



# CLI Reference Guide

**T3700G-28TQ**

**JetStream 28-Port Gigabit Stackable L3  
Managed Switch**



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## Preface

This Guide is intended for network administrator to provide referenced information about CLI (Command Line Interface). The device mentioned in this Guide stands for T3700G-28TQ JetStream 28-Port Gigabit Stackable L3 Managed Switch.

### Overview of this Guide

#### Chapter 1: Using the CLI

Provide information about how to use the CLI, CLI Command Modes, Security Levels and some Conventions.

#### Chapter 2: User Interface

Provide information about the commands used to switch between five CLI Command Modes.

#### Chapter 3: Stack

Provide information about the commands used for configuring stack.

#### Chapter 4: IEEE 802.1Q VLAN Commands

Provide information about the commands used for configuring IEEE 802.1Q VLAN.

#### Chapter 5: MAC-based VLAN Commands

Provide information about the commands used for configuring MAC-based VLAN.

#### Chapter 6: Protocol VLAN Commands

Provide information about the commands used for configuring Protocol VLAN.

#### Chapter 7: VLAN-VPN Commands

Provide information about the commands used for configuring VLAN-VPN (Virtual Private Network) function.

#### Chapter 8: Voice VLAN Commands

Provide information about the commands used for configuring Voice VLAN.

#### Chapter 9: Private VLAN Commands

Provide information about the commands used for configuring Private VLAN.

#### Chapter 10: GVRP Commands

Provide information about the commands used for configuring GVRP (GARP VLAN registration protocol).

#### Chapter 11: EtherChannel Commands

Provide information about the commands used for configuring LAG (Link Aggregation Group) and LACP (Link Aggregation Control Protocol).

**Chapter 12: User Manage Commands**

Provide information about the commands used for user management.

**Chapter 13: Binding Table Commands**

Provide information about the commands used for binding the IP address, MAC address, VLAN and the connected Port number of the Host together.

**Chapter 14: ARP Inspection Commands**

Provide information about the commands used for protecting the switch from the ARP cheating or ARP Attack.

**Chapter 15: IP Verify Source Commands**

Provide information about the commands used for guarding the IP Source by filtering the IP packets based on the IP-MAC Binding entries.

**Chapter 16: DoS Defend Command**

Provide information about the commands used for DoS defend and detecting the DoS attack.

**Chapter 17: IEEE 802.1X Commands**

Provide information about the commands used for configuring IEEE 802.1X function.

**Chapter 18: System Log Commands**

Provide information about the commands used for configuring system log.

**Chapter 19: SSH Commands**

Provide information about the commands used for configuring and managing SSH (Security Shell).

**Chapter 20: SSL Commands**

Provide information about the commands used for configuring and managing SSL (Secure Sockets Layer).

**Chapter 21: MAC Address Commands**

Provide information about the commands used for Address configuration.

**Chapter 22: System Configuration Commands**

Provide information about the commands used for configuring the System information and System IP, reboot and reset the switch, upgrade the switch system and commands used for device diagnose, including loopback test and cable test.

**Chapter 23: Ethernet Configuration Commands**

Provide information about the commands used for configuring the Bandwidth Control, Negotiation Mode, and Storm Control for ethernet ports.

**Chapter 24: QoS Commands**

Provide information about the commands used for configuring the QoS function.

**Chapter 25: Port Mirror Commands**

Provide information about the commands used for configuring the Port Mirror function.

**Chapter 26: Port Isolation Commands**

Provide information about the commands used for configuring Port Isolation function.

**Chapter 27: Loopback Detection Commands**

Provide information about the commands used for configuring the Loopback Detection function.

**Chapter 28: ACL Commands**

Provide information about the commands used for configuring the ACL (Access Control List).

**Chapter 29: MSTP Commands**

Provide information about the commands used for configuring the MSTP (Multiple Spanning Tree Protocol).

**Chapter 30: IGMP Commands**

Provide information about the commands used for configuring the IGMP Snooping (Internet Group Management Protocol Snooping).

**Chapter 31: SNMP Commands**

Provide information about the commands used for configuring the SNMP (Simple Network Management Protocol) functions.

**Chapter 32: LLDP Commands**

Provide information about the commands used for configuring LLDP function.

**Chapter 33: Cluster Commands**

Provide information about the commands used for configuring the Cluster Management function.

**Chapter 34: Static Routes Commands**

Provide information about the commands used for configuring the Static Route function.

**Chapter 35: DHCP Server Commands**

Provide information about the commands used for configuring the DHCP Server function.

**Chapter 36: DHCP Relay Commands**

Provide information about the commands used for configuring the DHCP Relay function.

**Chapter 37: Proxy ARP Commands**

Provide information about the commands used for configuring the Proxy ARP function.

**Chapter 38: IGMP Commands**

Provide information about the commands used for configuring the IGMP function.

**Chapter 39: PIM Commands**

Provide information about the commands used for configuring the PIM function.

**Chapter 40: Static Multicast Routing Commands**

Provide information about the commands used for configuring the Static Multicast Routing function.

**Chapter 41: VRRP Commands**

Provide information about the commands used for configuring the VRRP function.

**Chapter 42: RIP Commands**

Provide information about the commands used for configuring the RIP function.

**Chapter 43: OSPF Commands**

Provide information about the commands used for configuring the OSPF function.



# Chapter 1 Using the CLI

## 1.1 Accessing the CLI

You can log on to the switch and access the CLI by the following three methods:

1. Log on to the switch by the console port on the switch.
2. Log on to the switch remotely by a Telnet connection through an Ethernet port.
3. Log on to the switch remotely by an SSH connection through an Ethernet port.

### 1.1.1 Logon by a console port

To log on to the switch by the console port on the switch, please take the following steps:

1. Connect the PCs or Terminals to the console port on the switch by a provided cable.
2. Click **Start** → **All Programs** → **Accessories** → **Communications** → **Hyper Terminal** to open the Hyper Terminal as the Figure 1-1 shows.

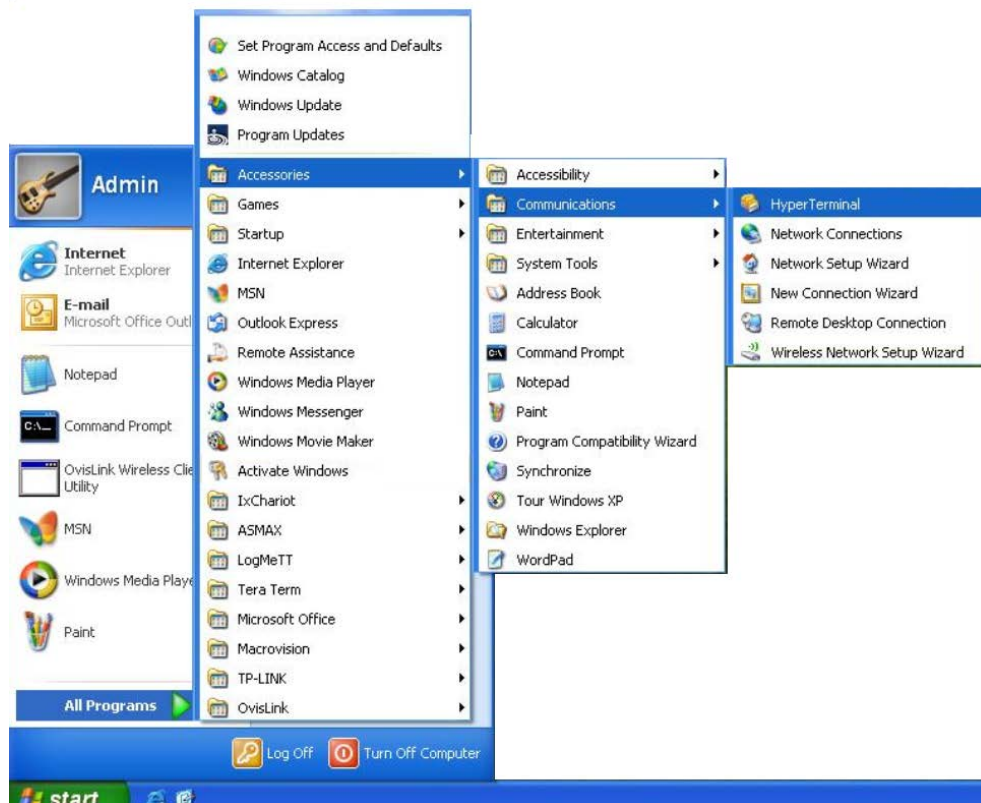


Figure 1-1 Open Hyper Terminal

3. The Connection Description Window will prompt as shown in Figure 1-2. Enter a name into the Name field and click **OK**.



Figure 1-2 Connection Description

4. Select the port to connect in Figure 1-3, and click **OK**.



Figure 1-3 Select the port to connect

5. Configure the port selected in the step above as shown in Figure 1-4. Configure **Bits per second** as 38400, **Data bits** as 8, **Parity** as None, **Stop bits** as 1, **Flow control** as None, and then click **OK**.



Figure 1-4 Port Settings

6. The DOS prompt "T3700G-28TQ>" will appear after pressing the **Enter** button as shown in Figure 1-5. It indicates that you can use the CLI now.

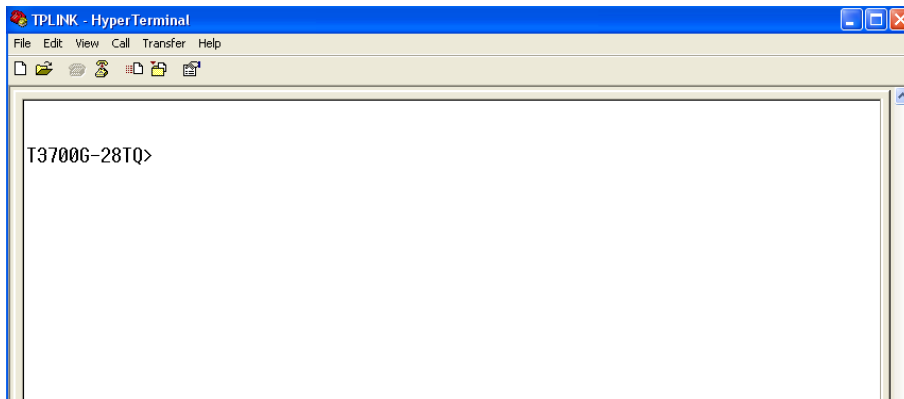
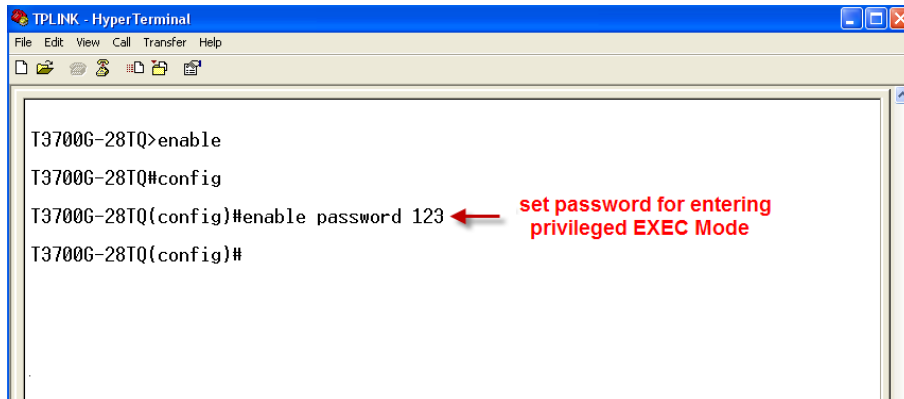


Figure 1-5 Log in the Switch

## 1.1.2 Configuring the Privileged EXEC Mode Password

To configure the switch remotely by a Telnet or SSH connection, please set a password for entering the Privileged EXEC Mode through the console connection first. Follow the steps in [1.1.1 Logon by a console port](#) to log on to the switch, and then follow the steps shown in Figure 1-6 to configure the Privileged EXEC Mode password.



```
T3700G-28TQ>enable
T3700G-28TQ#config
T3700G-28TQ(config)#enable password 123
T3700G-28TQ(config)#
```

Figure 1-6 Configure the Privileged EXEC Mode Password

## 1.1.3 Logon by Telnet

For Telnet connection, after configuring the Privileged EXEC Mode Password, you should also configure the Telnet login mode and login authentication information through console connection.

Telnet login has the following two modes. You can choose one according to your needs:

**Login local Mode:** It requires username and password, which are both **admin** by default.

**Login Mode:** It doesn't require username and password, but a connection password is required.



### Note:

Before Telnet login, you are required to configure Telnet login mode and login authentication information through console connection.

➤ Login Local Mode

Firstly, configure the Telnet login mode as “login local” in the prompted DOS screen shown in Figure 1-7.

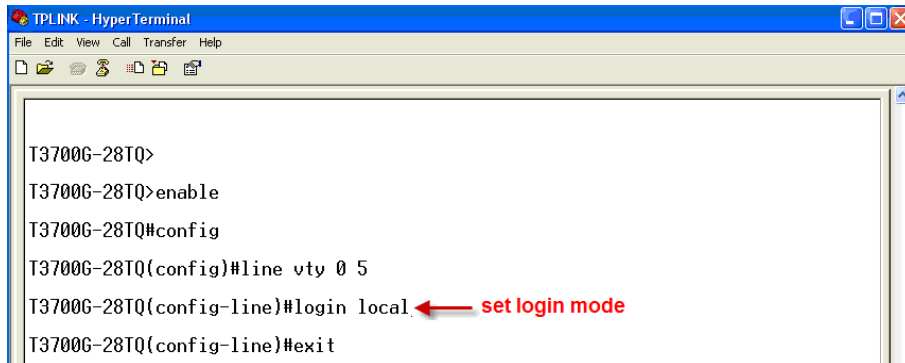


Figure 1-7 Configure login local mode

Now, you can logon by Telnet in **login local** mode.

1. Make sure the switch and the PC are in the same LAN. Click **Start** → **Run** to open the **Run** window, and type **cmd** in the prompt Run window as Figure 1-8 and click **OK**.

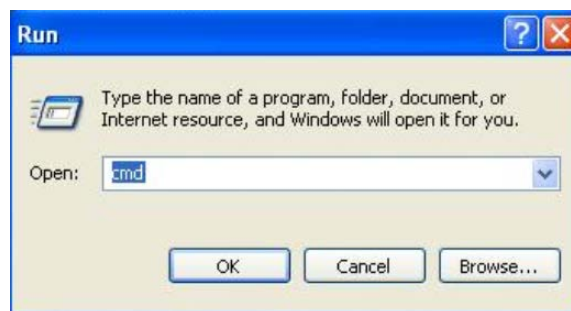


Figure 1-8 Run Window

2. Open Telnet, then type **telnet 192.168.0.1** in the command prompt shown as Figure 1-9, and press the **Enter** button.

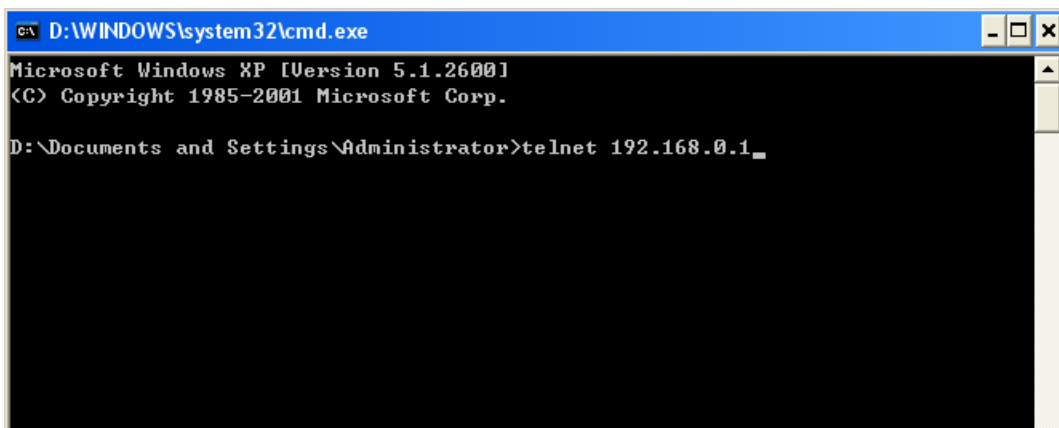


Figure 1-9 Connecting to the Switch

3. Type the default user name and password (both of them are **admin**), then press the **Enter** button so as to enter User EXEC Mode.

