VRRP Configuration

Contents

Chapter 1 VRRP Configuration

1.1 VRRP Description

On a TCP/IP network, routes must be configured between two devices without a physical connection to ensure their communication. Currently, routes can be specified through dynamic learning by means of a routing protocol (such as RIP and OSPF) or static configuration. It is impractical to run a dynamic routing protocol on every terminal. Most client operating systems do not support the dynamic routing and they are still under the restraint of management overhead, convergence degree, and security even if they can be configured with a routing protocol. Usually, static routes are configured for IP terminals by specifying one or more default gateways. Static routing simplifies network management and reduces the communication overhead of terminals. However, if a switch functioning as a default gateway is damaged, the communication in which the switch is used as the next-hop host will inevitably be interrupted. A terminal will not be switched to a new gateway even if there are multiple default gateways until it is restarted. Virtual Router Redundancy Protocol (VRRP) can rectify the defect of static routing.

VRRP introduces two pairs of concepts: VRRP switch and virtual switch, master switch and backup switch. A VRRP switch is a real switch where VRRP runs, while a virtual switch is a logical switch created by VRRP. A group of VRRP switches form a virtual switch, which is also called a backup group. The virtual switch is represented as a logical switch with a unique IP address and MAC address. Switches in a VRRP group are classified into master switches and backup switches. A VRRP group has only one master switch and one or more backup switches. VRRP selects a master switch from the switch group. The master switch responds to ARP requests and forwards IP packets, and the other switches are standby as a backup. If the master switch is faulty due to some reason, a backup switch will become the master one within several seconds. Such a switchover is completed very quickly without requiring you to change the IP address or MAC address, and therefore it is transparent to terminal users.

1.2 VRRP Configuration

1.2.1 Configuring VRRP

Table 1-1 VRRP configuration tasks

Configuration Task		Description	Details
Basic VRRP configuration	Adds or deletes a virtual IP address.	Mandatory	1.2.2
Configuring VRRP parameters	Sets the priority of a backup group.	Mandatory	1.2.3
	Sets the preemption mode and delay for backup groups.	Mandatory	1.2.3
	Sets the timer of a backup group.	Mandatory	1.2.3
	Enables the function of pinging a virtual IP address.	Mandatory	1.2.3

Configuration Task		Description	Details
	Configures an interface to be monitored for a backup group.	Mandatory	1.2.3
Displaying and maintaining VRRP configurations	Displays and maintains VRRP configurations.	Mandatory	1.2.4

1.2.2 Basic VRRP Configuration

The ip vrrp *vrid vip* command is used to assign a virtual switch (or a backup group) an IP address on the local network segment. The **no** form of this command is used to remove the virtual IP address of a backup group from the virtual IP address list.

Table 1-2 Basic VRRP configuration

Operation	Command	Remarks
Runs the command in VLAN/superVLAN interface configuration mode.	**ip vrrp** *vrid vip*	-
Runs the command in VLAN/superVLAN interface configuration mode.	**no ip vrrp** *vrid* [*vip*]	-

Description:
The backup group number ranges from 1 to 255. A virtual address can be an unassigned IP address on the network segment where the backup group resides or the IP address of an interface belonging to the backup group. A maximum of 255 backup groups can be configured. The IP address of the switch itself can be configured. In this case, the switch is known as an IP address owner. When the first IP address is assigned to a backup group, VRRP creates the backup group. Other virtual IP addresses configured for the backup group will only be added to the virtual IP address list of the backup group. A backup group can be configured with eight IP addresses at most. A backup group will be deleted together with the last virtual IP address. That is, this backup group does not exist on the interface and all configurations of the backup group will no longer take effect.
[Example]:
! To configure a backup group whose virtual IP address is 192.168.1.1 on VLAN interface 1, run the following command:
Switch(config-if-vlanInterface-1)#ip vrrp 1 192.168.1.1

