Content

Chapter 1 Commands for VRRP

Explanation：

The layer 3 switch in this chapter represents the a general sense of router or wireless controller which is running routing protocol.

1.1 advertisement-interval

Commands: advertisement-interval *<adver_interval>*

            no advertisement-interval

Function: Sets the vrrp timer values; the "**no advertisement-interval**" command restores the default setting.

Parameters: *<adver_interva>* is the interval for sending VRRP packets in seconds, ranging from 1 to 10.

Default: The default ***<adver_interva>*** is 1 second.

Command mode: VRRP protocol configuration mode

Usage Guide: The Master in a VRRP Standby cluster will send VRRP packets to member routers (or L3 Ethernet switch) to announce its properness at a specific interval; this interval is referred to as *adver_interval*. If a Backup does not receive the VRRP packets sent by the Master after a certain period (specified by *master_down_interval*), then it assume the Master is no longer operating properly, therefore turns its status to Master.

     The user can use this command to adjust the VRRP packet sending interval of the Master. For members in the same Standby cluster, this property should be set to a same value. To Backup, the value of *master_down_interval* is three times that of adver_interval. Extraordinary large traffic or timer setting differences between routers (or L3 Ethernet switches) may result in *master_down_interval* and invoke instant status changes. Such situations can be avoided through extending *adver_interval* interval and setting longer preemptive delay time.

Example: Configuring vrrp Timer value to 3

Switch(Config-Router-Vrrp)# advertisement-interval 3

1.2 circuit-failover

Commands: circuit-failover {IFNAME | Vlan <ID>} <value_reduced>

            no circuit-failover

Function: Configures the VRRP monitor interface.

Parameters: **< *IFNAME* >** is the name for the interface to be monitored.

<*value_reduced*> stands for the amount of priority decreased, the default value is 1~253.

Default: Not configured by default.

Command mode: VRRP protocol configuration mode

Usage Guide: The interface monitor function is a valuable extension to backup function, which not only enable VRRP to provide failover function on router (or L3 Ethernet switch) fail, but also allow decreasing the priority of a router (or L3 Ethernet switch) to ensure smooth implementation of backup function when status of that network interface is **down**.

When this command is used, if the status of an interface monitored turns from **up** to **down**, then the priority of that very router (or L3 Ethernet switch) in its Standby cluster will decrease, lest Backup cannot changes its status due to lower priority than the Master when the Master fails.

Example: Configuring VRRP monitor interface to vlan 2 and decreasing amount of priority to 10.

Switch(Config-Router-Vrrp)# circuit-failover vlan 2 10

1.3 debug vrrp

Commands: debug vrrp [all | event | packet [recv | send]]

no debug vrrp [all | event | packet [recv | send]]

Function: Displays information for VRRP standby cluster status and packet transmission; the "**no debug vrrp**" command disables the debug information.

Default: Debugging information is disabled by default.

Command mode: Admin Mode

Example:

Switch#debug vrrp

2001/01/01 00:50:28 : IMI: VRRP SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[10.1.1.1]

2001/01/01 00:50:30 : IMI: VRRP SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[10.1.1.1]

2001/01/01 00:50:31 : IMI: VRRP SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[10.1.1.1]

2001/01/01 00:50:32 : IMI: VRRP SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[10.1.1.1]

2001/01/01 00:50:33 : IMI: VRRP SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[10.1.1.1]

1.4 disable

Commands: disable

Function: Deactivates VRRP

Parameters: N/A.

Default: Not configured by default.

Command mode: VRRP protocol configuration mode

Usage Guide: Deactivates a Virtual Router. VRRP configuration can only be modified when VRRP is deactivated.

Example: Deactivating a Virtual Router numbered as 10.

Switch(config)# router vrrp 10

Switch(Config-Router-Vrrp)#disable

1.5 enable

Commands: enable

Function: Activates VRRP.

Parameters: N/A.

Default: Not configured by default.

Command mode: VRRP protocol configuration mode

Usage Guide: Activates the appropriate Virtual Router. Only a router (or L3 Ethernet switch) interface started by this enable command is part of Standby cluster. VRRP virtual IP and interface must be configured first before starting Virtual Router.

Example: Activating the Virtual Router of number 10.

Switch(config)#router vrrp 10

Switch(Config-Router)#enable

1.6 interface

Commands: interface {IFNAME | Vlan *<ID>*}

           no interface

Function: Configures the VRRP interface.

Parameters: IFNAME: Interface name, for example "VLAN1".

         Vlan *<ID>*: VLAN ID.

Default: Not configured by default.

Command mode: VRRP protocol configuration mode

Usage Guide: This command adds a layer 3 interface to an existing Standby cluster. The "**no interface**" command removes the L3 interface from the specified Standby cluster.

Example: Configuring the interface as "interface vlan 1".

Switch(config-router)#router vrrp 10

Switch(Config-router)#interface vlan 1

1.7 preempt-mode

Commands: preempt-mode {true | false}

Function: Configures the preemptive mode for VRRP.

Parameters: N/A.

Command mode: VRRP protocol configuration mode

Default: Preemptive mode is set by default.

Usage Guide: If a router (or L3 Ethernet switch) requiring high priority needs to preemptively become the active router (or L3 Ethernet switch), the preemptive mode should be enabled.

Example: Setting non-preemptive VRRP mode.

Switch(Config-Router-Vrrp)#preempt-mode false

1.8 priority

Commands: priority <*value*>

Function: Configures VRRP priority.

Parameters: < *value*> is the priority value, ranging from 1 to 254.

Default: The priority of all **backup** routers (or L3 Ethernet switch) in a Standby cluster is 100.

Command mode: VRRP protocol configuration mode

Usage Guide: Priority determines the ranking of a router (or L3 Ethernet switch) in a Standby cluster, the higher priority the more likely to become the Master. When a router (or L3 Ethernet switch) is configured as Master dummy IP address, its priority is always 254 and does not allow modification. When 2 or more routers (or L3 Ethernet switch) with the same priority value present in a Standby cluster, the router (or L3 Ethernet switch) with the greatest VLAN interface IP address becomes the Master.

