Contents

VRRP commands

VRRP does not take effect on member ports of aggregation groups.

IPv4 VRRP commands

display vrrp

Use **display vrrp** to display the states of IPv4 VRRP groups.

Syntax

display vrrp [**interface** *interface-type* *interface-number* [**vrid** *virtual-router-id*]] [**verbose**]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

vrid *virtual-router-id*: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

verbose: Displays detailed IPv4 VRRP group information. If you do not specify the **verbose** keyword, the command displays brief IPv4 VRRP group information.

Usage guidelines

If no interface or VRRP group is specified, this command displays the states of all IPv4 VRRP groups.

If only an interface is specified, this command displays the states of all IPv4 VRRP groups on the specified interface.

If both an interface and an IPv4 VRRP group are specified, this command displays the states of the specified IPv4 VRRP group on the specified interface.

Examples

Display brief information about all IPv4 VRRP groups on the device when VRRP operates in standard mode.

```
<Sysname> display vrrp
IPv4 Virtual Router Information:
 Running Mode      : Standard
 Gratuitous ARP sending interval : 120 sec
 Total number of virtual routers : 1
 Interface          VRID  State       Running Adver  Auth      Virtual
                                       Pri     Timer  Type      IP
 ----------------------------------------------------------------------
 Vlan2              1     Master      150     100    Simple    1.1.1.1
```

Table 1 Command output (in standard mode)

Field	Description
Running Mode	VRRP operating mode (standard mode).
Gratuitous ARP sending interval	Sending interval for gratuitous ARP packets. This field is displayed only after you configure the **vrrp send-gratuitous-arp** command.
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.
Adver Timer	VRRP advertisement sending interval in centiseconds.
Auth Type	Authentication type: • **None**—No authentication. • **Simple**—Simple text authentication. • **MD5**—MD5 authentication.
Virtual IP	Virtual IP address of the VRRP group.

Display detailed information about all IPv4 VRRP groups on the device when VRRP operates in standard mode.

```
<Sysname> display vrrp verbose
IPv4 Virtual Router Information:
 Running Mode      : Standard
 Gratuitous ARP sending interval : 120 sec
 Total number of virtual routers : 2
   Interface Vlan-interface2
     VRID           : 1                 Adver Timer  : 100
     Admin Status   : Up                State        : Master
     Config Pri     : 150               Running Pri  : 150
     Preempt Mode   : Yes               Delay Time   : 5
     Auth Type      : Simple            Key          : ******
     Virtual IP     : 1.1.1.1
     Virtual MAC    : 0000-5e00-0101
     Master IP      : 1.1.1.2
     Config Role    : Master
     Name           : abc
   VRRP Track Information:
     Track Object   : 1                         State : Positive   Pri Reduced : 50
```

```
Interface Vlan-interface2
  VRID            : 2                    Adver Timer  : 100
  Admin Status    : Up                   State        : Backup
  Config Pri      : 80                   Running Pri  : 80
  Preempt Mode    : Yes                  Delay Time   : 0
  Become Master   : 2370ms left
  Auth Type       : None
  Virtual IP      : 1.1.1.11
  Virtual MAC     : 0000-5e00-0102
  Master IP       : 1.1.1.12

Interface Vlan-interface2
  VRID            : 3                    Adver Timer : 100
  Admin Status    : Up                   State       : Master
  Config Pri      : 100                  Running Pri : 100
  Preempt Mode    : Yes                  Delay Time  : 0
  Auth Type       : None
  Pkt Sending Mode : v2-only
  Virtual IP      : 1.1.1.10
  Virtual MAC     : 0000-5e00-0103
  Master IP       : 1.1.1.2
  Config Role     : Subordinate
  Follow Name     : abc
```

Table 2 Command output (in standard mode)

Field	Description
Running Mode	VRRP operating mode (standard mode).
Gratuitous ARP sending interval	Sending interval for gratuitous ARP packets. This field is displayed only after you configure the **vrrp send-gratuitous-arp** command.
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
Adver Timer	VRRP advertisement sending interval in centiseconds.
Admin Status	Administrative status: **Up** or **Down**.
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Config Pri	Configured priority of the router, which is configured by using the **vrrp vrid priority** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.

Field	Description
Preempt Mode	Preemptive mode: • **Yes**. • **No**.
Delay Time	Preemption delay in centiseconds.
Become Master	Time (in milliseconds) that a backup router has to wait before it becomes the master. This field is displayed only when the router is a backup.
Auth Type	Authentication type: • **None**—No authentication. • **Simple**—Simple text authentication. • **MD5**—MD5 authentication.
Key	Authentication key, which is not displayed if no authentication is required.
Virtual IP	Virtual IP address of the VRRP group.
Virtual MAC	Virtual MAC address of the VRRP group's virtual IP address, which is displayed when the router is the master.
Master IP	Primary IP address of the interface where the master resides.
Config Role	The configured role of the VRRP group to which the router belongs. • **Master**. • **Subordinate**.
Name	Master group name assigned to the VRRP group. This field is displayed only after you configure the **vrrp vrid name** command.
Follow Name	Name of the master VRRP group that the VRRP group follows. This field is displayed only after you configure the **vrrp vrid follow** command.
VRRP Track Information	Track entry information. This field is displayed only after you configure the **vrrp vrid track** command.
Track Object	Track entry which is associated with the VRRP group.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.
Pri Reduced	Value by which the priority decreases when the status of the associated track entry changes to the Negative state.
Switchover	Switchover mode. When the status of the associated track entry changes to the Negative state, the backup immediately becomes the master.

Display brief information about all IPv4 VRRP groups on the device when VRRP operates in load balancing mode.

```
<Sysname> display vrrp
IPv4 Virtual Router Information:
 Running Mode      : Load Balance
 Total number of virtual routers : 1
 Interface         VRID  State       Running  Address            Active
                                     Pri
 ------------------------------------------------------------------
 Vlan2             1     Master      150      1.1.1.1            Local
```

```
-----            VF1   Active    255   000f-e2ff-0011    Local
```

Table 3 Command output (in load balancing mode)

Field	Description
Running Mode	VRRP operating mode (load balancing mode).
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number) or virtual forwarder (VF) ID.
State	- For a VRRP group, this field indicates the state of the router in the VRRP group: **Master**—The router is the master in the VRRP group. **Backup**—The router is the backup in the VRRP group. **Initialize**—The router is in **Initialize** state. **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command. - For a VF, this field indicates the state of the VF in the VRRP group: **Active**—The VF is created on the device. **Listening**—The VF is learned from another device. **Initialize**—The VF is in **Initialize** state.
Running Pri	- For a VRRP group, this field indicates the running priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes. - For a VF, this field indicates the running priority of the VF. When a track entry is associated with a VF, the priority of the VF changes if the track entry's status changes.
Address	- For a VRRP group, this field indicates the virtual IP address of the VRRP group. - For a VF, this field indicates the virtual MAC address of the VF.
Active	- For a VRRP group, this field indicates the IP address of the interface where the master resides. If the current router is the master, this field displays **local**. - For a VF, this field indicates the IP address of the interface where the active virtual forwarder (AVF) resides. If the current VF is the AVF, this field displays **local**.

Display detailed information about all IPv4 VRRP groups on the device when VRRP operates in load balancing mode.

```
<Sysname> display vrrp verbose
IPv4 Virtual Router Information:
 Running Mode      : Load Balance
 Total number of virtual routers : 2
   Interface Vlan-interface2
     VRID          : 1                    Adver Timer  : 100
     Admin Status  : Up                   State        : Master
     Config Pri    : 150                  Running Pri  : 150
     Preempt Mode  : Yes                  Delay Time   : 5
     Auth Type     : None
     Virtual IP    : 10.1.1.1
                     10.1.1.2
```

```
                        10.1.1.3
  Member IP List : 10.1.1.10 (Local, Master)
                   10.1.1.20 (Backup)
VRRP Track Information:
  Track Object   : 1                     State : Positive   Pri Reduced : 50
Forwarder Information: 2 Forwarders 1 Active
  Config Weight  : 255
  Running Weight : 255
 Forwarder 01
  State          : Active
  Virtual MAC    : 000f-e2ff-0011 (Owner)
  Owner ID       : 0000-5e01-1101
  Priority       : 255
  Active         : local
 Forwarder 02
  State          : Listening
  Virtual MAC    : 000f-e2ff-0012 (Learnt)
  Owner ID       : 0000-5e01-1103
  Priority       : 127
  Active         : 10.1.1.20
Forwarder Weight Track Information:
  Track Object   : 1            State : Positive   Weight Reduced : 250
Interface Vlan-interface2
  VRID           : 11                    Adver Timer  : 100
  Admin Status   : Up                    State        : Backup
  Config Pri     : 80                    Running Pri  : 80
  Preempt Mode   : Yes                   Delay Time   : 0
  Become Master  : 2370ms left
  Auth Type      : None
  Virtual IP     : 10.1.1.11
                 : 10.1.1.12
                 : 10.1.1.13
  Member IP List : 10.1.1.10 (Local, Backup)
                   10.1.1.15 (Master)
Forwarder Information: 2 Forwarders 1 Active
  Config Weight  : 255
  Running Weight : 255
 Forwarder 01
  State          : Active
  Virtual MAC    : 000f-e2ff-40b1 (Learnt)
  Owner ID       : 0000-5e01-1103
  Priority       : 127
  Active         : 10.1.1.15
 Forwarder 02
  State          : Listening
  Virtual MAC    : 000f-e2ff-40b2 (Owner)
  Owner ID       : 0000-5e01-1101
  Priority       : 255
```

```
            Active         : local
```

Table 4 Command output (in load balancing mode)

Field	Description
Running Mode	VRRP operating mode (load balancing mode).
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
Adver Timer	VRRP advertisement sending interval in centiseconds.
Admin Status	Administrative status: **Up** or **Down**.
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Config Pri	Configured priority of the router, which is configured by using the **vrrp vrid priority** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.
Preempt Mode	Preemptive mode: • **Yes**. • **No**.
Delay Time	Preemption delay in centiseconds.
Become Master	Time (in milliseconds) that a backup router has to wait before it becomes the master. This field is displayed only when the router is a backup.
Auth Type	Authentication type: • **None**—No authentication. • **Simple**—Simple text authentication. • **MD5**—MD5 authentication.
Key	Authentication key, which is not displayed if no authentication is required.
Virtual IP	Virtual IP address list of the VRRP group.
Member IP List	IP addresses of the member devices in the VRRP group: • **Local**—IP address of the local router. • **Master**—IP address of the master. • **Backup**—IP address of the backup.
VRRP Track Information	Track entry which is associated with the VRRP group. This field is displayed only after you configure the **vrrp vrid track** command.
Track Object	Track entry to be monitored.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.

