing with VRRP and BGP* section in *Brocade 5600 vRouter BGP Reference Guide*.

VRRP Commands

interfaces <interface> vrrp vrrp-group <group-id>

Assigns an interface to a VRRP group.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id*

delete interfaces *interface* **vrrp vrrp-group** *group-id*

show interfaces *interface* **vrrp vrrp-group** *group-id*

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface is to belong. The identifier ranges from 1 through 255.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
        }
    }
}
```

Usage Guidelines

Use this command to assign an interface to a VRRP group. An interface or virtual interface (vif) can belong to more than one VRRP group.

Use the **set** form of the command to assign an interface to a VRRP group.

Use the **delete** form of the command to remove an interface from a VRRP group.

Use the **show** form of the command to view VRRP group configuration settings for an interface.

interfaces <interface> vrrp vrrp-group <group-id> advertise-interval <interval>

Sets the advertisement interval for a VRRP version 2 group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **advertise-interval** *interval*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **advertise-interval**

show interfaces *interface* **vrrp vrrp-group** *group-id* **advertise-interval**

Command Default

The master router sends VRRP advertisements at one-second intervals.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

interval

The interval, in seconds, between VRRP advertisement packets. All interfaces in a given VRRP group must use the same advertisement interval. The interval ranges from 1 through 255. The default interval is 1.

NOTE
The default interval value

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            advertise-interval interval
        }
    }
}
```

Usage Guidelines

Use this command to set the advertisement interval for a VRRP version 2 group on an interface.

Use the **set** form of the command to set the advertisement interval for a VRRP version 2 group on an interface.

Use the **delete** form of the command to restore the default advertisement interval of 1000 ms (1 second) for a VRRP version 2 group on an interface, which means that the master router sends advertisement packets at one-second intervals.

Use the **show** form of the command to display the advertisement interval for a VRRP version 2 group on an interface.

interfaces dataplane <interface> vrrp vrrp-group <group-id> fast-advertise-interval <interval>

Sets the advertisement interval for a VRRP version 3 group on an interface.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **fast-advertise-interval** *interval*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **fast-advertise-interval**

show interfaces *interface* **vrrp vrrp-group** *group-id* **advertise-interval**

Command Default

The master router sends advertisement packets in VRRP version 3 at intervals of 1000 ms (1 second).

Parameters

interface

The type keyword and identifier of an interface data plane. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

interval

The interval between advertisement packets in VRRP version 3. All interfaces in a given VRRP group must use the same advertisement interval. The interval ranges from 10 through 40950 milliseconds. The default interval is 1000 milliseconds.

The VRRPv3 protocol operates in centiseconds and the millisecond value entered with the command is rounded up to the nearest 10 centiseconds for the protocol.

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interface {
    vrrp {
        vrrp-group group-id {
            fast-advertise-interval interval
        }
    }
}
```

Usage Guidelines

Use this command to set the advertisement interval for a VRRP version 3 group on an interface.

Use the **set** form of the command to set the advertisement interval for a VRRP version 3 group on an interface.

Use the **delete** form of the command to restore the default advertisement interval of 1000 ms (1 second) for a VRRP version 3 group on an interface, which means that the master router sends advertisement packets ranging from 10 to 40950 milliseconds.

Use the **show** form of the command to display the advertisement interval for a VRRP version 3 group on an interface.

While it is possible to configure a value as low as 10ms, pay attention to the capability of the network and hardware the hello packets are running on. If values are too low, then the network may become unstable. Values of hundreds of milliseconds tend to work in most environments.

interfaces <interface> vrrp vrrp-group <group-id> authentication password <pwd>

Sets the VRRP authentication password for a VRRP group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **authentication password** *pwd*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **authentication password**

show interfaces *interface* **vrrp vrrp-group** *group-id* **authentication password**

Command Default

If a password is not set, an interface is not required to authenticate itself to the VRRP group.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

pwd

The password the interface is to use to authenticate itself as a member of the VRRP group.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            authentication {
                password pwd
            }
        }
    }
}
```

Usage Guidelines

Use this command to set a password for a VRRP group on an interface.

If a password is set for VRRP authentication, the authentication type (AH or plain text-password) must also be defined. If the password is set and the authentication type is not defined, the system generates an error when you try to commit the configuration.

Use the **set** form of the command to specify the VRRP authentication password for a VRRP group on an interface.

Use the **delete** form of the command to delete the VRRP authentication password for a VRRP group on an interface.

- You cannot delete the VRRP password without also deleting the VRRP authentication type. If you attempt to delete the password, the system generates an error when you try to commit the configuration.
- If you delete both the VRRP authentication password and authentication type, VRRP authentication is disabled on the interface.

Use the **show** form of the command to view the VRRP authentication password for a VRRP group on an interface.

interfaces <interface> vrrp vrrp-group <group-id> authentication type <type>

Specifies the VRRP version 2 authentication type for a VRRP group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **authentication type** *type*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **authentication type**

show interfaces *interface* **vrrp vrrp-group** *group-id* **authentication type**

Command Default

An interface is not required to authenticate itself to the VRRP group.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

type

The type of authentication to be used. The type is either of the following:

- ah: IP Authentication Header (AH) protocol
- plaintext-password: Plain-text password authentication

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            authentication {
                type type
            }
        }
    }
}
```

Usage Guidelines

Use this command to set the VRRP version 2 authentication type for a VRRP group on an interface.

If the authentication type is set for VRRP authentication, a password must also be specified. If the authentication type is defined and a password is not set, the system generates an error when you try to commit the configuration.

Use the **set** form of the command to specify the VRRP version 2 authentication type for a VRRP group on an interface.

Use the **delete** form of the command to delete the VRRP version 2 authentication type for a VRRP group on an interface.

- You cannot delete the VRRP authentication type without also deleting the VRRP password. If you do delete the authentication type, the system generates an error when you try to commit the configuration.
- If you delete both the VRRP authentication password and authentication type, VRRP authentication is disabled on the interface.

Use the **show** form of the command to view the VRRP version 2 authentication type for a VRRP group on an interface.

interfaces <interface> vrrp vrrp-group <group-id> description <desc>

Records a brief description of a VRRP group.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **description** *desc*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **description**

show interfaces *interface* **vrrp vrrp-group** *group-id* **description**

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

desc

A description of the VRRP group on a virtual interface (vif).

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            description desc
        }
    }
}
```

Usage Guidelines

Use this command to record a brief description of a VRRP group.

Use the **set** form of the command to record a description of a VRRP group.

Use the **delete** form of the command to delete the description of a VRRP group.

Use the **show** form of the command to display the description of a VRRP group.

interfaces <interface> vrrp vrrp-group <group-id> disable

Disables a VRRP group without discarding VRRP configuration for the group.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **disable**

delete interfaces *interface* **vrrp vrrp-group** *group-id* **disable**

show interfaces *interface* **vrrp vrrp-group** *group-id*

Command Default

A VRRP group is enabled.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            disable
        }
    }
}
```

Usage Guidelines

Use this command to disable a VRRP group on a data plane interface without deleting VRRP configuration for the group. Later, you can re-enable the VRRP group by deleting the command.

Use the **set** form of the command to disable a VRRP group.

Use the **delete** form of the command to re-enable a VRRP group.

Use the **show** form of the command to view VRRP group configuration.

interfaces <interface> vrrp vrrp-group <group-id> hello-source-address <addr>

Specifies the source address for VRRP hello packets.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **hello-source-address** *addr*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **hello-source-address** *addr*

show interfaces *interface* **vrrp vrrp-group** *group-id* **hello-source-address**

Command Default

The IP address of the interface is used as the source of VRRP hello packets.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

addr

The IP address to use as the VRRP source address when sending VRRP hello packets. The format of the address is *ipv4-addr* or *IPv6-addr* . The address must already be defined on an interface.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            hello-source-address addr
        }
    }
}
```

Usage Guidelines

Use this command to specify the source address for VRRP hello packets. This address is typically used when an address other than the default address for the interface is required. Note that the address must already be defined on an interface.

Use the **set** form of the command to specify the source address of VRRP hello packets.

Use the **delete** form of the command to restore the default source address, which is the IP address of the interface.

Use the **show** form of the command to view the configuration.

interfaces <interface> vrrp vrrp-group <group-id> interface description <descr>

Specifies a description for a VRRP interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **interface description** *descr*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **interface description**

show interfaces *interface* **vrrp vrrp-group** *group-id* **interface description**

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

descr

A mnemonic name or description of the VRRP interface.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            interface {
                description desc
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify a description of a VRRP interface.