Example: Setting VRRP priority to 150.

Switch(Config-Router-Vrrp)# priority 150

1.9 router vrrp

Commands: router vrrp <*vrid*>

             no router vrrp <*vrid*>

Function: Creates/Removes the Virtual Router.

Parameters: <*vrid*> is the Virtual Router number ranging from 1 to 255.

Default: Not configured by default.

Command mode: Global Mode

Usage Guide: This command is used to create/remove Virtual Router, which is identified by a unique Virtual Router number. Virtual Router configurations are only available when a Virtual Router is created, 192 Virtual Routers can be configured at best.

Example: Configuring a Virtual Router with number 10.

Switch(config)# router vrrp 10

1.10 show vrrp

Commands: show vrrp [<*vrid*>]

Function: Displays status and configuration information for the VRRP standby cluster.

Parameters: < *vrid* > is the Virtual Router number ranging from 1 to 255.

Command mode: Admin and Configuration Mode.

Usage Guide: This command is used to display the Virtual Router configuration and current state. If not specified the Virtual Router number, then display all Virtual Router information.

Example:

Switch# show vrrp

  VrId <1>

  State is Initialize

  Virtual IP is 10.1.20.10 (Not IP owner)

  Interface is Vlan1

  Priority not configured, Current priority is 254

  Advertisement interval is 1 sec

  Preempt mode is TRUE

  Circuit failover interface Vlan1, Priority Delta 1, Status UP

VrId <10>

  State is Initialize

  Virtual IP is1.1.1.1 (Not IP owner)

  Interface is unset

Priority is unset

Advertisement interval is unset

Preempt mode is TRUE

Switch#

Displayed information	Explanation
State	Status
Virtual IP	Dummy IP address
Interface	Interface Name
Priority	Priority
Advertisement interval	Timer interval
Preempt	Preemptive mode
Circuit failover interface	Interface Monitor information

1.11 virtual-ip

Commands: virtual-ip <*A.B.C.D*>

no virtual-ip

Function: Configures the VRRP dummy IP address.

Parameters: <*A.B.C.D*> is the IP address in decimal format.

Default: Not configured by default.

Command mode: VRRP protocol configuration mode

Usage Guide: This command adds a dummy IP address to an existing Standby cluster. The "**no virtual-ip**" command removes the dummy IP address from the specified Standby cluster. Each Standby cluster can have only one dummy IP. VRRP priority as 255 (not configure), virtual-ip and interface ip should in the same segment.

Special Notice: When updating to the newest version from 5.2.0.0 or an older one, the original VRRP command configuration can't be restored. Please delete the original configuration with "no router vrrp <vrid>", and then reconfigure. Otherwise, problems like suspended tasks may happen.

Example: Setting the backup dummy IP address to 10.1.1.1.

Switch(Config-Router-Vrrp)# virtual-ip 10.1.1.1

1.12 vrrp track interface {ethernet IFNAME|IFNAME} priority <priority_value>

Command: vrrp track interface {ethernet IFNAME|IFNAME} priority <priority_value>
         no vrrp track interface {ethernet IFNAME|IFNAME}
Function: Configure the status of the VRRP session monitor port.
Parameters: interface {ethernet IFNAME|IFNAME}: port name.
         <priority_value>: priority, the range is from 1 to 254.
Command Mode: VRRP Configuration Mode.
Default: Disable.
Usage Guide: This command configures the status of the VRRP session monitor port. When the port status is DOWN, change the local VRRP priority to be the configured value for changing the VRRP session status. For example, when the local VRRP priority is lower than the priority of the opposite, the status of local VRRP should be BACKUP.
Example:
Switch(config)#router vrrp 1
Switch(config-router)#vrrp track interface ethernet 1/0/5 priority 60

Chapter 2 Commands for IPv6 VRRPv3 Configuration

2.1 advertisement-interval

Command: advertisement-interval *<adver_interval>*

Function: Configure the advertisement interval of VRRPv3.

Parameters: *<adver_interval>* is the interval of sending VRRPv3 advertisement messages, in centiseconds, ranging from 100 to 1000, and has to be a multiple of 100.

Command Mode: VRRPv3 Protocol Mode.

Default: *<adver_interval>* is 100 centiseconds (1 second) by default.

Usage Guide: The Master in a VRRPv3 backup group will send a VRRPv3 message to notify other routers (layer-three switches) in the group that it is working normally at intervals. This interval is *adver_interval*. If the Backup hasn't received any VRRPv3 message from Master over a certain period of time (the length of the time is *master_down_interval*), it will assume that the master is not working normally and will change the state of itself to Master.

Uses can use this command to adjust the interval of VRRPv3 advertisement messages sent by Master. For the members in the same backup group, this attribute should have same value. For Backup, the value of its *master_down_interval* should be three times more than *adver_interval*. If the network flow is too big or different routers (or layer-three switches) have different timers, *master_down_interval* might has a time-out, which will cause a state change as a result. This kind of situation can be solved by prolonging *adver_interval* or setting a longer preempts delay time.

Example: Configure the VRRPv3 advertisement interval as 300 centiseconds.

Switch(config-router)# advertisement-interval 300

2.2 circuit-failover

Commands: circuit-failover {vlan*<ID>*| *IFNAME*} *<value_reduced>*

                no circuit-failover

Function: Configures the VRRPv3 monitor interface.

Parameters: {vlan*<ID>*| *IFNAME*} is the name for the interface to be monitored.

                <value_reduced> stands for the amount of priority decreased, the range value is from 1 to 253.

Command mode: VRRPv3 Protocol Configuration Mode.

Default: Not configured by default.

Usage Guide: The interface monitor function is a valuable extension to backup function, which not only enable VRRPV3 to provide backup function on router (or L3 Ethernet switch) fail, but also allow decreasing the priority of a router (or L3 Ethernet switch) to ensure smooth implementation of backup function when status of that network interface is **down**.

