FSOS

Ethernet Port Configuration

Contents

1. Ethernet Port Configuration

This chapter describes the types of interfaces on switches and how to configure them.

1.1 Ethernet Port Overview

1.1.1 Link Type of Ethernet Ports

An Ethernet port can operate in one of the three link types:

➢ Access: An access port only belongs to one VLAN, normally used to connect user device.

➢ Trunk: A trunk port can belong to more than one VLAN. It can receive/send packets from/to multiple VLANs and is generally used to connect another switch. The packet sent from this port can only be with tag label.

➢ Hybrid: A hybrid port can belong to multiple VLANs, can receive, or send packets for multiple VLANs, used to connect either user or network devices. It allows packets of multiple VLANs to be sent with or without the tag label

1.1.2 Configuring Default VLAN ID for an Ethernet Port

Both hybrid port and trunk port can belong to more than one VLAN, but there is a default VLAN for each port. The default VLAN ID (PVID) is VLAN 1 and it can be changed if necessary (the way to change PVID refers to Table 1-5)

1.1.3 Handling Packets

Different ports have different ways to handle the packet. Details are in Table 1-1.

Table 1-1 Different port handles different packet

Port	Ingress		Egress
type	Untagged	Tagged packet	

1

	packet		
Access port	Receive it and add a tag with VID being equal to PVID.	If VID of the packet is equal to the port permitted VID, receive it; if VID is different, discard it.	Strip the Tag and transmit the packet as the VID of the packet is equal to the port permitted VID
Hybrid port			If VID of the packet is equal to the port permitted untag VID, remove the tag and transmit it; If VID of the packet is equal to the port permitted tag VID, keep the tag and transmit it.
Trunk port			If VID of the packet is equal to the port permitted VID, keep the tag and transmit it.

1.2   Configure Ethernet Port

Ethernet port configuration includes:

➢   Basic Ethernet Port Configuration

➢   Combo port

➢   Enable/disable ingress filtering

➢   Acceptable-frame type for Ethernet port

➢   Enable/Disable Flow Control for Ethernet Port

➢   Display and Debug Ethernet Port

1.2.1   Basic Ethernet Port Configuration

Basic Ethernet port configuration includes:

➢   Enter interface configuration mode

➢   Enter interface range mode

2

➢   Basic port configuration

➢ Configure default VLAN

➢ Add a port to a VLAN

➢ Basic port configuration

1.2.1.1 Enter Interface Configuration Mode

Before configuring the Ethernet port, enter interface configuration mode first.

Perform the following configuration in privileged mode.

Table 1-2 Enter interface configuration mode

Step	Command	Description
1	**configure terminal**	Enter global configuration mode.
2	**interface ethernet** { *device-num/slot-num/port-num* }	Enter interface configuration mode.

📖 **Note:**

The details of the parameters in Table 1-2 are in Interface list.

1.2.1.2 Enter Interface Range Mode

Sometimes we need to configure a patch of ports with the same configurations. We can use interface range mode to avoid the repetition. Perform the following configuration in privileged mode.

Table 1-3 Enter interface range mode

Step	Command	Description
1	**configure terminal**	Enter global configuration mode.
2	**interface range** *interface-list*	Enter interface range configuration mode.

3

Example:

! Divide interfaces from Ethernet 0/0/1 to Ethernet 0/0/16 into an interface range.

Switch(config)#interface range ethernet 0/0/1 to ethernet 0/0/16

Switch(config-if-range)#

1.2.1.3 Configure Port Mode

Table 1-4 Configure port mode

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	
Enter interface configuration mode	**interface ethernet** *device-num/slot-num/port-num*	
Configure port mode to be Access, Hybrid or Trunk	**switchport mode** {*access*|*hybrid*|*trunk*}	
Show port mode	**show interface ethernet** *device-num/slot-num/port-num*	

Example:

! There is VLAN 1-20. Configure uplink port e 0/1/1 to be trunk, and it can transceive packets of VLAN1-20

Switch(config)#vlan 2-20

Switch(config-if-vlan)#interface ethernet 0/1/1

Switch(config-if-ethernet-0/1/1)#switchport mode trunk

Switch(config-if-ethernet-0/1/1)#switchport trunk allowed vlan 2-20

Switch(config-if-ethernet-0/1/1)# show interface brief ethernet 0/1/1

Port	Desc	Link	shutdn	Speed	Pri	PVID	Mode	TagVlan	UtVlan
e0/1/1		down	FALSE	auto	0	1	trk	2-20	1

Total entries: 1 .