Use the **set** form of this command to specify a description of a VRRP interface.

Use the **delete** form of this command to remove the description of a VRRP interface.

Use the **show** form of this command to display the description of a VRRP interface.

interfaces <interface> vrrp vrrp-group <group-id> preempt <preempt>

Enables or disables preemption for a VRRP group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **preempt** *preempt*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **preempt**

show interfaces *interface* **vif vrrp vrrp-group** *group-id* **preempt**

Command Default

Preemption is enabled.

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

preempt

Allows a higher-priority VRRP backup router to assert itself as master over a lower-priority router. Supported values are as follows:

- **true**: Allow the master router to be preempted by a backup router with higher priority.
- **false**: Do not allow the master router to be preempted by a backup router with higher priority.

The default is **true**; that is, the master router can be preempted by a backup router with higher priority.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            preempt preempt
        }
    }
}
```

Usage Guidelines

Use this command to enable or disable preemption for a VRRP group on an interface.

If preemption is enabled, a backup router with a higher priority than the current master “preempts” the master and becomes the master itself.

A backup router preempts the master by beginning to send its own VRRP advertisements. The master router examines these advertisements and discovers that the backup router has a higher priority than itself. The master then stops sending advertisements, while the backup continues to send, thus, making itself the new master.

Preemption is useful when a lower-performance backup router becomes the master because a higher-performance router fails. In this case, a new higher-performance router can be brought online, and it automatically preempts the lower-performance backup.

Use the **set** form of the command to enable or disable preemption delay for a VRRP group on an interface.

Use the **delete** form of the command to restore preemption for a VRRP group on an interface.

Use the **show** form of the command to view VRRP preemption configuration on an interface.

interfaces <interface> vrrp vrrp-group <group-id> preempt-delay <delay>

Sets the preemption delay for a VRRP group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **preempt-delay** *delay*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **preempt-delay**

show interfaces *interface* **vif vrrp vrrp-group** *group-id* **preempt-delay**

Command Default

A router that is preempting another router does not wait.

Parameters

interface

The type of interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group that is being configured. The identifier ranges from 1 through 255.

delay

The amount of time, in seconds, to postpone preemption. The delay ranges from 0 through 1000 (16.67 minutes.), where 0 means no delay. The default delay is 0.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            preempt-delay delay
        }
    }
}
```

Usage Guidelines

Use this command to set the preemption delay for a VRRP group on an interface. The preemption delay is the amount of time a router must wait before preempting a lower-priority VRRP router and becoming the master.

Use the **set** form of the command to set the preemption for a VRRP group on an interface.

Use the **delete** form of the command to restore the default preemption delay, which is 0 seconds, for a VRRP group on an interface.

Use the **show** form of the command to display the preemption delay for a VRRP group on an interface.

interfaces <interface> vrrp vrrp-group <group-id> priority <priority>

Sets the priority of an interface within a VRRP group.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **priority** *priority*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **priority**

show interfaces *interface* **vrrp vrrp-group** *group-id* **priority**

Command Default

The default priority is 100.

Parameters

interface

The type of interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group that is being configured. The identifier ranges from 1 through 255.

priority

The priority with which this interface is considered for election as the master within the VRRP group. The higher the configured number, the higher the priority.

The priority for a VRRP backup router ranges from 1 through 254. The VRRP master router must have the highest priority, which is typically set to 50 greater than any backup router. The address owner is typically set to 255. The default priority is 100.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            priority priority
        }
    }
}
```

Usage Guidelines

Use this command to set the priority of an interface within a VRRP group. This priority determines the likelihood that it is elected the master router in a cluster of VRRP routers.

The master interface in the VRRP group is elected the master based on its priority in which the higher the configured number, the higher the priority. If the master interface fails, the interface with the next highest priority is elected master and assumes the virtual address of the group. The new master notifies the network of its MAC address by sending a gratuitous ARP message.

The priority of the master interface is typically set to 255. The backup interface can be left with the default priority; however, if more than one interface is acting as backup, the interfaces should be configured with different priorities.

Use the **set** form of the command to specify the priority of an interface within a VRRP group.

Use the **delete** form of the command to remove the priority of an interface within a VRRP group.

Use the **show** form of the command to view the priority of an interface within a VRRP group.

interfaces <interface> vrrp vrrp-group <group-id> rfc-compatibility

Creates a VRRP interface, which enables RFC-compliant MAC address behavior.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **rfc-compatibility**

delete interfaces *interface* **vrrp vrrp-group** *group-id* **rfc-compatibility**

show interfaces *interface* **vrrp vrrp-group** *group-id* **rfc-compatibility**

Command Default

If this option is not configured, the system uses legacy (non-RFC 3768-compliant) MAC address behavior when a new master is elected. For details, refer to Virtual MAC address on page 14.

Parameters

interface

The type keyword and identifier of an interface. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The identifier of a VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

In addition to the parameters shown here, a VRRP interface can be configured in the same way as the parent interface.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            rfc-compatibility
        }
    }
}
```

Usage Guidelines

Use this command to enable RFC 3768-compliant MAC address behavior when a new master router is elected. Setting this option defines a VRRP interface for the VRRP group that you are configuring.

RFC 3768 defines a specific 48-bit MAC address that is to be associated with each VRRP virtual router. The ARP translation of the IPv4 or IPv6 address for the virtual router points to this MAC address.

The master router uses this well-defined MAC address as the source MAC address of VRRP packets that it sends, in this way teaching switches to send packets for that MAC address to itself. If one master router fails and another router takes over as the master, it acts in the same way.

When a VRRP interface is configured for a VRRP group, the system assigns the well-defined MAC address to the VRRP interface according to RFC 3768. Using the well-defined MAC address ensures quick failover of traffic for that MAC address. In addition, the ARP translations of the other hosts and routers on the network do not need to change when a new router takes over as master router. This configuration is recommended.

When configured, the system automatically assigns the VRRP virtual MAC address to the VRRP interface. When a new master router is elected, the system uses the procedure described in RFC 3768 to have the new master take over the virtual MAC address. The VRRP interface remains on the system as long as the configuration does, independent of whether the VRRP instance is in a backup or master state.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 10 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

The VRRP interface remains on the system as long as the **rfc3768-compatibility** option is set, and remains on the system independent of the state of the VRRP instance (backup or master).

The VRRP interface that is created by the VRRP process operates in a special “pass-through” mode. The pass-through mode allows the router to receive packets addressed to the well-known VRRP MAC address for a given VRID on the parent interface. The VRRP interface is used only to send VRRP advertisement packets when its associated VRRP group is acting as the master router for the group.

Use the **set** form of this command to direct the system to use RFC 3768-compliant MAC address handling when a new master is elected and create a VRRP interface.

Use the **delete** form of this command to remove the VRRP interface and restore the legacy (non-compliant) VRRP MAC address behavior.

Use the **show** form of the command to view VRRP interface configuration.

NOTE
The default behavior of nonRFC-compliant MACs is necessary for any environment in which VMware provides Layer 2 services because the vSwitch product does not support true MAC learning and blocks traffic when virtual MAC addresses move ports unless the vSwitch is in promiscuous mode. For the latest product support information, refer to VMware documentation.

interfaces <interface> vrrp vrrp-group <group-id> run-transition-scripts

Specifies a script to run when the VRRP on an interface changes state.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **run-transition-scripts** [**backup** | **fault** | **master**] *script*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **run-transition-scripts** [**backup** | **fault** | **master**]

show interfaces *interface* **vrrp vrrp-group** *group-id* **run-transition-scripts** [**backup** | **fault** | **master**]

Parameters

interface
: The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id
: The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

backup *script*
: Specifies the name of the executable script to run during VRRP state transition to the backup state.

fault *script*
: Specifies the name of the executable script to run during VRRP state transition to the fault state.

master *script*
: Specifies the name of the executable script to run during VRRP state transition to the master state.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            run-transition-scripts {
                backup script
                fault script
                master script
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify a script to run when the VRRP group on an interface changes state. The state is backup, fault, or master. A script file is assumed to be in the /config/scripts directory unless an absolute path is specified.

Use the **set** form of the command to specify a script to run when the VRRP group on an interface changes state.

Use the **delete** form of the command to stop the script from being run when an interface changes states.