When this command is used, if the status of an interface monitored turns from **up** to **down**, then the priority of that very router (or L3 Ethernet switch) in its Standby cluster will decrease (If the priority of that value_reduced is higher than interface configuration, then the corresponding router is **down**, the priority of interface in Backup decrease until 0), lest Backup cannot changes its status due to lower priority than the Master when the Master fails. After the interface monitored turns up over again, the priority of corresponding router (or L3 Ethernet switch) will restore in Backup.

Example: Configuring VRRPv3 monitor interface to VLAN 2 and decreasing amount of priority to 10.

Switch(Config-router)# circuit-failover vlan 2 10

2.3 debug ipv6 vrrp

Command: debug ipv6 vrrp [all | events | packet [recv | send]]

no debug ipv6 vrrp [all | events | packet [recv | send]]

Function: Display the state change, message receiving and sending of a VRRPv3 backup group, the no operation of this command will disable the display of DEBUG.

Parameters: None.

Command Mode: Admin Mode.

Example:

Switch#debug ipv6 vrrp

Jan 01 01:03:13 2006 NSM: VRRP6 SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[fe80::2]

Jan 01 01:03:14 2006 NSM: VRRP6 SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[fe80::2]

Jan 01 01:03:15 2006 NSM: VRRP6 SEND[Hello]: Advertisement sent for vrid=[1], virtual-ip=[fe80::2]

2.4 disable

Command: disable

Function: Disable VRRPv3 virtual router.

Parameters: None.

Command Mode: VRRPv3 Protocol Mode.

Default: There is no configuration by default.

Usage Guide: Disable the corresponding virtual router session. Only after disabling the virtual router, can the relative configuration parameters be changed.

Examples: Disable the VRRPv3 virtual router whose ID is 10.

Switch(config)#router ipv6 vrrp 10

Switch(config-router)#disable

2.5 enable

Command: enable

Function: Enable VRRPv3 virtual router.

Parameters: None.

Command Mode: VRRPv3 Protocol Mode.

Default: There is no configuration by default.

Usage Guide: Start the corresponding virtual router session. Only the interface of the enabled router (or the layer-three switch) can actually join the backup group. Before enabling the virtual router, the virtual IPv6 address and interface of VRRPv3 should be configured.

Example: Enable the VRRPv3 virtual router whose ID is 10.

Switch(config)#router ipv6 vrrp 10

Switch(config-router)#enable

2.6 preempt-mode

Command: preempt-mode {true | false}

Function: Configure the preempt mode of VRRPv3.

Parameters: None.

Command Mode: VRRPv3 Protocol Mode.

Default: It is preempt mode by default.

Usage Guide: If it is needed that a router (or a layer-three switch) with higher priority can the role of master router, the preempt mode needs to be configured.

Example: Configure VRRPv3 as non-preempt mode.

Switch(config-router)# preempt-mode false

2.7 priority

Command: priority *<value>*

Function: Configure the priority of VRRPv3.

Parameters: *<value>* is the priority, whose range is from 1 to 254.

Command Mode: VRRPv3 Protocol Mode.

Default: Backup routers (or layer-three switches) all have a priority of 100, the priority of IP address owners are all 255 in the backup group they belong to.

Usage Guide: Priority decides the state of a router (or a layer-three Ethernet switch) in a backup group. The higher the priority is, the more possible the router can be a Master. The configurable priority ranges from 1 to 254, while the priority of 255 is reserved to the IP address owner. The priority of 0 has special usage, which is when disabling a VRRP session, Master will send an advertisement message with a priority of 0. When Backup receives such advertisement message, it will start a new round of Master selection. When there are two or more routers (or layer-three switches) in one backup group have the same priority, the router with biggest local link IPv6 address has higher priority.

Example: Configure the priority of VRRPv3 as 150.

Switch(config-router)# priority 150

2.8 router ipv6 vrrp

Command: router ipv6 vrrp *<vrid>*

          no router ipv6 vrrp *<vrid>*

Function: Create or delete a VRRPv3 virtual router.

Parameters: *<vrid>* is the ID of the virtual router, the valid range is 1 to 255.

Command Mode: Global Mode.

Default: There is no configuration by default.

Usage Guide: This command is used to create or delete a VRRPv3 virtual router. The virtual router is uniquely specified by the virtual router ID and the related virtual IPv6 address. Only after creating a virtual router, relative configuration can be set on it. Considering the stability, the number of configurable virtual routers should not be more than 64.

Example: Configure a virtual router whose ID is10.

Switch(config)# router ipv6 vrrp 10

2.9 show ipv6 vrrp

Command: show ipv6 vrrp [<*vrid*>]

Function: Display the state and configuration information of VRRPv3 backup group.

Parameters: *<vrid>*is the ID of the virtual router, whose range is from 1 to 255, no parameter means to display the state and configuration infomation of all backup gorups.

Command Mode: Admin and Configuration Mode.

Example:

Switch# show ipv6 vrrp

VrId 1

 State is Master

 Virtual IPv6 is fe80::2 (Not IPv6 owner)

 Interface is Vlan1

 Configured priority is 150, Current priority is 150

 Advertisement interval is 100 centisec

 Preempt mode is TRUE

 Circuit failover interface Vlan1, Priority Delta 3, Status UP

VrId 10

 State is Initialize

 Virtual IPv6 is fe80::3 (Not IPv6 owner)

 Interface is Vlan2

 Priority is 100

 Advertisement interval is 300 centisec

 Preempt mode is TRUE

 Circuit failover interface Vlan2, Priority Delta 10, Status UP

Display	Explanation
State	State.
Virtual IPv6	Virtual IPv6 address.
Interface	Interface name.
Priority	Priority.
Advertisement interval	The interval of VRRPv3 advertisement messages.
Preempt	Preempt mode.
Circuit failover interface	Monitor interface information.

2.10 virtual-ipv6 interface

Command: virtual-ipv6 *<ipv6-address>* interface {Vlan *<ID>*| *IFNAME*}

        no virtual-ipv6 interface

Function: Configure the virtual IPv6 address and interface of VRRPv3.

Parameters: *<ipv6-address>* is the virtual IPv6 address, which has to be an IPv6 local link address.

        {Vlan *<ID>*| *IFNAME*} is the interface name.

