Chapter37:IPv6 Protocol Configuration

Table of Contents

Chapter 1 IPv6 Protocol Configuration

1.1 IPv6 Protocol Configuration

The configuration of the IPv6 address of the router only takes effect on the VLAN interface, not on the physical interface.

The IPv6 protocol is disabled in default state. If the IPv6 protocol need be used on a VLAN interface, this protocol should be first enabled in VLAN interface configuration mode. To enable the IPv6 protocol, users have to set the IPv6 address. If on a VLAN interface at least one IPv6 address is set, the VLAN interface can handle the IPv6 packets and communicates with other IPv6 devices. Otherwise, there will be no IPv6 address and the protocol will not be enabled.

To enable the IPv6 protocol, users should finish the following task:

- Setting at least one IPv6 address in VLAN interface configuration mode

1.2 Enabling IPv6

1.2.1 Setting the IPv6 Address

The IPv6 address is used to determine the destination address to which the IPv6 packets can be sent. There are three kinds of IPv6 addresses.

Type	Referred Format	Usage Guidelines
Unicast address	2001:0:0:0:0DB8:800:200C:417A/64	2001:0:0:0:0DB8:800:200C:417A is address. Meanwhile the prefix length of the address must be specified (such as 64 in the reference format)
Multicast address	FF01:0:0:0:0:0:0:101	All multicast addresses begin with FF.
Any address	2002:0:0:0:0DB8:800:200C:417A/64	The format of this address is the same as that of the unicast address. Different VLAN interfaces can be set to have the same address, no matter it is a unicast/broadcast/multicast address. Packets forwarding to any broadcast address will "route" to the VLAN port with one configured broadcast address nearest to the sender.

For the further details of the IPv6 address, see RFC 4291.

In order to enable IPv6, users must set a unicast address in VLAN interface configuration mode. The set unicast address must be one or multiple addresses of the following type:

- IPv6 link-local address
- Global IPv6 address

To set an IPv6 link-local address in VLAN interface configuration mode, run the following commands.

Command	Purpose
ipv6 enable	Sets a link-address local automatically.
ipv6 address fe80::x link-local	Sets a link-address local manually.

Note:

- The link-local address must begin with fe80. The default length of the prefix is 64 bit. At manual settings only the values at the last 64 bits can be designated.
- On a VLAN interface can only one link-local address be set.

- After IPv6 is enabled through the configuration of the link-local address, IPv6 only takes effect on the local link.

To set a global IPv6 address in VLAN interface configuration mode, run the following commands.

Command	Purpose
ipv6 address autoconfig	Sets a global address automatically.
ipv6 address [ipv6-address/prefix-length | general-prefix prefix-name sub-bits/prefix-length] | [eui-64]	Sets a global address.
ipv6 address X:X:X:X::X/<0-128> anycast	Sets an addressof unicast/broadcast/multicast.

Note:

- When IPv6 is enabled through the configuration of a global address, all interconnected IPv6 device can be handled by IPv6.
- If a link-local address has not been set before the configuration of the global address, the system will set a link-local address automatically.

Chapter 2 Setting the IPv6 Services

2.1 Setting the IPv6 Services

After IPv6 is enabled, all services provided by IPv6 can be set. The configurable IPv6 service is shown below:

(1) Managing the IPv6 Link

2.1.1 Managing the IPv6 Link

IPv6 provides a series of services to control and manage the IPv6 link. This series of services includes:

(1) Setting the MTU of IPv6
(2) Setting IPv6 redirection
(3) Setting IPv6 destination unreachablity
(4) Setting IPv6 ACL

1. Setting the MTU of IPv6

All interfaces have a default IPv6 MTU. If the IP message length exceeds MTU, the routing switch segments the message.

To set IPv6 MTU on a specific interface, run the following command in interface configuration mode:

Command	Purpose
ipv6 mtu *bytes*	Sets IPv6 MTU on an interface.

2. Setting IPv6 redirection

Sometimes the host selects an unfavorable route. After a routing switch on the route receives a message from the host, it is to check the routing table and then forward the message through the message-receiving interface to another switch that is in the same network segment as the host. In this case, the switch notifies the source host of directly sending the message with the destination to another switch without winding itself. The redirection message requires the source host to discard the original route and take more direct route suggested in the message. Many host's operating system adds a host route to its routing table. However, the routing switch is more willing to trust information obtained through the routing protocol. Therefore, the switch would not add the host route according to the information.

IPv6 redirection is opened by default. However, if a hot standby router protocol is configured on an interface, IPv6 redirection is automatically closed. If the hot standby router protocol is canceled, this function will not automatically opened. To enable IPv6 redirection, run the following command:

Command	Purpose
ipv6 redirects	Allows IPv6 to transmit the redirection packets.

3. Setting IPv6 Destination Unreachablity

In many cases, the system will automatically transmit the destination-unreachable packets.

Users can close this function. If this function is closed, the system will not transmit the ICMP unreachable packets.

To enable this function, run the following command:

Command	Purpose

ipv6 unreachables	Allowing IPv6 to transmit the destination unreachable packets.

4. Setting IPv6 ACL

Users can use ACL to control the reception and transmission of packets on a VLAN interface. If you introduce ACL on a VLAN interface in global configuration mode and designate the filtration's direction, the IPv6 packets will be filtered on this VLAN interface. To filter the IPv6 packets, run the following command in interface configuration mode.

Command	Purpose
ipv6 access-group *WORD* { in | out }	Filters the IPv6 packets in the reception or transmission direction (in: receive; out: transmit) on a VLAN interface.