Use the **show** form of the command to view the configuration.

interfaces <interface> vrrp vrrp-group <group-id> sync-group <group>

Assigns an interface to a VRRP sync group on a router.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **sync-group** *group*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **sync-group**

show interfaces *interface* **vrrp vrrp-group** *group-id* **sync-group**

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

group

A text string defining the name of a sync group.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            sync-group group
        }
    }
}
```

Usage Guidelines

Use this command to assign an interface to a VRRP sync group on a router.

Interfaces in a sync group are synchronized such that, if one of the interfaces in the group fails over to backup, all interfaces in the group fail over to backup.

For example, in many cases, if one interface on a master router fails, the whole router fails over to a backup router. By assigning all the interfaces on the master to a sync group, the failure of one interface triggers a failover of all the interfaces in the sync group to the backup that is configured for the interface.

Use the **set** form of the command to assign an interface to a VRRP sync group on a router.

Use the **delete** form of the command to remove an interface from a VRRP sync group on a router.

Use the **show** form of the command to display the VRRP sync group on a router for an interface.

interfaces <interface> vrrp vrrp-group <group-id> virtual-address <addr>

Sets the virtual IP address or network address of a VRRP group on an interface.

Syntax

set interfaces *interface* **vrrp vrrp-group** *group-id* **virtual-address** *addr*

delete interfaces *interface* **vrrp vrrp-group** *group-id* **virtual-address**

show interfaces *interface* **vrrp vrrp-group** *group-id* **virtual-address**

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

addr

The virtual IP address or network address of the VRRP group. The format of the address is *ipv4-addr* for IPv4 addresses, or *ipv6-addr* for IPv6 addresses.

Modes

Configuration mode

Configuration Statement

```
interfaces interface {
    vrrp {
        vrrp-group group-id {
            virtual-address addr
    }
}
```

Usage Guidelines

Use this command to set the virtual IP address or network address of a VRRP group on an interface. Every VRRP group must have a virtual address, and all interfaces and vifs in the VRRP group must be configured with the same virtual address.

The virtual address is “shared” by the VRRP group and is dynamically assigned to the master interface in the group. The master links the virtual address to its own MAC address in the network by issuing a gratuitous ARP to the LAN segment. If the master interface fails, the group elects a new master to whom the virtual address is then assigned. The new master notifies the network of the changed MAC address by issuing another gratuitous ARP.

In general, a real interface or vif should not be configured with the virtual address of the VRRP group. In practice, if a real interface is configured with the virtual address, the interface is said to “own” the virtual address. The VRRP standard (RFC 2338) prescribes that a router owning the virtual address should be assigned a priority of 255, which automatically elects the router owning the VIP as the master. If you do assign a virtual address to a real interface, set the priority of the interface to 255.

Use the **set** form of the command to specify the virtual address or network address of a VRRP group on an interface.

Use the **delete** form of the command to remove the virtual address or network address of a VRRP group on an interface. However, note that the virtual address is mandatory in VRRP configuration.

Use the **show** form of the command to display the virtual address or network address of a VRRP group on an interface.

interfaces dataplane <interface-name> vrrp vrrp-group <group-id> notify ipsec

Notifies the IPSec daemon when VRRP on an interface changes state.

Syntax

set interfaces dataplane *interface-name* **vrrp vrrp-group** *group-id* **notify ipsec**

delete interfaces dataplane *interface-name* **vrrp vrrp-group** *group-id* **notify ipsec**

show interfaces dataplane *interface-name* **vrrp vrrp-group** *group-id*

Parameters

interface-name

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

Modes

Configuration mode

Configuration Statement

```
interfaces {
    dataplane interface-name {
        vrrp {
            vrrp-group group-id {
                notify {
                    ipsec
                }
            }
        }
    }
}
```

Usage Guidelines

Use the **set** form of the command to notify the IPSec daemon when VRRP on an interface changes state.

Use the **delete** form of the command to remove notification of the IPSec daemon when VRRP on an interface changes state.

Use the **show** form of the command to display whether the IPSec daemon is notified when VRRP on an interface changes state, which lets you determine if High Availability VPN is enabled.

interfaces dataplane <interface> vrrp vrrp-group <group-id> accept <accept>

Enables the master router to accept all packets destined for a virtual IP address.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **accept** *accept*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **accept**

show interfaces dataplane *interface* **vrrp vrrp-group** *group-id*

Command Default

The default accept value is false and is disabled on VRRP.

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

accept

Enable the virtual master router to accept packets destined for the address owner's IP address.

The options available are:

- True
- False

Deployments that rely on pinging the address owner's IP address must configure the accept mode to True.

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interface {
        vrrp {
            vrrp-group group-id {
                accept accept
            }
        }
}
```

Usage Guidelines

Use the **set** form of the command to set the master router to accept all packets destined for the virtual IP address.

Use the **delete** form of the command to remove the master router from accepting all packets destined for the virtual IP address.

Use the **show** form of the command to display whether the master router accepts all packets destined for the virtual IP address.

interfaces dataplane <interface> vrrp vrrp-group <group-id> notify <client>

Configures BGP as a client to notify VRRP state changes.

Syntax **set interfaces dataplane** *interface name* **vrrp vrrp-group** *group-id* **notify** *client*

delete interfaces dataplane *interface name* **vrrp vrrp-group** *group-id* **notify***client*

Command Default Disabled

Parameters *interface*

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

client

The available options are:

- bgp-Notifies BGP abput VRRP state transition.
- ipsec-Enables IPSec restart or stop on VRRP state transition.

Modes Configuration mode

```
interfaces dataplane interface {
        vrrp {
            vrrp-group group-id {
                notify client
            }
        }
}
```

Usage Guidelines Use the **set** form of this command to configure BGP as a client to notify VRRP state changes.

Use the **delete** form of this command to delete BGP as a client to notify VRRP state changes.

interfaces dataplane <interface> vrrp vrrp-group <group-id> version <version>

Displays the version of VRRP: 2 for RFC3768 or 3 for RFC5798.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **version** *version*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **version**

show interfaces dataplane *interface* **vrrp vrrp-group** *group-id*

Command Default

The default version of VRRP is 2.

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

version

The version of VRRP:

- 2 for RFC3768
- 3 for RFC5798

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interface {
        vrrp {
            vrrp-group group-id {
                version version
            }
        }
}
```

Usage Guidelines

Use the **set** form of the command to set the VRRP version to 2 for RFC3768 and to 3 for RFC5798.

Use the **delete** form of the command to remove the VRRP version.

interfaces dataplane <interface> vrrp vrrp-group <group-id> track-interface <interface>

Tracks an interface by monitoring whether the interface is up or down and sets the state of the VRRP instance accordingly.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface**

show interfaces dataplane *interface* **vrrp vrrp-group** *group-id*

Command Default

If the interface goes down, the VRRP instance is set to the FAULT state.

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

interface

The interface to be tracked.

After the interface is up, the VRRP instance reverts to the previous state.

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interface {
        vrrp {
            vrrp-group group-id {
                track-interface interface
            }
        }
}
```

Usage Guidelines

Use the **set** form of the command to set the interface tracking and check whether the interface is up or down and set the state of the VRRP instance accordingly.

Use the **delete** form of the command to remove the interface tracking.

interfaces dataplane <interface> vrrp vrrp-group <group-id> track-interface <interface> weight value <num>

Sets the weight for a VRRP group, which determines by how much the priority of a group is decremented or incremented when an interface goes down.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface* **weight value** *num*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface* **weight value**

show interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface**

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

vrrp-group *group-id*

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

track-interface *interface*

The interface to be tracked.

After the interface is up, the VRRP instance reverts to the previous state.

value *num*

The value to increment or decrement the priority. Number can range from 1 through 254. If weight 'value' is provided, 'type' must be provided and vice versa.

