

# Contents

|                                  |    |
|----------------------------------|----|
| RRPP commands .....              | 1  |
| control-vlan.....                | 1  |
| display rrpp brief.....          | 1  |
| display rrpp ring-group .....    | 3  |
| display rrpp statistics.....     | 4  |
| display rrpp verbose.....        | 7  |
| domain ring .....                | 9  |
| linkup-delay-timer.....          | 10 |
| protected-vlan .....             | 11 |
| reset rrpp statistics .....      | 12 |
| ring .....                       | 13 |
| ring enable .....                | 14 |
| rrpp domain .....                | 15 |
| rrpp enable .....                | 16 |
| rrpp ring-group .....            | 16 |
| snmp-agent trap enable rrpp..... | 17 |
| timer .....                      | 18 |

# RRPP commands

## control-vlan

Use **control-vlan** to configure the primary control VLAN for an RRPP domain.

Use **undo control-vlan** to restore the default.

### Syntax

```
control-vlan vlan-id  
undo control-vlan
```

### Default

No control VLANs exist in an RRPP domain.

### Views

RRPP domain view

### Predefined user roles

network-admin

### Parameters

*vlan-id*: Specifies the primary control VLAN by its ID in the range of 2 to 4093.

### Usage guidelines

When you configure control VLANs for an RRPP domain, you only need to configure the primary control VLAN. The system automatically configures the secondary control VLAN. It uses the primary control VLAN ID plus 1 as the secondary control VLAN ID. For the control VLAN configuration to succeed, make sure the IDs of the two control VLANs are consecutive and have not been assigned yet.

Do not configure the default VLAN of a port accessing an RRPP ring as the control VLAN.

The primary and secondary control VLAN IDs must be different from the Layer 3 Ethernet subinterface IDs of the master ring and subrings.

To ensure correct forwarding of RRPPDUs, do not enable QinQ or VLAN mapping on the control VLANs.

After you configure RRPP rings for an RRPP domain, you cannot delete or modify the primary control VLAN of the domain. To do so, use the **undo control-vlan** command.

### Examples

```
# Configure VLAN 100 as the primary control VLAN of RRPP domain 1 (assume that VLAN 100 and  
VLAN 101 have not been created yet).
```

```
<Sysname> system-view  
[Sysname] rrpp domain 1  
[Sysname-rrpp-domain1] control-vlan 100
```

## display rrpp brief

Use **display rrpp brief** to display brief RRPP information.

### Syntax

```
display rrpp brief
```

## Views

Any view

## Predefined user roles

network-admin

network-operator

## Examples

# Display brief RRPP information.

```
<Sysname> display rrpp brief
```

```
Flags for node mode: M -- Master, T -- Transit, E -- Edge, A -- Assistant-edge
```

```
RRPP protocol status: Enabled
```

```
Domain ID      : 1
Control VLAN   : Primary 5, Secondary 6
Protected VLAN: Reference instance 0 to 2, 4
Hello timer    : 1 sec, Fail timer: 3 sec
Linkup-Delay timer: 1 sec

Ring Ring  Node Primary/Common           Secondary/Edge           Enable
ID   level mode  port                       port                       status
-----
1    1      M    XGE1/0/1                   XGE1/0/2                   Yes
```

```
Domain ID      : 2
Control VLAN   : Primary 10, Secondary 11
Protected VLAN: Reference instance 0 to 2, 4
Hello timer    : 1 sec, Fail timer: 3 sec
Linkup-Delay timer: 1 sec

Ring Ring  Node Primary/Common           Secondary/Edge           Enable
ID   level mode  port                       port                       status
-----
1    0      T    XGE1/0/3                   XGE1/0/4                   Yes
2    1      E    XGE1/0/3                   XGE1/0/5                   Yes
                                XGE1/0/4
```