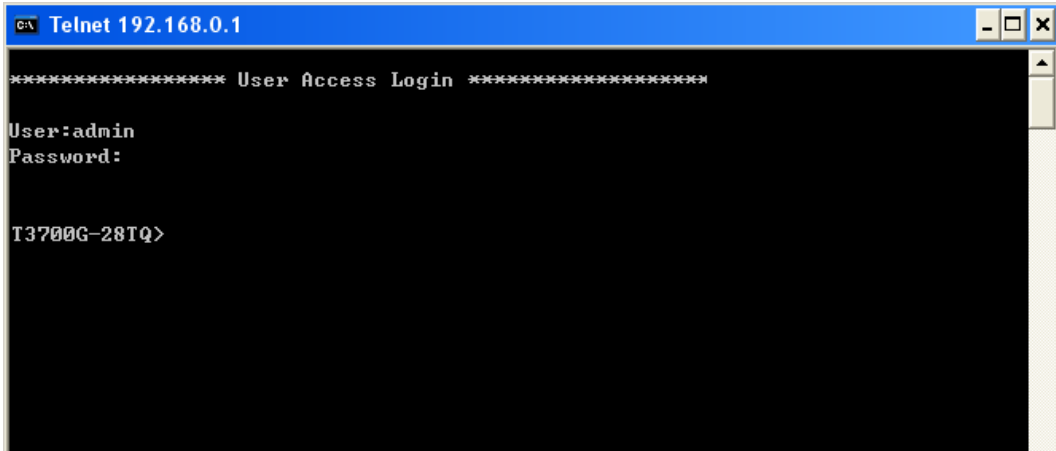


Figure 1-10 Enter into the User EXEC Mode

Now you can manage your switch with CLI commands through Telnet connection.

4. Type **enable** command to enter Privileged EXEC Mode. A password that you have set through Console port connection is required. Here the password has been set as **123**.

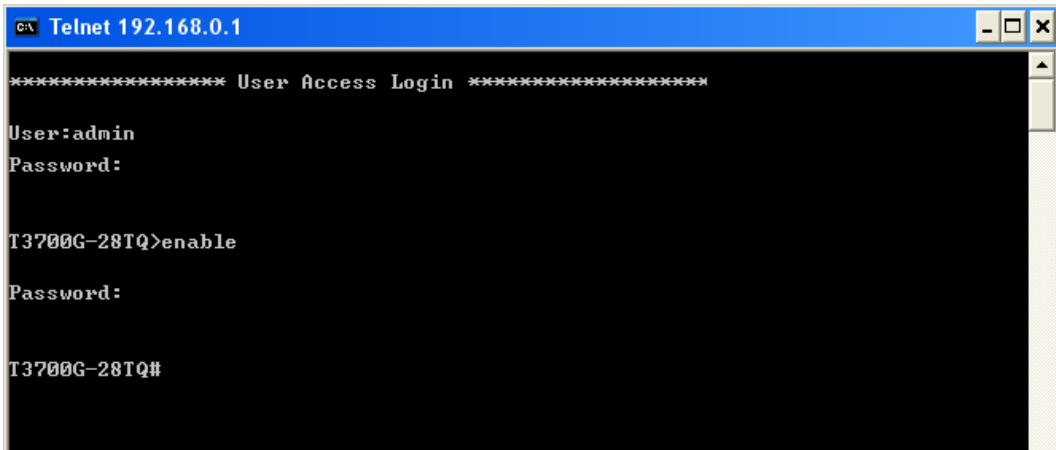


Figure 1-11 Enter into the Privileged EXEC Mode

➤ Login Mode

Firstly configure the Telnet login mode as “login” and the connection password as **456** in the prompted DOS screen shown in Figure 1-12.

```

T3700G-28TQ>enable
T3700G-28TQ#config
T3700G-28TQ(config)#line vty 0 5
T3700G-28TQ(config-line)#login ← set login mode
T3700G-28TQ(config-line)#password 456 ← set connection password
T3700G-28TQ(config-line)#exit
T3700G-28TQ(config)#
    
```

Figure 1-12 Configure login mode

Now, you can logon by Telnet in **login mode**:

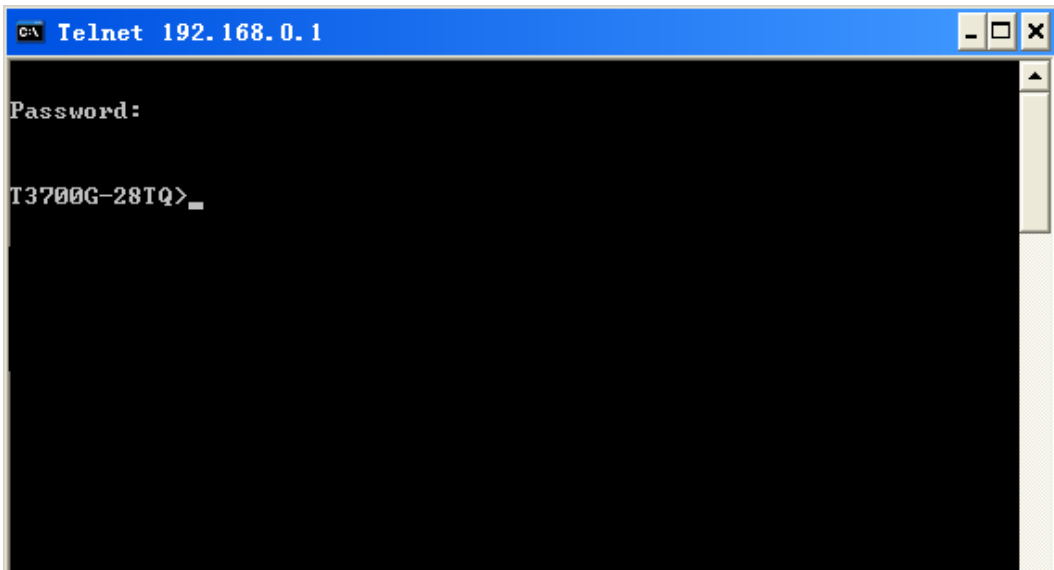
1. Open Telnet, then type **telnet 192.168.0.1** in the command prompt shown as Figure 1-13, and press the **Enter** button.

```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\Admin>telnet 192.168.0.1_
    
```

Figure 1-13 Connecting to the Switch

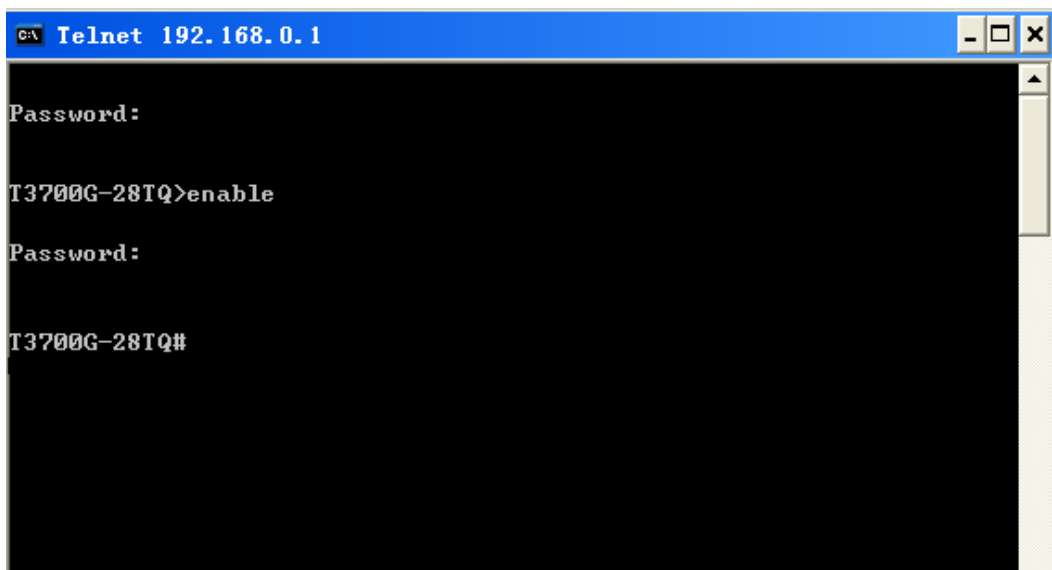
- You are prompted to enter the connection password **456** you have set through Console port connection, and then you are in User EXEC Mode.



```
C:\ Telnet 192.168.0.1
Password:
T3700G-28TQ>
```

Figure 1-14 Enter into the User EXEC Mode

- When entering **enable** command to access Privileged EXEC Mode, you are required to give the password **123** you have set through Console port connection.



```
C:\ Telnet 192.168.0.1
Password:
T3700G-28TQ>enable
Password:
T3700G-28TQ#
```

Figure 1-15 Enter into the Privileged EXEC Mode

Now you can manage your switch with CLI commands through Telnet connection.

 **Note:**

You can refer to [Chapter 12 User Manage Commands](#) for detailed commands information of the Telnet connection configuration.



### 1.1.4 Logon by SSH

To log on by SSH, a Putty client software is recommended. There are two authentication modes to set up an SSH connection:

**Password Authentication Mode:** It requires username and password, which are both **admin** by default.

**Key Authentication Mode:** It requires a public key for the switch and a private key for the SSH client software. You can generate the public key and the private key through Putty Key Generator.

**Note:**

Before SSH login, please follow the steps shown in Figure 1-16 to enable the SSH function through console connection.

```
T3700G-28TQ>enable
Password:
T3700G-28TQ#config
T3700G-28TQ(config)#ip ssh server
T3700G-28TQ(config)#_
```

Enter the Privileged EXEC Mode password

Enable SSH function

Figure 1-16 Enable SSH function

➤ Password Authentication Mode

1. Open the software to log on to the interface of PuTTY. Enter the IP address of the switch into Host Name field; keep the default value 22 in the Port field; select SSH as the Connection type.

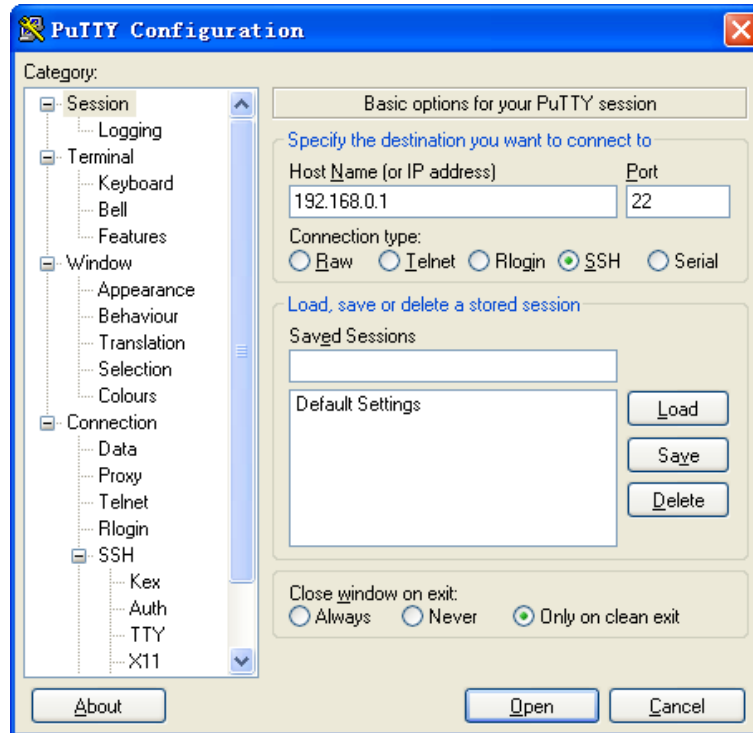


Figure 1-17 SSH Connection Config

2. Click the **Open** button in the above figure to log on to the switch. Enter the login user name and password to log on the switch, and then enter the Privileged EXEC Mode password, so you can continue to configure the switch.

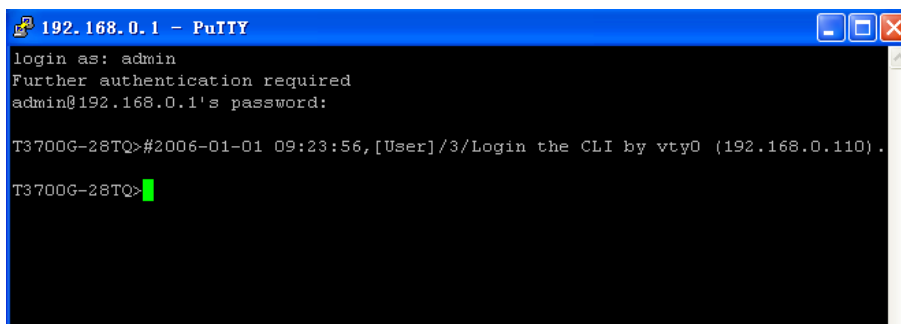


Figure 1-18 Log on the Switch

➤ **Key Authentication Mode**

1. Select the key type and key length, and generate SSH key.

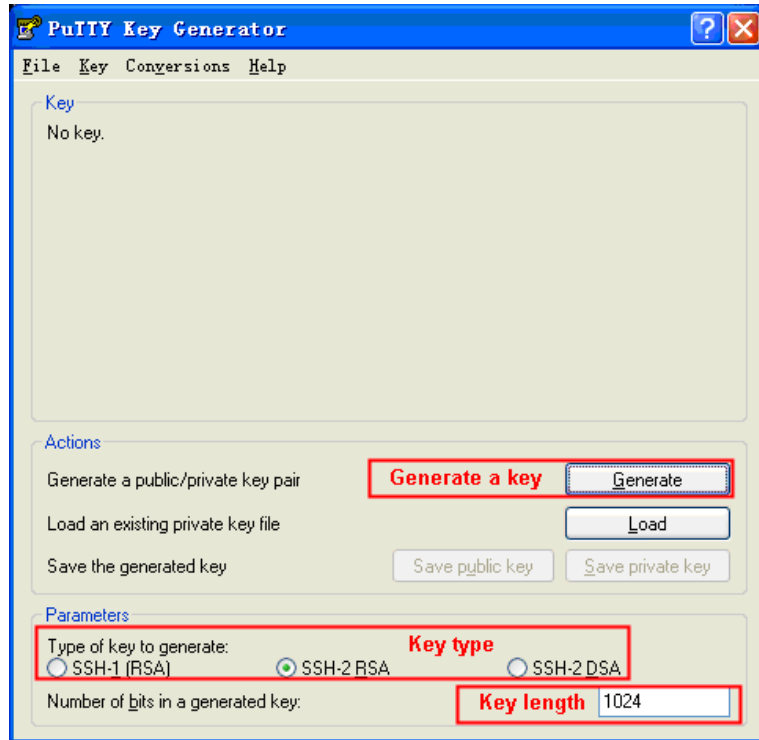


Figure 1-19 Generate SSH Key

 **Note:**

1. The key length is in the range of 256 to 3072 bits.
2. During the key generation, randomly moving the mouse quickly can accelerate the key generation.

- After the key is successfully generated, please save the public key and private key to a TFTP server.