1.2.3 Configuring VRRP Parameters

The master switch in a backup group will not be replaced unless it is faulty even if another switch is configured with a higher priority later. However, if the preemption mechanism is applied, a switch will become the master switch if its priority is higher than that of the master switch and the original master switch will become a backup switch accordingly. When preemption is enabled, you can set the delay of preemption. Then a backup switch becomes master after the delay. A backup switch will become the master switch if it does not receive a packet from the original

master switch. However, if a network has unstable performance, a backup switch may not receive a packet due to network congestion but the master switch is still working properly. In this situation, the backup switch will receive a packet from the master switch after waiting a short time. As a result, frequent switchovers can be avoided. The delay ranges from 0 to 255 seconds.

The master switch sends VRRP packets within the VRRP backup group at an interval specified by **adver_interval** to indicate that it is working properly. If the backup switch does not receive a VRRP packet from the master switch within a period of time specified by **master_down_interval**, it regards that the master switch is faulty and changes its state to Master.

You can modify the value of **adver_interval** by running a timer setting command. The value of **master_down_interval** is three times that of **adver_interval**. An abnormal switchover may occur in the event of extremely large traffic or variance in timer settings between switches. To solve this problem, you can set **adver_interval** to a greater value or modify the preemption delay. The value of **adver_interval** is in the unit of second.

Table 1-3 Configuring VRRP parameters

Operation	Command	Remarks
Runs the command in VLAN/superVLAN interface configuration mode.	**vrrp priority** *vrid priority*	The priority ranges from 0 to 255. A larger value indicates a higher priority.
Runs the command in VLAN/superVLAN interface configuration mode.	**no vrrp priority** *vrid*	-
Runs the command in VLAN/superVLAN interface configuration mode.	**vrrp preempt** *vrid* [**delay** *delay*]	
Runs the command in VLAN/superVLAN interface configuration mode.	**no vrrp preempt** *vrid*	
Runs the command in VLAN/superVLAN interface configuration mode.	**vrrp timer** *vrid adver-interval*	
Runs the command in VLAN/superVLAN interface configuration mode.	**no vrrp timer** *vrid*	
Runs the command in global configuration mode.	**vrrp ping-enable**	By default, the function of pinging a virtual IP address is disabled.
Runs the command in global configuration mode.	**no vrrp ping-enable**	
Runs the command in VLAN/superVLAN interface configuration mode	**vrrp track**	
Runs the command in VLAN/superVLAN interface configuration mode	**no vrrp track**	

Note: The priority of the IP address owner cannot be changed and is always 255.

[Parameter description]

vrid: virtual group ID, in the range of 1 to 255;

vlan-id: ID of the VLAN to which a VLAN interface belongs;

supervlan-id: ID of the super VLAN to which a superVLAN interface belongs;

pri-value: priority to be reduced if the interface under monitoring is down.

1.2.4   Displays and Maintaining VRRP Configurations

Table 1-4 Displaying and maintaining VRRP configurations.

Operation	Command	Remarks
Runs the command in any mode.	**show vrrp** [**vlan-interface** *vlan-id* [*vrid*]]	

1.2.5   Configuration Examples

! To configure the advertisement interval of backup group 1 to 1s, run the following command:
Switch(config-if-vlanInterface-1)#vrrp priority 1 200
! To enable a non-IP address owner to respond to ping requests, run the following command:
Switch(config)#vrrp ping-enable
! To configure the preemption mode and delay for a backup group, run the following command:
Switch(config-if-vlanInterface-1)#vrrp preempt 1 delay 3
! To configure the priority of a switch in backup group 1 to 200, run the following command:
Switch(config-if-vlanInterface-1)#vrrp timer 1 1
! To configure that the priority is reduced by 20 if VLAN interface 2 of backup group 1 under monitoring is down, run the following command:
Switch(config-if-vlanInterface-1)#vrrp track 1 vlan-if 2 reduced 20
! To display the VRRP information configured on a switch, run the following command:
Switch#show vrrp