Table 1 Command output

| Field                | Description  |
|----------------------|--|
| Flags for node mode  | RRPP node mode: <ul style="list-style-type: none"><li>• <b>M</b>—Master node.</li><li>• <b>T</b>—Transit node.</li><li>• <b>E</b>—Edge node.</li><li>• <b>A</b>—Assistant edge node.</li></ul> |
| RRPP protocol status | RRPP status: <ul style="list-style-type: none"><li>• <b>Enabled</b>—Globally enabled.</li><li>• <b>Disabled</b>—Globally disabled.</li></ul>   |
| Domain ID            | RRPP domain ID.  |
| Control VLAN         | Primary and secondary control VLANs of the RRPP domain.  |

| Field               | Description   |
|---------------------|---|
| Protected VLAN      | MSTIs corresponding to the VLANs protected by the RRPP domain. To view the VLAN-to-instance mappings, use the <b>display stp region-configuration</b> command (see <i>Layer 2—LAN Switching Command Reference</i> ).  |
| Hello timer         | Hello timer value in seconds.   |
| Fail timer          | Fail timer value in seconds.  |
| Linkup-Delay timer  | Link-up delay timer value in seconds.   |
| Ring ID             | RRPP ring ID.   |
| Ring level          | RRPP ring level: <ul style="list-style-type: none"> <li>• <b>0</b>—Primary ring.</li> <li>• <b>1</b>—Subring.</li> </ul>  |
| Primary/Common port | This field displays primary ports when the node mode is master node or transit node.<br>This field displays common ports when the node mode is edge node or assistant edge node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul> |
| Secondary/Edge port | This field displays secondary ports when the node mode is master node or transit node.<br>This field displays edge ports when the node mode is edge node or assistant edge node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul> |
| Enable status       | RRPP ring status: <ul style="list-style-type: none"> <li>• <b>Yes</b>—Enabled.</li> <li>• <b>No</b>—Disabled.</li> </ul>  |

## display rrpp ring-group

Use **display rrpp ring-group** to display the RRPP ring group configuration.

### Syntax

```
display rrpp ring-group [ ring-group-id ]
```

### Views

Any view

### Predefined user roles

network-admin

network-operator

## Parameters

*ring-group-id*: Specifies an RRPP ring group by its ID in the range of 1 to 64. If you do not specify this argument, the command displays the configuration of all ring groups.

## Usage guidelines

For an edge node RRPP ring group, this command also displays the subring sending Edge-Hello packets.

## Examples

# Display the configuration of all RRPP ring groups.

```
<Sysname> display rrpp ring-group
Ring group 1:
  Domain 1 ring 1 to 3, 5
  Domain 2 ring 1 to 3, 5
  Domain 1 ring 1 is the sending ring

Ring group 2:
  Domain 1 ring 4, 6 to 7
  Domain 2 ring 4, 6 to 7
```

**Table 2 Command output**

| Field                               | Description  |
|-------------------------------------|--|
| Ring group 1                        | RRPP ring group 1.   |
| Domain 1 ring 1 to 3, 5             | Subrings in the ring group, including rings 1, 2, 3, and 5 in RRPP domain 1. |
| Domain 1 ring 1 is the sending ring | The sending ring of the ring group is ring 1 in RRPP domain 1.               |

## display rrpp statistics

Use `display rrpp statistics` to display RRPPDU statistics.

### Syntax

```
display rrpp statistics domain domain-id [ ring ring-id ]
```

### Views

Any view

### Predefined user roles

network-admin  
network-operator

## Parameters

**domain** *domain-id*: Specifies an RRPP domain by its ID in the range of 1 to 128.

**ring** *ring-id*: Specifies an RRPP ring by its ID in the range of 1 to 128. If you do not specify this option, the command displays the RRPPDU statistics for all rings in the specified RRPP domain.

## Usage guidelines

If a port belongs to more than one ring, this command collects and displays RRPPDU statistics of the port by ring.

When a ring transits from inactive status to active status, packet counting for the ring restarts.