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interfaces {
        vrrp {
            vrrp-group group-id {
                track-interface interface {
                        weight {
                                value num

                        }
                }
            }
        }
}
```

Usage Guidelines

Use the **set** form of the command to change the priority of the VRRP instance.

Use the **delete** form of the command to remove the priority of the VRRP instance.

Use the **show** form of the command to display the priority of the VRRP instance.

interfaces dataplane <interface> vrrp vrrp-group <group-id> track-interface <interface> weight type <type>

Sets the tracking priority of a VRRP interface.

Syntax

set interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface* **weight type** *type*

delete interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface* **weight type**

show interfaces dataplane *interface* **vrrp vrrp-group** *group-id* **track-interface** *interface* **weight type**

Parameters

interface

The interface type and identifier. For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

vrrp-group *group-id*

The VRRP group to which the interface belongs. The identifier ranges from 1 through 255.

track-interface *interface*

The interface to be tracked.

After the interface is up, the VRRP instance reverts to the previous state.

type *type*

A keyword of either **increment** or **decrement** to specify how the value is to be applied to the group when the tracked interface goes down.

Modes

Configuration mode

Configuration Statement

```
interfaces dataplane interfaces {
        vrrp {
            vrrp-group group-id {
                track-interface interface {
                        weight {
                                type type

                        }
                }
            }
        }
}
```

Usage Guidelines

Use the **set** form of the command to set the interface tracking priority.

Use the **delete** form of the command to remove the interface tracking priority.

Use the **show** form of the command to display whether the interface tracking priority is enabled.

monitor interfaces vrrp <interface> flow

Displays flow statistics for a VRRP interface.

Syntax **monitor interfaces vrrp** *interface* **flow**

Parameters *interface*

The identifier of a VRRP interface. For the format of a VRRP interface name, refer to the usage guidelines.

Modes Operational mode

Usage Guidelines Use this command to display flow statistics for a VRRP interface. Type CTRL+C to stop the output.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 11 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

monitor interfaces vrrp <interface> traffic

Monitors traffic on a VRRP interface.

Syntax **monitor interfaces vrrp** *interface* **traffic** [**detail** [**filter** *filter-name* | **unlimited** [**filter** *filter-name*]] | **filter** *filter-name* | **save** *filename* | **unlimited** [**filter** *filter-name*]]

Parameters *interface*

The identifier of a VRRP interface. For the format of a VRRP interface name, refer to the usage guidelines.

detail

Provides detailed information about the monitored VRRP traffic.

unlimited

Monitors an unlimited amount of traffic.

save *filename*

Saves the monitored traffic to the specified file.

filter *filter-name*

Applies the specified PCAP (packet capture) filter to traffic.

Modes Operational mode

Usage Guidelines Use this command to monitor traffic on a VRRP interface. Type CTRL+C to stop the output.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 12 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

Examples The following example shows how to monitor traffic on the dp0p192p1 interface.

```
vyatta@vyatta:~$ monitor interfaces vrrp dp0p192p1 traffic
Capturing on /var/run/dataplane/capture/p192p1
  0.000000      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
  1.000298      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
  2.001358      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
  3.002449      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
  4.002937      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
  5.003872      1.1.1.1 -> 224.0.0.18   VRRP 54 Announcement (v2)
```

monitor vrrp

Generates debug information for the VRRP process.

Syntax **monitor vrrp**

Command Default When used with no option, monitoring is performed in the foreground.

Modes Operational mode

Usage Guidelines Use this command to monitor VRRP operation.

This is common to all the **monitor** commands.

As of now we do not have the option to save the logs to a file using the **monitor** command.

Examples The following example shows how to monitor VRRP in the foreground and then stop the output by typing CTRL+C. The example omits output from the command.

```
vyatta@vyatta:~$ monitor vrrp
...
CTRL+C
```

reset vrrp master interface <interface> group <group-id>

Forces a transition of the VRRP state to the backup state for an interface.

Syntax **reset vrrp master interface** *interface* **group** *group-id*

Parameters *interface*

An interface to force to the backup state. Include the type keyword and the interface identifier (for example, dataplane dp0p1p2). For detailed keywords and arguments that can be specified as interfaces, refer to Supported Data Plane Interfaces on page 95.

group-id

A VRRP group within the interface to force to the backup state.

Modes Operational mode

Usage Guidelines Use this command to force the VRRP master interface to transition to the backup state.

Examples The following example shows how to force the VRRP master interface to the backup state. Notice that before the **run** command is entered, the state is master, and after the command is entered, it is backup. Also, notice the change in “Master router”.

```
vyatta@vyatta:~$ reset vrrp master interface dp0p192p1 group 1
Forcing vyatta-dp0p192p1-1 to BACKUP...
vyatta@vyatta:~$ show vrrp
                                RFC        Addr   Last        Sync
Interface         Group  State  Compliant  Owner  Transition  Group
---------         -----  -----  ---------  -----  ----------  -----
dp0p192p1         1      MASTER yes        no     5s          <none>
```

restart vrrp

Restarts the VRRP process.

Syntax **restart vrrp process**

Modes Operational mode

Usage Guidelines Use this command to restart the VRRP process.

show vrrp interface

Displays information about the groups configured on the VRRP interface or all VRRP interfaces.

Syntax **show vrrp interfaces** [*vrrpx*]

Command Default When used with no option, this command displays information about all VRRP interfaces.

Parameters *vrrpx*

A VRRP interface. For the format of the VRRP interface name, refer to the usage guidelines.

Modes Operational mode

Usage Guidelines Use this command to display information about one VRRP interface or all VRRP interfaces.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 13 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

Examples The following example shows how to display summary information of the group configured on the VRRP interfaces.

```
vyatta@vyatta:~$ show vrrp interface dp0p5p1
------------------------------------------------
Interface: dp0p5p1
--------------
Group: 100
----------
State:                          BACKUP
Last transition:                33m50s

Master router:                  2ffe:20::15
Master priority:                255
Version:                        3
RFC Compliant
Virtual MAC interface:          dp0p5p1
Address Owner:                  no

Source Address:                 2ffe:20::20
Priority:                               100
Advertisement interval:         1000 milli-sec
Preempt:                        enabled
Accept                          disabled
Sync-group:                     ABC
Tracked interfaces count:                                       2
    dpop3p1     state     UP    weight     +20
    dp0p4p1     state     UP    weight     -10
VIP count:                      1
    2ffe:20::15/128
```

show vrrp details

Displays details about all the VRRP groups configured at the system level.

Syntax **show vrrp details** [*vrrpx*]

Command Default When used with no option, this command displays information about all VRRP interfaces.

Parameters *vrrpx*

A VRRP interface. For the format of the VRRP interface name, refer to the usage guidelines.

Modes Operational mode

Usage Guidelines Use this command to display information about all the VRRP groups configured at the system level.

The system automatically generates a name for the VRRP interface. This name is derived from the identifier of the parent interface plus the ID of the VRRP group. The following table shows the format for VRRP interface names.

TABLE 14 Format for VRRP interface names

Format	Interface Type	Example	
dp0pXpYvV	Data plane interface	dp0p1p1 and VRRP group 99	dp0p1p1v99
dp0pXpY.DvV	Vif on Data plane interface	dp0p1p1, VLAN ID 15 and VRRP group 99	dp0p1p1.15v99

Examples The following example shows how to display information about all the VRRP groups configured at the system level.

```
vyatta@vyatta:~$ show vrrp detail
------------------------------------------------
Interface: dp0p5p1
--------------
Group: 100
----------
State:                          BACKUP
Last transition:                33m46s

Master router:                  2ffe:20::15
Master priority:                255
Version:                        3
RFC Compliant
Virtual MAC interface:          dp0p5p1
Address Owner:                  no

Source Address:                 2ffe:20::20
Priority:                       100
Advertisement interval:         1000 milli-sec
Preempt:                        enabled
Accept                          disabled
Sync-group:                     ABC
Tracked interfaces count:       2
    dpop3p1    state    UP    weight    +20
    dp0p4p1    state    UP    weight    -10
VIP count:                      1
    2ffe:20::15/128
```

show log vrrp

Displays log messages that are generated by the VRRP process.

Syntax **show log vrrp**

Modes Operational mode

Usage Guidelines Use this command to display log messages that are generated by the VRRP process.

Examples The following example shows VRRP log messages from a backup router.

