

IPv6 Configuration Commands

Table of contents

CHAPTER 1 IPV6 CONFIGURATION COMMANDS	4
1.1. IPv6 Configuration Commands	4
1.1.1. ipv6 address	4
1.1.2. ipv6 address anycast	5
1.1.3. ipv6 address autoconfig	6
1.1.4. ipv6 address eui-64	6
1.1.5. ipv6 address link-local	7
1.1.6. ipv6 enable	8
1.1.7. show ipv6 interface	9
CHAPTER 2 IPV6 CONFIGURATION COMMANDS	11
2.1. IPv6 Configuration Commands	11
2.1.1. clear ipv6 traffic	11
2.1.2. debug ipv6 packet	12
2.1.3. ipv6 cur-hoplimit	14
2.1.4. ipv6 general-prefix	14
2.1.5. ipv6 icmp error-interval	15
2.1.6. ipv6 mtu	15
2.1.7. ipv6 redirects	16
2.1.8. ipv6 source-route	17
2.1.9. ipv6 access-group	18
2.1.10. ipv6 unreachable	19
2.1.11. show ipv6 general-prefix	19
2.1.12. show ipv6 pmtu	20
2.1.13. show ipv6 traffic	21
2.2. Network Testing Tool Commands	21
2.2.1. ping6	22
2.2.2. traceroute6	23
CHAPTER 3 RTV6 CONFIGURATION COMMANDS	26
3.1. rtv6 Configuration Commands	26
3.1.1. debug ipv6 routing	26
3.1.2. ipv6 route default	27
3.1.3. ipv6 route equal-cost-paths	28
3.1.4. ipv6 route max-number	28
3.1.5. ipv6 route	29
3.1.6. show ipv6 route	29

3.1.7.	ipv6 exf	31
3.1.8.	debug ipv6 fib exf	32
3.1.9.	ipv6 unicast-routing	32

CHAPTER 1 IPV6 CONFIGURATION COMMANDS

1.1. IPv6 Configuration Commands

IPv6 configuration commands include the following ones:

- `ipv6 address`
- `ipv6 address anycast`
- `ipv6 address autoconfig`
- `ipv6 address eui-64`
- `ipv6 address link-local`
- `ipv6 enable`
- `show ipv6 interface`

1.1.1. `ipv6 address`

Syntax

To set an IPv6 address in port configuration mode and meanwhile enable IPv6 on a port, run **`ipv6 address {ipv6-address/prefix-length | prefix-name sub-bits/prefix-length}`**. To delete the IPv6 address on a port, run **`no ipv6 address [ipv6-address/prefix-length | prefix-name sub-bits/prefix-length]`**.

`ipv6 address { ipv6-address/prefix-length | prefix-name sub-bits/prefix-length }`

`no ipv6 address [ipv6-address/prefix-length | prefix-name sub-bits/prefix-length]`

Parameter

Parameter	Description
<i>ipv6-address</i>	Means the to-be-added IPv6 address.
<i>/prefix-length</i>	Means the IPv6 prefix' length. It is a decimal value behind the symbol "/", meaning the successive bits in the network part in an address.
<i>Prefix-name</i>	Means a general prefix, defining the network part of the IPv6 address.
<i>Sub-bits</i>	Means the host part of the IPv6 address. It combines with the prefix, which is defined by <i>prefix-name</i> , to form an IPv6 address. This parameter must support the IPv6 address format regulated in RFC2373.

Default value

No default IPv6 address exists on the VLAN port.

Command mode

Interface configuration mode

Usage guidelines

If you run **no ipv6 address**, which has no parameters, all manually configured IPv6 addresses on the VLAN port will be deleted.

Example

The following example shows how to set an IPv6 address in VLAN port configuration mode and meanwhile enable IPv6 on the VLAN port.

```
Switch_config_v1# ipv6 address 2001:0:0:0:0DB8:800:200C:417A/64
```

Related command

ipv6 address anycast

ipv6 address eui-64

ipv6 address link-local

show ipv6 interface

1.1.2. ipv6 address anycast

Syntax

To set an anycast address and enable IPv6 on the VLAN port, run the first one of the following two commands:

ipv6 address *ipv6-prefix/prefix-length* anycast

no ipv6 address [*ipv6-prefix/prefix-length* anycast]

Parameter

Parameter	Description
<i>ipv6-address</i>	Means the to-be-added IPv6 address.
<i>/prefix-length</i>	Means the IPv6 prefix' length. It is a decimal value behind the symbol "/", meaning the successive bits in the network part in an address.