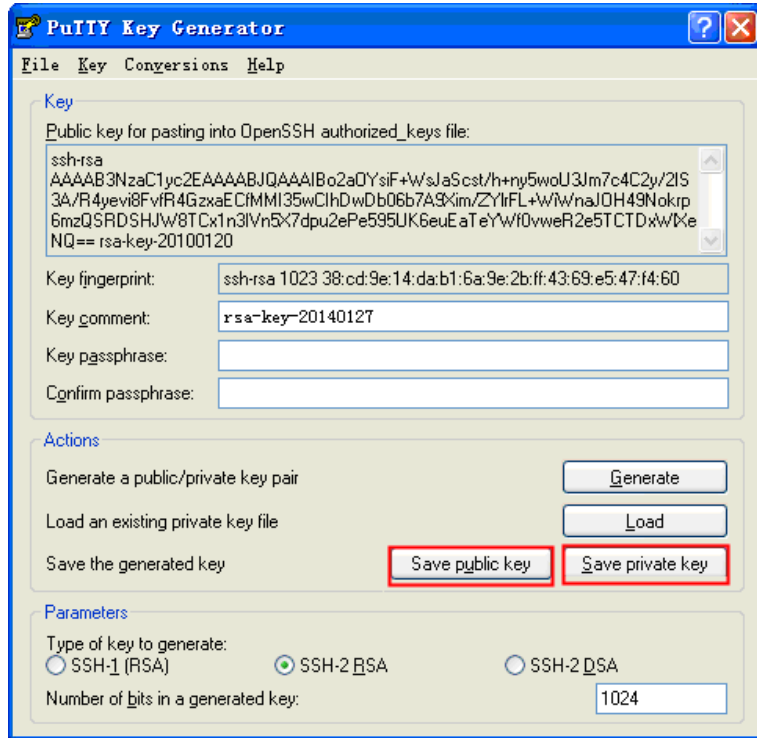


Figure 1-20 Save the Generated Key

- Log on to the switch by the console port, and download the public key file from the TFTP server to the switch, as the following figure shows:

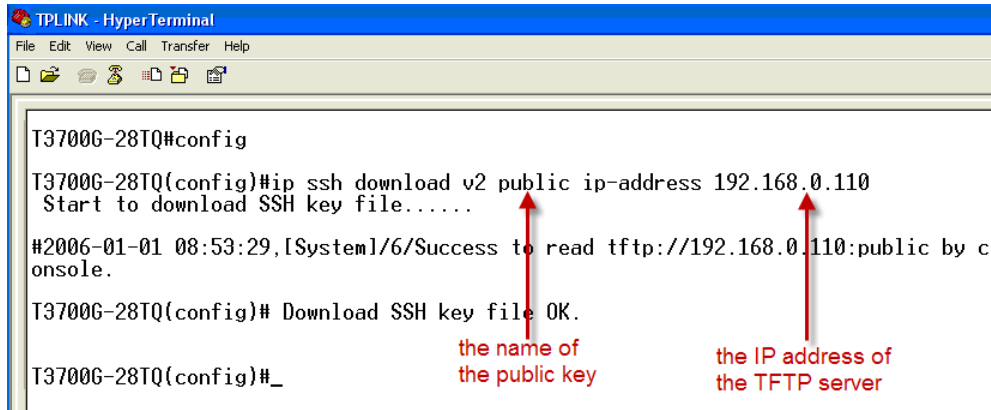


Figure 1-21 Download the Public Key

**Note:**

- The key type should accord with the type of the key file.
- The SSH key downloading cannot be interrupted.

- After the public key is downloaded, please log on to the interface of PuTTY and enter the IP address for login.

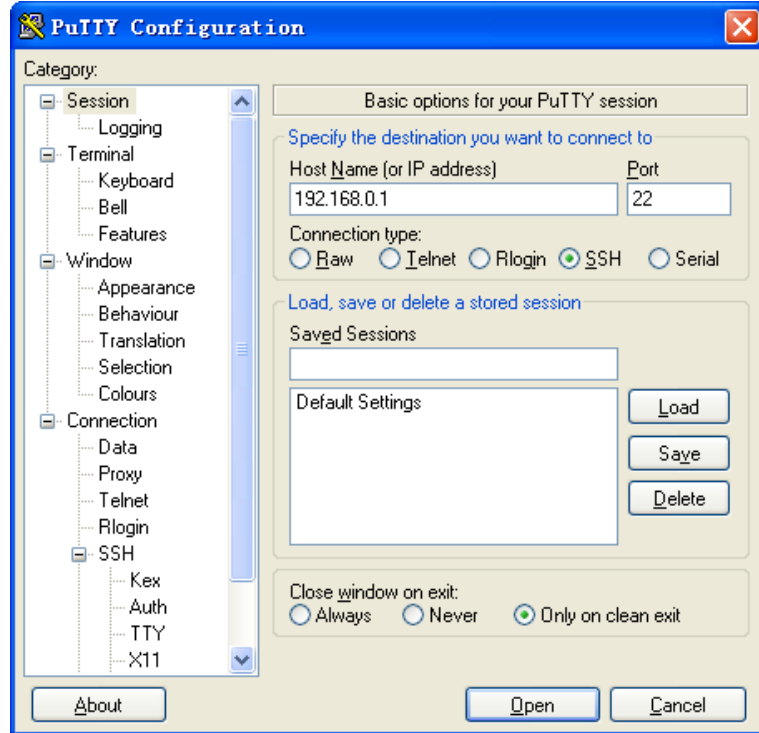


Figure 1-22 SSH Connection Config

- Click **Browse** to download the private key file to SSH client software and click **Open**.

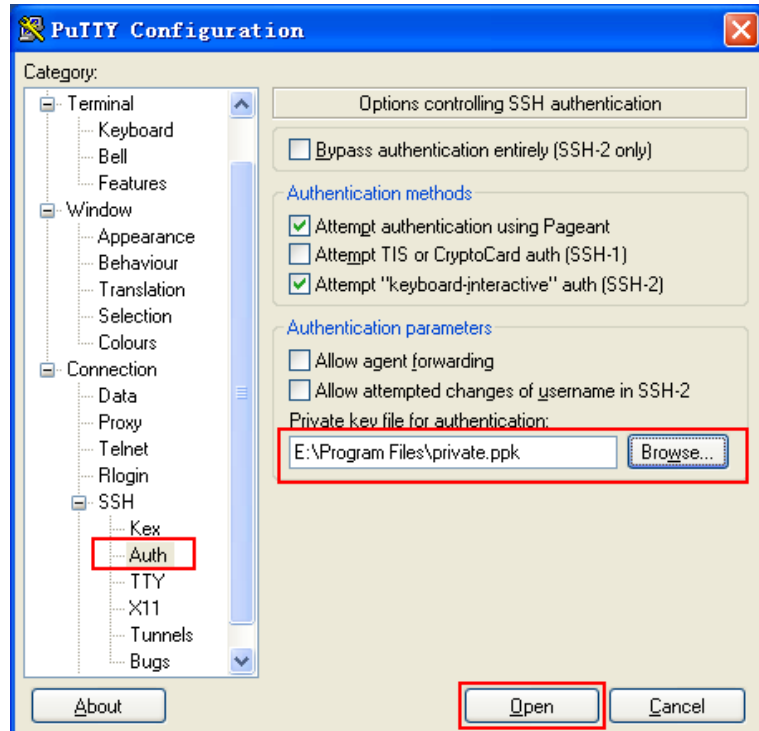


Figure 1-23 Download the Private Key

After successful authentication, please enter the login user name. If you log on to the switch without entering password, it indicates that the key has been successfully downloaded.

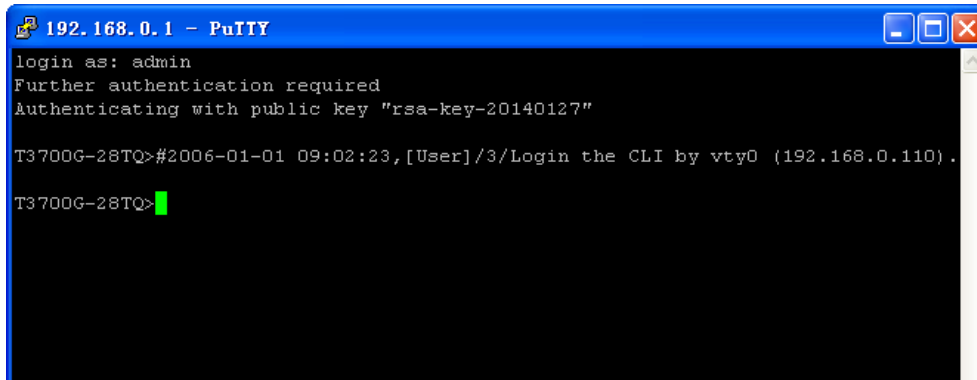
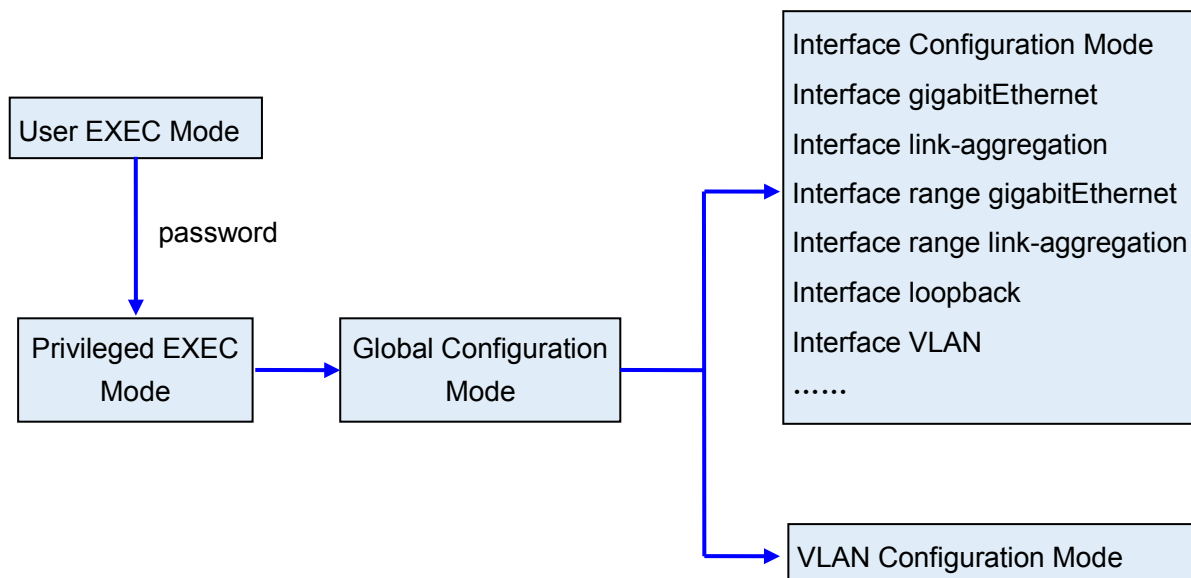


Figure 1-24 Log on the Switch

## 1.2 CLI Command Modes

The CLI is divided into different command modes: User EXEC Mode, Privileged EXEC Mode, Global Configuration Mode, Line Configuration Mode, VLAN Configuration Mode, Interface Configuration Mode, Router Configuration Mode, DHCP Configuration Mode and MST Configuration Mode. Interface Configuration Mode can also be divided into Interface gigabitEthernet, Interface link-aggregation and some other modes, which is shown as the following diagram.



The following table gives detailed information about the Accessing path, Prompt of each mode and how to exit the current mode and access the next mode.

Mode	Accessing Path	Prompt	Logout or Access the next mode
User EXEC Mode	Primary mode once it is connected with the switch.	<b>T3700G-28TQ&gt;</b>	Use the <b>exit</b> command to disconnect the switch (except that the switch is connected through the Console port). Use the <b>enable</b> command to access Privileged EXEC mode.
Privileged EXEC Mode	Use the <b>enable</b> command to enter this mode from User EXEC mode.	<b>T3700G-28TQ#</b>	Enter the <b>disable</b> or <b>exit</b> command to return to User EXEC mode. Enter <b>configure</b> command to access Global Configuration mode.
Global Configuration Mode	Use the <b>configure</b> command to enter this mode from Privileged EXEC mode.	<b>T3700G-28TQ(config)#</b>	Use the <b>exit</b> or the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Use the <b>interface gigabitEthernet port</b> or <b>interface range gigabitEthernet port-list</b> command to access interface Configuration mode. Use the <b>vlan vlan-list</b> to access VLAN Configuration mode.
Line Configuration Mode	Use the <b>line vty</b> command from Global Configuration mode to specify a line.	<b>T3700G-28TQ(config- line)</b>	Use the <b>exit</b> command to exit to the global configuration mode. Press <b>Ctrl-Z</b> or enter <b>end</b> to return to privileged EXEC mode.
VLAN Configuration Mode	Use the <b>vlan vlan-list</b> command to enter this mode from Global Configuration mode.	<b>T3700G-28TQ(config- vlan)#</b>	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global configuration mode.
Router Configuration Mode	Use the <b>router ospf process-id</b> to enter OSPF Router mode from Global Configuration mode. Use the <b>router rip</b> command to enter RIP Router mode from Global Configuration mode.	<b>T3700-28TQ(config- router)</b>	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode.

Mode	Accessing Path	Prompt	Logout or Access the next mode
Interface Configuration Mode	Layer 2 Interface: Use the <b>interface gigabitEthernet</b> <i>port</i> or <b>interface range gigabitEthernet</b> <i>port-list</i> command to enter this mode from Global Configuration mode.	T3700G-28TQ(config-if)# T3700G-28TQ(config-if-range)#	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode. A port number must be specified in the <b>interface</b> command.
	Layer 3 Interface: Use the <b>no switchport</b> command to enter Routed Port mode from Interface Configuration mode. Use the <b>interface vlan</b> <i>vlan-id</i> command to enter VLAN Interface mode from Global Configuration mode. Use the <b>interface loopback</b> <i>id</i> command to enter Loopback Interface mode from Global Configuration mode.	T3700G-28TQ(config-if)# T3700G-28TQ(config-if-range)#	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode.
DHCP Configuration Mode	Use the <b>ip dhcp server pool</b> <i>pool-name</i> command to enter DHCP Configuration Mode from Global Configuration mode.	T3700G-28TQ(config-dhcp)	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode.
MST Configuration Mode	Use the <b>spanning-tree mst configuration</b> command to enter this mode from Global Configuration mode.	T3700G-28TQ(config-mst)#	Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Enter the <b>exit</b> or the <b>#</b> command to return to Global configuration mode.



**Note:**

1. The user is automatically in User EXEC Mode after the connection between the PC and the switch is established by a console port or by a telnet connection.
2. Each command mode has its own set of specific commands. To configure some commands, you should access the corresponding command mode firstly.

- **Global Configuration Mode:** In this mode, global commands are provided, such as the Spanning Tree, Schedule Mode and so on.
- **Interface Configuration Mode:** In this mode, users can configure one or several ports, different ports corresponds to different commands



- a). Interface gigabitEthernet/ten-gigabitEthernet: Configure parameters for an Ethernet port, such as Duplex-mode, flow control status.
  - b). Interface range gigabitEthernet/ten-gigabitEthernet: Configure parameters for several Ethernet ports.
  - c). Interface link-aggregation: Configure parameters for a link-aggregation, such as broadcast storm.
  - d). Interface range link-aggregation: Configure parameters for multi-trunks.
  - e). Interface Loopback: Configure the parameters of the loopback interface.
  - f). Interface vlan: Configure parameters for the vlan interface.
- **Vlan Configuration Mode:** In this mode, users can create a VLAN and add a specified port to the VLAN.
  - **Router Configuration Mode:** In this mode, commands for configuring the Layer 3 functions are provided.
2. Some commands are global, that means they can be performed in all modes:
- **show:** Displays all information of switch, for example: statistic information, port information, VLAN information.
  - **history:** Displays the commands history.

## 1.3 Security Levels

This switch's security is divided into two levels: User level and Admin level.

User level only allows users to do some simple operations in User EXEC Mode; Admin level allows you to monitor, configure and manage the switch in Privileged EXEC Mode, Global Configuration Mode, Interface Configuration Mode and VLAN Configuration Mode.