## Examples

# Display RRPPDU statistics for all rings in RRPP domain 2.

```
<Sysname> display rrpp statistics domain 2
Ring ID      : 1
Ring level   : 0
Node mode    : Master
Active status: Yes
Primary port : XGE1/0/3
Direct Hello Link      Common   Complete Edge      Major      Total
              down      flush FDB flush FDB hello      fault
-----
Out   16924    0        0        1        0        0        16925
In    0        0        0        0        0        0        0
Secondary port: XGE1/0/4
Direct Hello Link      Common   Complete Edge      Major      Total
              down      flush FDB flush FDB hello      fault
-----
Out   0        0        0        0        0        0        0
In   16878    0        0        1        0        0        16879

Ring ID      : 2
Ring level   : 1
Node mode    : Edge
Active status: No
Common port  : XGE1/0/3
Direct Hello Link      Common   Complete Edge      Major      Total
              down      flush FDB flush FDB hello      fault
-----
Out   0        0        0        0        0        0        0
In   0        0        0        0        0        0        0
Common port  : XGE1/0/4
Direct Hello Link      Common   Complete Edge      Major      Total
              down      flush FDB flush FDB hello      fault
-----
Out   0        0        0        0        0        0        0
In   0        0        0        0        0        0        0
Edge port    : XGE1/0/5
Direct Hello Link      Common   Complete Edge      Major      Total
              down      flush FDB flush FDB hello      fault
-----
Out   0        0        0        0        0        0        0
In   0        0        0        0        0        0        0
```

**Table 3 Command output**

| Field   | Description   |
|---------|---------------|
| Ring ID | RRPP ring ID. |

| Field              | Description   |
|--------------------|---|
| Ring level         | RRPP ring level: <ul style="list-style-type: none"> <li>• <b>0</b>—Primary ring.</li> <li>• <b>1</b>—Subring.</li> </ul>  |
| Node mode          | Node mode: <ul style="list-style-type: none"> <li>• Master node.</li> <li>• Transit node.</li> <li>• Edge node.</li> <li>• Assistant edge node.</li> </ul>  |
| Active status      | RRPP ring status: <ul style="list-style-type: none"> <li>• <b>Yes</b>—Active.</li> <li>• <b>No</b>—Inactive.</li> </ul>   |
| Primary port       | The primary port field means the node mode is master node or transit node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>     |
| Secondary port     | The secondary port field means the node mode is master node or transit node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>   |
| Common port        | The common port field means the node mode is edge node or assistant edge node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul> |
| Edge port          | The edge port field means the node mode is edge node or assistant edge node.<br>A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>   |
| Packet direct      | Packet transmission direction on the port: <ul style="list-style-type: none"> <li>• <b>Out</b>—Packet sending direction.</li> <li>• <b>In</b>—Packet receiving direction.</li> </ul>  |
| Hello              | Statistics of Hello packets received/sent on the port.  |
| Link down          | Statistics of Link-Down packets received/sent on the port.  |
| Common flush FDB   | Statistics of Common-Flush-FDB packets received/sent on the port.   |
| Complete flush FDB | Statistics of Complete-Flush-FDB packets received/sent on the port.   |
| Edge hello         | Statistics of Edge-Hello packets received/sent on the port.   |

| Field       | Description  |
|-------------|--|
| Major fault | Statistics of Major-Fault packets received/sent on the port.   |
| Total       | Total number of packets received/sent on the port. Only Hello, Link-Down, Common-Flush-FDB, Complete-Flush-FDB, Edge-Hello, and Major-Fault packets of RRPP are counted. |

## Related commands

`reset rrpp statistics`

## display rrpp verbose

Use `display rrpp verbose` to display detailed RRPP information.

### Syntax

`display rrpp verbose domain domain-id [ ring ring-id ]`

### Views

Any view

### Predefined user roles

network-admin  
network-operator

### Parameters

**domain** *domain-id*: Specifies an RRPP domain by its ID in the range of 1 to 128.

**ring** *ring-id*: Specifies an RRPP ring by its ID in the range of 1 to 128. If you do not specify this option, the command displays detailed information for all rings in the specified RRPP domain.