Default value

It is set as an anycast address on the VLAN port by default.

Command mode

Interface configuration mode

Usage guidelines

If you run **no ipv6 address**, which has no parameters, all manually configured IPv6 addresses on the VLAN port will be deleted.

Example

```
Switch_config_v1# ipv6 address 2001:0DB8:1:1:FFFF:FFFF:FFFF:FFFE/64 anycast
```

Related command

ipv6 address aui-64
ipv6 address link-local
show ipv6 interface

1.1.3. ipv6 address autoconfig

Syntax

To use the stateless auto-configuration protocol to set an IPv6 address, run **ipv6 address autoconfig** in VLAN port configuration mode.

ipv6 address autoconfig
no ipv6 address autoconfig

Parameter

None

Default value

By default, IPv6 address auto-configuration is not used.

Command mode

Interface configuration mode

Example

```
Switch_config_v1# ipv6 address autoconfig
```

1.1.4. ipv6 address eui-64

Syntax

To set an IPv6 address in VLAN port configuration mode, run **ipv6 address eui-64**.

ipv6 address ipv6-prefix/prefix-length eui-64
ipv6 address [ipv6-prefix/prefix-length eui-64]

Parameter

Parameter	Description
<i>ipv6-address</i>	Means the network part of the IPv6 address.
<i>/prefix-length</i>	Means the IPv6 prefix' length. It is a decimal value behind the symbol "/", meaning the successive bits in the network part in an address.

Default value

The IPv6 address in the eui-64 form is not configured on the VLAN port.

Command mode

Interface configuration mode

Usage guidelines

If you run **no ipv6 address**, which has no parameters, all manually configured IPv6 addresses on the VLAN port will be deleted.

If the **prefix-length** parameter is bigger than 64 bits, the prefix-length is prior to the length of the VLAN port ID.

Example

```
Switch_config_v1# ipv6 address 2001:0:0:0:0DB8::/64 eui-64
```

Related command

ipv6 address link-local

show ipv6 interface

1.1.5. ipv6 address link-local

Syntax

To set a link-local address in VLAN port configuration mode and meanwhile enable IPv6 on the VLAN port, run the first one of the following two commands:

ipv6 address *ipv6-address* link-local

no ipv6 address [*ipv6-address* link-local]

Parameter

Parameter	Description
<i>ipv6-address</i>	Means the to-be-added IPv6 address. The format of this address must abide by the definition in RFC 4291 strictly.
link-local	Means a link-local address. The link-local address designated by the ipv6-address command will automatically replace the automatically configured link-local address.

Default value

No default IPv6 link-local address exists on the VLAN port.

Command mode

Interface configuration mode

Usage guidelines

If you run **no ipv6 address**, which has no parameters, all manually configured IPv6 addresses on the VLAN port will be deleted. If you run **ipv6 enable**, a link-local address will be automatically set. Of course you can set the link-local address manually, the command you will use is **ipv6 address link-local**.

Example

The following example shows how to set a link-local address manually on the VLAN port:

```
Switch_config_v1# ipv6 address FE80::A00:3EFF:FE12:3457 link-local
```

Related command

ipv6 address eui-64

show ipv6 interface

1.1.6. ipv6 enable

Syntax

If the IPv6 address is not set on the VLAN port but users want to enable the IPv6 protocol on this port, run **ipv6 enable**.

ipv6 enable

no ipv6 enable

Parameter

Parameter	Description

Default value

The IPv6 protocol is forbidden on the VLAN port.

Command mode

Interface configuration mode

Usage guidelines

After the **ipv6 enable** command is run, the system will add a link-local address on the VLAN port automatically. At the same time, the communication range of the IPv6 protocol on the VLAN port is confined to the links that the VLAN port connects. If the IPv6 address has already configured on the VLAN port explicitly, you cannot forbid IPv6 processing on the VLAN port even though you use the **no ipv6 enable** command.

Example

```
Switch_config# interface vlan 1
```

```
Switch_config_v1# ipv6 enable
```

Related command

ipv6 address link-local

ipv6 address eui-64

show ipv6 interface

1.1.7. show ipv6 interface

Syntax

To show the information about the VLAN port on which the IPv6 protocol is enabled, run the following command:

```
show ipv6 interface [ interface-type interface-number ] | [brief]
```

Parameter

Parameter	Description
<i>interface-type</i>	Stands for the type of the VLAN port.
<i>interface-number</i>	Stands for the ID of the VLAN port.

Default value

Those VLAN ports on which the IPv6 protocol is enabled will all be displayed.