```
vyatta@R1:~$ show log vrrp
Feb 14 21:31:27 vyatta Keepalived_vrrp: ------< Global definitions >------
Feb 14 21:31:27 vyatta Keepalived_vrrp:  Router ID = dut4
Feb 14 21:31:27 vyatta Keepalived_vrrp:  Smtp server connection timeout = 30
Feb 14 21:31:27 vyatta Keepalived_vrrp:  Email notification from = root@dut4
Feb 14 21:31:27 vyatta Keepalived_vrrp: ------< VRRP Topology >------
Feb 14 21:31:27 vyatta Keepalived_vrrp:  VRRP Instance = vyatta-dp0p1p2-2
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Want State = BACKUP
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Runing on device = dp0p1p2
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Virtual Router ID = 2
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Priority = 100
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Advert interval = 3sec
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Virtual IP = 1
Feb 14 21:31:27 vyatta Keepalived_vrrp:      172.16.117.100/32 dev dp0p1p2 scope
global
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Backup state transition script = /opt/
vyatta/sbin/vyatta-vrrp-state.pl backup dp0p1p2 2 dp0p1p2 null 172.16.117.100
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Master state transition script = /opt/
vyatta/sbin/vyatta-vrrp-state.pl master dp0p1p2 2 dp0p1p2 null 172.16.117.100
Feb 14 21:31:27 vyatta Keepalived_vrrp:    Fault state transition script = /opt/
vyatta/sbin/vyatta-vrrp-state.pl fault dp0p1p2 2 dp0p1p2 null 172.16.117.100
Feb 14 21:31:27 vyatta Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Feb 14 21:31:27 vyatta Keepalived_vrrp: VRRP_Instance(vyatta-dp0p1p2-2) Entering
BACKUP STATE
Feb 14 21:31:27 vyatta Keepalived_vrrp: VRRP_Instance(vyatta-dp0p1p2-2) removing
protocol VIPs.
Feb 14 21:31:27 vyatta Keepalived_vrrp: Opening script file /opt/vyatta/sbin/vyatta-
vrrp-state.pl
```

show vrrp

Displays information about VRRP.

Syntax **show vrrp** [**detail** | **interface** *interface* [**group** *group-name*] | **statistics** [**interface** *interface* [**group** *group-name*]] | **sync-group** [**group** *group-name*]]

Command Default When used with no option, this command displays VRRP state information for all VRRP-configured interfaces.

Parameters **detail**

Displays detailed VRRP information for all VRRP-configured interfaces.

interface *interface*

Displays VRRP information for the specified interface. Use the identifier for the physical Ethernet interface or vif. If the VRRP interface is configured, this command also displays the VRRP interface name and the name of the physical interface or vif. The information that is displayed includes whether the local system is currently running as the owner of the VRRP interface. Note that tab completion that is used after the **interface** keyword provides only parent interface names.

group-name

A VRRP group.

Modes Operational mode

Usage Guidelines Use this command to display information about VRRP groups, including current VRRP elections and statistics.

Examples The following example shows how to display information about VRRP.

```
vyatta@R1~$ show vrrp
                                  RFC        Addr   Last         Sync
Interface         Group  State    Compliant  Owner  Transition   Group
---------         -----  -----    ---------  -----  ----------   -----
dp0p1p1              10   BACKUP     yes        no     2m18s      SYNC
dp0p1p2              10   BACKUP     yes        no     2m18s      SYNC
```

Related commands

The following table lists related commands that are documented elsewhere.

Related commands documented elsewhere	
protocols bgp <asn> neighbor <id> vrrp-failover vrrp-group <vrrp-group-id> med <med-value>	Dynamically changes the BGP best path taken for incoming traffic according to the path taken by outgoing traffic, if the MED is used as the control mechanism.
interfaces dataplane <interface-name> vrrp vrrp-group <vrrp-group-id> notify bgp	Notifies BGP when a VRRP group changes state.

Configuration Synchronization

Configuration synchronization configuration

This section describes configuration synchronization and provides examples that show how to set it up and use it. This section presents the following topics:

- Configuration synchronization overview
- Master and standby systems
- Out-of-sync systems
- Configuration synchronization examples

Configuration synchronization overview

Many high-availability deployments involve the use of hot standby systems. In these scenarios, one priority reduces configuration differences between the master and standby systems. The ability to synchronize defined portions of configuration minimizes configuration differences at failover while posing the least-possible burden on the master system.

By default, all configuration is excluded from synchronization and you must explicitly include a configuration node for it to be synchronized. Only a single standby system is currently supported.

Every time the master system starts or a **commit**, **load**, or **merge** command is run on the master system, the standby system is synchronously updated and its configuration is saved. The system tries to make all parameter values on the standby system within the **sync-map** identical to the master. Partial commits, in the event of a commit failure, synchronize only the sections that were successfully committed on the master system.

NOTE
Be sure to save the configuration on the master system and be mindful that this operation does not trigger the standby system to save its configuration.

NOTE
Both the master and standby systems must be running Brocade vRouter, properly configured for entitlement, and able to access the Brocade vRouter entitlement server.

Master and standby systems

Configuration synchronization allows you to designate a master Brocade vRouter that can synchronize defined portions of the configuration with a remote standby system. The master system dispatches locally generated configuration commands (**set**, **delete**, **commit**, and so on) to the remote standby system; the commands are dispatched from the master system when the configuration change is committed.

The master system uses the REST API of theBrocade vRouter to propagate commands to the remote systems; for this reason, the remote system must have HTTPS enabled to participate.

When setting up the master and standby systems on the network, keep in mind that the Brocade vRouter does not prevent you from setting up mis-synchronization scenarios that can result in network problems. Take care to avoid scenarios that cause network problems. For example:

- Configuration information that is unique to a system should not be synchronized between systems because synchronizing this information can cause problems on the network. Examples of configuration that should be excluded from synchronization include interface, IP addresses, and VRRP priorities.
- Avoid setting up two master systems to synchronize each other.
- Avoid setting up two master systems so that both synchronize the same configuration on a third system.

Note that some configuration items are not allowed to be synchronized because synchronizing them would damage your system configuration. The two items that cannot be synchronized are the **system config-sync** configuration node itself and the **service https** configuration node. Disallowed configuration items do not appear in the configuration tree when excluded items are listed.

Note also that only one **sync-map** can be defined for the standby system.

Finally, avoid direct modification of the configuration on the standby system in areas contained in the **sync-map** as this may result in conflicts and commit failures during the synchronization process.

Out-of-sync systems

The master system logs a warning if configuration elements become out of synchronization (out of sync), but does not attempt to correct configuration. You can view the warnings in the log file by issuing the **show config-sync status** operational command.

If configuration does become out of sync, you can reset the configuration on the standby system by issuing the **update config-sync** operational command. When this command has successfully completed, the systems are synchronized again.

If the systems become out of sync because of a configuration conflict, the conflict must be addressed before entering the **update config-sync** command.

The **update config-sync** command is also useful if the secondary is booted with an out-of-sync configuration. Entering this command on the master system synchronizes the configurations without having to commit a configuration change on the master.

To set up configuration synchronization on the Brocade vRouter, use the following work flow.

1. Identify the master system.
2. Identify the remote standby system.
3. Identify the portion of the configuration tree to be synchronized (“include”).

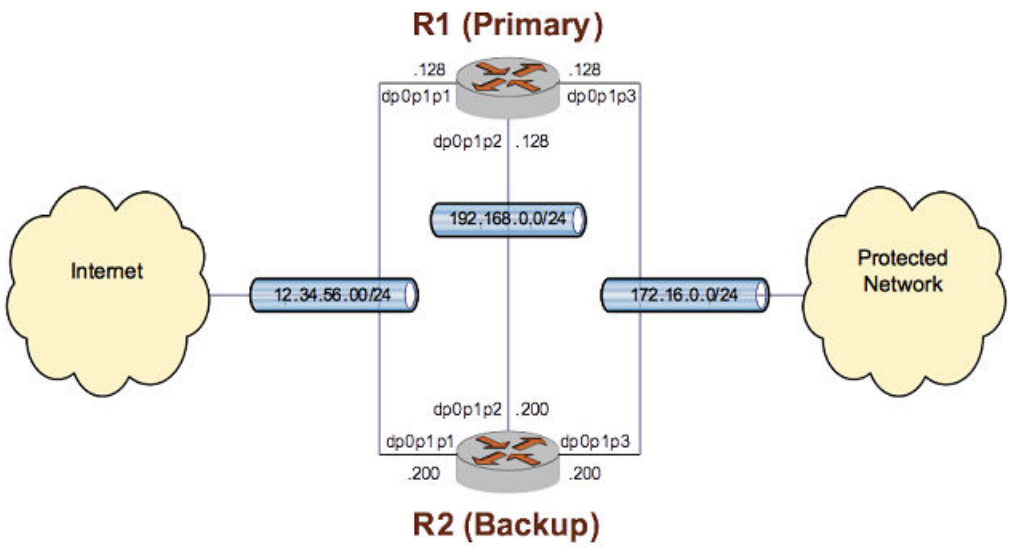
Configuration synchronization examples

This section contains examples of configuration synchronization on the Brocade vRouter.

Basic configuration synchronization

This section sets up configuration synchronization with the scenario shown in the following figure.

FIGURE 3 Configuration synchronization



In this example:

- The master system is R1.
- The standby system is R2. The remote system is to be accessed by using the default username and password: vyatta.
- Firewall configuration is to be synchronized.

To configure R1 for configuration synchronization in this way, perform the following steps in configuration mode.

TABLE 15 Configuring R1 for configuration synchronization

Step	Command
Create the configuration synchronization service and a synchronization map (TEST) with a rule (1) within the synchronization map. Specify a node (firewall) as a node on which to take action.	`vyatta@R1# set system config-sync sync-map TEST rule 1 location firewall`
Specify the synchronization action to take on the firewall configuration node during configuration synchronization. The firewall node is to be included in configuration synchronization.	`vyatta@R1# set system config-sync sync-map TEST rule 1 action include`
Define the remote system with which to synchronize and set the username (vyatta) to be used for connecting to the remote system.	`vyatta@R1# set system config-sync remote-router 192.168.1.22 username vyatta`
Set the password (vyatta) to be used for connecting to the remote system.	`vyatta@R1# set system config-sync remote-router 192.168.1.22 password vyatta`
Set TEST as the synchronization map to be used for configuration synchronization with the remote system.	`vyatta@R1# set system config-sync remote-router 192.168.1.22 sync-map TEST`
Commit the configuration.	`vyatta@R1# commit`

TABLE 15 Configuring R1 for configuration synchronization (Continued)

Step	Command

Display the configuration.	`vyatta@R1# show system config-sync`
	`  remote-router 192.168.1.22 {`
	`  password vyatta`
	`  sync-map TEST`
	`  username vyatta`
	`  }`
	`  sync-map TEST {`
	`  rule 1 {`
	`  action include`
	`  location firewall`
	`  }`
	`  }`

Configuration Synchronization Commands

system config-sync remote-router <addr>

Specifies the address of the standby system.

Syntax **set system config-sync remote-router** *addr*

delete system config-sync remote-router *addr*

show system config-sync remote-router *addr*

Parameters *addr*

Multi-node. The IPv4 address of the standby system.

Modes Configuration mode

Configuration Statement