1.2.1.4 Configure Default VLAN

Table 1-5 Configure default VLAN

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	

4

Enter interface configuration mode	**interface ethernet** *device-num/slot-num/port-num*	
Modify port default VLAN	**switchport default vlan** *vlan_id*	

Example:

! The first four ports (e 0/0/1 – e0/0/4) connect to different server. These four servers should be isolated. And the servers belong to VLAN 10,VLAN 20,VLAN 30 and VLAN 40

Switch(config)#vlan 10

Switch(config-if-vlan)#switchport ethernet 0/0/1

Add VLAN port   successfully.

Switch(config-if-vlan)#vlan 20

Switch(config-if-vlan)#switchport ethernet 0/0/2

Add VLAN port   successfully.

Switch(config-if-vlan)#vlan 30

Switch(config-if-vlan)#switchport ethernet 0/0/3

Add VLAN port   successfully.

Switch(config-if-vlan)#vlan 40

Switch(config-if-vlan)#switchport ethernet 0/0/4

Add VLAN port   successfully.

Switch(config-if-vlan)#interface ethernet 0/0/1

Switch(config-if-ethernet-0/0/1)#switchport default vlan 10

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

Switch(config-if-ethernet-0/0/2)#switchport default vlan 20

Switch(config-if-ethernet-0/0/2)#interface ethernet 0/0/3

Switch(config-if-ethernet-0/0/3)#switchport default vlan 30

Switch(config-if-ethernet-0/0/3)#interface ethernet 0/0/4

Switch(config-if-ethernet-0/0/4)#switchport default vlan 40

Switch(config-if-ethernet-0/0/4)#vlan 1

Switch(config-if-vlan)#no switchport ethernet 0/0/1 to ethernet 0/0/4

Switch(config-if-vlan)#show interface brief e 0/0/1 to e 0/0/4

Port	Desc	Link shutdn Speed		Pri PVID Mode TagVlan	UtVlan
e0/0/1		down false	auto	0 10 hyb	10
e0/0/2		down false	auto	0 20 hyb	20
e0/0/3		down false	auto	0 30 hyb	30
e0/0/4		down false	auto	0 40 hyb	40

Total entries: 4 .

1.2.1.5 Add a Port to a VLAN

User can add current ethernet port to a specific VLAN, thus, the ethernet port can forward packet of the vlan.

Hybrid port and Trunk port can belong to multiple VLANs and Access port can only belong to one VLAN, which is the default vlan. By default, all ports belong to VLAN 1.

In VLAN configuration mode, user can use switchport ethernet command to add a port to vlan, please refer to "VLAN configuration" chapter.

There is another way to add port to a vlan, in interface configuration mode.

Table 1-6 Add a port to a VLAN

Operation	Command	Remarks
Enter global configuration mode	**configure terminal**	
Enter interface configuration mode	**interface ethernet** *device-num/slot-num/port-num*	
Add Hybrid port to specific VLAN and keep the packet VID	**switchport hybrid tagged vlan** *vlan-list*	
Add Hybrid port to specific VLAN and strip the packet VID	**switchport hybrid untagged vlan** *vlan-list*	
Delete Hybrid port from specific VLAN	**no switchport hybrid vlan** *vlan-list*	
Add Trunk port to specific VLAN	**switchport trunk allowed vlan** *vlan-list*	
Delete Trunk port from specific VLAN	**no switchport trunk allowed vlan** *vlan-list*	

There are two ways to add an Access port to VLAN: one is to configure port default VLAN; the other is to add the port to another VLAN directly. Access port can only belong to one VLAN, so this port will be auto-deleted from the original VLAN.

Example:

e 0/0/1 is Hybrid. Configure this port keeping tag of VLAN 10.

Switch(config)#vlan 10

Switch (config-if-vlan)#interface ethernet 0/0/1

Switch (config-if-ethernet-0/0/1)#switchport hybrid tagged vlan 10

Switch (config-if-ethernet--0/0/1)#show interface brief   e 0/0/1

Port   Desc   Link shutdn Speed   Pri PVID Mode TagVlan   UtVlan

e0/0/1   down false   auto   0   1   hyb   10   1

Total entries: 1 .

1.2.1.6 Basic Port Configuration

Following basic port configurations are in the interface configuration mode.

Table 1-7 Basic port configuration

Operation	Command	Description
Disable specific port	**shutdown**	By default, the port is enabled. If you want to re-enable the port, use **no shutdown** command.
Configure duplex of a port	**duplex** { auto | full | half } **no duplex**	10/100/1000BASE-T supports full duplex, half duplex and auto-negotiation; 1000BASE-X supports full duplex and auto-negotiation. By default, the working mode is auto. If duplex is auto, the speed will be auto.
Configure speed of a port	**speed** { *speed-value* |	10/100/1000BASE-T supports 10Mbps, 100Mbps and 1000Mbps; 1000BASE-X

	auto } **no speed**	supports only 1000Mbps. By default, the speed is auto. If the speed is auto, the duplex will be auto.
Configure priority of a port	**priority** *priority-value* **no priority**	*Priority-value* could be 0 to 7 and the default interface priority is 0. The larger the priority value is, the higher the priority is. And the packet with the higher priority will be quickly handled.
Configure port description	**description** *description-list*	The description is used to distinguish ports. By default, the description of a port is empty.