Users get the privilege to the User level once connecting console port with the switch or logging in by Telnet/SSH. However, Guest users are restricted to access the CLI.

Users can enter Privileged EXEC mode from User EXEC mode by using the **enable** command. In Global Configuration Mode, you can configure password for Admin level by **enable password** command. Once password is configured, you are required to enter it to access Privileged EXEC mode.

## 1.4 Conventions

### 1.4.1 Format Conventions

The following conventions are used in this Guide:

- Items in square brackets [ ] are optional
- Items in braces { } are required
- Alternative items are grouped in braces and separated by vertical bars. For example: **speed** {10 | 100 | 1000 }
- Bold indicates an unalterable keyword. For example: **show logging**
- Normal Font indicates a constant (several options are enumerated and only one can be selected). For example: **switchport type** { access | trunk | general }
- Italic Font indicates a variable (an actual value must be assigned). For example: **bridge aging-time** *aging-time*

### 1.4.2 Special Characters

You should pay attentions to the description below if the variable is a character string:

- These six characters " < > , \ & cannot be input.
- If a blank is contained in a character string, single or double quotation marks should be used, for example 'hello world', "hello world", and the words in the quotation marks will be identified as a string. Otherwise, the words will be identified as several strings.

### 1.4.3 Parameter Format

Some parameters must be entered in special formats which are shown as follows:

- MAC Address must be entered in the format of xx:xx:xx:xx:xx:xx.
- One or several values can be typed for a port-list or a vlan-list using comma to separate. Use a hyphen to designate a range of values, for instance 1,3-5,7 indicates choosing 1,3,4,5,7.
- The port number should format as 1/0/3, meaning unit/slot/port. The unit number represents the unit ID of the switch in the stack. The slot number is either 0 or 1, with 0 representing ports on the front panel and 1 representing the two ports on the Interface Card inserted into the back panel. The port number is a variable (an actual value must be assigned).

## Chapter 2 User Interface

### enable

#### Description

The **enable** command is used to access Privileged EXEC Mode from User EXEC Mode.

#### Syntax

**enable**

#### Command Mode

User EXEC Mode

#### Example

If you have set the password to access Privileged EXEC Mode from User EXEC Mode:

```
T3700G-28TQ>enable
Password:
T3700G-28TQ#
```

### service password-encryption

#### Description

The **service password-encryption** command is used to encrypt the password when the password is defined or when the configuration is written, using the symmetric encryption algorithm. Encryption prevents the password from being readable in the configuration file. To disable the global encryption function, please use **no service password-encryption** command.

#### Syntax

**service password-encryption**  
**no service password-encryption**

#### Command Mode

Global Configuration Mode

## Example

Enable the global encryption function:

```
T3700G-28TQ(config)# service password-encryption
```

## enable password

### Description

The **enable password** command is used to set or change the password for users to access Privileged EXEC Mode from User EXEC Mode. To remove the password, please use **no enable password** command. This command uses the symmetric encryption.

### Syntax

```
enable password { [ 0 ] password | 7 encrypted-password }  
no enable password
```

### Parameter

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 31 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with fixed length will follow.

*encrypted-password* — A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password access Privileged EXEC Mode from User EXEC Mode..

### Command Mode

Global Configuration Mode

### User Guidelines

1. If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.
2. If both the enable password and enable secret password are defined, only the latest configured password will take effect.

## Example

Set the super password as “admin” and unencrypted to access Privileged EXEC Mode from User EXEC Mode:

```
T3700G-28TQ(config)#enable password 0 admin
```

## enable secret

### Description

The **enable secret** command is used to set a secret password for users to access Privileged EXEC Mode from User EXEC Mode. To return to the default configuration, please use **no enable secret** command. This command uses the MD5 encryption.

### Syntax

```
enable secret { [ 0 ] password | 5 encrypted-password }  
no enable secret
```

### Parameter

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 31 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty. The password in the configuration file will be displayed in the MD5 encrypted form.

5 — Indicates an MD5 encrypted password with fixed length will follow.

*encrypted-password* — An MD5 encrypted password with fixed length, which you can copy from another switch’s configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password when you access Privileged EXEC Mode from User EXEC Mode.

### Command Mode

Global Configuration Mode

### User Guidelines

If both the **enable password** and **enable secret** are defined, only the latest configured password will take effect.

## Example

Set the secret password as “admin” and unencrypted to access Privileged EXEC Mode from User EXEC Mode. The password will be displayed in the encrypted form.

```
T3700G-28TQ(config)#enable secret 0 admin
```

## disable

### Description

The **disable** command is used to return to User EXEC Mode from Privileged EXEC Mode.

### Syntax

```
disable
```

### Command Mode

Privileged EXEC Mode

### Example

Return to User EXEC Mode from Privileged EXEC Mode:

```
T3700G-28TQ#disable
```

```
T3700G-28TQ>
```

## configure

### Description

The **configure** command is used to access Global Configuration Mode from Privileged EXEC Mode.

### Syntax

```
configure
```

### Command Mode

Privileged EXEC Mode

### Example

Access Global Configuration Mode from Privileged EXEC Mode:

```
T3700G-28TQ#configure
```

```
T3700G-28TQ(config)#
```

## exit

### Description

The **exit** command is used to return to the previous Mode from the current Mode.

### Syntax

```
exit
```

### Command Mode

Any Configuration Mode

### Example

Return to Global Configuration Mode from Interface Configuration Mode, and then return to Privileged EXEC Mode:

```
T3700G-28TQ(config-if)#exit
T3700G-28TQ(config)#exit
T3700G-28TQ#
```

## end

### Description

The **end** command is used to return to Privileged EXEC Mode.

### Syntax

```
end
```

### Command Mode

Any Configuration Mode

### Example

Return to Privileged EXEC Mode from Interface Configuration Mode:

```
T3700G-28TQ(config-if)#end
```

## history

### Description

The **history** command is used to show the latest 20 commands you entered in the current mode since the switch is powered.

### Syntax

```
history
```

### Command Mode

Privileged EXEC Mode and any Configuration Mode

### Example

Show the commands you have entered in the current mode:

```
T3700G-28TQ(config)# history
1 history
```

## history clear

### Description

The **history clear** command is used to clear the commands you have entered in the current mode, therefore these commands will not be shown next time you use the **history** command.

### Syntax

```
history clear
```

### Command Mode

Privileged EXEC Mode and any Configuration Mode

### Example

Clear the commands you have entered in the current mode:

```
T3700G-28TQ(config)#history clear
```



## Chapter 3 Stack

The stack technology is to connect multiple stackable devices through their StackWise ports, forming a stack which works as a unified system and presents as a single entity to the network in Layer 2 and Layer 3 protocols. This chapter describes how to manage the T3700G-28TQ switch stacks.

### switch priority

#### Description

The **switch priority** command is specify the stack member number and the new priority for the stack member. To restore the priority of the specified stack member to the default value as 5, please use **no switch priority** command.

#### Syntax

```
swtich unitid priority priority  
no switch unitid priority
```

#### Parameter

*unitid* —— Specify the member number.

*priority* —— Specify the member's priority, ranging from 1 to 15.

#### Command Mode

Global Configuration Mode

#### Example

Specify the unit 1's priority as 10 in the stack:

```
T3700G-28TQ(config)# switch 1 priority 10
```

### switch renumber

#### Description

The **switch renumber** command is modify the member number of a specified stack member.

## Syntax

```
switch unitid renumber { newid | auto-numbering }
```

## Parameter

*unitid* — Specify the member to be renumbered.

*newid* — Specify the new stack member number for the stack member.

*auto-numbering* — The specified member will obtain its stack number through auto-numbering.

## Command Mode

Global Configuration Mode

## Example

Modify the unit 1's new member number as 2:

```
T3700G-28TQ(config)# switch 1 renumber 2
```

# switch authentication-mode

## Description

The **switch authentication-mode** command is used to configure the stack authentication mode. To disable the authentication function, please use **no switch authentication-mode** command.

## Syntax

```
switch authentication-mode { simple | md5 } { [ 0 ] password | 7 encrypted-password }
```

```
no switch authentication-mode
```

## Parameter

*simple* | *md5* — Specify the stack's authentication mode. "simple" means authentication will be performed using a text password. "md5" means authentication will be performed via a text password and MD5 algorithm. This authentication mode has a higher security than Simple mode.

*0* — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 16 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Global Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the stack's authentication mode as md5 and the unencrypted password as hello:

```
T3700G-28TQ(config)# switch authentication-mode md5 hello
```

# switch stack-name

## Description

The **switch stack-name** command is customize the stack's name. To restore to the default name "Stack", please use **no switch stack-name** command.

## Syntax

```
swtich stack-name { name }
```

```
no switch stack-name
```

## Parameter

*name* — Specify the name of the stack.

## Command Mode

Global Configuration Mode

## Example

Specify the name of the stack as Stack1:

```
T3700G-28TQ(config)# switch stack-name Stack1
```

## switch stack-port

### Description

The **switch stack-port** command is used to enable the stack port. To switch the stack port to Ethernet port, please use **no switch stack-port** command.

### Syntax

```
switch stack-port interface ten-gigabitEthernet port
```

```
no switch stack-port interface ten-gigabitEthernet port
```

### Parameter

*port* — The stack port number.

### Command Mode

Global Configuration Mode

## Example

Specify the ten-gigabit port 1/1/2 as stack port when the Interface Card is installed:

```
T3700G-28TQ(config)# switch stack-port interface ten-gigabitEthernet  
1/1/2
```

## show switch

### Description

The **show switch** command is used to display the current stack's information.

### Syntax

```
show switch [ unitid | detail | neighbor | stack-ports ]
```

### Parameter

*unitid* — Specify the member number.

**detail** — Display the detailed information of the stack, including stack member, stack port and neighboring information.

**neighbor** — Display the information of the stack neighbor.

**stack-ports** — Display the information of the stack ports.

### **Command Mode**

Privileged EXEC Mode and any Configuration Mode

### **Example**

Display the detailed information of the current stack:

```
T3700G-28TQ(config)# show switch detail
```

## Chapter 4 IEEE 802.1Q VLAN Commands

VLAN (Virtual Local Area Network) technology is developed for the switch to divide the LAN into multiple logical LANs flexibly. Hosts in the same VLAN can communicate with each other, regardless of their physical locations. VLAN can enhance performance by conserving bandwidth, and improve security by limiting traffic to specific domains.

### vlan

#### Description

The **vlan** command is used to create IEEE 802.1Q VLAN hereafter to access to VLAN Configuration Mode. To delete the IEEE 802.1Q VLAN, please use **no vlan** command.

#### Syntax

**vlan** vlan-list

**no vlan** vlan-list

#### Parameter

*vlan-list* — VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional.

#### Command Mode

Global Configuration Mode

#### Example

Create VLAN 2-10 and VLAN 100:

```
T3700G-28TQ(config)#vlan 2-10,100
```

Delete VLAN 2:

```
T3700G-28TQ(config)#no vlan 2
```

## interface vlan

### Description

The **interface vlan** command is used to create VLAN Interface hereafter to access to Interface VLAN Mode.

### Syntax

```
interface vlan vlan-id  
no interface vlan vlan-id
```

### Parameter

*vlan-id* —— Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

### Command Mode

Global Configuration Mode

### Example

Create VLAN Interface 2:

```
T3700G-28TQ(config)#interface vlan 2
```

## name

### Description

The **name** command is used to assign a description string to a VLAN. To clear the description, please use **no name** command.

### Syntax

```
name descript  
no name
```

### Parameter

*descript* —— String to describe the VLAN, which contains 16 characters at most.

### Command Mode

VLAN Configuration Mode (VLAN)

## Example

Specify the description string of the VLAN 2 as “VLAN002”:

```
T3700G-28TQ(config)#vlan 2
T3700G-28TQ(config-vlan)#name VLAN002
```

## switchport mode

### Description

The **switchport mode** command is used to configure the Link Types for the ports.

### Syntax

```
switchport mode { access | trunk | general }
```

### Parameter

access | trunk | general — Link Types. There are three Link Types for the ports.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Specify the Link Type of Gigabit Ethernet port 1/0/3 as “trunk”:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport mode trunk
```

## switchport access vlan

### Description

The **switchport access vlan** command is used to add the desired Access port to IEEE 802.1Q VLAN, or to remove a port from the corresponding VLAN.

### Syntax

```
switchport access vlan vlan-id
```



**no switchport access vlan**

### Parameter

*vlan-id* — Specify IEEE 802.1Q VLAN ID, ranging from 2 to 4094.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure Gigabit Ethernet port 1/0/3 whose link type is “access” to VLAN 2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport access vlan 2
```

## switchport trunk allowed vlan

### Description

The **switchport trunk allowed vlan** command is used to add the desired Trunk port to IEEE 802.1Q VLAN. To remove a Trunk port from the corresponding VLAN, please use **no switchport trunk allowed vlan** command.

### Syntax

```
switchport trunk allowed vlan { vlan-list | all }
no switchport trunk allowed vlan { vlan-list | all }
```

### Parameter

*vlan-list* — VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional.

all — Add the port to all of the existing VLANs.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the link type of port 2 as trunk and add it to VLAN 2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#switchport mode trunk
T3700G-28TQ(config-if)#switchport trunk allowed vlan 2
```

## switchport general allowed vlan

### Description

The **switchport general allowed vlan** command is used to add the desired General port to IEEE 802.1Q VLAN, or to remove a port from the corresponding VLAN.

### Syntax

```
switchport general allowed vlan vlan-list { tagged | untagged }
no switchport general allowed vlan vlan-list
```

### Parameter

*vlan-list* — VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional.

tagged | untagged — egress-rule.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure Gigabit Ethernet port 1/0/4 whose link type is “general” to VLAN 2 and its egress-rule as “tagged”:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/4
T3700G-28TQ(config-if)#switchport mode general
T3700G-28TQ(config-if)#switchport general allowed vlan 2 tagged
```

## switchport pvid

### Description

The **switchport pvid** command is used to configure the PVID for the switch ports. To restore the PVID of the specified port as 1, please use the **no switchport pvid**.

### Syntax

```
switchport pvid vlan-id
```

### Parameter

*vlan-id* — Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Specify the PVID of Gigabit Ethernet port 1/0/3 as 1:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport pvid 1
```

## show interface switchport

### Description

The **show interface switchport** command is used to display the information of one or all Ethernet ports.

### Syntax

```
show interface switchport [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of Gigabit Ethernet port 1/0/3:

```
T3700G-28TQ(config)#show interface switchport gigabitEthernet 1/0/3
```

## show vlan summary

### Description

The **show vlan summary** command is used to display the summarized information of IEEE 802.1Q VLAN.

### Syntax

```
show vlan summary
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the summarized information of IEEE 802.1Q VLAN:

```
T3700G-28TQ(config)#show vlan summary
```

## show vlan brief

### Description

The **show vlan brief** command is used to display the brief information of IEEE 802.1Q VLAN.

### Syntax

```
show vlan brief
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the brief information of IEEE 802.1Q VLAN:

```
T3700G-28TQ(config)#show vlan brief
```

## show vlan

### Description

The **show vlan** command is used to display the detailed information of IEEE 802.1Q VLAN.

### Syntax

```
show vlan [id vlan-id]
```

### Parameter

*vlan-id* — Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094. Using the **show vlan** command without parameter displays the detailed information of all the VLAN.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of VLAN 2:

```
T3700G-28TQ(config)#show vlan id 2
```

## Chapter 5 MAC-based VLAN Commands

MAC VLAN (Virtual Local Area Network) is the way to classify the VLANs based on MAC Address. A MAC address is relative to a single VLAN ID. The untagged packets and the priority-tagged packets coming from the MAC address will be tagged with this VLAN ID.

### mac-vlan mac-address

#### Description

The **mac-vlan mac-address** command is used to create a MAC-based VLAN entry. To delete a MAC-based VLAN entry, please use the **no mac-vlan mac-address** command.