```
system {
    config-sync {
        remote-router addr {}
    }
}
```

Usage Guidelines Use this command to specify the address of the system whose configuration is to be automatically synchronized with a subset of that defined on the master system by the **sync-map**.

Use the **set** form of the command to specify the address of the standby system.

Use the **delete** form of the command to remove the address of the standby system.

Use the **show** form of the command to view the configuration syncronization configuration of the standby system.

system config-sync remote-router <addr> password <password>

Specifies the password to be used to access the standby system.

Syntax

set system config-sync remote-router *addr* **password** *password*

delete system config-sync remote-router *addr* **password**

show system config-sync remote-router *addr* **password**

Parameters

addr

Multi-node. The IPv4 address of the standby system.

password

The password to use (with a username) to access the standby system.

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        remote-router addr {
            password password
        }
    }
}
```

Usage Guidelines

Use this command to specify the password to use to access the standby system for automated configuration synchronization.

Use the **set** form of the command to specify the password.

Use the **delete** form of the command to remove the password.

Use the **show** form of the command to display the password.

system config-sync remote-router <addr> sync-map <sync-map-name>

Specifies the synchronization map that is used to define the standby system configuration.

Syntax **set system config-sync remote-router** *addr* **sync-map** *sync-map-name*

delete system config-sync remote-router *addr* **sync-map**

show system config-sync remote-router *addr* **sync-map**

Parameters *addr*

Multi-node. The IPv4 address of the standby system.

sync-map-name

The name of a synchronization map.

Modes Configuration mode

Configuration Statement

```
system {
    config-sync {
        remote-router addr {
            sync-map sync-map-name
        }
    }
}
```

Usage Guidelines Use this command to specify a synchronization map that is used to define the subset of the local configuration to be synchronized with the standby system. Only one **sync-map** can be defined per **remote-router**.

Use the **set** form of the command to specify a synchronization map.

Use the **delete** form of the command to remove a synchronization map.

Use the **show** form of the command to display a synchronization map.

system config-sync remote-router <addr> username <username>

Specifies the username to be used to access the standby system.

Syntax

set system config-sync remote-router *addr* **username** *username*

delete system config-sync remote-router *addr* **username**

show system config-sync remote-router *addr* **username**

Parameters

addr

Multi-node. The IPv4 address of the standby system.

username

The username to use (with a password) to access the standby system.

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        remote-router addr {
            username username
        }
    }
}
```

Usage Guidelines

Use this command to specify the username to use to access the standby system for automated configuration synchronization. The user must have administrator (admin) rights on the standby system or synchronization fails. Synchronization also fails if an invalid username or password is specified.

Use the **set** form of the command to specify the username.

Use the **delete** form of the command to remove the username.

Use the **show** form of the command to display the username

system config-sync sync-map <sync-map-name>

Specifies the portions of the configuration to be synchronized with the standby system.

Syntax

set system config-sync sync-map *sync-map-name*

delete system config-sync sync-map *sync-map-name*

show system config-sync sync-map *sync-map-name*

Parameters

sync-map-name

Multi-node. The name of a synchronization map.

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        sync-map sync-map-name {}
    }
}
```

Usage Guidelines

Use this command to specify a synchronization map that defines the portions of the configuration to be synchronized with the standby system. Multiple configuration nodes can be specified to identify multiple synchronization maps. Only one synchronization map can be assigned to the standby system at one time.

Use the **set** form of the command to specify a synchronization map.

Use the **delete** form of the command to remove a synchronization map.

Use the **show** form of the command to display a synchronization map.

system config-sync sync-map <sync-map-name> rule <rule-num>

Specifies a synchronization map rule.

Syntax

set system config-sync sync-map *sync-map-name* **rule** *rule-num*

delete system config-sync sync-map *sync-map-name* **rule** *rule-num*

show system config-sync sync-map *sync-map-name* **rule** *rule-num*

Parameters

sync-map-name

Multi-node. The name of a synchronization map.

rule-num

Multi-node. The numeric identifier for a rule. The identifier ranges from 1 through 1024.

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        sync-map sync-map-name {
            rule rule-num {}
        }
    }
}
```

Usage Guidelines

Use this command to specify a synchronization map rule that defines the portions of the configuration to be synchronized with the standby system. Multiple configuration nodes can be specified to identify multiple synchronization map rules. The rule number specifies the order of evaluation with respect to other rules. The first match of a configuration element stops further comparisons.

Use the **set** form of the command to specify a synchronization map rule.

Use the **delete** form of the command to remove a synchronization map rule.

Use the **show** form of the command to display a synchronization map rule.

system config-sync sync-map <sync-map-name> rule <rule-num> action <action>

Specifies an action for a rule.

Syntax

set system config-sync sync-map *sync-map-name* **rule** *rule-num* **action** *action*

delete system config-sync sync-map *sync-map-name* **rule** *rule-num* **action**

show system config-sync sync-map *sync-map-name* **rule** *rule-num* **action**

Parameters

sync-map-name

Multi-node. The name of a synchronization map.

rule-num

Multi-node. The numeric identifier for a rule. The identifier ranges from 1 through 1024.

action *action*

Specifies the action to be taken:

- **include**: Include the configuration node specified by the **location** parameter in the configuration synchronization.
- **exclude**: Exclude the configuration node specified by the **location** parameter from the configuration synchronization.

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        sync-map sync-map-name {
            rule rule-num {
                action action
           }
        }
    }
}
```

Usage Guidelines

Use this command to specify an action for a rule.

Use the **set** form of the command to specify the action for a rule.

Use the **delete** form of the command to remove the action for a rule.

Use the **show** form of the command to display the action for a rule.

system config-sync sync-map <sync-map-name> rule <rule-num> location <config-path>

Specifies a configuration node to be acted on by a rule.

Syntax

set system config-sync sync-map *sync-map-name* **rule** *rule-num* **location** *config-path*

delete system config-sync sync-map *sync-map-name* **rule** *rule-num* **location**

show system config-sync sync-map *sync-map-name* **rule** *rule-num* **location**

Parameters

sync-map-name

Multi-node. The name of a synchronization map.

rule-num

Multi-node. The numeric identifier for a rule. The identifier ranges from 1 through 1024.

config-path

The path to the configuration node. If the configuration node contains more than one character string, the strings should be separated by spaces and the entire string should be enclosed in double quotation marks (for example, “system login user dave”).

Modes

Configuration mode

Configuration Statement

```
system {
    config-sync {
        sync-map sync-map-name {
            rule rule-num {
                location config-path
            }
        }
    }
}
```

Usage Guidelines

Use this command to specify a configuration node to be acted on by a rule.

Use the **set** form of the command to specify the configuration node to be acted on by a rule.

Use the **delete** form of the command to remove the location configuration.

Use the **show** form of the command to view the location configuration.

show config-sync difference

Displays configuration differences between the master system and the standby system.

Syntax **show config-sync difference [** *addr* [**detail**]]

Parameters *addr*

The IP address of the standby system.

detail

Provides detailed information.