1.2.2   Combo Port

A combo port is formed by two Ethernet ports on the panel, one of which is an optical port and the other is an electrical port. For the two ports forming a combo port, only one works at a given time. They are TX-SFP multiplexed. You can specify a combo port to operate as an electrical port or an optical port as needed. That is, a combo port cannot operate as both an electrical port and an optical port simultaneously.

Generally, if both electrical port and optical port are all inserted, only electrical port can work. If the user wants to use optical port, please unplug the electrical port.

1.2.3   Enable/Disable Ingress Filtering

If ingress filtering is enabled, the received 802.1Q packets which do not belong to the VLAN where the interface locates will be dropped. The packet will not be dropped if the function is disabled and the VLAN which the packet belonged to is existed.

Perform the following configuration in global configuration mode.

Table 1-8 Enable/disable ingress filtering

Operation	Command

Enable ingress filtering	**ingress filtering**
Disable ingress filtering	**no ingress filtering**

Note:

By default, ingress filtering is enabled.

Example:

! Disable VLAN ingress filtering

Switch(config)#no ingress filtering

Disable ingress filtering successfully!

! Enable VLAN ingress filtering

Switch(config)#ingress filtering

Enable ingress filtering successfully!

1.2.4 Acceptable-Frame Type for Ethernet Port

We can configure ingress acceptable frame mode to be all types or only tagged. The untagged

frame will not be accepted after the port setting to be only tagged.

Perform the following configuration in interface configuration mode.

Table 1-9 **Configure ingress acceptable-frame**

Operation	Command
Enable ingress acceptable-frame	**ingress acceptable-frame** { all | tagged }
Disable ingress acceptable-frame	**no ingress acceptable-frame**

Note:

By default, ingress acceptable-frame is all.

Example:

! Configure Ethernet 0/0/5 only to receive tagged frame

Switch(config)#interface ethernet 0/0/5

Switch(config-if-ethernet-0/0/5)#ingress acceptable-frame tagged

Config acceptable-frame type successfully!

! Restore the default ingress acceptable-frame of Ethernet 0/0/5

Switch(config)#interface ethernet 0/0/5

Switch(config-if-ethernet-0/0/5)#no ingress acceptable-frame

Config acceptable-frame type successfully!

1.2.5   Enable/Disable Flow Control for Ethernet Port

After enabling flow control in both the local and the peer switch, if congestion occurs in the local switch, the switch will inform its peer to pause packet sending. Once the peer switch receives this message, it will pause packet sending, and vice versa. In this way, packet loss is reduced effectively. The flow control function of the Ethernet port can be enabled or disabled through the following command.

Perform the following configuration in interface configuration mode.

Table 1-10   Enable/Disable Flow Control for Ethernet Port

Option	Command
Enable Ethernet port flow control	**flow-control**
Disable Ethernet port flow control	**no flow-control**

Note:

By default, Ethernet port flow control is disabled.

Example:

! Enable flow-control on ethernet 0/0/5

Switch(config)#interface ethernet 0/0/5

Switch(config-if-ethernet-0/0/5)#flow-control

Setting successfully! flow-control is enable   10

! Disable flow-control on ethernet 0/0/5

Switch(config)#interface ethernet 0/0/5

Switch(config-if-ethernet-0/0/5)#no flow-control

Setting successfully! flow-control is disable

1.2.6   Display and Debug Ethernet Port

After the above configuration, execute show command in any configuration mode to display the

running of the ethernet port configuration, and to verify the effect of the configuration.

Execute clear interface command in user mode to clear the statistics information of the port.

Table 1-11 Display and debug Ethernet port

Operation	Command	Description
Clear the statistics information of the port.	**clear interface** [*interface-num* | slot-num]	The information of the interface includes: numbers of unicast, multicast and broadcast message etc.
Display interface description.	**show description interface** [*interface-list*]	
Display port configuration	**show interface** [*interface-num*]	
Display the statistic information of specified port or all ports.	**show statistics interface** [*interface-num*]	
Display the statistic information of all	**show statistic dynamic interface**	Statistic information refreshes automatically

interfaces		every 3 seconds. Press "Enter" to exit.
Display the utilization information of all ports	**show utilization interface**	The utilization information of all ports includes receiving and sending speed, bandwidth utilization rate, etc. Press "Enter" to exit.