Command Mode: VRRPv3 Protocol Mode.

Default: There is no configuration by default.

Usage Guide: This command is used to add an IPv6 address and interface to an existing backup group. The no operation of this command will delete the virtual IPv6 address and interface of the specified backup group. The virtual IPv6 address is the link local unicast address. There can only be one virtual IPv6 address in a backup group. In order to avoid the fault of returning physical MAC address when Ping virtual IPv6 address, it is regulated that the virtual IPv6 address should not be the real IPv6 address of the interface. Thus, the interfaces of all VRRPv3 backup groups are Backup by default, and need to select a Master within the backup groups.

Example: Configure the virtual IPv6 address of the backup group as fe80::2, the interface is VLAN1.

Switch(config-router)# virtual-ipv6 fe80::2 interface vlan 1

Chapter 3 Commands for MRPP

3.1 control-vlan

Command: control-vlan *<vid>*

           no control-vlan

Function: Configure control VLAN ID of MRPP ring; the "**no control-vlan**" command deletes control VLAN ID.

Parameter: *<vid>* expresses control VLAN ID, the valid range is from 1 to 4094.

Command Mode: MRPP ring mode

Default: None

Usage Guide: The command specifies Virtual VLAN ID of MRPP ring, currently it can be any value in 1-4094. To avoid confusion, it is recommended that the ID is non-configured VLAN ID, and the same to MRPP ring ID. In configuration of MRPP ring of the same MRPP loop switches, the control VLAN ID must be the same, otherwise the whole MRPP loop may not be able to work normally or form broadcast.

     The mrpp enable command must be start before the control-vlan command be used. If primary port, secondary port, node-mode and enable commands all be configured after control-vlan, the mrpp-ring function is enabled.

Example: Configure control VLAN of mrpp ring 4000 is 4000.

Switch(config)#mrpp ring 4000

Switch(mrpp-ring-4000)#control-vlan 4000

3.2 clear mrpp statistics

Command: clear mrpp statistics [*<ring-id>*]

Function: Clear statistic information of MRPP data packet of MRPP ring receiving and transferring.

Parameter: *<ring-id>* is MRPP ring ID, the valid range is from 1 to 4096, if not specified ID, it clears all of MRPP ring statistic information.

Command Mode: Admin Mode.

Default: None.

Usage Guide: None.

Example: Clear statistic information of MRPP ring 4000 of switch.

Switch#clear mrpp statistics 4000

3.3 debug mrpp

Command: debug mrpp

        no debug mrpp

Function: Open MRPP debug information; "**no description**" command disables MRPP debug information.

Command Mode: Admin Mode

Parameter: None.

Usage Guide: Enable MRPP debug information, and check message process of MRPP protocol and receive data packet process, it is helpful to monitor debug.

Example: Enable debug information of MRPP protocol.

Switch#debug mrpp

3.4 enable

Command: enable

        no enable

Function: Enable configured MRPP ring, the "**no enable**" command disables this enabled MRPP ring.

Parameter:

Command Mode: MRPP ring mode

Default: Default disable MRPP ring.

Usage Guide: Executing this command, it must enable MRPP protocol, and if other commands have configured, the MRPP ring is enabled.

Example: Configure MRPP ring 4000 of switch to primary node, and enable the MRPP ring.

Switch(config)#mrpp enable

Switch(config)#mrpp ring 4000

Switch(mrpp-ring-4000)#control-vlan 4000

Switch(mrpp-ring-4000)# node-mode master

Switch(mrpp-ring-4000)#fail-timer 18

Switch(mrpp-ring-4000)#hello-timer 6

Switch(mrpp-ring-4000)#enable

Switch(mrpp-ring-4000)#exit

Switch(config)#in ethernet1/0/1

Switch(config-If-Ethernet1/0/1)#mrpp ring 4000 primary-port

Switch(config)#in ethernet 1/0/3

Switch(config-If-Ethernet1/0/3)#mrpp ring 4000 secondary-port

3.5 errp domain

Command: errp domain *<domain-id>*

     no errp domain *<domain-id>*

Function: Create ERRP domain, the no command deletes the configured ERRP domain.

Parameter: *<domain-id>* domain ID of ERRP, the range between 1 and 15.

Command Mode: Global mode

Usage Guide: If domain ID of ERRP needs to be configured, the compatible mode of ERRP should be enabled firstly. When executing this command, it should create a new ERRP domain if there is no ERRP domain. However, the no command is used to delete the corresponding domain ID of ERRP.

Example: Configure domain ID for ERRP globally.

Switch(Config)#errp domain 1

3.6 fail-timer

Command: fail-timer *<timer>*

     no fail-timer

Function: Configure if the primary node of MRPP ring receive Timer interval of Hello packet or not, the "**no fail-timer**" command restores default timer interval.

Parameter: *<timer>* valid range is from 1 to 300s.

Command Mode: MRPP ring mode

Default: Default configure timer interval 3s.

Usage Guide: If primary node of MRPP ring doesn't receives Hello packet from primary port of primary node on configured fail timer, the whole loop is fail. Transfer node of MRPP doesn't need this timer and configure. To avoid time delay by transfer node forwards Hello packet, the value of fail timer must be more than or equal to 3 times of Hello timer. On time delay loop, it needs to modify the default and increase the value to avoid primary node doesn't receive Hello packet on fail timer due to time delay.

Example: Configure fail timer of MRPP ring 4000 to 10s.

Switch(config)# mrpp ring 4000

Switch(mrpp-ring-4000)#fail-timer 10

3.7 hello-timer

Command: hello-timer <*timer*>

          no hello-timer

Function: Configure timer interval of Hello packet from primary node of MRPP ring, the "**no hello-timer**" command restores timer interval of default.

Parameter: <*timer*> valid range is from 1 to 100s.

Command Mode: MRPP ring mode

Default: Default configuration timer interval is 1s.

Usage Guide: The primary node of MRPP ring continuously sends Hello packet on configured Hello timer interval, if secondary port of primary node can receive this packet in configured period; the whole loop is normal, otherwise fail. Transfer node of MRPP ring doesn't need this timer and configure.