### Examples

# Display detailed information for all rings in RRPP domain 2.

```
<Sysname> display rrpp verbose domain 2
Domain ID      : 2
Control VLAN   : Primary 10, Secondary 11
Protected VLAN: Reference instance 3, 5 to 7
Hello timer    : 1 sec, Fail timer: 3 sec
Linkup-Delay timer: 1 sec

Ring ID        : 1
Ring level     : 0
Node mode      : Master
Ring state     : Completed
Enable status  : Yes, Active status: Yes
Primary port   : XGE1/0/4           Port status: UP
Secondary port : XGE1/0/5           Port status: BLOCKED

Ring ID        : 2
Ring level     : 1
Node mode      : Edge
Ring state     : Unknown
Enable status  : No, Active status: No
```



```

Common port   : XGE1/0/4           Port status: -
                XGE1/0/5           Port status: -
Edge port     : XGE1/0/3           Port status: -

```

**Table 4 Command output**

| Field              | Description  |
|--------------------|--|
| Domain ID          | RRPP domain ID.  |
| Control VLAN       | Control VLANs of the RRPP domain: <ul style="list-style-type: none"> <li>• <b>Primary</b>—Primary control VLAN.</li> <li>• <b>Secondary</b>—Secondary control VLAN.</li> </ul>   |
| Protected VLAN     | MSTIs corresponding to the VLANs protected by the RRPP domain. To view the VLAN-to-instance mappings, use the <b>display stp region-configuration</b> command (see <i>Layer 2—LAN Switching Command Reference</i> ).   |
| Hello timer        | Hello timer value in seconds.  |
| Fail timer         | Fail timer value in seconds.   |
| Linkup-Delay timer | Link-up delay timer value in seconds.  |
| Ring ID            | RRPP ring ID.  |
| Ring level         | RRPP ring level: <ul style="list-style-type: none"> <li>• <b>0</b>—Primary ring.</li> <li>• <b>1</b>—Subring.</li> </ul>   |
| Node mode          | Node mode: <ul style="list-style-type: none"> <li>• Master node.</li> <li>• Transit node.</li> <li>• Edge node.</li> <li>• Assistant edge node.</li> </ul>   |
| Ring state         | RRPP ring state: <ul style="list-style-type: none"> <li>• Possible states on the master node: <ul style="list-style-type: none"> <li>○ <b>Completed</b>—The ring is healthy.</li> <li>○ <b>Failed</b>—The ring is not closed.</li> <li>○ <b>Unknown</b>—The RRPP domain is disabled.</li> </ul> </li> <li>• Possible states on a transit node or edge node: <ul style="list-style-type: none"> <li>○ <b>LinkUp</b>—All ports on the node are up.</li> <li>○ <b>LinkDown</b>—At least one port on the node is down.</li> <li>○ <b>PreForward</b>—A port on the node is blocked.</li> <li>○ <b>Unknown</b>—The RRPP domain is disabled.</li> </ul> </li> <li>• Possible states on an assistant edge node: <ul style="list-style-type: none"> <li>○ <b>LinkUp</b>—All ports on the node are up.</li> <li>○ <b>LinkDown</b>—At least one port on the node is down.</li> <li>○ <b>PreForward</b>—A port on the node is blocked.</li> <li>○ <b>LinkUpNotify</b>—The node does not receive Edge-Hello packets in LinkUp state.</li> <li>○ <b>LinkDnNotify</b>—The node does not receive Edge-Hello packets in LinkDown state.</li> <li>○ <b>PreForwardNotify</b>—The port on the directly connected edge node comes up, or the assistant edge node does not receive Edge-Hello packets in PreForward state.</li> <li>○ <b>Unknown</b>—The RRPP domain is disabled.</li> </ul> </li> </ul> <p>If the ring is not enabled on the device operating as the master node or the device is not the master node of the ring, a hyphen (-) is displayed.</p> |