Command mode

Global configuration mode

Usage guidelines

This command can be used to display the state of IPv6 on the VLAN port, the configured IPv6 address and other IPv6 related parameters.

Example

The following example shows how to display the IPv6 state on port vlan1:

```
Switch# show ipv6 interface vlan 1
```

```
Vlan1 is up, line protocol is down
```

```
IPv6 is enabled, link-local address is FE80::A00:3EFF:FE12:3457 [TENTATIVE]
```

```
Global unicast address(es):
```

```
5678::111, subnet is 5678::/64 [TENTATIVE]
```

```
Joined group address(es):
```

```
FF02::1
```

```
FF02::2
```

```
FF02::1:FF12:3457
```

```
FF02::1:FF00:111
```

```
MTU is 1500 bytes
```

```
ICMP error messages limited to one every 100 milliseconds
```

```
ICMP redirects are enabled
```

```
ICMP unreachable are enabled
```

Field	Description
Vlan1 is up(down/administratively down)	Indicates whether the physical layer of the VLAN port is accessible or whether it can be shut down manageably.
line protocol is up(down)	Indicates whether the line protocol (the software layer) is accessible.
IPv6 is enabled	Enables the IPv6 protocol.
link-local address	Displays the link-local address of a port.
Global unicast address(es)	Displays the unicast address of a port.
Joined group address(es)	Displays the multicast address of a port.
MTU	Displays the MTU of a port.
ICMP error messages	Displays the transmission frequency of ICMPv6 error packets (the minimum interval).
ICMP redirects	Displays whether the redirection packet will be sent or not.
ICMP unreachable	Displays whether the destination unreachable packet will be enabled or shut down.

Related command

CHAPTER 2 IPV6 CONFIGURATION COMMANDS

2.1. IPv6 Configuration Commands

IPv6 configuration commands include the following ones:

- clear ipv6 traffic
- debug ipv6 packet
- ipv6 cur-hoplimit
- ipv6 general-prefix
- ipv6 icmp error-interval
- ipv6 mtu
- ipv6 redirects
- ipv6 source-route
- ipv6 access-group
- ipv6 unreachable
- show ipv6 general-prefix
- show ipv6 pmtu
- show ipv6 traffic

2.1.1. clear ipv6 traffic

Syntax

To delete the statistics information about the IPv6 flow, run the following command:

clear ipv6 traffic

Parameter

Parameter	Description

Command mode

EXEC

Usage guidelines

This command is used to delete all the statistics information about IPv6 flow.

Example

The following example shows how to delete the statistics information about IPv6 flow:

```
Switch# clear ipv6 traffic
```

```
Switch# show ipv6 traffic
```

```
IPv6 statistics:
```

```
Rcvd: 0 total, 0 local destination
```

```
0 badhdrs, 0 badvers
0 tooshort, 0 toosmall, 0 toomanyhdrs
0 source-routed, 0 badscope
0 badopts, 0 unknowopts, 0 exthdrtoolong
0 fragments, 0 total reassembled
0 reassembly timeouts, 0 reassembly failures
Sent: 0 generated, 0 forwarded, 0 cant forwarded
      0 fragmented into 0 fragments, 0 failed
      0 no route
Mcast: 0 received, 0 sent
ICMP statistics:
Rcvd: 0 total, 0 format errors, 0 checksum errors
      0 unreachable, 0 packet too big
      0 time exceeded, 0 parameter problem
      0 echos, 0 echo replies
      0 membership query, 0 membership report, 0 membership reduction
      0 Switch solicitations, 0 Switch advertisements
      0 neighbor solicitations, 0 neighbor advertisements, 0 redirect
Sent: 0 total, 0 bandwidth limit
      0 unreachable, 0 packet too big
      0 time exceeded, 0 parameter problem
      0 echos, 0 echo replies
      0 membership query, 0 membership report, 0 membership reduction
      0 Switch solicitations, 0 Switch advertisements
      0 neighbor solicitations, 0 neighbor advertisements, 0 redirect
```

Related command

show ipv6 traffic

2.1.2. debug ipv6 packet

To display the debug information about the IPv6 packet, run the first one of the following two commands:

```
debug ipv6 packet [ interface-type interface-number | access-list [ access-list-name ] ]
```

```
no debug ipv6 packet
```

Parameter

Parameter	Description
<i>Interface-type</i>	Type of the interface (optional)
<i>Interface-number</i>	ID of an interface (optional)
<i>access-list-name</i>	Name of ACL (optional)

Default value

The debug information is closed in default settings.