Field	Description
Pri Reduced	Value by which the priority decreases when the status of the associated track entry changes to the Negative state. This field is displayed only after you configure the `vrrp vrid track` command.
Switchover	Switchover mode. When the status of the associated track entry changes to the Negative state, the backup immediately becomes the master.
Forwarder Information: 2 Forwarders 1 Active	VF information: Two VFs exist, and one is the AVF.
Config Weight	Configured weight of the VF: 255.
Running Weight	Current weight of the VF. When a track entry is associated with the VFs of a VRRP group, the VFs' weights change when the track entry's status changes.
Forwarder 01	Information about VF 01.
State	VF state: • **Active**—The VF is created on the device. • **Listening**—The VF is learned from another device. • **Initialize**—The VF is in **Initialize** state.
Virtual MAC	Virtual MAC address of the VF.
Owner ID	Real MAC address of the VF owner.
Priority	VF priority in the range of 1 to 255.
Active	IP address of the interface where the AVF resides. If the current VF is the AVF, this field displays **local**.
Forwarder Weight Track Configuration	VF weight Track configuration. The field is displayed only after you configure the `vrrp vrid track` command.
Track Object	Track entry that is associated with the VFs. The field is displayed only after you configure the `vrrp vrid track` command.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.
Weight Reduced	Value by which the weights of the VFs decrease when the state of the associated track entry changes to Negative. The field is displayed only after you configure the `vrrp vrid track` command.
Forwarder Switchover Track Information:	VF switchover Track configuration. The field is displayed only after you configure the `vrrp vrid track` command.
Member IP	IP address of a member device. The field is displayed only after you configure the `vrrp vrid track` command.

display vrrp binding

Use `display vrrp binding` to display master-to-subordinate IPv4 VRRP group bindings.

Syntax

`display vrrp binding` [`interface` *interface-type interface-number* [`vrid` *virtual-router-id*] | `name` *name*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

`interface` *interface-type interface-number*: Specifies an interface by its type and number. The interface must be an interface to which master IPv4 VRRP groups belong.

`vrid` *virtual-router-id*: Specifies a master IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

`name` *name*: Specifies a master IPv4 VRRP group by its name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

If you do not specify any parameters, this command displays all master-to-subordinate IPv4 VRRP group bindings.

If you specify an interface but do not specify the virtual router ID of a master VRRP group, this command displays all master-to-subordinate VRRP group bindings on the specified interface.

If you specify an interface and the virtual router ID of a master VRRP group, this command displays the binding information about the specified master VRRP group on the specified interface.

Examples

Display master-to-subordinate IPv4 VRRP group bindings.

```
<Sysname> display vrrp binding
IPv4 virtual router binding information:
  Total number of master virtual routers        : 1
  Total number of subordinate virtual routers   : 2
  Interface : Vlan2                    Master VRID : 1
  Name      : a                        Status      : Backup
  Subordinate virtual routers : 1
    Interface : Vlan2                  VRID        : 4

  Interface : --                       Master VRID : --
  Name      : c                        Status      : --
  Subordinate virtual routers : 1
    Interface : Vlan2                  VRID        : 5
```

Table 5 Command output

Field	Description
Total number of master virtual routers	Total number of master VRRP groups.

Field	Description
Total number of subordinate virtual routers	Total number of subordinate VRRP groups.
Interface	Interface to which the master VRRP group belongs. If the master VRRP group does not exist, this field displays two hyphens (**--**).
Master VRID	Virtual router ID of the master VRRP group. If the master VRRP group does not exist, this field displays two hyphens (**--**).
Name	Name of the master VRRP group.
Status	Status of the router in the master VRRP group: • **Master**. • **Backup**. • **Initialize**. • **Inactive**. If the master VRRP group does not exist, this field displays two hyphens (**--**).
Subordinate virtual routers	Number of subordinate VRRP groups.
Interface	Interface to which the subordinate VRRP group belongs.
VRID	Virtual router ID of the subordinate VRRP group.

Related commands

> **vrrp vrid follow**
>
> **vrrp vrid name**

display vrrp statistics

Use **display vrrp statistics** to display statistics for IPv4 VRRP groups.

Syntax

> **display vrrp statistics** [**interface** *interface-type interface-number* [**vrid** *virtual-router-id*]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

vrid *virtual-router-id*: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

If no interface or VRRP group is specified, this command displays statistics for all IPv4 VRRP groups.

If only an interface is specified, this command displays statistics for all IPv4 VRRP groups on the specified interface.

If both an interface and an IPv4 VRRP group are specified, this command displays statistics for the specified IPv4 VRRP group on the specified interface.

Examples

Display statistics for all IPv4 VRRP groups when VRRP operates in standard mode.

```
<Sysname> display vrrp statistics
 Interface              : Vlan-interface2
 VRID                   : 1
 CheckSum Errors        : 0          Version Errors               : 0
 Invalid Pkts Rcvd  :     0          Unexpected Pkts Rcvd         : 0
 IP TTL Errors          : 0          Advertisement Interval Errors : 0
 Invalid Auth Type      : 0          Auth Failures                : 0
 Packet Length Errors   : 0          Auth Type Mismatch           : 0
 Become Master          : 1          Address List Errors          : 0
 Adver Rcvd             : 0          Priority Zero Pkts Rcvd       : 0
 Adver Sent            : 807         Priority Zero Pkts Sent       : 0
IP Owner Conflicts      : 0


 Global statistics
 CheckSum Errors        : 0
 Version Errors         : 0
 VRID Errors            : 0
```

Display statistics for all IPv4 VRRP groups when VRRP operates in load balancing mode.

```
<Sysname> display vrrp statistics
 Interface              : Vlan-interface2
 VRID                   : 1
 CheckSum Errors        : 0          Version Errors               : 0
 Invalid Pkts Rcvd      : 0          Unexpected Pkts Rcvd         : 0
 IP TTL Errors          : 0          Advertisement Interval Errors : 0
 Invalid Auth Type      : 0          Auth Failures                : 0
 Packet Length Errors   : 0          Auth Type Mismatch           : 0
 Become Master          : 39         Address List Errors          : 0
 Become AVF             : 13         Packet Option Errors         : 0
 Adver Rcvd            : 2562        Priority Zero Pkts Rcvd       : 1
 Adver Sent           : 16373        Priority Zero Pkts Sent       : 49
 Request Rcvd           : 2          Reply Rcvd                   : 10
 Request Sent           : 12         Reply Sent                   : 2
 Release Rcvd           : 0          VF Priority Zero Pkts Rcvd    : 1
 Release Sent           : 0          VF Priority Zero Pkts Sent    : 11
 Redirect Timer Expires : 1          Time-out Timer Expires        : 0


 Global statistics
 CheckSum Errors        : 0
 Version Errors         : 0
 VRID Errors            : 0
```

Table 6 Command output (in standard mode)

Field	Description
Interface	Interface where the VRRP group is configured.
VRID	VRRP group number.
CheckSum Errors	Number of packets with checksum errors.
Version Errors	Number of packets with version errors.
Invalid Pkts Rcvd	Number of received packets of invalid packet types.
Unexpected Pkts Rcvd	Number of received unexpected packets.
Advertisement Interval Errors	Number of packets with advertisement interval errors.
IP TTL Errors	Number of packets with TTL errors.
Auth Failures	Number of packets with authentication failures.
Invalid Auth Type	Number of packets with authentication failures because of invalid authentication types.
Auth Type Mismatch	Number of packets with authentication failures because of mismatching authentication types.
Packet Length Errors	Number of packets with VRRP packet length errors.
Address List Errors	Number of packets with virtual IP address list errors.
Become Master	Number of times that the router has been elected as the master.
Priority Zero Pkts Rcvd	Number of received advertisements with the router priority of 0.
Adver Rcvd	Number of received advertisements.
Priority Zero Pkts Sent	Number of sent advertisements with the router priority of 0.
Adver Sent	Number of sent advertisements.
IP Owner Conflicts	Number of VRRP packets that the local router (IP address owner) has received from conflicting IP address owners.
Global statistics	Global statistics for all VRRP groups.
CheckSum Errors	Total number of packets with checksum errors.
Version Errors	Total number of packets with version errors.
VRID Errors	Total number of packets with VRID errors.

Table 7 Command output (in load balancing mode)

Field	Description
Interface	Interface where the VRRP group is configured.
VRID	VRRP group number.
CheckSum Errors	Number of packets with checksum errors.
Version Errors	Number of packets with version errors.
Invalid Pkts Rcvd	Number of received packets of invalid packet types.
Unexpected Pkts Rcvd	Number of received unexpected packets.
Advertisement Interval Errors	Number of packets with advertisement interval errors.

Field	Description
IP TTL Errors	Number of packets with TTL errors.
Auth Failures	Number of packets with authentication failures.
Invalid Auth Type	Number of packets with authentication failures because of invalid authentication types.
Auth Type Mismatch	Number of packets with authentication failures because of mismatching authentication types.
Packet Length Errors	Number of packets with VRRP packet length errors.
Address List Errors	Number of packets with virtual IP address list errors.
Become Master	Number of times that the router has been elected as the master.
Redirect Timer Expires	Number of times that the redirect timer expired.
Become AVF	Number of times that the VF has been elected as the AVF.
Time-out Timer Expires	Number of times that the time-out timer expired.
Adver Rcvd	Number of received advertisements.
Request Rcvd	Number of received requests.
Adver Sent	Number of sent advertisements.
Request Sent	Number of sent requests.
Reply Rcvd	Number of received replies.
Release Rcvd	Number of received release packets.
Reply Sent	Number of sent replies.
Release Sent	Number of sent release packets.
Priority Zero Pkts Rcvd	Number of received advertisements with the router priority of 0.
VF Priority Zero Pkts Rcvd	Number of received advertisements with the VF priority of 0.
Priority Zero Pkts Sent	Number of sent advertisements with the router priority of 0.
VF Priority Zero Pkts Sent	Number of sent advertisements with the VF priority of 0.
Packet Option Errors	Number of packet option errors.
Global statistics	Global statistics for all IPv4 VRRP groups.
CheckSum Errors	Total number of packets with checksum errors.
Version Errors	Total number of packets with version errors.
VRID Errors	Total number of packets with VRID errors.

Related commands

`reset vrrp statistics`

reset vrrp statistics

Use **reset vrrp statistics** to clear statistics for IPv4 VRRP groups.

Syntax

> **reset vrrp statistics** [**interface** *interface-type interface-number* [**vrid**
> *virtual-router-id*]]

Views

> User view

Predefined user roles

> network-admin

Parameters

> **interface** *interface-type interface-number*: Specifies an interface by its type and
> number.
>
> **vrid** *virtual-router-id*: Specifies an IPv4 VRRP group by its virtual router ID. The value
> range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

> If no interface or VRRP group is specified, this command clears statistics for all IPv4 VRRP groups.
>
> If only an interface is specified, this command clears statistics for all IPv4 VRRP groups on the
> specified interface.
>
> If both an interface and an IPv4 VRRP group are specified, this command clears statistics for the
> specified IPv4 VRRP group on the specified interface.