| Field          | Description  |
|----------------|--|
| Enable status  | RRPP ring status: <ul style="list-style-type: none"> <li>• <b>Yes</b>—Enabled.</li> <li>• <b>No</b>—Disabled.</li> </ul>   |
| Active status  | RRPP ring status: <ul style="list-style-type: none"> <li>• <b>Yes</b>—Active.</li> <li>• <b>No</b>—Inactive.</li> </ul> <p>An RRPP ring can be active only when RRPP and the RRPP ring are both enabled. This field also helps you identify whether RRPP is enabled.</p>   |
| Primary port   | The primary port field means the node mode is master node or transit node. A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>     |
| Secondary port | The secondary port field means the node mode is master node or transit node. A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>   |
| Common port    | The common port field means the node mode is edge node or assistant edge node. A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul> |
| Edge port      | The edge port field means the node mode is edge node or assistant edge node. A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>   |
| Port status    | Port status: Down, up, or blocked. A hyphen (-) appears when one of the following cases occurs: <ul style="list-style-type: none"> <li>• The ring is inactive.</li> <li>• The port is not configured on the ring.</li> <li>• The interface expansion card to which the port belongs has not started up.</li> <li>• The port is a member of a link aggregation group.</li> </ul>            |

## domain ring

Use **domain ring** to configure subrings for an RRPP ring group.

Use **undo domain ring** to remove subrings from the RRPP ring group.

### Syntax

```
domain domain-id ring ring-id-list
```

```
undo domain domain-id [ ring ring-id-list ]
```

### Default

No subrings exist in an RRPP ring group.

## Views

RRPP ring group view

## Predefined user roles

network-admin

## Parameters

*domain-id*: Specifies an RRPP domain by its ID in the range of 1 to 128.

**ring** *ring-id-list*: Specifies a space-separated list of up to 10 RRPP subring ID items. Each item specifies an RRPP subring ID or a range of RRPP subring IDs. The value range for RRPP subring IDs is 1 to 128. If you do not specify this option, the command removes all subrings from the ring group in the specified domain.

## Usage guidelines

Follow these guidelines when you configure an RRPP ring group on the edge node and the assistant edge node:

- When you assign an active ring to a ring group, assign it on the assistant edge node first and then on the edge node.
- To remove an active ring from a ring group, remove it on the edge node first and then on the assistant edge node.
- To remove a ring group, remove it on the edge node first and then on the assistant edge node.
- When you activate rings in a ring group, activate them on the edge node first and then on the assistant edge node.
- When you deactivate rings in a ring group, deactivate them on the assistant edge node first and then on the edge node.

If you do not follow these guidelines, the assistant edge node might fail to receive Edge-Hello packets and consider the primary ring failed even if it did not.

## Examples

```
# Create RRPP ring group 1, and add subrings 1, 2, 3, and 5 to domain 1 and domain 2.
```

```
<Sysname> system-view
[Sysname] rrpp ring-group 1
[Sysname-ring-group1] domain 1 ring 1 to 3 5
[Sysname-ring-group1] domain 2 ring 1 to 3 5
```

## Related commands

```
display rrpp ring-group
rrpp ring-group
```

## linkup-delay-timer

Use **linkup-delay-timer** to set the link-up delay timer.

Use **undo linkup-delay-timer** to restore the default.

## Syntax

```
linkup-delay-timer delay-time [ distribute ]
undo linkup-delay-timer
```

## Default

The link-up delay timer is 0 seconds, and the **distribute** keyword is not specified.

## Views

RRPP domain view

## Predefined user roles

network-admin

## Parameters

*delay-time*: Specifies the link-up delay timer in the range of 0 to 30 seconds.

**distribute**: Enables all nodes in the RRPP domain to learn the link-up delay timer value.

## Usage guidelines

The link-up delay timer prevents frequent switchover of RRPP traffic forwarding paths caused by unstable RRPP port states.

You can configure this command on any node in an RRPP domain, but this command can take effect only on the master node.

If you specify the **distribute** keyword in an RRPP network implementing load balancing, you must configure the link-up delay timer for each RRPP domain for the timer to take effect. If you set different timer values for different RRPP domains, the smallest timer value takes effect.

If the **distribute** keyword is not specified, the link-up delay timer value cannot be greater than the Fail timer value minus twice the Hello timer value.