#### Syntax

```
mac-vlan mac-address mac-addr vlan vlan-id [description descript]  
no mac-vlan mac-address mac-addr
```

#### Parameter

*mac-addr* — MAC address, in the format of XX:XX:XX:XX:XX:XX.

*vlan-id* — Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

*descript* — Give a description to the MAC address for identification, which contains 8 characters at most.

#### Command Mode

Global Configuration Mode

#### Example

Create VLAN 2 with the MAC address 00:11:11:01:01:12 and the name "TP":

```
T3700G-28TQ(config)#mac-vlan mac-address 00:11:11:01:01:12 vlan 2  
description TP
```

## mac-vlan

### Description

The **mac-vlan** command is used to enable a port for the MAC-based VLAN feature. Only the port is enabled can the configured MAC-based VLAN take effect. To disable the MAC-based VLAN function, please use **no mac-vlan** command. All the ports are disabled by default.

### Syntax

```
mac-vlan
no mac-vlan
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the Gigabit Ethernet port 1/0/3 for the MAC-based VLAN feature:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#mac-vlan
```

## show mac-vlan

### Description

The **show mac-vlan** command is used to display the information of the MAC-based VLAN entry. MAC address and VLAN ID can be used to filter the displayed information.

### Syntax

```
show mac-vlan { all | mac-address mac-addr | vlan vlan-id }
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Parameter

*mac-addr* —— MAC address, in the format of XX:XX:XX:XX:XX:XX.

*vlan-id* — Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

### Example

Display the information of all the MAC-based VLAN entry:

```
T3700G-28TQ(config)#show mac-vlan all
```

## show mac-vlan interface

### Description

The **show mac-vlan interface** command is used to display the port state of MAC-based VLAN.

### Syntax

```
show mac-vlan interface
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the enable state of all the ports:

```
T3700G-28TQ(config)#show mac-vlan interface
```



## Chapter 6 Protocol-based VLAN Commands

Protocol VLAN (Virtual Local Area Network) is the way to classify VLANs based on Protocols. A Protocol is relative to a single VLAN ID. The untagged packets and the priority-tagged packets matching the protocol template will be tagged with this VLAN ID.

### protocol-vlan template

#### Description

The **protocol-vlan template** command is used to create Protocol-based VLAN template. To delete Protocol-based VLAN template, please use **no protocol-vlan template** command.

#### Syntax

```
protocol-vlan template name protocol-name frame { ether_2 ether-type type
| snap ether-type type | llc dsap dsap_type ssap ssap_type }
no protocol-vlan template template-idx
```

#### Parameter

*protocol-name* — Give a name for the Protocol-based VLAN Template , which contains 8 characters at most.

**ether\_2 ether-type** *type* — Specify the Ethernet type.

**snap ether-type** *type* — Specify the Ethernet type.

**llc dsap** *dsap\_type* **ssap** *ssap\_type* — Specify the DSAP type and the SSAP type.

*template-idx* — The number of the Protocol-based VLAN Template. You can get the template corresponding to the number by the [show protocol-vlan template](#) command.

#### Command Mode

Global Configuration Mode

#### Example

Create a Protocol-based VLAN template named “TP” whose Ethernet protocol type is 0x2024:

```
T3700G-28TQ(config)#protocol-vlan template name TP frame ether_2
ether-type 2024
```

## protocol-vlan vlan

### Description

The **protocol-vlan vlan** command is used to create a Protocol-based VLAN entry. To delete a Protocol-based VLAN entry, please use **no protocol-vlan vlan** command.

### Syntax

```
protocol-vlan vlan vlan-id template template-idx
no protocol-vlan vlan group-idx
```

### Parameter

*vlan-id* —— Specify IEEE 802.1Q VLAN ID, ranging from 1-4094.

*template-idx* ——The number of the Protocol-based VLAN Template. You can get the template corresponding to the number by the [show protocol-vlan template](#) command.

*group-idx* ——The number of the Protocol-based VLAN entry. You can get the Protocol-based VLAN entry corresponding to the number by the [show protocol-vlan vlan](#) command.

### Command Mode

Global Configuration Mode

### Example

Create Protocol-based VLAN 2 and bind it with Protocol-based VLAN Template 3:

```
T3700G-28TQ(config)#protocol-vlan vlan 2 template 3
```

## protocol-vlan group

### Description

The **protocol-vlan** command is used to add the port to a specified protocol group. To remove the port from this protocol group, please use **no protocol-vlan group** command.

## Syntax

**protocol-vlan group** *index*

**no protocol-vlan group** *index*

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Parameter

*index* — Specify the protocol group ID.

## Example

Add Gigabit Ethernet port 20 to protocol group 1:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
```

```
T3700G-28TQ(config-if)#protocol-vlan group 1
```

# show protocol-vlan template

## Description

The **show protocol-vlan template** command is used to display the information of the Protocol-based VLAN templates.

## Syntax

**show protocol-vlan template**

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of the Protocol-based VLAN templates:

```
T3700G-28TQ(config)#show protocol-vlan template
```

## show protocol-vlan vlan

### Description

The **show protocol-vlan vlan** command is used to display the information about Protocol-based VLAN entry.

### Syntax

```
show protocol-vlan vlan
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display information of the Protocol-based VLAN entry:

```
T3700G-28TQ(config)#show protocol-vlan vlan
```

## Chapter 7 VLAN-VPN Commands

VLAN-VPN (Virtual Private Network) function, the implement of a simple and flexible Layer 2 VPN technology, allows the packets with VLAN tags of private networks to be encapsulated with VLAN tags of public networks at the network access terminal of the Internet Service Provider. And these packets will be transmitted with double-tag across the public networks.

### dot1q-tunnel

#### Description

The **dot1q-tunnel** command is used to enable the VLAN-VPN function globally. To disable the VLAN-VPN function, please use the **no dot1q-tunnel** command.

#### Syntax

```
dot1q-tunnel
no dot1q-tunnel
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the VLAN-VPN function globally:

```
T3700G-28TQ(config)#dot1q-tunnel
```

### dot1q-tunnel tpid

#### Description

The **dot1q-tunnel tpid** command is used to configure Global TPID of the VLAN-VPN. To restore to the default value, please use the **no dot1q-tunnel tpid** command.

#### Syntax

```
dot1q-tunnel tpid tpid
no dot1q-tunnel tpid
```

### Parameter

*tpid* — The value of Global TPID. It must be 4 Hex integers. By default, it is 8100.

### Command Mode

Global Configuration Mode

### Example

Configure Global TPID of the VLAN-VPN as 0x9100:

```
T3700G-28TQ(config)#dot1q-tunnel tpid 9100
```

## dot1q-tunnel mapping

### Description

The **dot1q-tunnel mapping** command is used to enable the VLAN Mapping feature globally. To disable this function, please use the **no dot1q-tunnel mapping** command. By default, the VLAN Mapping feature is disabled.

### Syntax

```
dot1q-tunnel mapping  
no dot1q-tunnel mapping
```

### Command Mode

Global Configuration Mode

### Example

Enable the VLAN mapping feature globally:

```
T3700G-28TQ(config)#dot1q-tunnel mapping
```

## switchport dot1q-tunnel mapping

### Description

The **switchport dot1q-tunnel mapping** command is used to add the VLAN Mapping entry on a specified port. To delete the VLAN Mapping entry on this port, please use the **no switchport dot1q-tunnel mapping** command.

## Syntax

```
switchport dot1q-tunnel mapping c-vlan sp-vlan [descript]
no switchport dot1q-tunnel mapping c-vlan
```

## Parameter

*c-vlan* — Customer VLAN ID, ranging from 1 to 4094.

*sp-vlan* — Service Provider VLAN ID, ranging from 1 to 4094.

*descript* — Give a description to the VLAN Mapping entry, which contains 15 characters at most.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Add a VLAN Mapping entry on the Gigabit Ethernet port 1/0/3 with the Customer VLAN as VLAN 2 and the Service Provider VLAN as VLAN 3:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport dot1q-tunnel mapping 2 3
```

# switchport dot1q-tunnel mode

## Description

The **switchport dot1q-tunnel mode** command is used to configure the VPN port's mode. To close this VPN port, please use the **no switchport dot1q-tunnel mode** command. By default, no port has been configured as the VPN port. The VPN port mode uni and nni cannot switch to each other directly, so please close the VPN port and switch to the other mode if needed.

## Syntax

```
switchport dot1q-tunnel mode { uni/nni }
no switchport dot1q-tunnel mode
```

## Parameter

*uni* — The port connected to the clients.

*nni* — The port connected to the ISP.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the Gigabit Ethernet port 1/0/3 as the VPN UNI ports:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
```

```
T3700G-28TQ(config-if)#switchport dot1q-tunnel mode uni
```

# show dot1q-tunnel

## Description

The **show dot1q-tunnel** command is used to display the global configuration information of the VLAN VPN.

## Syntax

```
show dot1q-tunnel
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the global configuration information of the VLAN VPN:

```
T3700G-28TQ(config)#show dot1q-tunnel
```

# show dot1q-tunnel mapping

## Description

The **show dot1q-tunnel mapping** command is used to display the information of VLAN Mapping entry.

## Syntax

```
show dot1q-tunnel mapping
```



## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of VLAN Mapping entry:

```
T3700G-28TQ(config)#show dot1q-tunnel mapping
```

# show dot1q-tunnel interface

## Description

The **show dot1q-tunnel mapping interface** command is used to display the VLAN VPN port type.

## Syntax

```
show dot1q-tunnel interface
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the port type of all VLAN VPN ports:

```
T3700G-28TQ(config)#show dot1q-tunnel interface
```

## Chapter 8 Voice VLAN Commands

Voice VLANs are configured specially for voice data stream. By configuring Voice VLANs and adding the ports with voice devices attached to voice VLANs, you can perform QoS-related configuration for voice data, ensuring the transmission priority of voice data stream and voice quality.

### voice vlan

#### Description

The **voice vlan** command is used to enable Voice VLAN function. To disable Voice VLAN function, please use **no voice vlan** command.

#### Syntax

**voice vlan** *vlan-id*

**no voice vlan**

#### Parameter

*vlan-id* —— Specify IEEE 802.1Q VLAN ID, ranging from 2 to 4094.

#### Command Mode

Global Configuration Mode

#### Example

Enable the Voice VLAN function for VLAN 10:

```
T3700G-28TQ(config)#voice vlan 10
```

### voice vlan aging

#### Description

The **voice vlan aging** command is used to set the aging time for a voice VLAN. To restore to the default aging time for the Voice VLAN, please use **no voice vlan aging** command. By default, the aging time is 1440 minutes.

#### Syntax

**voice vlan aging** *time*

**no voice vlan aging**

### Parameter

*time* — Aging time (in minutes) to be set for the Voice VLAN. It ranges from 1 to 43200.

### Command Mode

Global Configuration Mode

### Example

Set the aging time for the Voice VLAN as 1 minute:

```
T3700G-28TQ(config)#voice vlan aging 1
```

## voice vlan priority

### Description

The **voice vlan priority** command is used to configure the priority for the Voice VLAN. To restore to the default priority, please use **no voice vlan priority** command. By default, the priority value is 6.

### Syntax

**voice vlan priority** *pri*

**no voice vlan priority**

### Parameter

*pri* — Priority, ranging from 0 to 7.

### Command Mode

Global Configuration Mode

### Example

Configure the priority of the Voice VLAN as 5:

```
T3700G-28TQ(config)#voice vlan priority 5
```

## voice vlan mac-address

### Description

The **voice vlan mac-address** command is used to create Voice VLAN OUI. To delete the specified Voice VLAN OUI, please use **no voice vlan mac-address** command.

### Syntax

**voice vlan mac-address** *mac-addr* **mask** *mask* [**description** *descriptf*]

**no voice vlan mac-address** *mac-addr*

### Parameter

*mac-addr* — The OUI address of the voice device, in the format of XX:XX:XX:XX:XX:XX.

*mask* — The OUI address mask of the voice device, in the format of XX:XX:XX:XX:XX:XX.

*descript* — Give a description to the OUI for identification which contains 16 characters at most.

### Command Mode

Global Configuration Mode

### Example

Create a Voice VLAN OUI described as “TP-Phone” with the OUI address 00:11:11:00:00:00 and the mask address FF:FF:FF:00:00:00:

```
T3700G-28TQ(config)#voice vlan mac-address 00:11:11:00:00:00 mask
FF:FF:FF:00:00:00 description TP- Phone
```

## switchport voice vlan mode

### Description

The **switchport voice vlan mode** command is used to configure the Voice VLAN mode for the Ethernet port.

### Syntax

**switchport voice vlan mode** { manual | auto }

## Parameter

manual | auto — Port mode.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the Gigabit Ethernet port 1/0/3 to operate in the auto voice VLAN mode:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport voice vlan mode auto
```

# switchport voice vlan security

## Description

The **switchport voice vlan security** command is used to enable the Voice VLAN security feature. To disable the Voice VLAN security feature, please use **no switchport voice vlan security** command.

## Syntax

```
switchport voice vlan security
no switchport voice vlan security
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the Gigabit Ethernet port 1/0/3 for Voice VLAN security feature:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport voice vlan security
```

## show voice vlan

### Description

The **show voice vlan** command is used to display the global configuration information of Voice VLAN.

### Syntax

```
show voice vlan
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of Voice VLAN globally:

```
T3700G-28TQ(config)#show voice vlan
```

## show voice vlan oui

### Description

The **show voice vlan oui** command is used to display the configuration information of Voice VLAN OUI.

### Syntax

```
show voice vlan oui
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of Voice VLAN OUI:

```
T3700G-28TQ(config)#show voice vlan oui
```

## show voice vlan switchport

### Description

The **show voice vlan switchport** command is used to display the configuration information of all the ports or one specified port in the Voice VLAN.

### Syntax

```
show voice vlan switchport [fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port ]
```

### Parameter

*port* —The Fast/Gigabit/Ten-Gigabit Ethernet port number selected to display the configuration information.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of Gigabit Ethernet port 1/0/1 in the Voice VLAN:

```
T3700G-28TQ(config)#show voice vlan switchport gigabitEthernet 1/0/1
```

Display the configuration information of all the ports in the Voice VLAN:

```
T3700G-28TQ(config)#show voice vlan switchport
```

## Chapter 9 Private VLAN Commands

Private VLANs are configured specially for saving VLAN resource of uplink devices and decreasing broadcast.

### private-vlan primary

#### Description

The **private-vlan primary** command is used to configure the designated VLAN as the primary VLAN of the Private VLAN. To remove the primary VLAN property of the current VLAN, please use **no private-vlan primary** command.

#### Syntax

```
private-vlan primary
no private-vlan primary
```

#### Command Mode

VLAN Configuration Mode (VLAN)

#### Example

Configure the VLAN 3 as the primary VLAN of the private VLAN:

```
T3700G-28TQ(config)#vlan 3
T3700G-28TQ(config-vlan)#private-vlan primary
```

### private-vlan community

#### Description

The **private-vlan community** command is used to configure the designated VLAN as the community VLAN of the Private VLAN. To remove the community VLAN property of the current VLAN, please use **no private-vlan community** command.

#### Syntax

```
private-vlan community
no private-vlan community
```



## Command Mode

VLAN Configuration Mode (VLAN)

## Example

Configure the VLAN 4 as the community VLAN of the private VLAN:

```
T3700G-28TQ(config)#vlan 4
T3700G-28TQ(config-vlan)#private-vlan community
```

## private-vlan isolated

### Description

The **private-vlan isolated** command is used to configure the designated VLAN as the isolated VLAN of the Private VLAN. To remove the isolated VLAN property of the current VLAN, please use **no private-vlan isolated** command.

### Syntax

```
private-vlan isolated
no private-vlan isolated
```

### Command Mode

VLAN Configuration Mode (VLAN)

## Example

Configure the VLAN 3 as the isolated VLAN of the private VLAN:

```
T3700G-28TQ(config)#vlan 3
T3700G-28TQ(config-vlan)#private-vlan isolated
```

## private-vlan association

### Description

The **private-vlan association** command is used to associate primary VLAN with secondary VLAN. To exterminate the currently association, please use **no private-vlan association** command.