Examples

> \# Clear statistics for all IPv4 VRRP groups on all interfaces.
>
> ```
> <Sysname> reset vrrp statistics
> ```

Related commands

> **display vrrp statistics**

snmp-agent trap enable vrrp

> Use **snmp-agent trap enable vrrp** to enable SNMP notifications for VRRP.
>
> Use **undo snmp-agent trap enable vrrp** to disable SNMP notifications for VRRP.

Syntax

> **snmp-agent trap enable vrrp** [**auth-failure** | **new-master**]
>
> **undo snmp-agent trap enable vrrp** [**auth-failure** | **new-master**]

Default

> SNMP notifications for VRRP are enabled.

Views

> System view

Predefined user roles

> network-admin

Parameters

> **auth-failure**: Generates notifications as defined in RFC 2787 when the device in a VRRP group
> receives a VRRP advertisement with the authentication type or key not matching the local
> configuration.

new-master: Generates notifications as defined in RFC 2787 when the state of a device in a VRRP group changes from Initialize or Backup to Master.

Usage guidelines

To report critical VRRP events to an NMS, enable SNMP notifications for VRRP. For VRRP event notifications to be sent correctly, you must also configure SNMP on the device. For more information about SNMP configuration, see the network management and monitoring configuration guide for the device.

Examples

Generate notifications as defined in RFC 2787 when the device in a VRRP group receives a VRRP advertisement with the authentication type or key not matching the local configuration.

```
<Sysname> system-view
[Sysname] snmp-agent trap enable vrrp auth-failure
```

vrrp check-ttl enable

Use **vrrp check-ttl enable** to enable TTL check for IPv4 VRRP packets.

Use **undo vrrp check-ttl enable** to disable TTL check for IPv4 VRRP packets.

Syntax

vrrp check-ttl enable

undo vrrp check-ttl enable

Default

TTL check for IPv4 VRRP packets is enabled.

Views

Interface view

Predefined user roles

network-admin

Usage guidelines

The master in an IPv4 VRRP group periodically sends VRRP advertisements to declare its presence. The VRRP advertisements are multicast in the local subnet and cannot be forwarded by routers, so the TTL value is not changed. When the master sends VRRP advertisements, it sets the TTL value to 255. If you enable TTL check, the backups drop the VRRP advertisements with TTL other than 255, preventing attacks from other subnets.

Devices from different vendors might implement VRRP differently. When the device is interoperating with devices of other vendors, TTL check on VRRP packets might result in unexpected dropping of packets. In this scenario, use the **undo vrrp check-ttl enable** command to disable TTL check on VRRP packets.

Examples

Disable TTL check for IPv4 VRRP packets.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] undo vrrp check-ttl enable
```

vrrp dscp

Use **vrrp dscp** to set a DSCP value for VRRP packets.

Use **undo vrrp dscp** to restore the default.

Syntax

vrrp dscp *dscp-value*

undo vrrp dscp

Default

The DSCP value for VRRP packets is 48.

Views

System view

Predefined user roles

network-admin

Parameters

dscp-value: Specifies a DSCP value for VRRP packets, in the range of 0 to 63.

Usage guidelines

The DSCP value identifies the packet priority during transmission. A greater DSCP value means a higher packet priority.

Examples

Set the DSCP value to 30 for VRRP packets.

```
<Sysname> system-view
[Sysname] vrrp dscp 30
```

vrrp mode

Use **vrrp mode** to specify the operating mode for IPv4 VRRP.

Use **undo vrrp mode** to restore the default.

Syntax

vrrp mode load-balance [**version-8**]

undo vrrp mode

Default

IPv4 VRRP operates in standard mode.

Views

System view

Predefined user roles

network-admin

Parameters

load-balance: Specifies the load balancing mode.

version-8: Specifies the version carried in VRRP packets as 8.

Usage guidelines

After you create IPv4 VRRP groups on the router, you can use this command to modify their operating mode. All IPv4 VRRP groups on the router operate in the specified mode.

The **version-8** keyword takes effect only when the version of IPv4 VRRP configured on the interface is VRRPv2. The **version-8** keyword is required in the following conditions:

- A router running Comware 5 software exists in the VRRP group.

  To display the software version, use the **display version** command.

- All routers in the IPv4 VRRP group are operating in load balancing mode.

- All routers in the IPv4 VRRP group are configured with the version of VRRPv2.

Examples

Specify the load balancing mode for IPv4 VRRP.

```
<Sysname> system-view
[Sysname] vrrp mode load-balance
```

Related commands

display vrrp

vrrp send-gratuitous-arp

Use **vrrp send-gratuitous-arp** to enable periodic sending of gratuitous ARP packets for IPv4 VRRP.

Use **undo vrrp send-gratuitous-arp** to disable periodic sending of gratuitous ARP packets for IPv4 VRRP.

Syntax

vrrp send-gratuitous-arp [**interval** *interval*]

undo vrrp send-gratuitous-arp

Default

Periodic sending of gratuitous ARP packets is disabled for IPv4 VRRP.

Views

System view

Predefined user roles

network-admin

Parameters

interval: Specifies the sending interval in the range of 30 to 1200 seconds. The default value is 120 seconds.

Usage guidelines

This command ensures that the MAC address entry for the virtual MAC address of a VRRP group can be updated on downstream devices in a timely manner.

This command takes effect only in VRRP standard mode.

If you change the sending interval for gratuitous ARP packets, the configuration takes effect at the next sending interval.

The master sends the first gratuitous ARP packet at a random time in the second half of the set interval after you execute the **vrrp send-gratuitous-arp** command. This prevents too many gratuitous ARP packets from being sent at the same time.

The sending interval for gratuitous ARP packets might be much longer than the set interval when the following conditions are met:

- Multiple VRRP groups exist on the device.

- A short sending interval is set.

Examples

Enable periodic sending of gratuitous ARP packets for IPv4 VRRP and set the sending interval to 200 seconds.

```
<Sysname> system-view
[Sysname] vrrp send-gratuitous-arp interval 200
```

vrrp version

Use **vrrp version** to specify the version of IPv4 VRRP on an interface.

Use **undo vrrp version** to restore the default.

Syntax

vrrp version *version-number*

undo vrrp version

Default

VRRPv3 is used.

Views

Interface view

Predefined user roles

network-admin

Parameters

version-number: Specifies a VRRP version. The version number is 2 or 3, where 2 indicates VRRPv2 (described in RFC 3768), and 3 indicates VRRPv3 (described in RFC 5798).

Usage guidelines

The version of VRRP on all routers in an IPv4 VRRP group must be the same.

Examples

Specify VRRPv2 to run on VLAN-interface 10.

```
<Sysname> system-view
[Sysname] interface vlan-interface 10
[Sysname-Vlan-interface10] vrrp version 2
```

vrrp vrid

Use **vrrp vrid** to create an IPv4 VRRP group and assign a virtual IP address to it, or to assign a virtual IP address to an existing IPv4 VRRP group.

Use **undo vrrp vrid** to remove all configurations of an IPv4 VRRP group, or to remove a virtual IP address from an IPv4 VRRP group.

Syntax

vrrp vrid *virtual-router-id* **virtual-ip** *virtual-address*

undo vrrp vrid *virtual-router-id* [**virtual-ip** [*virtual-address*]]

Default

No IPv4 VRRP groups exist.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

virtual-ip *virtual-address*: Specifies a virtual IP address. You cannot specify the virtual IP address as any of the following IP addresses:

- All-zero address (0.0.0.0).
- Broadcast address (255.255.255.255).
- Loopback address.
- IP address of other than Class A, Class B, and Class C.
- Invalid IP address (for example, 0.0.0.1).

If you do not specify the *virtual-address* argument, the **undo vrrp vrid** command removes all virtual IP addresses from the specified IPv4 VRRP group.

Usage guidelines

You can execute this command multiple times to assign multiple virtual IP addresses to an IPv4 VRRP group. An IPv4 VRRP group can have a maximum of 16 virtual IP addresses.

An IPv4 VRRP group without virtual IP addresses configured can exist on a device provided that other settings (for example, priority and preemption mode) are available. Such a VRRP group stays in inactive state and does not function.

The virtual IP address of an IPv4 VRRP group and the downlink interface IP addresses of the VRRP group members must be in the same subnet. Otherwise, the hosts in the subnet might fail to access external networks.

For VRRP to operate correctly in load balancing mode, make sure the virtual IP address of an IPv4 VRRP group is not the IP address of any interfaces in the VRRP group.

Examples

Create IPv4 VRRP group 1 and assign virtual IP address 10.10.10.10 to the VRRP group. Then assign virtual IP address 10.10.10.11 to the VRRP group.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 virtual-ip 10.10.10.10
[Sysname-Vlan-interface2] vrrp vrid 1 virtual-ip 10.10.10.11
```

Related commands

display vrrp

vrrp vrid authentication-mode

Use **vrrp vrid authentication-mode** to configure the authentication mode and the authentication key for an IPv4 VRRP group to send and receive VRRP packets.

Use **undo vrrp vrid authentication-mode** to restore the default.

Syntax

vrrp vrid *virtual-router-id* **authentication-mode** { **md5** | **simple** } { **cipher** | **plain** } *string*

undo vrrp vrid *virtual-router-id* **authentication-mode**

Default

Authentication is disabled when a VRRP group sends and receives VRRP packets.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

md5: Specifies the MD5 authentication mode.

simple: Specifies the simple authentication mode.

cipher: Specifies a key in encrypted form.

plain: Specifies a key in plaintext form. For security purposes, the key specified in plaintext form will be stored in encrypted form.

string: Specifies the key. Its plaintext form is a case-sensitive string of 1 to 8 characters. Its encrypted form is a case-sensitive string of 1 to 41 characters.

Usage guidelines

To avoid attacks from unauthorized users, VRRP member routers add authentication keys in VRRP packets to authenticate one another. VRRP provides the following authentication modes:

- **simple**—Simple text authentication.

  The sender fills an authentication key into the VRRP packet, and the receiver compares the received authentication key with its local authentication key. If the two authentication keys are the same, the received VRRP packet is legitimate. Otherwise, the received packet is illegitimate.

- **md5**—MD5 authentication.

  The sender computes a digest for the VRRP packet by using the authentication key and MD5 algorithm, and saves the result to the authentication header. The receiver performs the same operation by using the authentication key and MD5 algorithm, and it compares the result with the content in the authentication header. If the results are the same, the received VRRP packet is legitimate. Otherwise, the received packet is illegitimate.

The MD5 authentication is more secure than the simple text authentication, but it costs more resources.