## Examples

```
# Set the link-up delay timer to 10 seconds for RRPP domain 1.
```

```
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] linkup-delay-timer 10
```

## Related commands

**timer**

# protected-vlan

Use **protected-vlan** to configure the protected VLANs for an RRPP domain.

Use **undo protected-vlan** to remove the protected VLANs from an RRPP domain.

## Syntax

```
protected-vlan reference-instance instance-id-list
undo protected-vlan [ reference-instance instance-id-list ]
```

## Default

No protected VLANs exist in an RRPP domain.

## Views

RRPP domain view

## Predefined user roles

network-admin

## Parameters

**reference-instance** *instance-id-list*: Specifies the Multiple Spanning Tree Instances (MSTIs) you want to reference in the form of *instance-id-list* = { *instance-id* [ **to** *instance-id* ] }&<1-10>. The *instance-id* argument is an MSTI ID in the range of 0 to 4094.

You can specify up to 10 MSTI IDs or ID ranges. You can use the **display stp region-configuration** command to display the VLAN-to-instance mappings. If you do not specify this option, the command removes all MSTIs referenced by the RRPP domain.

### Usage guidelines

You can delete or modify the protected VLANs configured for an RRPP domain before and after you configure rings for the domain. However, after you configure rings for the RRPP domain, you cannot delete configurations of all the protected VLANs configured for the domain.

When the VLAN-to-instance mappings change, the protected VLANs of an RRPP domain also change.

### Examples

```
# Map VLANs 1 through 30 to MSTI 1, and activate the MST region configuration. Configure VLAN 100 as the control VLAN of RRPP domain 1. Configure VLANs mapped to MSTI 1 as the primary control VLANs of RRPP domain 1.
```

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] instance 1 vlan 1 to 30
[Sysname-mst-region] active region-configuration
[Sysname-mst-region] quit
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] control-vlan 100
[Sysname-rrpp-domain1] protected-vlan reference-instance 1
```

### Related commands

**display stp region-configuration** (*Layer 2—LAN Switching Command Reference*)  
**rrpp domain**

## reset rrpp statistics

Use **reset rrpp statistics** to clear RRPPDU statistics.

### Syntax

```
reset rrpp statistics domain domain-id [ring ring-id ]
```

### Views

User view

### Predefined user roles

network-admin

### Parameters

**domain** *domain-id*: Specifies an RRPP domain by its ID in the range of 1 to 128.

**ring** *ring-id*: Specifies an RRPP ring by its ID in the range of 1 to 128. If you do not specify this option, the command clears RRPPDU statistics of all RRPP rings in the specified RRPP domain.

### Examples

```
# Clear the RRPPDU statistics of ring 10 in RRPP domain 1.
<Sysname> reset rrpp statistics domain 1 ring 10
```

### Related commands

**display rrpp statistics**

# ring

Use **ring** to configure the node mode of the device, the role of the specified RRPP port, and the level of the RRPP ring.

Use **undo ring** to delete the RRPP ring.

## Syntax

```
ring ring-id node-mode { { master | transit } [ primary-port interface-type  
interface-number ] [ secondary-port interface-type interface-number ]  
level level-value | { assistant-edge | edge } [ edge-port interface-type  
interface-number ] }
```