### Syntax

```
private-vlan association vlan_list
```

**no private-vlan association** *vlan\_list*

### Parameter

*vlan\_list* — Secondary VLAN ID, ranging from 2 to 4094.

### Command Mode

VLAN Configuration Mode (VLAN)

### Example

Associate primary VLAN 3 with community VLAN 4 as a private VLAN:

```
T3700G-28TQ(config)#vlan 3
T3700G-28TQ(config-vlan)#private-vlan association 4
```

## switchport private-vlan

### Description

The **switchport private-vlan** command is used to configure the private VLAN mode for the switchport. To invalid the configuration, please use **no switchport private-vlan** command.

### Syntax

```
switchport private-vlan { promiscuous | host }
no switchport private-vlan
```

### Parameter

promiscuous | host — Configure the private VLAN mode for the switchport.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure Gigabit Ethernet port 3 as “host”:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport private-vlan host
```

## switchport private-vlan host-association

### Description

The **switchport private-vlan host-association** command is used to add host type port to private VLAN. To remove the port from Private VLAN, please use **no switchport private-vlan host-association** command.

### Syntax

```
switchport private-vlan host-association primary_vlan_id secondary_vlan_id
vlantype
```

```
no switchport private-vlan host-association
```

### Parameter

*primary-vlan-id* — Primary VLAN ID, ranging from 2 to 4094.

*secondary-vlan-id* — Secondary VLAN ID, ranging from 2 to 4094.

*vlantype* — Specify the type of the secondary VLAN, either *community* or *isolated*.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure host type Gigabit Ethernet port 1/0/3 as a member of primary VLAN 3 and secondary VLAN 4, with the type of VLAN 4 as community:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#switchport private-vlan host-association 3 4
community
```

## switchport private-vlan mapping

### Description

The **switchport private-vlan mapping** command is used to add promiscuous type port to private VLAN. To remove the port from Private VLAN, please use **no switchport private-vlan mapping** command.

## Syntax

**switchport private-vlan mapping** *primary\_vlan\_id* *secondary\_vlan\_id*

**no switchport private-vlan mapping**

## Parameter

*primary-vlan-id* — Primary VLAN ID, ranging from 2 to 4094.

*secondary-vlan-id* — Secondary VLAN ID, ranging from 2 to 4094.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure promiscuous type Gigabit Ethernet port 1/0/3 as a member of primary VLAN 3 and secondary VLAN 4:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
```

```
T3700G-28TQ(config-if)#switchport private-vlan mapping 3 4
```

# show vlan private-vlan

## Description

The **show vlan private-vlan** command is used to display the Private VLAN configuration information of the switch.

## Syntax

**show vlan private-vlan**

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configuration information of all Private VLAN:

```
T3700G-28TQ(config)#show vlan private-vlan
```

## show vlan private-vlan interface

### Description

The **show vlan private-vlan interface** command is used to display the Private VLAN configuration information of the specified port(s).

### Syntax

```
show vlan private-vlan interface [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ]
```

### Parameter

*port* — The list of Ethernet ports.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of all the Ethernet ports:

```
T3700G-28TQ(config)#show vlan private-vlan interface
```

## Chapter 10 GVRP Commands

GVRP (GARP VLAN registration protocol) is an implementation of GARP (generic attribute registration protocol). GVRP allows the switch to automatically add or remove the VLANs via the dynamic VLAN registration information and propagate the local VLAN registration information to other switches, without having to individually configure each VLAN.

### gvrp

#### Description

The **gvrp** command is used to enable the GVRP function globally. To disable the GVRP function, please use **no gvrp** command.

#### Syntax

```
gvrp
no gvrp
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the GVRP function globally:

```
T3700G-28TQ(config)#gvrp
```

### gvrp (interface)

#### Description

The **gvrp** command is used to enable the GVRP function for the desired port. To disable it, please use **no gvrp** command. The GVRP feature can only be enabled for the trunk-type ports.

#### Syntax

```
gvrp
no gvrp
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the GVRP function for Gigabit Ethernet ports 1/0/2-6:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-6
T3700G-28TQ(config-if-range)#gvrp
```

# gvrp registration

## Description

The **gvrp registration** command is used to configure the GVRP registration type for the desired port. To restore to the default value, please use **no gvrp registration** command.

## Syntax

```
gvrp registration { normal | fixed | forbidden }
no gvrp registration
```

## Parameter

normal | fixed | forbidden — Registration mode. By default, the registration mode is “normal”.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the GVRP registration mode as “fixed” for Gigabit Ethernet ports 1/0/2-6:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-6
T3700G-28TQ(config-if-range)#gvrp registration fixed
```

## gvrp timer

### Description

The **gvrp timer** command is used to set a GVRP timer for the desired port. To restore to the default setting of a GARP timer, please use **no gvrp timer** command.

### Syntax

**gvrp timer** { leaveall | join | leave } *value*

**no gvrp timer** [leaveall | join | leave]

### Parameter

leaveall | join | leave — They are the three timers: leave All, join and leave. Once the LeaveAll Timer is set, the port with GVRP enabled can send a LeaveAll message after the timer times out, so that other GARP ports can re-register all the attribute information. After that, the LeaveAll timer will start to begin a new cycle. To guarantee the transmission of the Join messages, a GARP port sends each Join message two times. The Join Timer is used to define the interval between the two sending operations of each Join message. Once the Leave Timer is set, the GARP port receiving a Leave message will start its Leave timer, and deregister the attribute information if it does not receive a Join message again before the timer times out.

*value* — The value of the timer. The LeaveAll Timer ranges from 1000 to 30000 centiseconds and the default value is 1000 centiseconds. The Join Timer ranges from 20 to 1000 centiseconds and the default value is 20 centiseconds. The Leave Timer ranges from 60 to 3000 centiseconds and the default value is 60 centiseconds.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Set the GARP leaveall timer of Gigabit Ethernet port 1/0/6 as 2000 centiseconds and restore the join timer of it to the default value:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/6
T3700G-28TQ(config-if)#gvrp timer leaveall 2000
```



```
T3700G-28TQ(config-if)#no gvrp timer join
```

## show gvrp global

### Description

The **show gvrp global** command is used to display the global GVRP status.

### Syntax

```
show gvrp global
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global GVRP status:

```
T3700G-28TQ(config)#show gvrp global
```

## show gvrp interface

### Description

The **show gvrp interface** command is used to display the GVRP configuration information of a specified Ethernet port or of all Ethernet ports.

### Syntax

```
show gvrp interface [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ]
```

### Parameter

*port* —The Fast/Gigabit/Ten-Gigabit Ethernet port number. By default, the GVRP configuration information of all the Ethernet ports is displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the GVRP configuration information of Gigabit Ethernet port 1:

```
T3700G-28TQ(config)#show gvrp interface gigabitEthernet 1/0/1
```

Display the GVRP configuration information of all Ethernet ports:

```
T3700G-28TQ(config)#show gvrp interface
```

## Chapter 11 Etherchannel Commands

Etherchannel Commands are used to configure LAG and LACP function.

LAG (Link Aggregation Group) is to combine a number of ports together to make a single high-bandwidth data path, which can highly extend the bandwidth. The bandwidth of the LAG is the sum of bandwidth of its member port.

LACP (Link Aggregation Control Protocol) is defined in IEEE802.3ad and enables the dynamic link aggregation and disaggregation by exchanging LACP packets with its partner. The switch can dynamically group similarly configured ports into a single logical link, which will highly extend the bandwidth and flexibly balance the load.

### channel-group

#### Description

The **channel-group** command is used to add a port to the EtherChannel Group and configure its mode. To delete the port from the EtherChannel Group, please use **no channel-group** command.

#### Syntax

```
channel-group num mode { on | active | passive }
no channel-group
```

#### Parameter

*num* — The number of the EtherChannel Group, ranging from 1 to 32.  
 on — Enable the static LAG.  
 active — Enable the active LACP mode.  
 passive — Enable the passive LACP mode.

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

#### Example

Add the Gigabit Ethernet port 2-4 to EtherChannel Group 1 and enable the static LAG:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-4
T3700G-28TQ(config-if-range)#channel-group 1 mode on
```

## port-channel load-balance

### Description

The **port-channel load-balance** command is used to configure the Aggregate Arithmetic for LAG. To return to the default configurations, please use **no port-channel load-balance** command.

### Syntax

```
port-channel load-balance {src-dst-mac | src-dst-ip}
no port-channel load-balance
```

### Parameter

src-dst-mac — The source and destination MAC address. When this option is selected, the Aggregate Arithmetic will be based on the source and destination MAC addresses of the packets. The Aggregate Arithmetic for LAG is “src-dst-mac” by default.

src-dst-ip — The source and destination IP address. When this option is selected, the Aggregate Arithmetic will be based on the source and destination IP addresses of the packets.

### Command Mode

Global Configuration Mode

### Example

Configure the Aggregate Arithmetic for LAG as “src-dst-mac”:

```
T3700G-28TQ(config)#port-channel load-balance src-dst-mac
```

## lacp system-priority

### Description

The **lacp system-priority** command is used to configure the LACP system priority globally. To return to the default configurations, please use **no lacp system-priority** command.

## Syntax

```
lACP system-priority pri  
no lACP system-priority
```

## Parameter

*pri* — The system priority, ranging from 0 to 65535. It is 32768 by default.

## Command Mode

Global Configuration Mode

## Example

Configure the LACP system priority as 1024 globally:

```
T3700G-28TQ(config)#lACP system-priority 1024
```

# lACP port-priority

## Description

The **lACP port-priority** command is used to configure the LACP system priority globally. To return to the default configurations, please use **no lACP port-priority** command.

## Syntax

```
lACP port-priority pri  
no lACP port-priority
```

## Parameter

*pri* — The port priority, ranging from 0 to 65535. It is 32768 by default.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the LACP port priority as 1024 for Gigabit Ethernet port 1:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1  
T3700G-28TQ(config-if)#lACP port-priority 1024
```

## show etherchannel

### Description

The **show etherchannel** command is used to display the EtherChannel information.

### Syntax

```
show etherchannel [channel-group-num] { detail | summary }
```

### Parameter

*channel-group-num* — The EtherChannel Group number, ranging from 1 to 32. By default, it is empty, and will display the information of all EtherChannel Groups.

detail — The detailed information of EtherChannel.

summary — The EtherChannel information in summary.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of EtherChannel Group 1:

```
T3700G-28TQ(config)#show etherchannel 1 detail
```

## show etherchannel load-balance

### Description

The **show etherchannel load-balance** command is used to display the Aggregate Arithmetic of LAG.

### Syntax

```
show etherchannel load-balance
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the Aggregate Arithmetic of LAG:

```
T3700G-28TQ(config)#show etherchannel load-balance
```

## show lacp

### Description

The **show lacp** command is used to display the LACP information for a specified EtherChannel Group.

### Syntax

```
show lacp [ channel-group-num ] { internal | neighbor }
```

### Parameter

*channel-group-num* — The EtherChannel Group number, ranging from 1 to 32. By default, it is empty, and will display the information of all LACP groups.

internal — The internal LACP information.

neighbor — The neighbor LACP information.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the internal LACP information of EtherChannel Group 1:

```
T3700G-28TQ(config)#show lacp 1 internal
```

## show lacp sys-id

### Description

The **show lacp sys-id** command is used to display the LACP system priority globally.

### Syntax

```
show lacp sys-id
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the LACP system priority:

```
T3700G-28TQ(config)#show lacp sys-id
```

## Chapter 12 User Manage Commands

User Manage Commands are used to manage the user's logging information by Web, Telnet or SSH, so as to protect the settings of the switch from being randomly changed.

### user name (password)

#### Description

The **user name** command is used to add a new user or modify the existed users' information. To delete the existed users, please use **no user name** command. This command uses the symmetric encryption.

#### Syntax

```
user name name [ privilege admin | guest ] password { [ 0 ] password | 7  
encrypted-password }
```

```
no user name name
```

#### Parameter

*name* —— Type a name for users' login, which contains 16 characters at most, composed of digits, English letters and under dashes only.

admin | guest —— Access level. "Admin" means that you can edit, modify and view all the settings of different functions. "Guest" means that you can only view the settings without the right to edit and modify. It is "admin" by default.

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* —— Users' login password, a string from 1 to 31 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 —— Indicates a symmetric encrypted password with fixed length will follow.

*encrypted-password* —— A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.



## Command Mode

Global Configuration Mode

## User Guidelines

1. If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.
2. If both the user's password and secret password are defined, only the latest configured password will take effect.

## Example

Add and enable a new admin user named "tplink", of which the password is "admin" and unencrypted:

```
T3700G-28TQ(config)#user name tplink privilege admin password 0 admin
```

## user name (secret)

### Description

The **user name** command is used to add a new user or modify the existed users' information. To delete the existed users, please use **no user name** command. The password of the user configured here will be displayed in the MD5 encrypted form in the configuration file.

### Syntax

```
user name name [ privilege admin | guest ] secret { [ 0 ] password | 5 encrypted-password }
```

```
no user name name
```

### Parameter

*name* —— Type a name for users' login, which contains 16 characters at most, composed of digits, English letters and under dashes only.

admin | guest —— Access level. "Admin" means that you can edit, modify and view all the settings of different functions. "Guest" means that you can only view the settings without the right to edit and modify. It is "admin" by default.

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* —Users' login password, a string from 1 to 31 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty. The password in the configuration file will be displayed in the MD5 encrypted form.

5 — Indicates an MD5 encrypted password with fixed length will follow.

*encrypted-password* — An MD5 encrypted password with fixed length, which you can copy from another switch's configuration file.

## Command Mode

Global Configuration Mode

## User Guidelines

If both the user name's password and secret password are defined, only the latest configured password will take effect.

## Example

Add and enable a new admin user named "tplink", of which the password is "admin". The password will be displayed in the encrypted form.