Modes Operational mode

Usage Guidelines Use this command to compare the configuration that is identified in the synchronization map on the standby system with the synchronization map of the master system to find any differences.

Examples The following example shows how to display differences in configuration synchronization.

```
vyatta@R1> show config-sync difference

192.168.0.200 configuration is in sync
```

The following example shows how to display detailed differences in configuration synchronization.

```
vyatta@R1> show config-sync difference 192.168.74.200 detail

Configuration only on master (compared to 192.168.74.200):
  zone-policy zone lan default-action drop
  zone-policy zone lan from public firewall name public_to_lan
  zone-policy zone lan interface dp0p1p1
  zone-policy zone public default-action drop
  zone-policy zone public from lan firewall name lan_to_public
  zone-policy zone public interface dp0p1p4
192.168.74.200 configuration is out of sync
```

show config-sync status

Provides details of the last commit to the standby system.

Syntax **show config-sync status** [*addr* [**detail**]]

Parameters *addr*

The IP address of the standby system.

detail

Provides detailed information.

Modes Operational mode

Usage Guidelines Use this command to display the commit status of the standby system. The status includes any errors and where they occurred in the synchronization process, the reason for the errors, and the software versions of the local and remote systems.

Examples The following example shows how to display the status of configuration synchronization.

```
vyatta@R1> show config-sync status
remote-router:  192.168.0.200
  version:              999.larkspurse.08101304
  sync-map:             MAP1
  last sync:            good
  last sync time:       Thu Aug 12 18:18:14 2010
  in-sync?:             yes
  access-status:        connected
```

The following example shows how to display the detailed status of configuration synchronization.

```
vyatta@R1> show config-sync status 192.168.0.200 detail
remote-router:  192.168.0.200
  version:              999.larkspurse.08101304
  sync-map:             MAP1
  last sync:            good
  last sync time:       Thu Aug 12 18:18:14 2010
  in-sync?:             yes
  access-status:        connected

remote configuration:
   cluster {
     dead-inteval 2000
     group MAIN {
        auto-fallback true
        monitor 172.16.0.131
        monitor 12.34.56.133
        primary R1
        secondary R2
        service 12.34.56.100/24/dp0p1p1
        service 172.16.0.100/24/dp0p1p3
     }
     interface dp0p1p2
     keepalive-interval 500
     monitor-dead-interval 2000
     pre-shared-secret testing
  }
  firewall {
     name internet_to_protected {
        default_action drop
:
```

update config-sync

Synchronizes configuration on the standby system.

Syntax **update config-sync [** *addr*]

Parameters *addr*

The IP address of the standby system.

Modes Operational mode

Usage Guidelines Use this command to synchronize the configuration of the standby system with the master system based on the configuration nodes specified in the **sync-map**.

Connection Synchronization

Connection synchronization overview

Connection synchronization is a feature that is used by the system to support high availability between two instances of Brocade vRouter running VRRP.

To support high availability, the firewall and NAT states must be synchronized between the master and backup routers. The connection synchronization feature is used by the system to perform this synchronization. When a backup router with VRRP becomes the master router, this feature initializes the firewall and NAT states in the new master.

Connection synchronization helps keep existing stateful connections going through the master and backup routers alive even after failover.

NOTE
When you configure connection synchronization on a 5600 vRouter, the maximum number of session entries that you can configure by using the **system session table-size** command is 200000 when the system memory is 4G, or 100000 entries when the system memory is 2G.

Connection Synchronization Commands

reset connsync external-cache

Resets the external cache and requests a connection resynchronization with other systems.

Syntax **reset connsync external-cache**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to reset the external cache and request a resynchronization (resync) with other systems.

reset connsync internal-cache

Resets the internal cache, syncs with the data plane table, and sends a bulk update.

Syntax **reset connsync internal-cache**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to reset the internal cache, synchronize with the data plane table, and send a bulk update.

service connsync failover-mechanism vrrp sync-group <sync-group>

Enables or disables the failover mechanism for connection synchronization.

Syntax

set service connsync failover-mechanism vrrp sync-group *sync-group*

delete service connsync failover-mechanism vrrp sync-group [*sync-group*]

show service connsync failover-mechanism vrrp sync-group

Parameters

sync-group

The name of a VRRP synchronization group.

Modes

Configuration mode

Configuration Statement

```
service {
    connsync {
        failover-mechanism {
            vrrp {
                sync-group sync-group
            }
        }
    }
}
```

Usage Guidelines

Use the **set** form of this command to enable or disable the failover mechanism for connection synchronization.

Use the **delete** form of this command to delete the current configuration of the failover mechanism for connection synchronization.

Use the **show** form of this command to display the state of the failover mechanism for connection synchronization.

service connsync interface <interface>

Specifies the interface to use for connection synchronizing flow entries.

Syntax **set service connsync interface** *interface*

delete service connsync interface [*interface*]

show service connsync interface

Parameters *interface*

The name of an interface.

Modes Configuration mode

Configuration Statement

```
service {
    connsync {
        interface interface {
        }
    }
}
```

Usage Guidelines Use the **set** form of this command to specify the interface to use for synchronizing flow entries.

Use the **delete** form of this command to remove the interface that is used for synchronizing flow entries.

Use the **show** form of this command to display the interface that is used for synchronizing flow entries.

service connsync remote-peer <address>

Specifies the remote peer for connection synchronization.

Syntax

set service connsync remote-peer *address*

delete service connsync interface [*address*]

show service connsync interface

Parameters

address

The IP address for a remote peer.

Modes

Configuration mode

Configuration Statement

```
service {
    connsync {
        remote-peer address {
        }
    }
}
```

Usage Guidelines

Use the **set** form of this command to specify the address of a connection synchronization remote peer.

Use the **delete** form of this command to delete the address of the remote peer for connection synchronization.

Use the **show** form of this command to display the address of the remote peer for connection synchronization.

reset connsync

Resets the parameters for connection synchronization.

Syntax **reset connsync**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to reset parameters for connection synchronization.

show connsync external-cache

Displays external cache entries for connection synchronization.

Syntax **show connsync external-cache**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to display external cache entries for connection synchronization.

Examples The following example shows how to display cache information for connection synchronization.

```
vyatta@vyatta:~$ show connsync external-cache
Numner of entries: 16385
Source                          Destination                Protocol
192.168.17.30:58337             192.168.100.40:5007         udp [17]
192.168.17.30:37468             192.168.100.40:5001         udp [17]
192.168.17.30:38719             192.168.100.40:5001         udp [17]
192.168.17.30:51328             192.168.100.40:5009         udp [17]
192.168.17.30:47237             192.168.100.40:5001         udp [17]
192.168.17.30:40794             192.168.100.40:5002         udp [17]
192.168.17.30:46375             192.168.100.40:5001         udp [17]
192.168.17.30:57484             192.168.100.40:5000         udp [17]
192.168.17.30:59403             192.168.100.40:5001         udp [17]
192.168.17.30:46396             192.168.100.40:5001         udp [17]
192.168.17.30:41066             192.168.100.40:5001         udp [17]
192.168.17.30:36309             192.168.100.40:5009         udp [17]
192.168.17.30:47408             192.168.100.40:5006         udp [17]
192.168.17.30:32963             192.168.100.40:5003         udp [17]
192.168.17.30:33957             192.168.100.40:5002         udp [17]
192.168.17.30:40226             192.168.100.40:5005         udp [17]
192.168.17.30:38901             192.168.100.40:5005         udp [17]
192.168.17.30:53885             192.168.100.40:5004         udp [17]
192.168.17.30:46619             192.168.100.40:5002         udp [17]
192.168.17.30:39099             192.168.100.40:5007         udp [17]
192.168.17.30:48855             192.168.100.40:5008         udp [17]
192.168.17.30:44828             192.168.100.40:5009         udp [17]
192.168.17.30:47916             192.168.100.40:5009         udp [17]
```

show connsync internal-cache

Displays internal cache entries for connection synchronization.

Syntax **show connsync internal-cache**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to display internal cache entries for connection synchronization.