```
undo ring ring-id
```

## Default

The device is not a node of the RRPP ring.

## Views

RRPP domain view

## Predefined user roles

network-admin

## Parameters

*ring-id*: Specifies an RRPP ring by its ID in the range of 1 to 128.

**master**: Specifies the device as the master node of the RRPP ring.

**transit**: Specifies the device as the transit node of the RRPP ring.

**primary-port**: Specifies the port as a primary port.

*interface-type interface-number*: Specifies a port by its type and number.

**secondary-port**: Specifies the port as a secondary port.

**level level-value**: Specifies an RRPP ring level, 0 for the primary ring and 1 for the subring.

**assistant-edge**: Specifies the device as the assistant edge node of the RRPP ring.

**edge**: Specifies the device as the edge node of the RRPP ring.

**edge-port**: Specifies the edge port for the node.

## Usage guidelines

The ID of an RRPP ring in a domain must be unique.

When an RRPP ring is activated, you cannot configure its RRPP ports.

When you configure the edge node and the assistant edge node, first configure the primary ring, and then the subrings.

The node mode, RRPP port role, and ring level settings of an RRPP ring cannot be modified after they are configured. To modify the settings, first remove the current settings.

Remove all subring configurations before you delete the primary ring configuration of the edge node or the assistant edge node. However, an active RRPP ring cannot be deleted.

When RRPP is enabled on a device, you must disable the RRPP ring before you can delete it. When RRPP is disabled on the device, you can directly delete the RRPP ring, as well as the setting of the **ring enable** command.

Do not assign a port to both an aggregation group and an RRPP ring. If you do so, the port does not take effect on the RRPP ring.

## Examples

# Specify the device as the master node of primary ring 10 in RRPP domain 1. Specify Ten-GigabitEthernet 1/0/1 as the primary port and Ten-GigabitEthernet 1/0/2 as the secondary port.

```
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] control-vlan 100
[Sysname-rrpp-domain1] protected-vlan reference-instance 0 1 2
[Sysname-rrpp-domain1] ring 10 node-mode master primary-port ten-gigabitethernet 1/0/1
secondary-port ten-gigabitethernet 1/0/2 level 0
```

# Specify the device as the transit node of primary ring 10 in RRPP domain 1. Specify Ten-GigabitEthernet 1/0/1 as the primary port and Ten-GigabitEthernet 1/0/2 as the secondary port. Specify the device as the edge node of subring 20 in RRPP domain 1, and specify Ten-GigabitEthernet 1/0/3 as the edge port.

```
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] control-vlan 100
[Sysname-rrpp-domain1] protected-vlan reference-instance 0 1 2
[Sysname-rrpp-domain1] ring 10 node-mode transit primary-port ten-gigabitethernet 1/0/1
secondary-port ten-gigabitethernet 1/0/2 level 0
[Sysname-rrpp-domain1] ring 20 node-mode edge edge-port ten-gigabitethernet 1/0/3
```

## Related commands

**ring enable**

# ring enable

Use **ring enable** to enable an RRPP ring.

Use **undo ring enable** to disable the RRPP ring.

## Syntax

```
ring ring-id enable
undo ring ring-id enable
```

## Default

An RRPP ring is disabled.

## Views

RRPP domain view

## Predefined user roles

network-admin

## Parameters

*ring-id*: Specifies an RRPP ring by its ID in the range of 1 to 128.

## Usage guidelines

To activate an RRPP ring, you must enable RRPP and the RRPP ring.

Before you enable subrings on a device, you must enable the primary ring. Before you disable the primary ring on the device, you must disable all subrings. Otherwise, the system displays error prompts.

## Examples

```
# Enable RRPP ring 10 in RRPP domain 1.
```

```
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] control-vlan 100
[Sysname-rrpp-domain1] protected-vlan reference-instance 0 1 2
[Sysname-rrpp-domain1] ring 10 node-mode master primary-port ten-gigabitethernet 1/0/1
secondary-port ten-gigabitethernet 1/0/2 level 0
[Sysname-rrpp-domain1] ring 10 enable
```

## Related commands

**rrpp enable**

# rrpp domain

Use **rrpp domain** to create an RRPP domain and enter its view, or enter the view of an existing RRPP domain.

Use **undo rrpp domain** to remove an RRPP domain.

## Syntax

```
rrpp domain domain-id
undo rrpp domain domain-id
```

## Default

No RRPP domains exist.

## Views

System view

## Predefined user roles

network-admin

## Parameters

*domain-id*: Specifies an RRPP domain by its ID in the range of 1 to 128.

## Usage guidelines

When you delete an RRPP domain, configurations of the control VLANs and protected VLANs are deleted at the same time.

To delete an RRPP domain successfully, make sure it has no RRPP rings.

## Examples