Example: Configure hello-timer of MRPP ring 4000 to 3 seconds.

Switch(config)# mrpp ring 4000

Switch(mrpp-ring-4000)#hello-timer 3

3.8 mrpp eaps compatible

Command: mrpp eaps compatible

          no mrpp eaps compatible

Function: Enable the compatible mode for EAPS, the no command disables the compatible mode.

Parameter: None.

Command Mode: Global mode

Default: Disable the compatible function of EAPS.

Usage Guide: If the compatible function of EAPS needs to be configured, MRPP protocol should be enabled firstly. When executing **no mrpp eaps compatible** command, it should ensure that the switch has enabled MRPP protocol.

Example: Enable the compatible function of EAPS globally.

Switch(Config)#mrpp enable

Switch(Config)#mrpp eaps compatible

3.9 mrpp enable

Command: mrpp enable

no mrpp enable

Function: Enable MRPP protocol module, the "**no mrpp enable**" command disables MRPP protocol.

Parameter: None.

Command Mode: Global Mode.

Default: The system doesn't enable MRPP protocol module.

Usage Guide: If it needs to configure MRPP ring, it enables MRPP protocol. Executing "**no mrpp enable**" command, it ensures to disable the switch enabled MRPP ring.

Example: Globally enable MRPP.

Switch(config)#mrpp enable

3.10 mrpp errp compatible

Command: mrpp errp compatible

no mrpp errp compatible

Function: Enable the compatible mode for ERRP, the no command disables the compatible mode.

Parameter: None.

Command Mode: Global mode

Default: Disable the compatible function of ERRP.

Usage Guide: If the compatible function of ERRP needs to be configured, MRPP protocol should be enabled firstly. Furthermore, the port with ERRP compatible mode should be configured as hybrid or trunk mode and allow the packets with Control Vlan information.

Example: Enable the compatible function of ERRP globally.

Switch(Config)#mrpp enable

Switch(Config)#mrpp errp compatible

Switch(Config)#mrpp ring 2

Switch(mrpp-ring-2)#control-vlan 4000

Switch(config-if-ethernet1/0/51)#switchport mode hybrid

Switch(config-if-ethernet1/0/51)#switchport hybrid allowed vlan 4000 tag

Switch(config-if-ethernet1/0/52)#switchport mode hybrid

Switch(config-if-ethernet1/0/52)#switchport hybrid allowed vlan 4000 tag

3.11 mrpp poll-time

Command: mrpp poll-time <20-2000>

Function: Configure the query interval of MRPP.

Command mode: Global mode.

Usage Guide: Configure the query time to adjust the query interval of MRPP, the default interval is 100ms.

Example: Set the query time as 200ms.

Switch(Config)# mrpp poll-time 200

3.12 mrpp ring

Command: mrpp ring <*ring-id*>

            no mrpp ring <*ring-id*>

Function: Create MRPP ring, and access MRPP ring mode, the "**no mrpp ring<*ring-id*>**" command deletes configured MRPP ring.

Parameter: <*ring-id*> is MRPP ring ID, the valid range is from 1 to 4096.

Command Mode: Global Mode

Usage Guide: If this MRPP ring doesn't exist it create new MRPP ring when executing the command, and then it enter MRPP ring mode. It needs to ensure disable this MRPP ring when executing the "**no mrpp ring**" command.

Example:

Switch(config)#mrpp ring 100

3.13 mrpp ring primary-port

Command: mrpp ring <*ring-id*> primary-port

            no mrpp ring <*ring-id*> primary-port

Function: Specify MRPP ring primary-port.

Parameter: <*ring-id*> is the ID of MRPP ring; range is <1-4096>.

Command Mode: Port mode

Default: None

Usage Guide: The command specifies MRPP ring primary port. Primary node uses primary port to send Hello packet, secondary port is used to receive Hello packet from primary node. There are no difference on function between primary port and secondary of secondary node.

The mrpp enable command must be enabled before the control-vlan command be used. If primary port, secondary port, node-mode and enable commands all be configured after control-vlan, then the mrpp-ring function is enabled.

Example: Configure the primary of MRPP ring 4000 to Ethernet 1/0/1.

Switch(Config)#interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)#mrpp ring 4000 primary-port

3.14 mrpp ring secondary-port

Command: mrpp ring < *ring-id* > secondary-port

no mrpp ring < *ring-id* > secondary-port

Function: Specify secondary of MRPP ring.

Parameter: *<ring-id>* is the ID of MRPP ring; range is <1-4096>.

Command Mode: Port mode

Default: None

Usage Guide: The command specifies secondary port of MRPP ring. The primary node uses secondary port to receive Hello packet from primary node. There are no difference on function between primary port and secondary of secondary node.

The mrpp enable command must be enabled before the control-vlan command be used. If primary port, secondary port, node-mode and enable commands all be configured after control-vlan, then the mrpp-ring function is enabled.

Example: Configure secondary port of MRPP ring to 1/0/3.

Switch(config)#interface ethernet1/0/3

Switch(Config-If-Ethernet1/0/3)#mrpp ring 4000 secondary-port

3.15 node-mode

Command: node-mode {maser | transit}

Function: Configure the type of the node to primary node or secondary node.

Parameter: None.

Command Mode: MRPP ring mode.

Default: Default the node mode is secondary node.

Usage Guide: None.

Example: Configure the switch to primary node. MRPP ring 4000.

Switch(config)# mrpp ring 4000

Switch(mrpp-ring-4000)#node-mode master

3.16 show mrpp

Command: show mrpp [*<ring-id>*]

Function: Display MRPP ring configuration.

Parameter: *<ring-id>* is MRPP ring ID, the valid range is from 1 to 4096, if not specified ID, it display all of MRPP ring configuration.

Command Mode: Admin and Configuration Mode.

Default: None

Usage Guide: None

Example: Display configuration of MRPP ring 4000 of switch

Switch# show mrpp 4000

3.17 show mrpp statistics

Command: show mrpp statistics [*<ring-id>*]

Function: Display statistic information of data packet of MRPP ring receiving and transferring.