Examples The following example shows how to display cache information for connection synchronization.

```
vyatta@vyatta:~$ show connsync internal-cache
Numner of entries: 16385
Source                          Destionation                    Protocol
192.168.17.30:58337             192.168.100.40:5007             udp [17]
192.168.17.30:37468             192.168.100.40:5001             udp [17]
192.168.17.30:38719             192.168.100.40:5001             udp [17]
192.168.17.30:51328             192.168.100.40:5009             udp [17]
192.168.17.30:47237             192.168.100.40:5001             udp [17]
192.168.17.30:40794             192.168.100.40:5002             udp [17]
192.168.17.30:46375             192.168.100.40:5001             udp [17]
192.168.17.30:57484             192.168.100.40:5000             udp [17]
192.168.17.30:59403             192.168.100.40:5001             udp [17]
192.168.17.30:46396             192.168.100.40:5001             udp [17]
192.168.17.30:41066             192.168.100.40:5001             udp [17]
192.168.17.30:36309             192.168.100.40:5009             udp [17]
192.168.17.30:47408             192.168.100.40:5006             udp [17]
192.168.17.30:32963             192.168.100.40:5003             udp [17]
192.168.17.30:33957             192.168.100.40:5002             udp [17]
192.168.17.30:40226             192.168.100.40:5005             udp [17]
192.168.17.30:38901             192.168.100.40:5005             udp [17]
192.168.17.30:53885             192.168.100.40:5004             udp [17]
192.168.17.30:46619             192.168.100.40:5002             udp [17]
192.168.17.30:39099             192.168.100.40:5007             udp [17]
192.168.17.30:48855             192.168.100.40:5008             udp [17]
192.168.17.30:44828             192.168.100.40:5009             udp [17]
192.168.17.30:47916             192.168.100.40:5009             udp [17]
```

show connsync statistics

Displays statistics for connection synchronization.

Syntax **show connsync statistics**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command display statistics for connection synchronization.

The errors in the statistics report indicate that the connection synchronization messages are not delivered to connection synchronization clients correctly to connection synchronization clients. The error counter increases when memory allocation issues, communication issues due to wrong messaging, or an installation error due to a version mismatch among peers occurs. Therefore, when the error counter increases, the administrator miust ensure that the same image version is running on both connection synchronization peers and then reboot the peers.

Examples The following example shows how to display statistics for connection synchronization.

```
vyatta@vyatta:~$ show connsync statistics
local:
msg: tx/rx 0/456880 tx_err/rx_err 0/0 tx_end/rx_end 1/1
cache: size/max: 65292/1048576       insert: 65292 update: 391587
       delete: 0 expirted: 0 evicted: 0
       err: update/delete/stale 0/0/0
remote:
msg: tx/rx 0/1 tx_err/rx_err 0/0 tx_end/rx_end 1/1
cache: size/max: 0/1048576       insert: 0 update: 0
       delete: 0 expirted: 0 evicted: 0
       err: update/delete/stale 0/0/0
```

show connsync status

Displays status of connection synchronization.

Syntax **show connsync status**

Modes Operational mode

Usage Guidelines Connection synchronization must be configured on the system to use this command.

Use this command to display the status of connection synchronization.

Supported Data Plane Interfaces

The following table shows the syntax and parameters of the supported types of data plane interfaces.

Interface Type	Syntax	Parameters
Data plane	**dataplane** *interface-name*	*interface-name*: The name of a data plane interface. Following are the supported formats of the interface name: • **dp***x***p***y***p***z*—The name of a data plane interface, where — **dp***x* specifies the data plane identifier (ID). Currently, only dp0 is supported. — p*y* specifies a physical or virtual PCI slot index (for example, p129). — **p***z* specifies a port index (for example, p1). For example, dp0p1p2, dp0p160p1, and dp0p192p1. • **dp***x***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***y* specifies an embedded network interface number (typically, a small number). For example, dp0em3. • **dp***x***s***y* —The name of a data plane interface on a device that is installed on a virtual PCI slot, where *x***s***y* 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. • **dp***x***P***n***p***y***p***z* —The name of a data plane interface on a device that is installed on a secondary PCI bus, where **P***n* 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.
Data plane vif	**dataplane** *interface-name* **vif** *vif-id* [**vlan** *vlan-id*]	*interface-name*: Refer to the preceding description. *vif-id*: A virtual interface ID. The ID ranges from 1 through 4094. *vlan-id*: The VLAN ID of a virtual interface. The ID ranges from 1 through 4094.

List of Acronyms

Acronym	Description
ACL	access control list
ADSL	Asymmetric Digital Subscriber Line
AH	Authentication Header
AMI	Amazon Machine Image
API	Application Programming Interface
AS	autonomous system
ARP	Address Resolution Protocol
AWS	Amazon Web Services
BGP	Border Gateway Protocol
BIOS	Basic Input Output System
BPDU	Bridge Protocol Data Unit
CA	certificate authority
CCMP	AES in counter mode with CBC-MAC
CHAP	Challenge Handshake Authentication Protocol
CLI	command-line interface
DDNS	dynamic DNS
DHCP	Dynamic Host Configuration Protocol
DHCPv6	Dynamic Host Configuration Protocol version 6
DLCI	data-link connection identifier
DMI	desktop management interface
DMVPN	dynamic multipoint VPN
DMZ	demilitarized zone
DN	distinguished name
DNS	Domain Name System
DSCP	Differentiated Services Code Point
DSL	Digital Subscriber Line
eBGP	external BGP
EBS	Amazon Elastic Block Storage
EC2	Amazon Elastic Compute Cloud
EGP	Exterior Gateway Protocol
ECMP	equal-cost multipath
ESP	Encapsulating Security Payload

Acronym	Description
FIB	Forwarding Information Base
FTP	File Transfer Protocol
GRE	Generic Routing Encapsulation
HDLC	High-Level Data Link Control
I/O	Input/Output
ICMP	Internet Control Message Protocol
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
IGP	Interior Gateway Protocol
IPS	Intrusion Protection System
IKE	Internet Key Exchange
IP	Internet Protocol
IPOA	IP over ATM
IPsec	IP Security
IPv4	IP Version 4
IPv6	IP Version 6
ISAKMP	Internet Security Association and Key Management Protocol
ISM	Internet Standard Multicast
ISP	Internet Service Provider
KVM	Kernel-Based Virtual Machine
L2TP	Layer 2 Tunneling Protocol
LACP	Link Aggregation Control Protocol
LAN	local area network
LDAP	Lightweight Directory Access Protocol
LLDP	Link Layer Discovery Protocol
MAC	medium access control
mGRE	multipoint GRE
MIB	Management Information Base
MLD	Multicast Listener Discovery
MLPPP	multilink PPP
MRRU	maximum received reconstructed unit
MTU	maximum transmission unit
NAT	Network Address Translation
NBMA	Non-Broadcast Multi-Access
ND	Neighbor Discovery

Acronym	Description
NHRP	Next Hop Resolution Protocol
NIC	network interface card
NTP	Network Time Protocol
OSPF	Open Shortest Path First
OSPFv2	OSPF Version 2
OSPFv3	OSPF Version 3
PAM	Pluggable Authentication Module
PAP	Password Authentication Protocol
PAT	Port Address Translation
PCI	peripheral component interconnect
PIM	Protocol Independent Multicast
PIM-DM	PIM Dense Mode
PIM-SM	PIM Sparse Mode
PKI	Public Key Infrastructure
PPP	Point-to-Point Protocol
PPPoA	PPP over ATM
PPPoE	PPP over Ethernet
PPTP	Point-to-Point Tunneling Protocol
PTMU	Path Maximum Transfer Unit
PVC	permanent virtual circuit
QoS	quality of service
RADIUS	Remote Authentication Dial-In User Service
RHEL	Red Hat Enterprise Linux
RIB	Routing Information Base
RIP	Routing Information Protocol
RIPng	RIP next generation
RP	Rendezvous Point
RPF	Reverse Path Forwarding
RSA	Rivest, Shamir, and Adleman
Rx	receive
S3	Amazon Simple Storage Service
SLAAC	Stateless Address Auto-Configuration
SNMP	Simple Network Management Protocol
SMTP	Simple Mail Transfer Protocol
SONET	Synchronous Optical Network
SPT	Shortest Path Tree

Acronym	Description
SSH	Secure Shell
SSID	Service Set Identifier
SSM	Source-Specific Multicast
STP	Spanning Tree Protocol
TACACS+	Terminal Access Controller Access Control System Plus
TBF	Token Bucket Filter
TCP	Transmission Control Protocol
TKIP	Temporal Key Integrity Protocol
ToS	Type of Service
TSS	TCP Maximum Segment Size
Tx	transmit
UDP	User Datagram Protocol
VHD	virtual hard disk
vif	virtual interface
VLAN	virtual LAN
VPC	Amazon virtual private cloud
VPN	virtual private network
VRRP	Virtual Router Redundancy Protocol
WAN	wide area network
WAP	wireless access point
WPA	Wired Protected Access