```
# Create RRPP domain 1, and enter RRPP domain 1 view.
```

```
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1]
```

## Related commands

**control-vlan**

**protected-vlan**



## rrpp enable

Use `rrpp enable` to enable RRPP.

Use `undo rrpp enable` to disable RRPP.

### Syntax

```
rrpp enable
undo rrpp enable
```

### Default

RRPP is disabled.

### Views

System view

### Predefined user roles

network-admin

### Usage guidelines

To activate an RRPP domain, enable RRPP and the RRPP rings for the RRPP domain.

### Examples

```
# Enable RRPP.
<Sysname> system-view
[Sysname] rrpp enable
```

### Related commands

```
ring enable
```

## rrpp ring-group

Use `rrpp ring-group` to create an RRPP ring group and enter its view, or enter the view of an existing RRPP ring group.

Use `undo rrpp ring-group` to remove an RRPP ring group.

### Syntax

```
rrpp ring-group ring-group-id
undo rrpp ring-group ring-group-id
```

### Default

No RRPP ring groups exist.

### Views

System view

### Predefined user roles

network-admin

### Parameters

*ring-group-id*: Specifies an RRPP ring group ID in the range of 1 to 64.

## Usage guidelines

When you remove a ring group, remove it on the edge node first and then on the assistant edge node. Otherwise, the assistant edge node might fail to receive Edge-Hello packets and consider the primary ring failed even if it is not.

After a ring group is removed, all subrings in the ring group do not belong to any ring group.

## Examples

```
# Create RRPP ring group 1 and enter its view.
```

```
<Sysname> system-view
[Sysname] rrpp ring-group 1
[Sysname-ring-group1]
```

## Related commands

```
display rrpp ring-group
domain ring
```

# snmp-agent trap enable rrpp

Use `snmp-agent trap enable rrpp` to enable SNMP notifications for RRPP.

Use `undo snmp-agent trap enable rrpp` to disable SNMP notifications for RRPP.

## Syntax

```
snmp-agent trap enable rrpp [ major-fault | multi-master | ring-fail |
ring-recover ] *
undo snmp-agent trap enable rrpp [ major-fault | multi-master | ring-fail
| ring-recover ] *
```

## Default

SNMP notifications for RRPP are disabled.

## Views

System view

## Predefined user roles

network-admin

## Parameters

**major-fault**: Generates notifications when an SRPT between the assistant edge node and edge node is disconnected.

**multi-master**: Generates notifications when multiple master nodes are configured for the RRPP ring.

**ring-fail**: Generates notifications when the state of the RRPP ring changes from Health to Disconnect.

**ring-recover**: Generates notifications when the state of the RRPP ring changes from Disconnect to Health.

## Usage guidelines

To report critical RRPP events to an NMS, enable SNMP notifications for RRPP. For RRPP 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.

If you do not specify any keyword, this command enables or disables all SNMP notifications for RRPP.

## Examples

```
# Generate notifications when the state of the RRPP ring changes from Disconnect to Health.
<Sysname> system-view
[Sysname] snmp-agent trap enable rrpp ring-recover
```

## timer

Use **timer** to set the Hello timer and the Fail timer.

Use **undo timer** to restore the default.

### Syntax

```
timer hello-timer hello-value fail-timer fail-value
undo timer
```

### Default

The Hello timer is 1 second and the Fail timer is 3 seconds.

### Views

RRPP domain view

### Predefined user roles

network-admin

### Parameters

**hello-timer** *hello-value*: Specifies the Hello timer in the range of 1 to 10 seconds.

**fail-timer** *fail-value*: Specifies the Fail timer in the range of 3 to 30 seconds.

### Usage guidelines

The Fail timer must be greater than or equal to three times the Hello timer.

## Examples

```
# Set the Hello timer to 2 seconds and the Fail timer to 7 seconds for RRPP domain 1.
<Sysname> system-view
[Sysname] rrpp domain 1
[Sysname-rrpp-domain1] timer hello-timer 2 fail-timer 7
```