Command mode

EXEC

Example

The following example shows how to export the IPv6 debug information:

```
Switch# debug ipv6 packet
```

```
2002-1-1 05:07:16
```

```
IPv6: source FE80::A00:3EFF:FE12:3459, dest FF02::1
```

```
    plen 32, proto 58, hops 255
```

```
    sending on Ethernet1/0
```

Field	Description
source	Source address in the IPv6 packet
dest	Destination address in the IPv6 packet
plen	Load length in the IPv6 packet
proto	Protocol for the next header encapsulation, which is presented by next-header in the IPv6 packet
hops	Value of hop-limit in the IPv6 packet
sending (receiving, forwarding) on Ethernet	Displays packet transmission, reception and forwarding on an interface.

Related command

2.1.3. ipv6 cur-hoplimit

Syntax

To configure the maximum hop-limit value in the RA packet and the hop-limit value which is applied in the IPv6 header of all transmitted packets, run the first one of the following two commands:

ipv6 cur-hoplimit *values*

no ipv6 cur-hoplimit *values*

Parameter

Parameter	Description
<i>values</i>	Stands for the maximum value of hop-limit (1-255).

Default value

The default hop-limit is 64.

Command mode

Interface configuration mode

Example

The following example shows how to set the maximum hop-limit value in the RA packet and the hop-limit value which is applied in the IPv6 header of all transmitted packets.

```
Switch_config_v1# ipv6 cur-hoplimit 16
```

2.1.4. ipv6 general-prefix

Syntax

To define a general IPv6 prefix, run the first one of the following two commands:

ipv6 general-prefix *prefix-name ipv6-prefix/prefix-length*

no ipv6 general-prefix *prefix-name ipv6-prefix/prefix-length*

Parameter

Parameter	Description
<i>Prefix-name</i>	Stands for the name of a general prefix.
<i>Ipv6-prefix</i>	Stands for the general IPv6 prefix (that is, the network part of the IPv6 address). This parameter must support the IPv6 address format regulated in RFC2373.
<i>/Prefix-length</i>	Means the IPv6 prefix' length. It is a decimal value behind the symbol "/", meaning the successive bits in the network part in an

	address.
--	----------

Default value

There is no default general prefix.

Command mode

Global configuration mode

Example

The following example shows how to set a general IPv6 prefix:

```
Switch_config# ipv6 general-prefix my-prefix 2001:DB8:2222::/48
```

2.1.5. ipv6 icmp error-interval**Syntax**

To set the minimum interval of ICMPv6 error packet transmission, run the first one of the following two commands. To return to the default setting, use the no form of this command.

ipv6 icmp error-interval *us*

no ipv6 icmp error-interval

Parameters

Parameter	Description
<i>us</i>	Stands for the minimum interval (unit: milisecond).

Default Value

100 miliseconds

Command Mode

Global configuration mode

Usage Guidelines

This command can be used to set the transmission frequency of ICMPv6 error packets.

Example

```
Switch_config# ipv6 icmp error-interval 2000
```

2.1.6. ipv6 mtu**Syntax**

To set the MTU of the VLAN port, run the first one of the following two commands:

ipv6 mtu *bytes*

no ipv6 mtu *bytes*

Parameter

Parameter	Description
<i>bytes</i>	Stands for MTU, whose unit is byte.

Default value

The default value depends on the port type, but the minimum value of any port is 1280 bytes.

Command mode

Interface configuration mode

Usage guidelines

When MTU is the default value, RA has the MTU option.

When a switch forwards packet, a packet will not be fragmented just because the MTU of the egress is smaller than the packet's length. But it will be fragmented only when the transmitted packet is generated.

Example

The following example shows how to set the MTU of a port:

```
Switch_config_v1# ipv6 mtu 2000
```

Related command

```
show ipv6 interface
```

2.1.7. ipv6 redirects

Syntax

To control whether to transmit a redirection packet after the packet is forwarded, run **ipv6 redirects**.

```
ipv6 redirects
```

```
no ipv6 redirects
```

Parameter

Parameter	Description

Default value

The redirection packet will be transmitted by default.

Command mode

Interface configuration mode

Usage guidelines

The redirection packets are transmitted through the ICMPv6 protocol. Because of the limitation of the `ipv6 icmp-ratelimit` command, the redirection packet may not be transmitted.

Example

The following example shows how to shut down a port to transmit the redirection packet.

```
Switch_config_v1# no ipv6 redirects
```

Related command

ipv6 icmp-ratelimit

show ipv6 interface

2.1.8. ipv6 source-route

Syntax

To enable a switch to process the packets with type0 source route, run **ipv6 source-route**.

ipv6 source-route

no ipv6 source-route

Parameter

Parameter	Description

Default value

The type 0 source route is handled in default settings.