(!) **IMPORTANT:**

- You can configure different authentication modes and authentication keys for the VRRP groups on an interface. However, members of the same VRRP group must use the same authentication mode and authentication key.

- For VRRPv3, this command does not take effect because VRRPv3 does not support authentication.

Examples

Set the authentication mode to **simple** and the authentication key to **Sysname** for VRRP group 1 on VLAN-interface 2.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 authentication-mode simple plain Sysname
```

Related commands

display vrrp

vrrp version

vrrp vrid follow

Use **vrrp vrid follow** to configure an IPv4 VRRP group to follow a master group.

Use **undo vrrp vrid follow** to remove the configuration.

Syntax

vrrp vrid *virtual-router-id* **follow** *name*

undo vrrp vrid *virtual-router-id* **follow**

Default

An IPv4 VRRP group does not follow a master group.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

name: Specifies a master IPv4 VRRP group by its name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

This command configures an IPv4 VRRP group as a subordinate VRRP group to follow a master group. A subordinate VRRP group can forward service traffic.

An IPv4 VRRP group cannot be both a master group and a subordinate group.

An IPv4 VRRP group stays in **Inactive** state if it is configured to follow a nonexistent master VRRP group.

If an IPv4 VRRP group in **Inactive** or **Initialize** state follows a master group that is not in **Inactive** state, the state of the VRRP group does not change.

Examples

Configure IPv4 VRRP group 1 to follow master group **abc**.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 follow abc
```

Related commands

> **display vrrp binding**
>
> **vrrp vrid name**

vrrp vrid name

Use **vrrp vrid name** to configure an IPv4 VRRP group as a master group and assign a name to it.

Use **undo vrrp vrid name** to remove the configuration.

Syntax

> **vrrp vrid** *virtual-router-id* **name** *name*
>
> **undo vrrp vrid** *virtual-router-id* **name**

Default

An IPv4 VRRP group does not act as a master group.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

name: Specifies a master IPv4 VRRP group name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

This command configures an IPv4 VRRP group as a master group by assigning a master group name to it. A VRRP group that follows the master group is a subordinate VRRP group. The master VRRP group exchanges VRRP packets among member devices. The subordinate VRRP group does not exchange VRRP packets and follows the state of the master group. Both the master and subordinate VRRP groups can forward service traffic.

You cannot assign the same master VRRP group name to different VRRP groups on a device.

Examples

Configure IPv4 VRRP group 1 as a master group and assign master group name **abc** to it.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 name abc
```

Related commands

> **display vrrp binding**
>
> **vrrp vrid follow**

vrrp vrid preempt-mode

Use **vrrp vrid preempt-mode** to enable the preemptive mode for the device in an IPv4 VRRP group and set the preemption delay.

Use **undo vrrp vrid preempt-mode** to disable the preemptive mode for the device in an IPv4 VRRP group.

Use **undo vrrp vrid preempt-mode delay** to restore the default preemption delay.

Syntax

vrrp vrid *virtual-router-id* **preempt-mode** [**delay** *delay-value*]

undo vrrp vrid *virtual-router-id* **preempt-mode** [**delay**]

Default

The device operates in preemptive mode and the preemption delay is 0 centiseconds.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

delay *delay-value*: Specifies the preemption delay in the range of 0 to 180000 in centiseconds.

Usage guidelines

In non-preemptive mode, the master router acts as the master as long as it operates correctly, even if a backup is assigned a higher priority later. The non-preemptive mode helps avoid frequent switchover between the master and backups.

In preemptive mode, a backup sends VRRP advertisements when it detects that it has a higher priority than the master. Then the backup takes over as the master and the previous master becomes a backup. This mechanism ensures that the master is always the device with the highest priority.

You can configure the VRRP preemption delay for the following purposes:

- Avoid frequent state changes among members in a VRRP group.
- Provide the backups with enough time to collect information (such as routing information).

A backup does not immediately become the master after it receives an advertisement with a lower priority than the local priority. Instead, it waits for a period of time before taking over as the master.

Examples

Enable the preemptive mode for the device in VRRP group 1, and set the preemption delay to 5000 centiseconds.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 preempt-mode delay 5000
```

Related commands

display vrrp

vrrp vrid priority

Use **vrrp vrid priority** to set the priority of the device in an IPv4 VRRP group.

Use **undo vrrp vrid priority** to restore the default.

Syntax

vrrp vrid *virtual-router-id* **priority** *priority-value*

undo vrrp vrid *virtual-router-id* **priority**

Default

The priority of a device in an IPv4 VRRP group is 100.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

priority-value: Specifies a priority value in the range of 1 to 254. A higher value indicates a higher priority.

Usage guidelines

VRRP determines the role (master or backup) of each device in a VRRP group by priority. A device with a higher priority is more likely to become the master.

Priorities 1 to 254 are configurable. Priority 0 is reserved for special uses, and priority 255 is for the IP address owner. The IP address owner in a VRRP group always has a running priority of 255 and acts as the master as long as it operates correctly.

Examples

Set the priority of the switch to 150 in VRRP group 1 on VLAN-interface 2.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 priority 150
```

Related commands

display vrrp

vrrp vrid track

vrrp vrid shutdown

Use **vrrp vrid shutdown** to disable an IPv4 VRRP group.

Use **undo vrrp vrid shutdown** to enable an IPv4 VRRP group.

Syntax

vrrp vrid *virtual-router-id* **shutdown**

undo vrrp vrid *virtual-router-id* **shutdown**

Default

An IPv4 VRRP group is enabled.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

You can use this command to temporarily disable an IPv4 VRRP group. After this command is configured, the VRRP group stays in **Initialize** state, and its configurations remain unchanged. You can change the configuration of the VRRP group, and your changes take effect when you enable the VRRP group again.

Examples

Disable IPv4 VRRP group 1.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 shutdown
```

vrrp vrid source-interface

Use **vrrp vrid source-interface** to specify the source interface for an IPv4 VRRP group, instead of the interface where the VRRP group resides, to send and receive VRRP packets.

Use **undo vrrp source-interface** to cancel the specified source interface.

Syntax

vrrp vrid *virtual-router-id* **source-interface** *interface-type interface-number*

undo vrrp vrid *virtual-router-id* **source-interface**

Default

No source interface is specified for a VRRP group. The interface where the VRRP group resides sends and receives VRRP packets.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

interface-type interface-number: Specifies an interface by its type and number.

Usage guidelines

If VRRP group members cannot exchange VRRP packets through the interfaces where the VRRP group resides, use this command to specify interfaces for VRRP packet exchange.

Examples

Specify VLAN-interface 20 as the source interface for VRRP packet exchange in IPv4 VRRP group 10.

```
<Sysname> system-view
```

```
[Sysname] interface vlan-interface 10
[Sysname-Vlan-interface10] vrrp vrid 10 source-interface vlan-interface 20
```

vrrp vrid timer advertise

Use **vrrp vrid timer advertise** to set the interval at which the master in an IPv4 VRRP group sends VRRP advertisements.

Use **undo vrrp vrid timer advertise** to restore the default.

Syntax

vrrp vrid *virtual-router-id* **timer advertise** *adver-interval*

undo vrrp vrid *virtual-router-id* **timer advertise**

Default

The master in an IPv4 VRRP group sends VRRP advertisements at an interval of 100 centiseconds.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

adver-interval: Specifies an interval for the master in the specified IPv4 VRRP group to send VRRP advertisements. The value range for this argument is 10 to 4095 centiseconds. For VRRPv2, the value of the *adver-interval* argument can only be a multiple of 100. For example, if you configure values in the range of 10 to 100, 101 to 200, and 4001 to 4095, the actual values are 100, 200, and 4100, respectively. For VRRPv3, the configured value for the *adver-interval* argument takes effect.

Usage guidelines

The master in an IPv4 VRRP group periodically sends VRRP advertisements to declare its presence. You can use this command to configure the interval at which the master sends VRRP advertisements.

As a best practice to maintain system stability, set the VRRP advertisement interval to be greater than 100 centiseconds.

In VRRPv2, all routers in an IPv4 VRRP group must have the same interval for sending VRRP advertisements.

In VRRPv3, the routers in an IPv4 VRRP group can have different intervals for sending VRRP advertisements. The master in the VRRP group sends VRRP advertisements at the specified interval and carries the interval attribute in the advertisements. After a backup receives the advertisement, it records the interval in the advertisement. If the backup does not receive any VRRP advertisement when the timer (3 × recorded interval + Skew_Time) expires, it regards the master as failed and takes over.

Large network traffic might disable a backup from receiving VRRP advertisements from the master within the specified timer and trigger an unexpected master switchover. To solve this problem, you can use this command to set a larger interval.

Examples

Configure the master in IPv4 VRRP group 1 to send VRRP advertisements at an interval of 500 centiseconds.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 timer advertise 500
```

Related commands

display vrrp

vrrp vrid track

Use **vrrp vrid track** to associate a VRRP group or the VFs in a VRRP group with a track entry.

Use **undo vrrp vrid track** to remove the association between a VRRP group or the VFs in a VRRP group and a track entry.

Syntax

vrrp vrid *virtual-router-id* **track** *track-entry-number* { **forwarder-switchover member-ip** *ip-address* | **priority reduced** [*priority-reduced*] | **switchover** | **weight reduced** [*weight-reduced*] }

undo vrrp vrid *virtual-router-id* **track** [*track-entry-number*] [**forwarder-switchover** | **priority reduced** | **switchover** | **weight reduced**]

Default

A VRRP group and the VFs in a VRRP group are not associated with any track entries.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group number. The value range for the *virtual-router-id* argument is 1 to 255.

track-entry-number: Specifies a track entry by its number in the range of 1 to 1024.

forwarder-switchover member-ip *ip-address*: Enables the LVF on the router to take over the role of the AVF at the specified IP address immediately after the specified track entry changes to the Negative state. The *ip-address* argument specifies the IP address of a member router. You can use the **display vrrp verbose** command to view the IP addresses of the members.

priority reduced [*priority-reduced*]: Reduces the priority of the router in the VRRP group by the specified value when the state of the specified track entry changes to Negative. The value range for the *priority-reduced* argument is 1 to 255, and the default value is 10.

switchover: Enables the router in backup state to take over as the master immediately after the specified track entry changes to the Negative state.

weight reduced [*weight-reduced*]: Reduces the weight of all VFs on the router in the VRRP group by the specified value when the state of the specified track entry changes to Negative. The value range for the *weight-reduced* argument is 1 to 255, and the default value is 30.

Usage guidelines

When the associated track entry changes to the Negative state, one of the following events occurs depending on your configuration:

- The priority of the router in the VRRP group decreases by a specified value.
- The weight of VFs decreases by a specified value.

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- The router immediately takes over as the master if it is a backup.

- The LVF on the router immediately takes over the role of the AVF at the specified IP address.

When the track entry changes from Negative to Positive or NotReady, one of the following events occurs:

- The router automatically restores its priority or VF weight.

- The failed master router becomes the master again.

- The failed AVF becomes active again.

Before executing this command, create a VRRP group on the interface and assign a virtual IP address to the VRRP group.

You can create a track entry by using the **track** command before or after you associate it with a VRRP group or the VFs in a VRRP group. For more information about configuring track entries, see *High Availability Configuration Guide*.

If no track entry is specified, the **undo vrrp vrid track** command removes all associations between track entries and the VRRP group or VFs in the VRRP group.

The **vrrp vrid track priority reduced** command and the **vrrp vrid track switchover** command do not take effect on an IP address owner. If you configure the command on an IP address owner, the configuration takes effect after the router changes to be a non-IP address owner.

The following parameters take effect only when the IPv4 VRRP group is operating in load balancing mode:

- The **forwarder-switchover member-ip** *ip-address* option.

- The **weight reduced** *weight-reduced* option.

- The **weight reduced** keyword.

The weight of a VF is 255, and its lower limit of failure is 10.

When the weight of a VF owner is higher than or equal to the lower limit of failure, its priority is always 255. The priority does not change with the weight. When the upstream link of the VF owner fails, an LVF must take over as the AVF. The switchover occurs when the weight of the VF owner drops below the lower limit of failure. This requires that the reduced weight for the VF owner be higher than 245.

Examples

Associate VRRP group 1 on VLAN-interface 2 with track entry 1 and decrease the router priority by 50 when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 track 1 priority reduced 50
```