Parameter: *<ring-id>* is MRPP ring ID, the valid range is from 1 to 4096, if not specified ID, it displays all of MRPP ring statistic information.

Command Mode: Admin and Configuration Mode.

Default: None

Usage Guide: None

Example: Display statistic information of MRPP ring 4000 of switch.

Switch# show mrpp statistic 4000

Chapter 4 Commands for ULPP

4.1 clear ulpp flush counter interface

Command: clear ulpp flush counter interface <name>

Function: Clear the statistic information of the flush packets.

Parameter: *<name>* is the name of the port.

Default: None.

Command mode: Admin mode.

Usage Guide: None.

Example: Clear the statistic information of the flush packets for the port1/0/1.

Switch#clear ulpp flush counter interface e1/0/1

ULPP flush counter has been reset.

4.2 control vlan

Command: control vlan <integer>

            no control vlan

Function: Configure the control VLAN of ULPP group; the no command restores the default value.

Parameter: *<integer>* is the control VLAN ID that sends the flush packets, range from 1 to 4094.

Default: The default is VLAN 1.

Command mode: ULPP group configuration mode.

Usage Guide: Configure the control VLAN of ULPP group. This VLAN must correspond the existent VLAN, after it is configured, this VLAN can't be deleted. It must belong to the VLAN protected by ULPP group to avoid flush packets loopback.

Example: Configure the sending control VLAN of ULPP group as 10.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# control vlan 10

4.3 debug ulpp error

Command: debug ulpp error

            no debug ulpp error

Function: Show the error information of ULPP. The no operation disables showing the error information of ULPP.

Parameter: None.

Default: Do not display.

Command mode: Admin mode.

Usage Guide: None.

Example: Show the error information of ULPP.

Switch# debug ulpp error

Unrecognized Flush packet received.

4.4 debug ulpp event

Command: debug ulpp event

             no debug ulpp event

Function: Show the event information of ULPP. The no operation disables showing the event information of ULPP.

Parameter: None.

Default: Do not display.

Command mode: Admin mode.

Usage Guide: None.

Example: Show the event information of ULPP.

Switch# debug ulpp event

ULPP group 1 state changes:

Master port ethernet 1/0/1 in ULPP group 1 changed state to Forwading.

Slave port ethernet 1/0/2 in ULPP group 1 changed state to Standby.

4.5 debug ulpp flush content interface

Command: debug ulpp flush content interface *<name>*

             no debug ulpp flush content interface *<name>*

Function: Show the contents of the receiving flush packets. The no operation disables the shown contents.

Parameter: *<name>* is the name of the port.

Default: Do not display.

Command mode: Admin mode.

Usage Guide: None.

Example: Show the contents of the receiving flush packets for the port1/0/1.

Switch# debug ulpp flush content interface e1/0/1

Flush packet content:

Destination MAC: 01-03-0f-cc-cc-cc

Source MAC: 00-a0-cc-d7-5c-ea

Type: 8100

Vlan ID: 1

Length: 518

Control Type: 2

Control Vlan: 10

MAC number:0

Vlan Bitmap:

4.6 debug ulpp flush {send | receive} interface

Command: debug ulpp flush {send | receive} interface *<name>*
      no debug ulpp flush {send | receive} interface *<name>*
Function: Show the information of the receiving/sending flush packets, it only shows the receiving packets, but do not show the detailed contents of the packets. The no operation disables the shown information.
Parameter: *<name>* is the name of the port.
Default: Do not display.
Command mode: Admin mode.
Usage Guide: None.
Example: Show the information that send the flush packets for the port1/0/1.
Switch# debug ulpp flush send interface e1/0/1
Flush packet send on port Ethernet 1/0/1.

4.7 description

Command: description *<string>*
      no description
Function: Configure the description character string of ULPP group. The no command deletes the description.
Parameter: *<string>* is the name of ULPP group, the max number of the characters is 128.
Default: Do not configure ULPP name by default.
Command mode: ULPP group configuration mode.

Usage Guide: None.

Example: Configure the description of ULPP group as dcn.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# description dcn

4.8 flush disable arp

Command: flush disable arp

Function: Disable sending the flush packets of deleting ARP.

Parameter: None.

Default: By default, enable the sending function of the flush packets which are deleted by ARP.

Command mode: ULPP group configuration mode.

Usage Guide: If configure this command, when the link is switched, it will not actively send the flush packets to notify the upstream device to delete the entries of ARP.

Example: Disable sending the flush packets of deleting ARP.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# flush disable arp

4.9 flush disable mac

Command: flush disable mac

Function: Disable sending the flush packets of updating MAC address.

Parameter: None.

Default: By default, enable sending the flush packets of updating MAC address.

Command mode: ULPP group configuration mode.

Usage Guide: If configure this command, when the link is switched, it will not actively send the flush packets to notify the upstream device to update the MAC address table.

Example: Disable sending the flush packets of updating MAC address.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# flush disable mac

4.10 flush disable mac-vlan

Command: flush disable mac-vlan

Function: Disable sending the flush packets of deleting the dynamic unicast mac according to vlan.

Parameter: None.

Default: Disable.

Command mode:ULPP group configuration mode.

Usage Guide: If configure this command, when the link is switched, it will not actively send the flush packets to notify the upstream device to delete the dynamic unicast mac according to vlan.

Example: Disable sending the flush packets deleted by mac-vlan.

Switch(config)#ulpp group 1

Switch(ulpp-group-1)#flush disable mac-vlan

4.11 flush enable arp

Command: flush enable arp

Function: Enable sending the flush packets of deleting ARP.

Parameter: None.

Default: By default, enable sending the flush packets of deleting ARP.

Command mode: ULPP group configuration mode.

Usage Guide: If enable this function, when the link is switched, it will actively send the flush packets to notify the upstream device, so as to delete the list entries of ARP.

Example: Enable sending the flush packets of deleting ARP.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# flush enable arp

4.12 flush enable mac

Command: flush enable mac

Function: Enable sending the flush packets of updating MAC address.

Parameter: None.

Default: By default, enable sending the flush packets of updating MAC address.