Command mode

Global configuration mode

Usage guidelines

If you want to forbid a switch to handle the source routes of type 0, you can use the **no ipv6 source-route** command. After the running of this command, the switch will drop this kind of packets if they are received, and send an ICMPv6 unreachable packet.

Because of the limitation of **ipv6 icmp-ratelimit**, ICMPv6 error packets may not be transmitted.

Example

The following example shows how to disable the processing of source routes of type 0.

```
Switch_config# no ipv6 source-route
```

Related command

ipv6 icmp-ratelimit

2.1.9. ipv6 access-group

Syntax

To filter the receiving and forwarding packets of a port, run `ipv6 access-group`. To disable the function, run `no ipv6 access-group`.

```
ipv6 access-group access-list-name {{ in | out } | [egress] [[[vlan {value | add value | remove value} [egree]] | egree]]}
```

```
no ipv6 access-group {{ in | out } | [egress] [[[vlan [egree]] | egree]]}
```

Parameters

Parameters	Description
<i>access-list-name</i>	<i>access list name</i>
In	<i>filtration direction, receiving packet</i>
Out	<i>filtration direction, forwarding packet</i>
egress	<i>egress direction</i>
value	<i>vlan range, for instance, 1, 2-5</i>

Default Value

Filtration function is not configured by default.

Command Mode

VLAN interface configuration mode, global configuration mode

Usage Guidelines

If the command is configured under the physical interface, the hardware routing switching chip realizes ACL function. If the command is configured under the vlan interface, the software realizes the ACL function.

```
ipv6 access-group access-list-name {in | out}
```

The command in the global configuration mode is:

```
ipv6 access-group access-list-name [[vlan {value | add value | remove value} [egree]] | egree]
```

The command in other available configuration modes is:

```
pv6 access-group access-list-name [egree]
```

Example

The following example shows how to use access list `aacom` to filter received packet on interface `vlan 1`.

```
Switch_config# interface vlan 1
```

```
Switch_config_v1# ipv6 access-group xxcom in
```

The following command enables access list xxcom filters forwarded packet on the port vlan 1, 3-9:

```
Switch_config# ipv6 access-group xxcom vlan add 1, 3-9 egress
```

Related Command

ipv6 access-list

show ipv6 interface

2.1.10. ipv6 unreachable

Syntax

To enable an interface to generate and transmit the ICMPv6 unreachable packets, run **ipv6 unreachable**.

ipv6 unreachable

no ipv6 unreachable

Parameter

Parameter	Description

Default value

The unreachable packets are transmitted by default.

Command mode

Interface configuration mode

Usage guidelines

The unreachable packets are transmitted through the ICMPv6 protocol. Because of the limitation of **ipv6 icmp-ratelimit**, unreachable packets may not be transmitted.

Example

The following example shows how to disable the VLAN interface to transmit the unreachable packets.

```
Switch_config_v1# no ipv6 unreachable
```

Related command

2.1.11. show ipv6 general-prefix

Syntax

To display the detailed information about the general prefix of IPv6, run the following command:

show ipv6 general-prefix**Parameter**

Parameter	Description

Command mode

EXEC

Example

```
Switch_config#show ipv6 general-prefix
IPv6 Prefix my-prefix, acquired via manual
2002::/64
Vlan1 (Address command)
```

Field	Remarks
IPv6 Prefix	Stands for the name of the general IPv6 prefix defined by user.
Acquire via	Stands for the configuration method of the general prefix. At present, the manual configuration and the automatic DHCP obtainment are supported.
Vlan1 (Address command)	Stands for a list of ports that use this general prefix.

Related command**ipv6 general-prefix****2.1.12. show ipv6 pmtu****Syntax**

To display the cache options of path MTU, run the following command:

show ipv6 pmtu**Parameter**

Parameter	Description

Command mode

EXEC

Example

```
Switch_config#show ipv6 pmtu
PMTU Expired Destination Address
00:04:00 2002:1::1
00:01:00 2001:2::2
```

The cache of path MTU stores the path MTU which is applied to reach a destination address. If the to-be-transmitted packets generated by routers or switches are bigger than the path MTU, they will be fragmented during being transmitted.

The switch will create a path MTU record when receiving an ICMPv6 too-big packet.