Associate the VFs of IPv4 VRRP group 1 on VLAN-interface 2 with track entry 1. Enable the LVF to take over the role of the AVF at the IP address of 10.1.1.3 immediately when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 track 1 forwarder-switchover member-ip 10.1.1.3
```

Associate the VFs of IPv4 VRRP group 1 on VLAN-interface 2 with track entry 1. Decrease the weight of all VFs on the router in the VRRP group by 50 when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 track 1 weight reduced 50
```

Related commands

display vrrp

vrrp vrid vrrpv3-send-packet

Use **vrrp vrid vrrpv3-send-packet** to set the packet sending mode for IPv4 VRRPv3.

Use **undo vrrp vrid vrrpv3-send-packet** to restore the default.

Syntax

vrrp vrid *virtual-router-id* **vrrpv3-send-packet** { **v2-only** | **v2v3-both** }

undo vrrp vrid *virtual-router-id* **vrrpv3-send-packet**

Default

A router configured with IPv4 VRRPv3 sends only VRRPv3 packets.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv4 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

v2-only: Sends VRRPv2 packets only.

v2v3-both: Sends both VRRPv2 and VRRPv3 packets.

Usage guidelines

This command takes effect only on IPv4 VRRPv3.

The packet sending mode for IPv4 VRRPv3 takes effect only on outgoing VRRP packets. A router configured with VRRPv3 can process incoming VRRPv2 and VRRPv3 packets.

If you set the packet sending mode for IPv4 VRRPv3 and configure VRRP packet authentication, authentication information will be carried in outgoing VRRPv2 packets but not in outgoing VRRPv3 packets.

The VRRP advertisement interval is set in centiseconds by using the **vrrp vrid timer advertise** command. The VRRP advertisement interval carried in VRRPv2 packets sent from routers configured with VRRPv3 might be different from the configured value. For information about the VRRP advertisement interval, see the **vrrp vrid timer advertise** command.

Examples

Configure VRRP group 1 to send both VRRPv2 and VRRPv3 packets.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp vrid 1 vrrpv3-send-packet v2v3-both
```

Related commands

display vrrp

vrrp vrid timer advertise

IPv6 VRRP commands

display vrrp ipv6

Use **display vrrp ipv6** to display the states of IPv6 VRRP groups.

Syntax

display vrrp ipv6 [**interface** *interface-type* *interface-number* [**vrid** *virtual-router-id*]] [**verbose**]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

vrid *virtual-router-id*: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

verbose: Displays detailed IPv6 VRRP group information. If you do not specify the **verbose** keyword, the command displays brief IPv6 VRRP group information.

Usage guidelines

If no interface or VRRP group is specified, this command displays the states of all IPv6 VRRP groups.

If only an interface is specified, this command displays the states of all IPv6 VRRP groups on the specified interface.

If both an interface and an IPv6 VRRP group are specified, this command displays the states of the specified IPv6 VRRP group on the specified interface.

Examples

Display brief information about all IPv6 VRRP groups on the device when VRRP operates in standard mode.

```
<Sysname> display vrrp ipv6
IPv6 Virtual Router Information:
 Running Mode      : Standard
 ND sending interval : 120 sec
 Total number of virtual routers : 1
 Interface          VRID  State      Running Adver  Auth      Virtual
                                     Pri     Timer  Type       IP
 ----------------------------------------------------------------------
 Vlan2               1    Master     150     100    None      FE80::1
```

Table 8 Command output (in standard mode)

Field	Description
Running Mode	VRRP operating mode (standard mode).

Field	Description
ND sending interval	Sending interval for ND packets. This field is displayed only after you configure the **vrrp ipv6 send-nd** command.
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.
Adver Timer	VRRP advertisement sending interval in centiseconds.
Auth Type	Authentication type. Only **none** is available, which means no authentication is required.
Virtual IP	Virtual IP address of the VRRP group.

Display detailed information about all IPv6 VRRP groups on the device when VRRP operates in standard mode.

```
<Sysname> display vrrp ipv6 verbose
IPv6 Virtual Router Information:
 Running Mode      : Standard
 ND sending interval : 120 sec
 Total number of virtual routers : 2
   Interface Vlan-interface2
     VRID          : 1                    Adver Timer  : 100
     Admin Status  : Up                   State        : Master
     Config Pri    : 150                  Running Pri  : 150
     Preempt Mode  : Yes                  Delay Time   : 10
     Auth Type     : None
     Virtual IP    : FE80::1
     Virtual MAC   : 0000-5e00-0201
     Master IP     : FE80::2
     Config Role   : Master
     Name          : abc
   VRRP Track Information:
     Track Object  : 1                    State : Positive   Pri Reduced : 50

   Interface Vlan-interface2
     VRID          : 2                    Adver Timer  : 100
     Admin Status  : Up                   State        : Backup
     Config Pri    : 80                   Running Pri  : 80
     Preempt Mode  : Yes                  Delay Time   : 0
```

```
   Become Master    : 2450ms left
   Auth Type        : None
   Virtual IP       : FE80::11
   Virtual MAC      : 0000-5e00-0202
   Master IP        : FE80::12

 Interface Vlan-interface2
   VRID             : 3                  Adver Timer  : 100
   Admin Status     : Up                 State        : Master
   Config Pri       : 100                Running Pri  : 100
   Preempt Mode     : Yes                Delay Time   : 0
   Auth Type        : None
   Virtual IP       : FE80::10
   Virtual MAC      : 0000-5e00-0203
   Master IP        : FE80::2
   Config Role      : Subordinate
   Follow Name      : abc
```

Table 9 Command output (in standard mode)

Field	Description
Running Mode	VRRP operating mode (standard mode).
ND sending interval	Sending interval for ND packets. This field is displayed only after you configure the **vrrp ipv6 send-nd** command.
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
Adver Timer	VRRP advertisement sending interval in centiseconds.
Admin Status	Administrative status: **Up** or **Down**.
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Config Pri	Configured priority of the router, which is configured by using the **vrrp ipv6 vrid priority** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.
Preempt Mode	Preemptive mode: • **Yes**. • **No**.
Delay Time	Preemption delay in centiseconds.
Become Master	Time (in milliseconds) that a backup router has to wait before it becomes the master. This field is displayed only when the router is a backup.

Field	Description
Auth Type	Authentication type. Only **none** is available, which means no authentication is required.
Virtual IP	Virtual IP address of the VRRP group.
Virtual MAC	Virtual MAC address of the VRRP group's virtual IP address, which is displayed when the router is the master.
Master IP	Link-local address of the interface where the master resides.
Config Role	The configured role of the IPv6 VRRP group to which the router belongs. • **Master**. • **Subordinate**.
Name	Master group name assigned to the IPv6 VRRP group. This field is displayed only after you configure the **vrrp ipv6 vrid name** command.
Follow Name	Name of the master VRRP group that the IPv6 VRRP group follows. This field is displayed only after you configure the **vrrp ipv6 vrid follow** command.
VRRP Track Information	Track entry information. This field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Track Object	Track entry which is associated with the VRRP group.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.
Pri Reduced	Value by which the priority decreases when the state of the associated track entry becomes Negative.
Switchover	Switchover mode. When the state of the associated track entry becomes Negative, the backup immediately becomes the master.

\# Display brief information about all IPv6 VRRP groups on the device when VRRP operates in load balancing mode.

```
<Sysname> display vrrp ipv6
IPv6 Virtual Router Information:
 Running Mode      : Load Balance
 Total number of virtual routers : 1
 Interface          VRID  State      Running  Address              Active
                                      Pri
 -------------------------------------------------------------------
 Vlan2              1     Master     150      FE80::1              Local
 -----              VF1   Active     255      000f-e2ff-4011       Local
```

Table 10 Command output (in load balancing mode)

Field	Description
Running Mode	VRRP operating mode (load balancing mode).
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number) or VF ID.

Field	Description

State	• For a VRRP group, this field indicates the state of the router in the VRRP group:
	  ○ **Master**—The router is the master in the VRRP group.
	  ○ **Backup**—The router is the backup in the VRRP group.
	  ○ **Initialize**—The router is in **Initialize** state.
	  ○ **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
	• For a VF, this field indicates the state of the VF in the VRRP group:
	  ○ **Active**—The VF is created on the device.
	  ○ **Listening**—The VF is learned from another device.
	  ○ **Initialize**—The VF is in **Initialize** state.

Running Pri	• For a VRRP group, this field indicates the running priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes. • For a VF, this field indicates the running priority of the VF. When a track entry is associated with a VF, the priority of the VF changes if the state of the track entry changes.
Address	• For a VRRP group, this field indicates the virtual IP address of the VRRP group. • For a VF, this field indicates the virtual MAC address of the VF.
Active	• For a VRRP group, this field indicates the link-local address of the interface where the master resides. If the current router is the master, this field displays **local**. • For a VF, this field indicates the link-local address of the interface where the AVF resides. If the current VF is the AVF, this field displays **local**.

Display detailed information about all IPv6 VRRP groups on the device when VRRP operates in load balancing mode.