```
T3700G-28TQ(config)#user name tplink privilege admin secret 0 admin
```

# user access-control ip-based

## Description

The **user access-control ip-based** command is used to limit the IP-range of the users for login. Only the users within the IP-range you set here are allowed to login. To cancel the user access limit, please use **no user access-control** command.

## Syntax

**user access-control ip-based** *ip-addr ip-mask*

**no user access-control**

## Parameter

*ip-addr* — The source IP address. Only the users within the IP-range you set here are allowed to login.

*ip-mask* —The subnet mask of the IP address.

## Command Mode

Global Configuration Mode

## Example

Configure that only the user with the IP address 192.168.0.148 is allowed to login:

```
T3700G-28TQ(config)#user access-control ip-based 192.168.0.148
255.255.255.255
```

# user access-control mac-based

## Description

The **user access-control mac-based** command is used to limit the MAC address of the users for login. Only the user with this MAC Address you set here is allowed to login. To cancel the user access limit, please use **no user access-control** command.

## Syntax

```
user access-control mac-based mac-addr
no user access-control
```

## Parameter

*mac-addr* — The source MAC address. Only the user with this MAC Address is allowed to login.

## Command Mode

Global Configuration Mode

## Example

Configure that only the user with the MAC address 00:00:13:0A:00:01 is allowed to login:

```
T3700G-28TQ(config)#user access-control mac-based 00:00:13:0A:00:01
```

## user access-control port-based

### Description

The **user access-control port-based** command is used to limit the ports for login. Only the users connected to these ports you set here are allowed for login. To cancel the user access limit, please use **no user access-control** command. At most 5 ports can be configured.

### Syntax

```
user access-control port-based interface { fastEthernet port | gigabitEthernet
port | ten-gigabitEthernet port | none }
no user access-control
```

### Parameter

*port* — The Fast/Gigabit/ten-Gigabit Ethernet port number.  
**none** — Set the access port list to be none.

### Command Mode

Global Configuration Mode

### Example

Configure that only the users connected to Gigabit Ethernet ports 2 are allowed to login:

```
T3700G-28TQ(config)#user access-control port-based interface
gigabitEthernet 1/0/2
```

## user max-number

### Description

The **user max-number** command is used to configure the maximum login user number at the same time. To cancel the limit on login number, please use **no user max-number** command.

### Syntax

```
user max-number admin-num guest-num
no user max-number
```

## Parameter

*admin-num* — The maximum number of the users allowed to log on as Admin, ranging from 1 to 16. The total number of Admin and Guest should be less than 16.

*guest-num* — The maximum number of the users allowed to log on as Guest, ranging from 0 to 15. The total number of Admin and Guest should be less than 16.

## Command Mode

Global Configuration Mode

## Example

Configure the maximum number of users' login as Admin and Guest as 5 and 3:

```
T3700G-28TQ(config)#user max-num 5 3
```

# user idle-timeout

## Description

The **user idle-timeout** command is used to configure the timeout time of the switch. To restore to the default timeout time, please use **no user idle-timeout** command.

## Syntax

**user idle-timeout** *minutes*

**no user idle-timeout**

## Parameter

*minutes* — The timeout time, ranging from 5 to 30 in minutes. The value is 10 by default.

## Command Mode

Global Configuration Mode

## Example

Configure the timeout time of the switch as 15 minutes:

```
T3700G-28TQ(config)#user idle-timeout 15
```

## line

### Description

The **line** command is used to enter the Line Configuration Mode and make related configurations for the desired user(s), including the login mode and password configurations.

### Syntax

```
line [console linenum | vty startlinenum endlinenum ]
```

### Parameter

*linenum* — The number of users allowed to login through console port. Its value is 0 in general as there is only one console port on a switch.

*startlinenum* — The start serial number of the login user selected to configure the login mode and password, ranging from 0 to 15. 0 means the first login user number, 1 means the second, and the rest can be done on the same manner.

*endlinenum* — The end serial number of the login user selected to configure the login mode and password, ranging from 0 to 15. 0 means the first login user number, 1 means the second, and the rest can be done on the same manner.

### Command Mode

Global Configuration Mode

### Example

Enter the Console port configuration mode and configure the console port 0:

```
T3700G-28TQ(config)#line console 0
```

Enter the Virtual Terminal configuration mode so as to prepare further configurations such as password and login mode for virtual terminal 0 to 5:

```
T3700G-28TQ(config)#line vty 0 5
```

## password

### Description

The **password** command is used to configure the connection password. To clear the password, please use **no password** command.

## Syntax

```
password { [ 0 ] password | 7 encrypted-password }
no password
```

## Parameter

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Connection password, a string from 1 to 31 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with fixed length will follow.

*encrypted-password* — A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Line Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the connection password of Console port connection 0 as “tplink” and unencrypted:

```
T3700G-28TQ(config)#line console 0
T3700G-28TQ(config-line)#password 0 tplink
```

Configure the connection password of virtual terminal connection 0-5 as “tplink” and unencrypted:

```
T3700G-28TQ(config)#line vty 0 5
T3700G-28TQ(config-line)#password 0 tplink
```

## login

### Description

The **login** command is used to configure the login mode of a switch which uses connection password to login. At this situation, a connection password must be set for virtual terminal connection.

### Syntax

**login**

### Command Mode

Line Configuration Mode

### Example

Configure the login of Console port connection 0 as login mode:

```
T3700G-28TQ(config)#line console 0
T3700G-28TQ(config-line)#login
```

Configure the login of virtual terminal connection 0-5 as login mode:

```
T3700G-28TQ(config)#line vty 0 5
T3700G-28TQ(config-line)#login
```

## login local

### Description

The **login local** command is used to configure the login mode of the switch which uses the user name and password to login.

### Syntax

**login local**

### Command Mode

Line Configuration Mode

### Example

Configure the login of virtual terminal connection 0-5 as login local mode:

```
T3700G-28TQ(config)#line vty 0 5
T3700G-28TQ(config-line)#login local
```



Configure the login of Console port connection 0 as login local mode:

```
T3700G-28TQ(config)#line console 0
T3700G-28TQ(config-line)#login local
```

## show user account-list

### Description

The **show user account-list** command is used to display the information of the current users.

### Syntax

```
show user account-list
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of the current users:

```
T3700G-28TQ(config)#show user account-list
```

## show user configuration

### Description

The **user configuration** command is used to display the security configuration information of the users, including access-control, max-number and the idle-timeout, etc.

### Syntax

```
show user configuration
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the security configuration information of the users:

```
T3700G-28TQ(config)#show user configuration
```

## Chapter 13 Binding Table Commands

You can bind the IP address, MAC address, VLAN and the connected Port number of the Host together, which can be the condition for the ARP Inspection and IP verify source to filter the packets.

### ip source binding

#### Description

The **ip source binding** command is used to bind the IP address, MAC address, VLAN ID and the Port number together manually. You can manually bind the IP address, MAC address, VLAN ID and the Port number together in the condition that you have got the related information of the Hosts in the LAN. To delete the IP-MAC-VID-PORT entry from the binding table, please use **no ip source binding index** command.

#### Syntax

```
ip source binding hostname ip-addr mac-addr vlan vlan-id interface
{ fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port } { none |
arp-detection | ip-verify-source | both } [ forced-source {arp-scanning |
dhcp-snooping} ]
```

```
no ip source binding unit unit-id index idx
```

#### Parameter

*hostname* — The Host Name, which contains 20 characters at most.

*ip-addr* — The IP address of the Host.

*mac-addr* — The MAC address of the Host.

*vlan-id* — The VLAN ID needed to be bound, ranging from 1 to 4094.

*port* — The number of port connected to the Host.

none | arp-detection | ip-verify-source | both — The protect type for the entry. “arp-detection” indicates ARP detection; “ip-verify-source” indicates IP source filter; “none” indicates applying none; “both” indicates applying both.

forced-source — The source of the binding entry can be specified as “arp-scanning” or “dhcp-snooping”. It is multi-optional.

*unit-id* — Specify the unit in the stack which the binding table belongs to.

*idx* — The entry number needed to be deleted. You can use the [show ip source binding](#) command to get the *idx*. Pay attention that the entry number is the actual number in the binding table which is not display in an arranged order.

## Command Mode

Global Configuration Mode

## Example

Bind an ACL entry with the IP 192.168.0.1, MAC 00:00:00:00:00:01, VLAN ID 2 and the Port number 5 manually. And then enable the entry for the ARP detection and IP filter function:

```
T3700G-28TQ(config)#ip source binding host1 192.168.0.1
00:00:00:00:00:01 vlan 2 interface gigabitEthernet 1/0/5 both
```

Delete the IP-MAC-VID-PORT entry with the index 5:

```
T3700G-28TQ(config)#no ip source binding unit 1 index 5
```

# ip dhcp snooping

## Description

The **ip dhcp snooping** command is used to enable DHCP Snooping function globally. To disable DHCP Snooping function globally, please use **no ip dhcp snooping** command. DHCP Snooping functions to monitor the process of the Host obtaining the IP address from DHCP server, and record the IP address, MAC address, VLAN and the connected Port number of the Host for automatic binding. The switch can also propagate the control information and the network parameters via the Option 82 field to provide more information for the Host.

## Syntax

```
ip dhcp snooping
no ip dhcp snooping
```

## Command Mode

Global Configuration Mode

## Example

Enable the DHCP Snooping function globally:

```
T3700G-28TQ(config)#ip dhcp snooping
```

## ip dhcp snooping global

### Description

The **ip dhcp snooping global** command is configure DHCP Snooping globally. To restore to the default value, please use **no dhcp snooping global** command.

### Syntax

```
ip dhcp snooping global { global-rate global-rate | dec-threshold dec-threshold | dec-rate dec-rate }
```

```
no ip dhcp snooping global { dec-threshhold | global-rate }
```

### Parameter

*global-rate* — The value to specify the maximum amount of DHCP messages that can be forwarded by the switch per second. The excessive messages will be discarded. The options are 10/20/30/40/50 (packet/second).By default, it is 0 standing for “disable”.

*dec-threshold* —The value to specify the minimum transmission rate of the Decline packets to trigger the Decline protection for the specific port. The options are 5/10/15/20/25/30 (packet/second).By default, it is 0 standing for “disable”.

*dec-rate* —The value to specify the Decline Flow Control. The traffic flow of the corresponding port will be limited to be this value if the transmission rate of the Decline packets exceeds the Decline Threshold. The options are 5/10/15/20/25/30 (packet/second). By default, it is 5.

### Command Mode

Global Configuration Mode

### Example

Configure the Global Flow Control as 30pps for DHCP Snooping:

```
T3700G-28TQ(config)#ip dhcp snooping global global-rate 30
```

## ip dhcp snooping information option

### Description

The **ip dhcp snooping information option** command is used to enable the Option 82 function of DHCP Snooping. To disable the Option 82 function, please use **no ip dhcp snooping information option** command.

### Syntax

```
ip dhcp snooping information option
no ip dhcp snooping information option
```

### Command Mode

Global Configuration Mode

### Example

Enable the Option 82 function of DHCP Snooping:

```
T3700G-28TQ(config)#ip dhcp snooping information option
```

## ip dhcp snooping information strategy

### Description

The **ip dhcp snooping information strategy** command is used to select the operation for the Option 82 field of the DHCP request packets from the Host. To restore to the default option, please use **no ip dhcp snooping information strategy** command.

### Syntax

```
ip dhcp snooping information strategy strategy
no ip dhcp snooping information strategy
```

### Parameter

*strategy* — The operations for Option 82 field of the DHCP request packets from the Host, including three types:

keep: Indicates to keep the Option 82 field of the packets. It is the default option;

replace: Indicates to replace the Option 82 field of the packets with the switch defined one;

drop: Indicates to discard the packets including the Option 82 field

## Command Mode

Global Configuration Mode

## Example

Replace the Option 82 field of the packets with the switch defined one and then send out:

```
T3700G-28TQ(config)#ip dhcp snooping information strategy replace
```

# ip dhcp snooping information user-defined

## Description

The **ip dhcp snooping information user-defined** command is used to enable the customized Option 82. To return to the default Option 82, please use **no ip dhcp snooping information user-defined** command.

## Syntax

```
ip dhcp snooping information user-defined  
no ip dhcp snooping information user-defined
```

## Command Mode

Global Configuration Mode

## Example

Enable the customized Option 82 function:

```
T3700G-28TQ(config)#ip dhcp snooping information user-defined
```

# ip dhcp snooping information remote-id

## Description

The **ip dhcp snooping information remote-id** command is used to configure the customized sub-option Remote ID for the Option 82. To return to default Remote ID for the Option 82, please use **no ip dhcp snooping information remote-id** command.

## Syntax

```
ip dhcp snooping information remote-id string  
no ip dhcp snooping information remote-id
```

**Parameter**

*string* — Enter the sub-option Remote ID, which contains 63 characters at most.

**Command Mode**

Global Configuration Mode

**Example**

Configure the customized sub-option Remote ID for the Option 82 as tplink:

```
T3700G-28TQ(config)#ip dhcp snooping information remote-id tplink
```

## ip dhcp snooping information circuit-id

**Description**

The **ip dhcp snooping information circuit-id** command is used to enable and configure the customized sub-option Circuit ID for the Option 82. To return to the default Circuit ID for the Option 82, please use **no ip dhcp snooping information circuit-id** command.

**Syntax**

```
ip dhcp snooping information circuit-id string
no ip dhcp snooping information circuit-id
```

**Parameter**

*string* — Enter the sub-option Circuit ID, which contains 63 characters at most.

**Command Mode**

Global Configuration Mode

**Example**

Enable and configure the customized sub-option Circuit ID for the Option 82 as “tplink”:

```
T3700G-28TQ(config)#ip dhcp snooping information circuit-id tplink
```

## ip dhcp snooping trust

### Description

The **ip dhcp snooping trust** command is used to configure a port to be a Trusted Port. Only the Trusted Port can receive the DHCP packets from DHCP servers. To turn the port back to a distrusted port, please use **no ip dhcp snooping trust** command.

### Syntax

```
ip dhcp snooping trust
no ip dhcp snooping trust
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the Gigabit Ethernet port 1/0/2 to be a Trusted Port:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#ip dhcp snooping trust
```

## ip dhcp snooping mac-verify

### Description

The **ip dhcp snooping mac-verify** command is used to enable the MAC Verify feature. To disable the MAC Verify feature, please use **no ip dhcp snooping mac-verify** command. There are two fields of the DHCP packet containing the MAC address of the Host. The MAC Verify feature is to compare the two fields and discard the packet if the two fields are different.

### Syntax

```
ip dhcp snooping mac-verify
no ip dhcp snooping mac-verify
```



## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the MAC Verify feature for the Gigabit Ethernet port 10/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#ip dhcp snooping mac-verify
```

# ip dhcp snooping limit rate

## Description

The **ip dhcp snooping limit rate** command is used to enable the Flow Control feature for the DHCP packets. The excessive DHCP packets will be discarded. To restore to the default configuration, please use **no ip dhcp snooping limit rate** command.

## Syntax

```
ip dhcp snooping limit rate value
no ip dhcp snooping limit rate
```

## Parameter

*value* — The value of Flow Control. The options are 5/10/15/20/25/30 (packet/second). The default value is 0, which stands for “disable”.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Set the Flow Control of GigabitEthernet port 2 as 20 pps:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#ip dhcp snooping limit rate 20
```

## ip dhcp snooping decline

### Description

The **ip dhcp snooping decline** command is used to enable the Decline Protect feature. To disable the Decline Protect feature, please use **no ip dhcp snooping decline** command.

### Syntax

```
ip dhcp snooping decline
no ip dhcp snooping decline
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the Decline Protect feature of Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#ip dhcp snooping decline
```

## show ip source binding

### Description

The **show ip source binding** command is used to display the IP-MAC-VID-PORT binding table.

### Syntax

```
show ip source binding [ unit unit-id ]
```

### Parameter

*unit-id* —— Specify the unit in the stack which the binding table belongs to.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the IP-MAC-VID-PORT binding table:

```
T3700G-28TQ(config)#show ip source binding
```

## show ip dhcp snooping

### Description

The **show ip dhcp snooping** command is used to display the running status of DHCP Snooping.

### Syntax

```
show ip dhcp snooping
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the running status of DHCP Snooping:

```
T3700G-28TQ#show ip dhcp snooping
```

## show ip dhcp snooping interface

### Description

The **show ip dhcp snooping interface** command is used to display the DHCP Snooping configuration of a desired Fast/Gigabit Ethernet ports or of all Ethernet ports.

### Syntax

```
show ip dhcp snooping interface [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ]
```

### Parameters

*port* —The Fast/Gigabit Ethernet/Ten-Gigabit Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the DHCP Snooping configuration of all Ethernet ports:

```
T3700G-28TQ#show ip dhcp snooping interface
```

Display the DHCP Snooping configuration of Gigabit Ethernet port 1/0/5:

```
T3700G-28TQ#show ip dhcp snooping interface gigabitEthernet 1/0/5
```

## Chapter 14 ARP Inspection Commands

ARP (Address Resolution Protocol) Detect function is to protect the switch from the ARP cheating, such as the Network Gateway Spoofing and Man-In-The-Middle Attack, etc.

### ip arp inspection(global)

#### Description

The **ip arp inspection** command is used to enable the ARP Detection function globally. To disable the ARP Detection function, please use **no ip arp detection** command.

#### Syntax

**ip arp inspection**  
**no ip arp inspection**

#### Command Mode

Global Configuration Mode

#### Example

Enable the ARP Detection function globally:

```
T3700G-28TQ(config)#ip arp inspection
```

### ip arp inspection trust

#### Description

The **ip arp inspection trust** command is used to configure the port for which the ARP Detect function is unnecessary as the Trusted Port. To clear the Trusted Port list, please use **no ip arp detection trust** command. The specific ports, such as up-linked port, routing port and LAG port, should be set as Trusted Port. To ensure the normal communication of the switch, please configure the ARP Trusted Port before enabling the ARP Detect function.