Field	Remarks
MTU	Stands for the value of the path MTU. It is this MTU that is contained in the received ICMPv6 too-big packet.
Expired	It means expiration. The expiration time starts counting when the ICMPv6 “too-big” packet is received. When the expired parameter is 0, this path MTU record will be deleted.
Destination Address	Stands for the destination address. It is this destination address that is contained in the received ICMPv6 too-big packet.

Related command

```
ipv6 mtu
```

2.1.13. show ipv6 traffic

Syntax

To display the statistics of IPv6 flow, run the following command:

```
show ipv6 traffic
```

Parameter

Parameter	Description

Command mode

```
EXEC
```

2.2. Network Testing Tool Commands

IPv6 Network Testing Tool Commands

- ping6

- traceroute6

2.2.1. ping6

Syntax

To test host accessibility and network connectivity, run the following command. After the ping command is run, an ICMP request message is sent to the destination host, and then the destination host returns an ICMP response message.

```
ping6 host [-a] [-l length] [-n number] [-v] [-w waittime] [-b interval]
```

Parameter

Parameters	Description
<i>host</i>	The destination host address or the host name
-a	icmp echo request packets are forwarded continuously until the user stops it manually.
-l length	Sets the length of ICMP data in the message. Default: 56 bytes
-n number	Sets the total number of messages. Default: 5 messages
-w waittime	Time for each message to wait for response Default: 2 seconds
-b interval	Sets the time interval of sending ping packet. Unit: 10ms; Value range: 0-65535; Default Value: 0.

Command Mode

EXEC and global configuration mode

Usage Guidelines

Press the Q key to stop the ping command.

Simple output is adopted by default.

Parameters	Description
!	A response message is received.
.	Response message is not received in the timeout time.
U	The message that the ICMP destination cannot be reached is received.

R	The ICMP redirection message is received.
T	The ICMP timeout message is received.
P	The ICMP parameter problem message is received.

The statistics information is exported:

Parameters	Description
packets transmitted	Number of transmitted messages
packets received	Number of received response messages, excluding other ICMP messages
packet loss	Rate of messages that are not responded to
round-trip min/avg/max	Minimum/average/maximum time of a round trip (ms)

The routing OLT supports the destination address to be link-local address or the multicast address. When ping this address, the vlan port must be specified at the end and forward ICMP packets on the specified port. The routing OLT is to export the addresses of all response hosts.

Example

```
switch#ping6 2008::2 -l 10000 -n 30
PING 2008::2 (2008::2): 10000 data bytes
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
--- 2008::2 ping6 statistics ---
30 packets transmitted, 30 packets received, 0% packet loss
round-trip min/avg/max = 0/1/20 ms
ping multicast address:
switch#ping6 ff02::1 vlan 1 -n 2
PING 1 (FF02:1B::1): 56 data bytes
Reply to request 0 from FE80::2E0:FFF:FEDB:583F, <10 ms
Reply to request 0 from FE80::1EAF:F7FF:FE35:D02A, 10 ms
Reply to request 1 from FE80::2E0:FFF:FEDB:583F, <10 ms
Reply to request 1 from FE80::1EAF:F7FF:FE35:D02A, 10 ms
```

2.2.2. traceroute6

Syntax

To detect which routes have already reached the destination, run the following command.

You can transmit to the destination the UDP packets (or ICMP ECHO packets) of different TTLs to confirm which routes have come to the destination. Each router on this path has to deduct 1 from the TTL value before forwarding ICMP ECHO packets. Speaking from this aspect, TTL is an effective hop count. When the TTL value of a packet is deducted to zero, the router sends back to the source system the ICMP timeout message. Send the first response packet whose TTL is 1 and send TTL plus 1 subsequently until the target reaches to the max TTL.

By checking the ICMP timeout message sent back by inter medial routers, you can confirm the routers. At the arrival of the destination, the traceroute sends a UDP packet whose port ID is larger than 30000; the destination node hence can only transmit back a Port Unreachable ICMP message. This reception of this message means the arrival of destination.

```
traceroute6 host [-i source-ip-address] [-p port-number] [-q probe-count] [-t ttl] [-w waittime] [-x icmp]
```

Parameters

Parameters	Description
<i>host</i>	The destination host address or the host name
-i <i>source-ip-address</i>	Sets the source address.
-p <i>port-number</i>]	Sets the ID of destination port that transmits UDP packets. Default value: 33434 Default: 33434
-q <i>probe-count</i>	Sets the number of packets that you detect each time. Default: 3 messages
-t <i>ttl</i>	Sets IP TTL of the message to ttl. Default: the minimum and maximum TTLs are 1 and 30 respectively.
-w <i>waittime</i>	Time for each message to wait for response Default: 3 seconds
-x <i>icmp</i>	Sets the detection packet to be the ICMP ECHO packet. Default: UDP packet

Command Mode

EXEC and global configuration mode

Usage Guidelines

The UDP packet is used for detection by default, but you can run `- x icmp` to replace it with ICMP ECHO for detection.