Command mode: ULPP group configuration mode.

Usage Guide: If enable this function, when the link is switched, it will actively send the flush packets to notify the upstream device, so as to update the MAC address table.

Example: Enable sending the flush packets of updating MAC address.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# flush enable mac

4.13 flush enable mac-vlan

Command: flush enable mac-vlan

Function: Enable sending the flush packets of deleting the dynamic unicast mac according to vlan.

Parameter: None.

Default: Disable.

Command mode:ULPP group configuration mode.

Usage Guide: If configure this command, when the link is switched, it will actively send the flush packets to notify the upstream device to delete the dynamic unicast mac according to vlan.

Example: Enable sending the flush packets deleted by mac-vlan.

Switch(config)#ulpp group 1

Switch(ulpp-group-1)#flush enable mac-vlan

4.14 preemption delay

Command: preemption delay *<integer>*

     no preemption delay

Function: Configure the preemption delay, the no command configures the preemption delay as the default value.

Parameter: *<integer>*: the preemption delay, range from 1 to 600, in second.

Default: The default preemption delay is 30.

Command mode: ULPP group configuration mode.

Usage Guide: The preemption delay is the delay time before the master port is preempted as the forwarding state, for avoiding the link oscillation in a short time. After the preemption mode is enabled, the preemption delay takes effect.

Example: Configure the preemption delay as 50s for ULPP group.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# preemption delay 50

4.15 preemption mode

Command: preemption mode

     no preemption mode

Function: Enable/disable the preemption mode of ULPP group.

Parameter: None.

Default: Do not preempt.

Command mode: ULPP group configuration mode.

Usage Guide: If the preemption mode configured by ULPP group, and the slave port is in forwarding state, and the master port is in the standby state, the master port will turn into the forwarding state and the slave port turn into the standby state after the preemption delay.

Example: Configure the preemption mode of ULPP group.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# preemption mode

4.16 protect vlan-reference-instance

Command: protect vlan-reference-instance *<instance-list>*

                no protect vlan-reference-instance *<instance-list>*

Function: Configure the protective VLANs of ULPP group, the no command cancels the protective VLANs.

Parameter: *<instance-list>* is MSTP instance list, such as: i; j-k. The number of the instances is not limited in the list.

Default: Do not protect any VLANs by default that means any instances are not quoted.

Command mode: ULPP group configuration mode.

Usage Guide: Quote the instances of MSTP to protect the VLANs. The VLAN corresponds to this instance is at the forwarding state on one port of this group, and at the blocked state on another port of this group. Each ULPP group can quotes all instances of MSTP. And it can quotes the inexistent MSTP instances that means any VLANs are not protected, the different ULPP groups can't quote the same instance.

Example: Configure the protective VLAN quoted from instance 1 for ULPP group.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)# protect vlan-reference-instance 1

4.17 show ulpp flush counter interface

Command: show ulpp flush counter interface {ethernet <IFNAME> | <IFNAME>}

Function: Show the statistic information of the flush packets.

Parameter: <IFNAME> is the name of the ports.

Default: None.

Command mode: Admin mode.

Usage Guide: Show the statistic information of the flush packets, such as: the information

of the flush packets number which has been received, the time information that receive the flush packets finally.

Example: Show the statistic information of the flush packets for ULPP group1.

Switch# show ulpp flush counter interface e1/0/1

Received flush packets: 10

4.18 show ulpp flush-receive-port

Command: show ulpp flush-receive-port

Function: Show the port which receive flush packet, flush type and control VLAN.

Parameter: None.

Default: None.

Command mode: Admin mode.

Usage Guide: None.

Example: Show the information that the port receives flush packets.

Switch# show ulpp flush-receive-port

ULPP flush-receive portlist:

Portname	Type	Control Vlan
Ethernet1/0/1	ARP	1
Ethernet1/0/3	MAC	1;3;5-10

4.19 show ulpp group

Command: show ulpp group [group-id]

Function: Show the configuration information of the ULPP groups which have been configured.

Parameter: [group-id]: Show the information of the specific ULPP group.

Default: By default, show the information of all ULPP groups which have been configured.

Command mode: Admin mode.

Usage Guide: Show the configuration information of ULPP groups which have been configured, such as: the state of the master port and the slave port, the preemption mode, the preemption delay, etc.

Example: Show the configuration information of ULPP group1.

Switch# show ulpp group 1

ULPP group 1 information:

Description: abc

Preemption mode: on

Preemption delay: 30s

Control VLAN:1

Protected VLAN: Reference Instance 1

Member   Role   State

Ethernet1/0/1   MASTER   FORWARDING

Ethernet1/0/2   SLAVE   STANDBY

4.20 ulpp control vlan

Command: ulpp control vlan *<vlan-list>*

        no ulpp control vlan *<vlan-list>*

Function: Configure the receiving control VLANs of the port, the no command restores the default value.

Parameter: *<vlan-list>* specify the control VLAN list that receives the flush packets, such as: i; j-k. The number of VLANs in Each character string can not exceed 100. The receiving control VLAN of the port can be added.

Default: The default is VLAN 1.

Command mode: Port mode.

Usage Guide: Configure the receiving control VLAN for the port. This VLAN must correspond the existent VLAN, after it is configured, this VLAN can't be deleted.

Example: Configure the receiving control VLAN as 10.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp control vlan 10

4.21 ulpp flush disable arp

Command: ulpp flush disable arp

Function: Disable receiving the flush packets of deleting ARP.

Parameter: None.

Default: By default, disable receiving the flush packets of deleting ARP.

Command mode: Port mode.

Usage Guide: If this command is configured, then it will not receive the flush packets of deleting ARP.

Example: Disable receiving the flush packets of deleting ARP.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp flush disable arp

4.22 ulpp flush disable mac

Command: ulpp flush disable mac

Function: Disable receiving the flush packets of updating MAC address.

Parameter: None.

Default: By default, disable receiving the flush packets of updating MAC address.

Command mode: Port mode.

Usage Guide: If this command is configured, then it will not receive the flush packets of updating MAC address.