```
<Sysname> display vrrp ipv6 verbose
IPv6 Virtual Router Information:
 Running Mode      : Load Balance
 Total number of virtual routers : 2
   Interface Vlan-interface2
     VRID          : 1                   Adver Timer  : 100
     Admin Status  : Up                  State        : Master
     Config Pri    : 150                 Running Pri  : 150
     Preempt Mode  : Yes                 Delay Time   : 5
     Auth Type     : None
     Virtual IP    : FE80::10
     Member IP List : FE80::3 (Local, Master)
                      FE80::2 (Backup)
     Master IP     : FE80::3
   VRRP Track Information:
     Track Object  : 1                      State : Positive   Pri Reduced : 50
   Forwarder Information: 2 Forwarders 1 Active
     Config Weight  : 255
     Running Weight : 255
   Forwarder 01
```

```
        State         : Active
        Virtual MAC   : 000f-e2ff-4011 (Owner)
        Owner ID      : 0000-5e01-1101
        Priority      : 255
        Active        : local
     Forwarder 02
        State         : Listening
        Virtual MAC   : 000f-e2ff-4012 (Learnt)
        Owner ID      : 0000-5e01-1103
        Priority      : 127
        Active        : FE80::2
     Forwarder Weight Track Information:
        Track Object   : 1           State : Positive   Weight Reduced : 250
     Interface Vlan-interface2
        VRID          : 11                Adver Timer  : 100
        Admin Status  : Up                State        : Backup
        Config Pri    : 80                Running Pri  : 80
        Preempt Mode  : Yes               Delay Time   : 0
        Become Master  : 2450ms left
        Auth Type     : None
        Virtual IP    : FE80::11
        Member IP List : FE80::3 (Local, Backup)
                        FE80::2 (Master)
        Master IP     : FE80::2
     Forwarder Information: 2 Forwarders 1 Active
        Config Weight  : 255
        Running Weight : 255
      Forwarder 01
        State         : Active
        Virtual MAC   : 000f-e2ff-40b1 (Learnt)
        Owner ID      : 0000-5e01-1103
        Priority      : 127
        Active        : FE80::2
      Forwarder 02
        State         : Listening
        Virtual MAC   : 000f-e2ff-40b2 (Owner)
        Owner ID      : 0000-5e01-1101
        Priority      : 255
        Active        : local
```

Table 11 Command output (in load balancing mode)

Field	Description
Running Mode	VRRP operating mode (load balancing mode).
Total number of virtual routers	Total number of VRRP groups.
Interface	Interface where the VRRP group is configured.
VRID	Virtual router ID (VRRP group number).
Adver Timer	VRRP advertisement sending interval in centiseconds.

Field	Description
Admin Status	Administrative status: **Up** or **Down**.
State	State of the router in the VRRP group: • **Master**—The router is the master in the VRRP group. • **Backup**—The router is the backup in the VRRP group. • **Initialize**—The router is in **Initialize** state. • **Inactive**—The router is in **Inactive** state, for example, when the router is not assigned a virtual IP address by using the **vrrp vrid** command.
Config Pri	Configured priority of the router, which is configured by using the **vrrp ipv6 vrid priority** command.
Running Pri	Current priority of the router. When a track entry is associated with a VRRP group on the router, the router's priority changes when the track entry's status changes.
Preempt Mode	Preemptive mode: • **Yes**. • **No**.
Delay Time	Preemption delay in centiseconds.
Become Master	Time (in milliseconds) that a backup router has to wait before it becomes the master. This field is displayed only when the router is a backup.
Auth Type	Authentication type. Only **none** is available, which means no authentication is required.
Virtual IP	Virtual IP address list of the VRRP group.
Member IP List	IP addresses of the member devices in the VRRP group: • **Local**—IP address of the local router. • **Master**—IP address of the master. • **Backup**—IP address of the backup.
VRRP Track Information	Track entry that is associated with the VRRP group. This field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Track Object	Track entry to be monitored. This field is displayed only after you configure the **vrrp ipv6 vrid track** command.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.
Pri Reduced	Value by which the priority decreases when the status of the associated track entry becomes Negative. This field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Switchover	Switchover mode. When the status of the associated track entry becomes Negative, the backup immediately becomes the master.
Forwarder Information: 2 Forwarders 1 Active	VF information: Two VFs exist and one is the AVF.
Config Weight	Configured weight of the VF: 255.
Running Weight	Current weight of the VF. When a track entry is associated with the VFs of a VRRP group, the VFs' weights change when the track entry's status changes.

Field	Description
Forwarder 01	Information about VF 01.
State	VF state: • **Active**—The VF is created on the device. • **Listening**—The VF is learned from another device. • **Initialize**—The VF is in **Initialize** state.
Virtual MAC	Virtual MAC address of the VF.
Owner ID	Real MAC address of the VF owner.
Priority	VF priority in the range of 1 to 255.
Active	Link-local address of the interface where the AVF resides. If the current VF is the AVF, this field displays **local**.
Forwarder Weight Track Configuration	VF weight Track configuration. The field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Track Object	Track entry which is associated with the VFs. The field is displayed only after you configure the **vrrp ipv6 vrid track** command.
State	Track entry state: • **Negative**. • **Positive**. • **NotReady**.
Weight Reduced	Value by which the weights of the VFs decrease when the state of the associated track entry changes to Negative. The field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Forwarder Switchover Track Information:	VF switchover Track configuration. The field is displayed only after you configure the **vrrp ipv6 vrid track** command.
Member IP	IPv6 address of a member device. The field is displayed only after you configure the **vrrp ipv6 vrid track** command.

display vrrp ipv6 binding

Use **display vrrp ipv6 binding** to display master-to-subordinate IPv6 VRRP group bindings.

Syntax

display vrrp ipv6 binding [**interface** *interface-type interface-number* [**vrid** *virtual-router-id*] | **name** *name*]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number. The interface must be an interface to which master IPv6 VRRP groups belong.

vrid *virtual-router-id*: Specifies a master IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

name *name*: Specifies a master IPv6 VRRP group by its name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

If you do not specify any parameters, this command displays all master-to-subordinate IPv6 VRRP group bindings.

If you specify an interface but do not specify the virtual router ID of a master IPv6 VRRP group, this command displays all master-to-subordinate IPv6 VRRP group bindings on the specified interface.

If you specify an interface and the virtual router ID of a master IPv6 VRRP group, this command displays the binding information about the specified master VRRP group on the specified interface.

Examples

\# Display master-to-subordinate IPv6 VRRP group bindings.

```
<Sysname> display vrrp ipv6 binding
IPv6 virtual router binding information:
  Total number of master virtual routers        : 1
  Total number of subordinate virtual routers    : 2
  Interface : Vlan2                     Master VRID : 1
  Name      : a                         Status      : Backup
  Subordinate virtual routers : 1
    Interface : Vlan2                   VRID        : 4

  Interface : --                        Master VRID : --
  Name      : c                         Status      : --
  Subordinate virtual routers : 1
    Interface : Vlan2                   VRID        : 5
```

Table 12 Command output

Field	Description
Total number of master virtual routers	Total number of master IPv6 VRRP groups.
Total number of subordinate virtual routers	Total number of subordinate IPv6 VRRP groups.
Interface	Interface to which the master IPv6 VRRP group belongs. If the master IPv6 VRRP group does not exist, this field displays two hyphens (**--**).
Master VRID	Virtual router ID of the master IPv6 VRRP group. If the master IPv6 VRRP group does not exist, this field displays two hyphens (**--**).
Name	Name of the master IPv6 VRRP group.
Status	Status of the router in the master IPv6 VRRP group: • **Master**. • **Backup**. • **Initialize**. • **Inactive**.

Field	Description
	If the master IPv6 VRRP group does not exist, this field displays two hyphens (--).
Subordinate virtual routers	Number of subordinate IPv6 VRRP groups.
Interface	Interface to which the subordinate IPv6 VRRP group belongs.
VRID	Virtual router ID of the subordinate IPv6 VRRP group.

Related commands

vrrp ipv6 vrid follow

vrrp ipv6 vrid name

display vrrp ipv6 statistics

Use **display vrrp ipv6 statistics** to display statistics for IPv6 VRRP groups.

Syntax

display vrrp ipv6 statistics [**interface** *interface-type interface-number* [**vrid** *virtual-router-id*]]

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

vrid *virtual-router-id*: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

If no interface or VRRP group is specified, this command displays statistics for all IPv6 VRRP groups.

If only an interface is specified, this command displays statistics for all IPv6 VRRP groups on the specified interface.

If both an interface and an IPv6 VRRP group are specified, this command displays statistics for the specified IPv6 VRRP group on the specified interface.

Examples

Display statistics for all IPv6 VRRP groups when VRRP operates in standard mode.

```
<Sysname> display vrrp ipv6 statistics
 Interface             : Vlan-interface2
 VRID                  : 1
 CheckSum Errors       : 0          Version Errors              : 0
 Invalid Pkts Rcvd     : 0          Unexpected Pkts Rcvd        : 0
 Hop Limit Errors      : 0          Advertisement Interval Errors : 0
 Invalid Auth Type     : 0          Auth Failures               : 0
```

```
Packet Length Errors    : 0        Auth Type Mismatch        : 0
Become Master           : 1        Address List Errors       : 0
Adver Rcvd              : 0        Priority Zero Pkts Rcvd    : 0
Adver Sent              : 425      Priority Zero Pkts Sent    : 0
IP Owner Conflicts      : 0

Global statistics
CheckSum Errors         : 0
Version Errors          : 0
VRID Errors             : 0
```

\# Display statistics for all IPv6 VRRP groups when VRRP operates in load balancing mode.