If you want to stop traceroute, press q or Q. By default, the simple output information is as follows.

Simple output is adopted by default.

Parameters	Description
!N	Receives ICMP destination unreachable packets (route unreachable, code: 0)
!P	Receives ICMP destination unreachable packets (management forbid, code: 1)
!S	Receives ICMP destination unreachable packets (not neighbor, code: 2)
!A	Receives ICMP destination unreachable packets (address unreachable, code: 3)
!	Receives ICMP destination unreachable packets (port unreachable, code: 4)

The statistics information is exported:

Parameters	Description
hops max	Means the maximum detection hops (the threshold of ICMP).
byte datalen	Stands for the size of each detection packet.

Example

```
switch#traceroute6 2008::2
tracert6 to 2008::2, 30 hops max, 12 byte datalen
1 2008::2 0 ms * 0 ms
```

CHAPTER 3 RTV6 CONFIGURATION COMMANDS

3.1. rtv6 Configuration Commands

- debug ipv6 routing
- ipv6 route default
- ipv6 route equal-cost-paths
- ipv6 route max-number
- ipv6 route
- show ipv6 route
- ipv6 exf
- debug ipv6 fib exf
- ipv6 unicast-routing

3.1.1. debug ipv6 routing

Syntax

To trace ipv6-routing process, run **debug ipv6 routing**. To disable this feature, use the no form of the command.

```
debug ip routing [ message | search | timer ]
```

```
no debug ip routing [ message | search | timer ]
```

Parameter

message (optional) trace the receiving and forwarding of the routing information

search (optional) trace the search of route

timer (optional) trace routing clock information

Default value

No default behavior or values.

Command Mode

EXEC

Usage Guidelines

This command can be used to trace the main procedures of RIPNG.

Example

The following example shows the routing processing information.

Add an ipv6 address to interface e0/1

```
Router#debug ipv6 routing
```

```
2004-1-1 22:53:50 Rtv6: Receive msg NSM_MSG_ADDR_ADD[e0/1: aid=0, net=fc01::1/64] from Ipv6.
```

2004-1-1 22:53:50 Rtv6: Send msg NSM_MSG_ADDR_ADD[e0/1: aid=0, net=fc01::1/64] to PMs.

2004-1-1 22:53:50 Rtv6: Receive msg NSM_MSG_ROUTE_ADD[fc01::1/128] from PM Direct.

2004-1-1 22:53:50 Rtv6: Direct add fc01::1/128 to main routing table.

2004-1-1 22:53:50 Rtv6: Send msg NSM_MSG_ROUTE_CHG_NOTIFY[Add : fc01::1/128] to PMs.

2004-1-1 22:53:50 Rtv6: Receive msg NSM_MSG_ROUTE_ADD[fc01::/64] from PM Direct.

2004-1-1 22:53:50 Rtv6: Direct add fc01::/64 to main routing table.

2004-1-1 22:53:50 Rtv6: Send msg NSM_MSG_ROUTE_CHG_NOTIFY[Add: fc01::/64] to PMs.

Related Commands

None

3.1.2. ipv6 route default

Syntax

To configure ipv6 default route, **runipv6 route default**. To disable this feature, use the no form of the command.

ipv6 route default [Ethernet | Serial | Null | X:X:X:X::X]

no ipv6 route default

Parameter

Ethernet:	Ethernet interface
Serial:	synchronous/asynchronous serial interface
Null:	Null interface
X:X:X:X::X	gateway address

Default value

No default behavior or values.

Command mode

Global configuration

Usage Guidelines

No default behavior or values.

Example

None

Related Commands

None

3.1.3. ipv6 route equal-cost-paths

Syntax

To configure the equivalent maximum item of ipv6 route equal-cost-paths, run **ipv6 route equal-cost-paths**. To delete the configuration, run the no form of the command.

ipv6 route equal-cost-paths *value*

no ipv6 route equal-cost-paths

Parameter

value corresponding items(<1~6>)

Default value

The equivalent routing items are 6

Command mode

Global configuration

Usage Guidelines

None

Example

None

Related Commands

None

3.1.4. ipv6 route max-number

Syntax

To configure the maximum routing item, run **ipv6 route max-number**. To disable this feature, use the no form of the command.

pv6 route max-number {**value1** | static **value2** | dynamic **value3** }

Parameter

value1: max route number

value2: max static route number

value3: max dynamic route number

Default value

The maximum route number is 128000.

