



GEL-2060

IPv6 Configuration Commands

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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`

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 prefix-name, 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

Instruction

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 2001:0:0:0DB8:800:200C:417A/64

Related command

ipv6 address anycast

ipv6 address eui-64

ipv6 address link-local

show ipv6 interface

1.1.2 ipv6 address anycast

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-prefix</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

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

Command mode

Interface configuration mode

Instruction

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

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

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-prefix</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

Instruction

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

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

Instruction

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

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

Instruction

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

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

Instruction

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 icmp6-ratelimit
- ipv6 mtu
- ipv6 redirect
- ipv6 source-route
- show ipv6 pmtu
- show ipv6 traffic

2.1.1 clear ipv6 traffic

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

clear ipv6 traffic

Parameter

Parameter	Description

Command mode

EXEC

Instruction

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

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

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-ratelimit

To set the minimum interval of ICMPv6 error packet transmission, run the first one of the following two commands:

ipv6 icmp-ratelimit *us*

no ipv6 icmp-ratelimit

Parameter

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

Default value

1000 miliseconds

Command mode

Global mode

Instruction

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

Example

```
Switch_config# ipv6 icmp6-ratelimit 2000
```

2.1.6 ipv6 mtu

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

Instruction

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

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

Instruction

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

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

Instruction

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 traffic-filter

To filter the received or transmitted packets on an interface, run the first one of the following two commands:

ipv6 traffic-filter *access-list-name* { in | out }

no ipv6 traffic-filter { in | out }

Parameter

Parameter	Description
<i>access-list-name</i>	Stands for the name of the ACL.
In	Filters the incoming packets.
Out	Filters the outgoing packets.

Default value

The filtration function is not set by default.

Command mode

Interface configuration mode

Instruction

Example

The following example shows how to use the ACL to filter packets when interface vlan1 receives the packets.

```
Switch_config_v1# ipv6 traffic-filter in
```

Related command

Ipv6 access-list

Show ipv6 interface

2.1.10 ipv6 unreachable

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

Instruction

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

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

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

1300 00:04:00 2002:1::1

1280 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

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

show ipv6 traffic

Parameter

Parameter	Description

Command mode

EXEC

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