```
<Sysname> display vrrp ipv6 statistics
Interface               : Vlan-interface2
VRID                    : 1
CheckSum Errors         : 0        Version Errors            : 0
Invalid Pkts Rcvd       : 0        Unexpected Pkts Rcvd      : 0
Hop Limit Errors        : 0        Advertisement Interval Errors : 0
Invalid Auth Type       : 0        Auth Failures             : 0
Packet Length Errors    : 0        Auth Type Mismatch        : 0
Become Master           : 39       Address List Errors       : 0
Become AVF              : 13       Packet Option Errors      : 0
Adver Rcvd              : 2562     Priority Zero Pkts Rcvd    : 1
Adver Sent              : 16373    Priority Zero Pkts Sent    : 49
Request Rcvd            : 2        Reply Rcvd                : 10
Request Sent            : 12       Reply Sent                : 2
Release Rcvd            : 0        VF Priority Zero Pkts Rcvd : 1
Release Sent            : 0        VF Priority Zero Pkts Sent : 11
Redirect Timer Expires  : 1        Time-out Timer Expires    : 0

Global statistics
CheckSum Errors         : 0
Version Errors          : 0
VRID Errors             : 0
```

Table 13 Command output (in standard mode)

Field	Description
Interface	Interface where the VRRP group is configured.
VRID	VRRP group number.
CheckSum Errors	Number of packets with checksum errors.
Version Errors	Number of packets with version errors.
Invalid Pkts Rcvd	Number of received packets of invalid packet types.
Unexpected Pkts Rcvd	Number of received unexpected packets.
Advertisement Interval Errors	Number of packets with advertisement interval errors.
Hop Limit Errors	Number of packets with hop limit errors.
Auth Failures	Number of packets with authentication failures.

Field	Description
Invalid Auth Type	Number of packets with authentication failures because of invalid authentication types.
Auth Type Mismatch	Number of packets with authentication failures because of mismatching authentication types.
Packet Length Errors	Number of packets with VRRP packet length errors.
Address List Errors	Number of packets with virtual IP address list errors.
Become Master	Number of times that the router has been elected as the master.
Priority Zero Pkts Rcvd	Number of received advertisements with the router priority of 0.
Adver Rcvd	Number of received advertisements.
Priority Zero Pkts Sent	Number of sent advertisements with the router priority of 0.
Adver Sent	Number of sent advertisements.
IP Owner Conflicts	Number of VRRP packets that the local router (IP address owner) has received from conflicting IP address owners.
Global statistics	Global statistics for all IPv6 VRRP groups.
CheckSum Errors	Total number of packets with checksum errors.
Version Errors	Total number of packets with version errors.
VRID Errors	Total number of packets with VRID errors.

Table 14 Command output (in load balancing mode)

Field	Description
Interface	Interface where the VRRP group is configured.
VRID	VRRP group number.
CheckSum Errors	Number of packets with checksum errors.
Version Errors	Number of packets with version errors.
Invalid Pkts Rcvd	Number of received packets of invalid packet types.
Unexpected Pkts Rcvd	Number of received unexpected packets.
Advertisement Interval Errors	Number of packets with advertisement interval errors.
Hop Limit Errors	Number of packets with hop limit errors.
Auth Failures	Number of packets with authentication failures.
Invalid Auth Type	Number of packets with authentication failures because of invalid authentication types.
Auth Type Mismatch	Number of packets with authentication failures because of mismatching authentication types.
Packet Length Errors	Number of packets with VRRP packet length errors.
Address List Errors	Number of packets with virtual IP address list errors.
Become Master	Number of times that the router has been elected as the master.
Redirect Timer Expires	Number of times that the redirect timer expired.

Field	Description
Become AVF	Number of times that the VF has been elected as the AVF.
Time-out Timer Expires	Number of times that the time-out timer expired.
Adver Rcvd	Number of received advertisements.
Request Rcvd	Number of received requests.
Adver Sent	Number of sent advertisements.
Request Sent	Number of sent requests.
Reply Rcvd	Number of received replies.
Release Rcvd	Number of received release packets.
Reply Sent	Number of sent replies.
Release Sent	Number of sent release packets.
Priority Zero Pkts Rcvd	Number of received advertisements with the router priority of 0.
VF Priority Zero Pkts Rcvd	Number of received advertisements with the VF priority of 0.
Priority Zero Pkts Sent	Number of sent advertisements with the router priority of 0.
VF Priority Zero Pkts Sent	Number of sent advertisements with the VF priority of 0.
Packet Option Errors	Number of packet option errors.
Global statistics	Global statistics for all IPv6 VRRP groups.
CheckSum Errors	Total number of packets with checksum errors.
Version Errors	Total number of packets with version errors.
VRID Errors	Total number of packets with VRID errors.

Related commands

> `reset vrrp ipv6 statistics`

reset vrrp ipv6 statistics

Use `reset vrrp ipv6 statistics` to clear statistics for IPv6 VRRP groups.

Syntax

`reset vrrp ipv6 statistics` [`interface` *interface-type interface-number* [`vrid` *virtual-router-id*]]

Views

User view

Predefined user roles

network-admin

Parameters

`interface` *interface-type interface-number*: Specifies an interface by its type and number.

`vrid` *virtual-router-id*: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

If no interface or VRRP group is specified, this command clears statistics for all IPv6 VRRP groups.

If only an interface is specified, this command clears statistics for all IPv6 VRRP groups on the specified interface.

If both an interface and an IPv6 VRRP group are specified, this command clears statistics for the specified IPv6 VRRP group on the specified interface.

Examples

Clear statistics for all IPv6 VRRP groups on all interfaces.

```
<Sysname> reset vrrp ipv6 statistics
```

Related commands

display vrrp ipv6 statistics

vrrp ipv6 dscp

Use **vrrp ipv6 dscp** to set a DSCP value for IPv6 VRRP packets.

Use **undo vrrp ipv6 dscp** to restore the default.

Syntax

vrrp ipv6 dscp *dscp-value*

undo vrrp ipv6 dscp

Default

The DSCP value for IPv6 VRRP packets is 56.

Views

System view

Predefined user roles

network-admin

Parameters

dscp-value: Specifies a DSCP value for IPv6 VRRP packets, in the range of 0 to 63.

Usage guidelines

The DSCP value identifies the packet priority during transmission. A greater DSCP value means a higher packet priority.

Examples

Set the DSCP value to 30 for IPv6 VRRP packets.

```
<Sysname> system-view
[Sysname] vrrp ipv6 dscp 30
```

vrrp ipv6 mode

Use **vrrp ipv6 mode** to specify the operating mode for IPv6 VRRP.

Use **undo vrrp ipv6 mode** to restore the default.

Syntax

vrrp ipv6 mode load-balance

```
undo vrrp ipv6 mode
```

Default

IPv6 VRRP operates in standard mode.

Views

System view

Predefined user roles

network-admin

Parameters

`load-balance`: Specifies the load balancing mode.

Usage guidelines

For IPv6 VRRP to operate correctly in load balancing mode, make sure the virtual IPv6 address of an IPv6 VRRP group is not the IPv6 address of any interfaces in the VRRP group.

After you create IPv6 VRRP groups on the router, you can use this command to modify their operating mode. All IPv6 VRRP groups on the router operate in the specified mode.

Examples

Specify the load balancing mode for IPv6 VRRP.
```
<Sysname> system-view
[Sysname] vrrp ipv6 mode load-balance
```

Related commands

`display vrrp ipv6`

vrrp ipv6 send-nd

Use `vrrp ipv6 send-nd` to enable periodic sending of ND packets for IPv6 VRRP.

Use `undo vrrp ipv6 send-nd` to disable periodic sending of ND packets for IPv6 VRRP.

Syntax

`vrrp ipv6 send-nd` [`interval` *interval*]

`undo vrrp ipv6 send-nd`

Default

Periodic sending of ND packets is disabled for IPv6 VRRP.

Views

System view

Predefined user roles

network-admin

Parameters

interval: Specifies the sending interval in the range of 30 to 1200 seconds. The default value is 120 seconds.

Usage guidelines

This command ensures that the MAC address entry for the virtual MAC address of an IPv6 VRRP group can be updated on downstream devices in a timely manner.

This command takes effect only in VRRP standard mode.

If you change the sending interval for ND packets, the configuration takes effect at the next sending interval.

The master sends the first ND packet at a random time in the second half of the set interval after you execute the **vrrp ipv6 send-nd** command. This prevents too many ND packets from being sent at the same time.

The sending interval for ND packets might be much longer than the set interval when the following conditions are met:

- Multiple IPv6 VRRP groups exist on the device.
- A short sending interval is set.

Examples

Enable periodic sending of ND packets for IPv6 VRRP and set the sending interval to 200 seconds.
```
<Sysname> system-view
[Sysname] vrrp ipv6 send-nd interval 200
```

vrrp ipv6 vrid

Use **vrrp ipv6 vrid** to create an IPv6 VRRP group and assign a virtual IPv6 address to it, or to assign a virtual IPv6 address to an existing IPv6 VRRP group.

Use **undo vrrp ipv6 vrid** to remove all configurations of an IPv6 VRRP group, or to remove a virtual IPv6 address from an IPv6 VRRP group.

Syntax

vrrp ipv6 vrid *virtual-router-id* **virtual-ip** *virtual-address* [**link-local**]

undo vrrp ipv6 vrid *virtual-router-id* [**virtual-ip** [*virtual-address* [**link-local**]]]

Default

No IPv6 VRRP groups exist.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

virtual-ip *virtual-address*: Specifies a virtual IPv6 address. If you do not specify this option, the **undo vrrp ipv6 vrid** command removes all virtual IPv6 addresses from the specified IPv6 VRRP group.

link-local: Specifies a link-local address as the virtual IPv6 address.

Usage guidelines

You can execute this command multiple times to assign multiple virtual IPv6 addresses to an IPv6 VRRP group. An IPv6 VRRP group can have a maximum of 16 virtual IPv6 addresses.

The first virtual IPv6 address that you assign to an IPv6 VRRP group must be a link-local address, and it must be removed last.

An IPv6 VRRP group can have only one link-local address as its virtual IPv6 address.

An IPv6 VRRP group without virtual IPv6 addresses configured can exist on a device provided that other settings (for example, priority and preemption mode) are available. Such a VRRP group stays in inactive state and does not function.

The virtual IPv6 address of an IPv6 VRRP group and the downlink interface IPv6 address of the VRRP group members must be in the same subnet. Otherwise, the hosts in the subnet might fail to access external networks.

Examples

Create IPv6 VRRP group 1 and assign virtual IPv6 address fe80::10 to the VRRP group. Then assign virtual IPv6 address 1::10 to the VRRP group.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 virtual-ip fe80::10 link-local
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 virtual-ip 1::10
```

Related commands

display vrrp ipv6

vrrp ipv6 vrid follow

Use **vrrp ipv6 vrid follow** to configure an IPv6 VRRP group to follow a master group.

Use **undo vrrp ipv6 vrid follow** to remove the configuration.

Syntax

vrrp ipv6 vrid *virtual-router-id* **follow** *name*

undo vrrp ipv6 vrid *virtual-router-id* **follow**

Default

An IPv6 VRRP group does not follow a master group.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

name: Specifies a master IPv6 VRRP group by its name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

This command configures an IPv6 VRRP group as a subordinate VRRP group to follow a master group. A subordinate IPv6 VRRP group can forward service traffic.

An IPv6 VRRP group cannot be both a master group and a subordinate group.

An IPv6 VRRP group stays in **Inactive** state if it is configured to follow a nonexistent master VRRP group.

If an IPv6 VRRP group in **Inactive** or **Initialize** state follows a master group that is not in **Inactive** state, the state of the VRRP group does not change.