The maximum static route number is 10000.

The maximum dynamic route number is 64000.

Command mode

Global configuration

Usage guidelines

None

Example

None

Related commands

None

3.1.5. ipv6 route

Syntax

To configure the static route, run **ipv6 route**. To disable this feature, use the no form of the command.

```
ipv6 route dest_address { Ethernet | Serial | Null | gateway_address } [distance]
```

```
no ipv6 route
```

Parameter

<code>dest_address:</code>	destination address(X:X:X:X::X/<0-128>)
<code>Ethernet:</code>	Ethernet interface
<code>Serial:</code>	synchronous/asynchronous serial interface
<code>Null:</code>	Null interface
<code>Gateway_address</code>	gateway address (X:X:X:X::X)
<code>Distance:</code>	management distance

Default value

No default behavior or values.

Command mode

Global configuration

Usage guidelines

None

Example

None

Related commands

None

3.1.6. show ipv6 route

Syntax

To show the route details, run **show ipv6 route**.

```
show ipv6 route [ all | bgp | connect | information | ospf | rip | static | summary |  
dest_address | <cr> ]
```

Parameter

All:	show all routes in the routing table
Bgp	show BGP protocol route
Connect	show direct route
Information	show route information
Ospf	show OSPF protocol route
Rip	show rip protocol route
Static	show static route
Summary	show the summary of the routing table
Dest_address	show all routes of destination IPv6 address (format: X:X:X:X::X)

Default value

No default behavior or values.

Command mode

Global configuration, EXE

Usage guidelines

None

Example

None

Related commands

None

Example

```
Switch#show ipv6 traffic
```

IPv6 statistics:

Rcvd: 0 total, 0 local destination

0 badhdrs, 0 badvers

0 tooshort, 0 toosmall, 0 toomanyhdrs

0 source-routed, 0 badscope

0 badopts, 0 unknowopts, 0 exthdrtoolong

0 fragments, 0 total reassembled

0 reassembly timeouts, 0 reassembly failures

Sent: 25 generated, 0 forwarded, 0 cant forwarded

0 fragmented into 0 fragments, 0 failed

0 no route

Mcast: 0 received, 25 sent

ICMP statistics:

Rcvd: 25 total, 0 format errors, 0 checksum errors
0 unreachable, 0 packet too big
0 time exceeded, 0 parameter problem
0 echos, 0 echo replies
0 membership query, 0 membership report, 0 membership reduction
0 Switch solicitations, 0 Switch advertisements
0 neighbor solicitations, 0 neighbor advertisements, 0 redirect

Sent: 0 total, 0 bandwidth limit
0 unreachable, 0 packet too big
0 time exceeded, 0 parameter problem
0 echos, 0 echo replies
0 membership query, 0 membership report, 0 membership reduction
0 Switch solicitations, 0 Switch advertisements
0 neighbor solicitations, 0 neighbor advertisements, 0 redirect

Related command

clear ipv6 traffic

3.1.7. ipv6 exf

Syntax

To enable ipv6 hardware subnet routing function, run the following command. To return to the default setting, use the no form of this command.

ipv6 exf [value]

[no] ipv6 exf

Parameter

Value: Auto-restart percentage of exf.

Default value

Enabled (The default is 90)

Command mode

Global configuration mode

Usage guidelines

The command is used to enable IPV6 hardware subnet routing function. When the routing number exceeds the capacity of hardware table, the hardware table will be automatically shut down. Then, if the routing number continues to decrease to a number below value% of the hardware table capacity, the hardware table will be restarted automatically.

Example

The following example shows how to enable IPV6 hardware subnet routing.

```
Switch_config#ipv6 exf
```

Related commands

None

3.1.8. debug ipv6 fib exf

Syntax

To enable ipv6 exf, run the following command.

```
[no] debug ipv6 fib exf
```

Parameter

None

Default value

Disabled

Command mode

Management mode

Usage guidelines

The command is used to show how rtv6 inform ipv6 to add and delete the hardware table.

Example

None

Related command

None

3.1.9. ipv6 unicast-routing

Syntax

To enable ipv6 unicast routing function, run the following command.

```
[no] ipv6 unicast-routing
```

Parameter

None

Default value

Disabled

Command mode

Global configuration mode

Usage guidelines

The command is used to inform other modules to enable ipv6 routing function. Generally speaking, this command is a precondition of ipv6 function.

Example

None

Related command

None