Example: Disable receiving the flush packets of updating MAC address.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp flush disable mac

4.23 ulpp flush disable mac-vlan

Command: ulpp flush disable mac-vlan

Function: Disable receiving the flush packets of mac-vlan type.

Parameter: None.

Default: Disable.

Command mode: Port mode.

Usage Guide: If enabling this function, forward the hardware of the flush packets with mac-vlan type received in port. It will not be analyzed.

Example: Disable receiving the flush packets deleted by mac-vlan of port.

Switch(config)#interface e1/0/2

Switch(config-if-ethernet1/0/2)#ulpp flush disable mac-vlan

4.24 ulpp flush enable arp

Command: ulpp flush enable arp

Function: Enable receiving the flush packets of deleting ARP.

Parameter: None.

Default: By default, disable receiving the flush packets of deleting ARP.

Command mode: Port mode.

Usage Guide: Enable this function to receive the flush packets which delete ARP.

Example: Enable receiving of the flush packets of deleting ARP.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp flush enable arp

4.25 ulpp flush enable mac

Command: ulpp flush enable mac

Function: Enable receiving the flush packets of updating MAC address.

Parameter: None.

Default: By default, disable receiving the flush packets of updating MAC address.

Command mode: Port mode.

Usage Guide: Enable receiving the flush packets of updating MAC address table.

Example: Enable receiving the flush packets of updating the MAC address.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp flush enable mac

4.26 ulpp flush enable mac-vlan

Command: ulpp flush enable mac-vlan

Function: Enable receiving the flush packets of mac-vlan type.

Parameter: None.

Default: Disable.

Command mode: Port mode.

Usage Guide: If enabling this function, configure the interface to receive the flush packets
handled mac-vlan type and delete the dynamic unicast mac according to vlan information
in the packets.

Example: Enable receiving the flush packets deleted by mac-vlan of port.

Switch(config)#interface e1/0/2

Switch(config-if-ethernet1/0/2)#ulpp flush enable mac-vlan

4.27 ulpp group

Command: ulpp group *<integer>*

             no ulpp group *<integer>*

Function: Create a ULPP group. If this group exists, then enter the configuration mode of
ULPP group. The no command deletes a ULPP group.

Parameter: *<integer>* is the ID of ULPP group, range from 1 to 48.

Command mode: Global Mode.

Default: Any ULPP groups are not configured.

Usage Guide: None.

Example: Configure ulpp group 20 or enter the mode of ulpp group 20.

Switch(config)# ulpp group 20

Switch(ulpp-group-20)#

4.28 ulpp group master

Command: ulpp group *<integer>* master

        no ulpp group *<integer>* master

Function: Configure the master port of ULPP group, the no command deletes the master port.

Parameter: *<integer>* is the ID of ULPP group, range from 1 to 48.

Default: There is no master port configured by default.

Command mode: Port mode.

Usage Guide: There is no sequence requirement for the master and slave port configuration in a group, but the protective VLANs must be configured before the member ports. Each group has only one master port, if the master port exists, then the configuration fail.

Example: Configure the master port of ULPP group.

Switch(config)# interface ethernet 1/0/1

Switch(config-If-Ethernet1/0/1)# ulpp group 20 master

4.29 ulpp group slave

Command: ulpp group *<integer>* slave

        no ulpp group *<integer>* slave

Function: Configure the slave port of ULPP group, the no command deletes the slave port.

Parameter: *<integer>* is the ID of ULPP group, the range from 1 to 48.

Default: There is no slave port configured by default.

Command mode: Port mode.

Usage Guide: There is no sequence requirement for the master and slave port configuration in a group, but the protective VLANs must be configured before the member ports. Each group has only one slave port, if the slave port exists, then the configuration is fail.

Example: Configure the slave port of ULPP group.

Switch(config)# interface ethernet 1/0/2

Switch(config-If-Ethernet1/0/2)# ulpp group 20 slave

Chapter 5 Commands for ULSM

5.1 debug ulsm event

Command: debug ulsm event

       no debug ulsm event

Function: Show the event information of ULSM. The no operation disables showing ULSM events.

Parameter: None.

Default: None.

Command mode: Admin Mode.

Usage Guide: None.

Example: Show the event information of ULSM.

Switch# debug ulsm event

Downlink synchoronized with ULSM group, change state to Down.

5.2 show ulsm group

Command: show ulsm group [group-id]

Function: Show the configuration information of ULSM group.

Parameter: [group-id]: the ID of ULSM group.

Default: By default, show the information of all ULSM groups which have been configured.

Command mode: Admin Mode.

Usage Guide: None.

Example: Show the configuration information of ULSM group1.

Switch# show ulsm group 1

ULSM group 1 information:

ULSM group state: Down

Member	Role	State	Down by ULSM
ethernet1/0/1	UpLINK	Down	
ethernet1/0/2	DownLINK	Down	Yes

5.3 ulsm group

Command: ulsm group *<group-id>*

        no ulsm group *<group-id>*

Function: Create a ULSM group. The no command deletes the ULSM group.

Parameter: *<group-id>* is the ID of ULSM group, range from 1 to 32.

Default: There is no ULSM group configured by default.

Command mode: Global Mode.

Usage Guide: None.

Example: Create ULSM group 10.

Switch(config)# ulsm group 10

5.4 ulsm group {uplink | downlink}

Command: ulsm group *<group-id>* **{uplink | downlink}**

        no ulsm group *<group-id>*

Function: Configure the uplink/downlink ports of ULSM group. The no command deletes the uplink/downlink ports.

Parameter: *<group-id>***:** The ID of ULSM group, the range from 1 to 32.

        uplink: Configure the port as the uplink port.

        downlink: Configure the port as the downlink port.

Default: The port does not belong to any ULSM group.

Command mode: Port Mode.

Usage Guide: Configure the uplink/downlink ports of ULSM group. Each ULSM group can configure 8 uplink ports and 16 downlink ports at most.

Example: Configure port1/0/3 as the uplink port of ULSM group10.

Switch(config)# interface ethernet 1/0/3

Switch(config-If-Ethernet1/0/3)# ulsm group 10 uplink