Examples

Configure IPv6 VRRP group 1 to follow master group **abc**.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 follow abc
```

Related commands

display vrrp ipv6 binding

vrrp ipv6 vrid name

vrrp ipv6 vrid name

Use **vrrp ipv6 vrid name** to configure an IPv6 VRRP group as a master group and assign a name to it.

Use **undo vrrp ipv6 vrid name** to remove the configuration.

Syntax

vrrp ipv6 vrid *virtual-router-id* **name** *name*

undo vrrp ipv6 vrid *virtual-router-id* **name**

Default

An IPv6 VRRP group does not act as a master group.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

name: Specifies a master IPv6 VRRP group name, a case-sensitive string of 1 to 20 characters.

Usage guidelines

This command configures an IPv6 VRRP group as a master group through assigning a master group name to it. An IPv6 VRRP group that follows the master group is a subordinate VRRP group. The master VRRP group exchanges VRRP packets among member devices. The subordinate group does not exchange VRRP packets and follows the state of the master group. Both the master and subordinate VRRP groups can forward service traffic.

You cannot assign the same master VRRP group name to different IPv6 VRRP groups on a device.

Examples

Configure IPv6 VRRP group 1 as a master VRRP group and assign master group name **abc** to it.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 name abc
```

Related commands

display vrrp ipv6 binding

vrrp ipv6 vrid follow

vrrp ipv6 vrid preempt-mode

Use **vrrp ipv6 vrid preempt-mode** to enable the preemptive mode for the router in an IPv6 VRRP group and set the preemption delay.

Use **undo vrrp ipv6 vrid preempt-mode** to disable the preemptive mode for the router in an IPv6 VRRP group.

Use **undo vrrp ipv6 vrid preempt-mode delay** to restore the default preemption delay.

Syntax

vrrp ipv6 vrid *virtual-router-id* **preempt-mode** [**delay** *delay-value*]

undo vrrp ipv6 vrid *virtual-router-id* **preempt-mode** [**delay**]

Default

The router operates in preemptive mode and the preemption delay is 0 centiseconds.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

delay *delay-value*: Specifies the preemption delay in the range of 0 to 180000 in centiseconds.

Usage guidelines

In non-preemptive mode, the master router acts as the master as long as it operates correctly, even if a backup is assigned a higher priority later. The non-preemptive mode helps avoid frequent switchover between the master and backups.

In preemptive mode, a backup sends VRRP advertisements when it detects that it has a higher priority than the master. Then the backup takes over as the master and the previous master becomes a backup. This mechanism ensures that the master is always the router with the highest priority.

You can configure the VRRP preemption delay for the following purposes:

- Avoid frequent state changes among members in a VRRP group.
- Provide the backups with enough time to collect information (such as routing information).

A backup does not immediately become the master after it receives an advertisement with a lower priority than the local priority. Instead, it waits for a period of time before taking over.

Examples

Enable the preemptive mode for VRRP group 1, and set the preemption delay to 5000 centiseconds.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 10 preempt-mode delay 5000
```

Related commands

display vrrp ipv6

vrrp ipv6 vrid priority

Use **vrrp ipv6 vrid priority** to set the priority of the router in an IPv6 VRRP group.

Use **undo vrrp ipv6 vrid priority** to restore the default.

Syntax

vrrp ipv6 vrid *virtual-router-id* **priority** *priority-value*

undo vrrp ipv6 vrid *virtual-router-id* **priority**

Default

The priority of a router in an IPv6 VRRP group is 100.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

priority-value: Specifies a priority value in the range of 1 to 254. A higher value indicates a higher priority.

Usage guidelines

VRRP determines the role (master or backup) of each router in a VRRP group by priority. A router with a higher priority is more likely to become the master.

Priorities 1 to 254 are configurable. Priority 0 is reserved for special uses, and priority 255 is for the IP address owner. The IP address owner in a VRRP group always has a running priority of 255 and acts as the master as long as it operates correctly.

Examples

Set the priority of the switch to 150 in VRRP group 1 on VLAN-interface 2.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 priority 150
```

Related commands

display vrrp ipv6

vrrp ipv6 vrid shutdown

Use **vrrp ipv6 vrid shutdown** to disable an IPv6 VRRP group.

Use **undo vrrp ipv6 vrid shutdown** to enable an IPv6 VRRP group.

Syntax

vrrp ipv6 vrid *virtual-router-id* **shutdown**

undo vrrp ipv6 vrid *virtual-router-id* **shutdown**

Default

An IPv6 VRRP group is enabled.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

Usage guidelines

You can use this command to temporarily disable an IPv6 VRRP group. After this command is configured, the VRRP group stays in **Initialize** state, and its configurations remain unchanged. You can change the configuration of the VRRP group, and your changes take effect when you enable the VRRP group again.

Examples

Disable IPv6 VRRP group 1.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 shutdown
```

vrrp ipv6 vrid timer advertise

Use **vrrp ipv6 vrid timer advertise** to set the interval at which the master in an IPv6 VRRP group sends VRRP advertisements.

Use **undo vrrp ipv6 vrid timer advertise** to restore the default.

Syntax

vrrp ipv6 vrid *virtual-router-id* **timer advertise** *adver-interval*

undo vrrp ipv6 vrid *virtual-router-id* **timer advertise**

Default

The master in an IPv6 VRRP group sends VRRP advertisements at an interval of 100 centiseconds.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group by its virtual router ID. The value range for the *virtual-router-id* argument is 1 to 255.

adver-interval: Specifies an interval for the master in the specified IPv6 VRRP group to send VRRP advertisements, in the range of 100 to 4095 centiseconds.

Usage guidelines

The master in an IPv6 VRRP group periodically sends VRRP advertisements to declare its presence. You can use this command to set the interval at which the master sends VRRP advertisements.

As a best practice to maintain system stability, set the VRRP advertisement interval to be greater than 100 centiseconds.

The routers in an IPv6 VRRP group can have different intervals for sending VRRP advertisements. The master in the VRRP group sends VRRP advertisements at the specified interval and carries the interval attribute in the advertisements. After a backup receives the advertisement, it records the interval in the advertisement. If the backup does not receive any VRRP advertisement when the timer (3 x VRRP advertisement sending interval + Skew_Time) expires, it regards the master as failed and takes over.

Large network traffic might disable a backup from receiving VRRP advertisements from the master within the specified timer and trigger an unexpected master switchover. To solve this problem, you can use this command to configure a larger interval.

Examples

Configure the master in IPv6 VRRP group 1 to send VRRP advertisements at an interval of 500 centiseconds.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 timer advertise 500
```

Related commands

display vrrp ipv6

vrrp ipv6 vrid track

Use **vrrp ipv6 vrid track** to associate an IPv6 VRRP group or the VFs in an IPv6 VRRP group with a track entry.

Use **undo vrrp ipv6 vrid track** to remove the association between an IPv6 VRRP group or the VFs in an IPv6 VRRP group and a track entry.

Syntax

vrrp ipv6 vrid *virtual-router-id* **track** *track-entry-number* { **forwarder-switchover member-ip** *ipv6-address* | **priority reduced** [*priority-reduced*] | **switchover** | **weight reduced** [*weight-reduced*] }

undo vrrp ipv6 vrid *virtual-router-id* **track** [*track-entry-number*] [**forwarder-switchover** | **priority reduced** | **switchover** | **weight reduced**]]

Default

An IPv6 VRRP group and the VFs in an IPv6 VRRP group are not associated with any track entries.

Views

Interface view

Predefined user roles

network-admin

Parameters

virtual-router-id: Specifies an IPv6 VRRP group number. The value range for the *virtual-router-id* argument is 1 to 255.

track-entry-number: Specifies a track entry by its number in the range of 1 to 1024.

forwarder-switchover member-ip *ipv6-address*: Enables the LVF on the router to take over the role of the AVF at the specified IPv6 address immediately after the specified track entry changes to the Negative state. The *ipv6-address* argument specifies the IPv6 address of a member router. You can use the **display vrrp ipv6 verbose** command to view the IPv6 addresses of the members.

priority reduced [*priority-reduced*]: Reduces the priority of the router in the VRRP group by the specified value when the state of the specified track entry changes to Negative. The value range for the *priority-reduced* argument is 1 to 255, and the default value is 10.

switchover: Enables the router in backup state to take over as the master immediately after the specified track entry changes to the Negative state.

weight reduced [*weight-reduced*]: Reduces the weight of all VFs on the router in the VRRP group by the specified value when the state of the specified track entry changes to Negative. The value range for the *weight-reduced* argument is 1 to 255, and the default value is 30.

Usage guidelines

When the associated track entry changes to the Negative state, one of the following events occurs depending on your configuration:

- The priority of the router in the VRRP group decreases by a specified value.
- The weight of VFs decreases by a specified value.
- The router immediately takes over as the master if it is a backup.
- The LVF on the router immediately takes over the role of the AVF at the specified IPv6 address.

When the track entry changes from Negative to Positive or NotReady, one of the following events occurs:

- The router automatically restores its priority or VF weight.
- The failed master router becomes the master again.
- The failed AVF becomes active again.

Before executing this command, create an IPv6 VRRP group on the interface and assign a virtual IPv6 address to the IPv6 VRRP group.

You can create a track entry by using the **track** command before or after you associate it with an IPv6 VRRP group or the VFs in an IPv6 VRRP group. For more information about configuring track entries, see *High Availability Configuration Guide*.

If no track entry is specified, the **undo vrrp ipv6 vrid track** command removes all associations between track entries and the IPv6 VRRP group or VFs in the IPv6 VRRP group.

The **vrrp ipv6 vrid track priority reduced** command and the **vrrp ipv6 vrid track switchover** command do not take effect on an IP address owner. If you configure the command on an IP address owner, the configuration takes effect after the router changes to be a non-IP address owner.

The following parameters take effect only when the IPv6 VRRP group is operating in load balancing mode:

- The **forwarder-switchover member-ip** *ip-address* option.
- The **weight reduced** *weight-reduced* option.
- The **weight reduced** keyword.

The weight of a VF is 255, and its lower limit of failure is 10.

When the weight of a VF owner is higher than or equal to the lower limit of failure, its priority is always 255. The priority does not change with the weight. When the upstream link of the VF owner fails, an LVF must take over as the AVF. The switchover happens when the weight of the VF owner drops below the lower limit of failure. This requires that the reduced weight for the VF owner be higher than 245.

Examples

Associate IPv6 VRRP group 1 on VLAN-interface 2 with track entry 1 and decrease the router priority by 50 when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
```

```
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 track 1 priority reduced 50
```

Associate the VFs of IPv6 VRRP group 1 on VLAN-interface 2 with track entry 1. Enable the LVF to take over the role of the AVF at the IPv6 address of 1::3 immediately when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 track 1 forwarder-switchover member-ip 1::3
```

Associate the VFs of IPv6 VRRP group 1 on VLAN-interface 2 with track entry 1. Decrease the weight of all VFs on the router in the VRRP group by 50 when the state of track entry 1 changes to Negative.

```
<Sysname> system-view
[Sysname] interface vlan-interface2
[Sysname-Vlan-interface2] vrrp ipv6 vrid 1 track 1 weight reduced 50
```

Related commands

display vrrp ipv6