Note:

Using **clear interface** command in global mode, if the interface-num and slot-num are not assigned, the information of all interfaces is cleared. If the slot-num is assigned, the port information of the assigned slot is cleared. In interface mode, only the information of the current port can be cleared.

If port type and port number are not specified, the above command displays information about all ports. If both port type and port number are specified, the command displays information about the specified port.

Example:

! Show description of all port

Switch(config-if-ethernet-0/0/1)#show description interface

Port   description

e0/0/1   test

e0/0/2

e0/0/3   XXXX

e0/0/4

e0/0/5

……

! Show interface Ethernet 0/0/5

Switch(config-if-ethernet-0/0/1)#show interface ethernet 0/0/5

Ethernet e0/0/5 is enabled, port link is down

  Hardware is Fast Ethernet, Hardware address is 00:0a:5a:11:b5:71

  SetSpeed is auto, ActualSpeed is unknown, porttype is 10/100/1000M

  Priority is 0

  Flow control is disabled

  PVID is 1

  Port mode:hybrid

   Tagged   VLAN ID :

   Untagged VLAN ID : 1

  0 packets output

   0 bytes, 0 unicasts, 0 multicasts, 0 broadcasts

  0 packets input

   0 bytes, 0 unicasts, 0 multicasts, 0 broadcasts

! Show statistic interface ethernet 0/0/2

Switch(config-if-ethernet-0/0/1)#show statistics interface ethernet 0/0/2

Port number   :   e0/0/2

input rate 0 bits/sec, 0 packets/sec

output rate 0 bits/sec, 0 packets/sec

64 byte packets:0

65-127 byte packets:0

128-255 byte packets:0

256-511 byte packets:0

512-1023 byte packets:0

1024-1518 byte packets:0

0 packets input, 0 bytes , 0 discarded packets

0 unicasts, 0 multicasts, 0 broadcasts

0 input errors, 0 FCS error, 0 symbol error, 0 false carrier

0 runts, 0 giants   13

0 packets output, 0 bytes, 0 discarded packets

0 unicasts, 0 multicasts, 0 broadcasts

0 output errors, 0 deferred, 0 collisions

0 late collisions

Total entries: 1.

! Show statistic dynamic interface

Switch(config-if-ethernet-0/0/1)#show statistics dynamic interface

Port Statistics   Sat Jan 1 00:39:37 2000

port	link Status	Tx Pkt Count	Tx Byte Count	Rx Pkt Count	Rx Byte Count	Rx Bcast	Rx Mcast
e0/0/1	down	0	0	0	0	0	0
e0/0/2	down	0	0	0	0	0	0
e0/0/3	down	0	0	0	0	0	0
e0/0/4	down	0	0	0	0	0	0
e0/0/5	down	0	0	0	0	0	0
e0/0/6	down	0	0	0	0	0	0
e0/0/7	down	0	0	0	0	0	0
e0/0/8	down	0	0	0	0	0	0
e0/0/9	down	0	0	0	0	0	0
e0/0/10	down	0	0	0	0	0	0
e0/0/11	down	0	0	0	0	0	0
e0/0/12	down	0	0	0	0	0	0
e0/0/13	down	0	0	0	0	0	0
e0/0/14	down	0	0	0	0	0	0
e0/0/15	down	0	0	0	0	0	0
e0/0/16	down	0	0	0	0	0	0
e0/0/17	down	0	0	0	0	0	0

===========0->Clear Counters   U->page up 14D->page down CR->exit===========

! Show utilization interface

Switch(config-if-ethernet-0/0/1)#show utilization interface

Link Utilization Averages   Sat Jan 1 00:43:44 2000

port	link Status	Receive pkts/sec	Peak Rx pkts/sec	Transmit pkts/sec	Peak Tx pkts/sec
e0/0/1	down	0	0	0	0
e0/0/2	down	0	0	0	0
e0/0/3	down	0	0	0	0
e0/0/4	down	0	0	0	0
e0/0/5	down	0	0	0	0
e0/0/6	down	0	0	0	0
e0/0/7	down	0	0	0	0
e0/0/8	down	0	0	0	0
e0/0/9	down	0	0	0	0
e0/0/10	down	0	0	0	0
e0/0/11	down	0	0	0	0
e0/0/12	down	0	0	0	0
e0/0/13	down	0	0	0	0
e0/0/14	down	0	0	0	0
e0/0/15	down	0	0	0	0
e0/0/16	down	0	0	0	0
e0/0/17	down	0	0	0	0

====spacebar->toggle screen U->page up   D->page down CR->exit====

! Clear interface

Switch(config-if-ethernet-0/0/1)#clear interface

clear current port statistics information record successfully !