#### Syntax

**ip arp inspection trust**  
**no ip arp inspection trust**

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the Gigabit Ethernet ports 1/0/2-5 as the Trusted Port:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-5
T3700G-28TQ(config-if-range)#ip arp inspection trust
```

# ip arp inspection(interface)

## Description

The **ip arp inspection** command is used to enable the ARP Defend function. To disable the ARP detection function, please use **no ip arp inspection** command. ARP Attack flood produces lots of ARP Packets, which will occupy the bandwidth and slow the network speed extremely. With the ARP Defend enabled, the switch can terminate receiving the ARP packets for 300 seconds when the transmission speed of the legal ARP packet on the port exceeds the defined value so as to avoid ARP Attack flood.

## Syntax

```
ip arp inspection
no ip arp inspection
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the arp defend function for the Gigabit Ethernet ports 1/0/2-6:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-6
T3700G-28TQ(config-if-range)#ip arp inspection
```

## ip arp inspection limit-rate

### Description

The **ip arp inspection limit-rate** command is used to configure the ARP speed of a specified port. To restore to the default speed, please use **no ip arp inspection limit-rate** command.

### Syntax

```
ip arp inspection limit-rate value  
no ip arp inspection limit-rate
```

### Parameter

*value* —The *value* to specify the maximum amount of the received ARP packets per second, ranging from 10 to 100 in pps(packet/second). By default, the value is 15.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the maximum amount of the received ARP packets per second as 50 pps for Gigabit Ethernet port 5:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5  
T3700G-28TQ(config-if)#ip arp inspection limit-rate 50
```

## ip arp inspection recover

### Description

The **ip arp inspection recover** command is used to restore a port to the ARP transmit status from the ARP filter status.

### Syntax

```
ip arp inspection recover
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Restore Gigabit Ethernet port 1/0/5 to the ARP transmit status:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#ip arp inspection recover
```

# show ip arp inspection

## Description

The **show ip arp inspection** command is used to display the ARP detection global configuration including the enable/disable status and the Trusted Port list.

## Syntax

```
show ip arp inspection
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the ARP detection configuration globally:

```
T3700G-28TQ(config)#show ip arp inspection
```

# show ip arp inspection interface

## Description

The **show ip arp inspection interface** command is used to display the interface configuration of ARP detection.

## Syntax

```
show ip arp inspection interface [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```



### Parameter

*port* —The Fast/Gigabit/Ten-Gigabit Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of Gigabit Ethernet port 1:

```
T3700G-28TQ(config)#show ip arp inspection interface gigabitEthernet
1/0/1
```

Display the configuration of all Ethernet ports:

```
T3700G-28TQ(config)#show ip arp inspection interface
```

## show ip arp inspection statistics

### Description

The **show ip arp inspection statistics** command is used to display the number of the illegal ARP packets received.

### Syntax

```
show ip arp inspection statistics
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the number of the illegal ARP packets received:

```
T3700G-28TQ(config)#show ip arp inspection statistics
```

## clear ip arp inspection statistics

### Description

The **clear ip arp inspection statistics** command is used to clear the statistic of the illegal ARP packets received.

### Syntax

```
clear ip arp inspection statistics
```

## **Command Mode**

Privileged EXEC Mode and Any Configuration Mode

## **Example**

Clear the statistic of the illegal ARP packets received:

```
T3700G-28TQ(config)#clear ip arp inspection statistics
```

## Chapter 15 IP Verify Source Commands

IP Verify Source is to filter the IP packets based on the IP-MAC Binding entries. Only the packets matched to the IP-MAC Binding rules can be processed, which can enhance the bandwidth utility.

### ip verify source

#### Description

The **ip verify source** command is used to configure the IP Verify Source mode for a specified port. To disable the IP Verify Source function, please use **no ip verify source** command.

#### Syntax

```
ip verify source {sip | sip+mac}  
no ip verify source
```

#### Parameter

sip | sip+mac—— Security type. “sip” indicates that only the packets with its source IP address and port number matched to the IP-MAC binding rules can be processed. “sip+mac” indicates that only the packets with its source IP address, source MAC address and port number matched to the IP-MAC binding rules can be processed.

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

#### Example

Enable the IP Verify Source function for Gigabit Ethernet ports 5-10. Configure that only the packets with its source IP address, source MAC address and port number matched to the IP-MAC binding rules can be processed:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/5-10  
T3700G-28TQ(config-if-range)#ip verify source sip+mac
```

## show ip verify source

### Description

The **show ip verify source** command is used to display the IP Verify Source configuration information.

### Syntax

```
show ip verify source
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the IP Verify Source configuration information:

```
T3700G-28TQ(config)#show ip verify source
```

## Chapter 16 DoS Defend Command

DoS (Denial of Service) Attack is to occupy the network bandwidth maliciously by the network attackers or the evil programs sending a lot of service requests to the Host. With the DoS Defend enabled, the switch can analyze the specific field of the received packets and provide the defend measures to ensure the normal working of the local network.

### ip dos-prevent

#### Description

The **ip dos-prevent** command is used to enable the DoS defend function globally. To disable the DoS defend function, please use **no ip dos-prevent** command.

#### Syntax

```
ip dos-prevent
no ip dos-prevent
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the DoS defend function globally:

```
T3700G-28TQ(config)#ip dos-prevent
```

### ip dos-prevent type

#### Description

The **ip dos-prevent type** command is used to select the DoS Defend Type. To disable the corresponding Defend Type, please use **no ip dos-prevent type** command.

#### Syntax

```
ip dos-prevent type { land | scan-synfin | xma-scan | null-scan | port-less-1024
| blat | ping-flood | syn-flood }
no ip dos-prevent type { land | scan-synfin | xma-scan | null-scan |
port-less-1024 | blat | ping-flood | syn-flood }
```

## Parameter

land — Land attack.

scan-synfin — Scan SYNFIN attack.

xma-scan — Xma Scan attack.

null-scan — NULL Scan attack.

port-less-1024 — The SYN packets whose Source Port less than 1024.

blat — Blat attack.

ping-flood — Ping flooding attack. With the ping flood attack enabled, the switch will limit automatically the forwarding speed of ping packets to 512K when attacked by ping flood.

syn-flood — SYN/SYN-ACK flooding attack. With the syn-flood attack enabled, the switch will limit automatically the forwarding speed of ping packets to 512K when attacked by syn-flood.

## Command Mode

Global Configuration Mode

## Example

Enable the DoS Defend Type named Land attack:

```
T3700G-28TQ(config)#ip dos-prevent type land
```

# show ip dos-prevent

## Description

The **show ip dos-prevent** command is used to display the DoS information of the detected DoS attack, including enable/disable status, the DoS Defend Type, the count of the attack, etc.

## Syntax

```
show ip dos-prevent
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the DoS information of the detected DoS attack globally:

```
T3700G-28TQ(config)#show ip dos-prevent
```

## Chapter 17 IEEE 802.1X Commands

IEEE 802.1X function is to provide an access control for LAN ports via the authentication. Only the supplicant passing the authentication can access the LAN.

### dot1x system-auth-control

#### Description

The **dot1x system-auth-control** command is used to enable the IEEE 802.1X function globally. To disable the IEEE 802.1X function, please use **no dot1x system-auth-control** command.

#### Syntax

```
dot1x system-auth-control
no dot1x system-auth-control
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the IEEE 802.1X function:

```
T3700G-28TQ(config)#dot1x system-auth-control
```

### dot1x auth-method

#### Description

The **dot1x auth-method** command is used to configure the Authentication Method of IEEE 802.1X and the default 802.1x authentication method is “eap-md5”. To restore to the default 802.1x authentication method, please use **no dot1x auth-method** command.

#### Syntax

```
dot1x auth-method { pap | eap-md5 }
no dot1x auth-method
```

#### Parameter

pap | eap-md5 —Authentication Methods.

pap: IEEE 802.1X authentication system uses extensible authentication protocol (EAP) to exchange information between the switch and the client. The transmission of EAP packets is terminated at the switch and the EAP packets are converted to the other protocol (such as RADIUS) packets for transmission

eap-md5: IEEE 802.1X authentication system uses extensible authentication protocol (EAP) to exchange information between the switch and the client. The EAP protocol packets with authentication data can be encapsulated in the advanced protocol (such as RADIUS) packets to be transmitted to the authentication server.

### Command Mode

Global Configuration Mode

### Example

Configure the Authentication Method of IEEE 802.1X as “pap”:

```
T3700G-28TQ(config)#dot1x auth-method pap
```

## dot1x guest-vlan(global)

### Description

The **dot1x guest-vlan** command is used to enable the Guest VLAN function globally. To disable the Guest VLAN function, please use **no dot1x guest-vlan** command.

### Syntax

```
dot1x guest-vlan vid  
no dot1x guest-vlan
```

### Parameter

*vid* — The VLAN ID needed to enable the Guest VLAN function, ranging from 2 to 4094. The supplicants in the Guest VLAN can access the specified network source.

### Command Mode

Global Configuration Mode

### Example

Enable the Guest VLAN function for VLAN 5:



```
T3700G-28TQ(config)#dot1x guest-vlan 5
```

## dot1x quiet-period

### Description

The **dot1x quiet-period** command is used to enable the quiet-period function. To disable the function, please use **no dot1x quiet-period** command.

### Syntax

```
dot1x quiet-period [ time ]  
no dot1x quiet-period
```

### Parameter

*time* — The length of the quiet-period time. If one user's authentication fails, its subsequent IEEE 802.1x authentication requests will not be processed during the quiet-period time. It ranges from 1 to 999 seconds and the default value is 10 seconds.

### Command Mode

Global Configuration Mode

### Example

Enable the quiet-period function:

```
T3700G-28TQ(config)#dot1x quiet-period
```

Enable the quiet-period function and set the quiet-period as 5 seconds:

```
T3700G-28TQ(config)#dot1x quiet-period 5
```

## dot1x timeout

### Description

The **dot1x timeout** command is used to configure the server timeout and the supplicant timeout. To restore to the default, please use **no dot1x timeout** command.

### Syntax

```
dot1x timeout { server-timeout time | supplicant-timeout time }  
no dot1x timeout { server-timeout | supplicant-timeout }
```

## Parameter

**server-timeout** *time* —The maximum time for the switch to wait for the response before resending a request to the server, ranging from 1 to 9 in second. By default, it is 3 seconds.

**supplicant-timeout** *time* —The maximum time for the switch to wait for the response from supplicant before resending a request to the supplicant., ranging from 1 to 9 in second. By default, it is 3 seconds.

## Command Mode

Global Configuration Mode

## Example

Configure the server's timeout value as 5 seconds:

```
T3700G-28TQ(config)#dot1x timeout server-timeout 5
```

# dot1x max-reauth-req

## Description

The **dot1x max-reauth-req** command is used to configure the maximum transfer times of the repeated authentication request when the server cannot be connected. To restore to the default value, please use **no dot1x max-reauth-req** command.

## Syntax

```
dot1x max-reauth-req times
```

```
no dot1x max-reauth-req
```

## Parameter

*times* — The maximum transfer times of the repeated authentication request, ranging from 1 to 9 in times. By default, the value is 3.

## Command Mode

Global Configuration Mode

## Example

Configure the maximum transfer times of the repeated authentication request as 5:

```
T3700G-28TQ(config)#dot1x max-reauth-req 5
```

## dot1x

### Description

The **dot1x** command is used to enable the IEEE 802.1X function for a specified port. To disable the IEEE 802.1X function for a specified port, please use **no dot1x** command.

### Syntax

```
dot1x
no dot1x
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the IEEE 802.1X function for the Gigabit Ethernet port 1:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#dot1x
```

## dot1x guest-vlan(interface)

### Description

The **dot1x guest-vlan** command is used to enable the guest VLAN function for a specified port. To disable the Guest VLAN function for a specified port, please use **no dot1x guest-vlan** command. Please ensure that the Control Type of the corresponding port is port-based before enabling the guest VLAN function for it.

### Syntax

```
dot1x guest-vlan
no dot1x guest-vlan
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the Guest VLAN function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#dot1x guest-vlan
```

## dot1x port-control

### Description

The **dot1x port-control** command is used to configure the Control Mode of IEEE 802.1X for the specified port. By default, the control mode is “auto”. To restore to the default configuration, please use **no dot1x port-control** command.

### Syntax

**dot1x port-control** {auto | authorized-force | unauthorized-force}

**no dot1x port-control**

### Parameter

auto | authorized-force | unauthorized-force — The Control Mode for the port.

auto: In this mode, the port will normally work only after passing the 802.1X Authentication.

authorized-force: In this mode, the port can work normally without passing the 802.1X Authentication.

unauthorized-force: In this mode, the port is forbidden working for its fixed unauthorized status.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the Control Mode for Gigabit Ethernet port 20 as “authorized-force”:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
T3700G-28TQ(config-if)#dot1x port-control authorized-force
```

## dot1x port-method

### Description

The **dot1x port-method** command is used to configure the control type of IEEE 802.1X for the specified port. By default, the control type is “mac-based”. To restore to the default configuration, please use **no dot1x port-method** command.

### Syntax

```
dot1x port-method { mac-based | port-based }
```

```
no dot1x port-method
```

### Parameter

mac-based | port-based —The control type for the port.

mac-based: Any client connected to the port should pass the 802.1X authentication for access.

port-based: All the clients connected to the port can access the network on the condition that any one of the clients has passed the 802.1X Authentication.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the Control Type for Gigabit Ethernet port 20 as “port-based”:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
```

```
T3700G-28TQ(config-if)#dot1x port-method port-based
```

## radius

### Description

The **radius** command is used to configure the parameters of radius.

## Syntax

```
radius { [auth-pri ip] [auth-sec ip] [auth-port port] [acct-pri ip] [acct-sec ip]
[acct-port port] [auth-key { [ 0 ] password | 7 encrypted-password } ] [acct-key
{ [ 0 ] password | 7 encrypted-password} ] }
```

```
no radius { auth-port | auth-key | auth-pri | auth-sec | acct-port | acct-key |
acct-pri | acct-sec }
```

## Parameter

**auth-pri ip** — The IP address of the authentication server.

**auth-sec ip** — The IP address of the alternative authentication server.

**auth-port port** —The UDP port of authentication server(s) ranging from 1 to 65535. The default value is 1812.

**acct-pri ip** — The IP address of the accounting server.

**acct-sec ip** — The IP address of the alternative accounting server.

**acct-port port** — The UDP port of accounting server(s) ranging from 1 to 65535. The default value is 1813.

**auth-key { [ 0 ] password | 7 encrypted-password }** — 0 and 7 are the encryption type. 0 indicates that an unencrypted password will follow. 7 indicates that a symmetric encrypted password with a fixed length will follow. By default, the encryption type is 0. “password” is the shared password for the switch and the authentication servers to exchange messages which contains 31 characters at most. The question marks and spaces are not allowed. “encrypted-password” is a symmetric encrypted password with a fixed length, which you can copy from another switch’s configuration file. The password or encrypted-password you configured here will be displayed in the encrypted form.

**acct-key { [ 0 ] password | 7 encrypted-password }** — 0 and 7 are the encryption type. 0 indicates that an unencrypted password will follow. 7 indicates that a symmetric encrypted password with a fixed length will follow. By default, the encryption type is 0. “password” is the shared password for the switch and the authentication servers to exchange messages which contains 31 characters at most. The question marks and spaces are not allowed. “encrypted-password” is a symmetric encrypted password with a fixed length, which you can copy from another switch’s configuration file. The password or encrypted-password you configured here will be displayed in the encrypted form.

## Command Mode

Global Configuration Mode

## Example

Configure the IP address of the accounting server as 10.20.1.100 and password as tlink:

```
T3700G-28TQ(config)#radius auth-pri 10.20.1.100 auth-key tlink
```

## radius server-account

### Description

The **radius server-account** command is used to enable the accounting feature. To disable the accounting feature, please use **no radius server-account** command.

### Syntax

```
radius server-account  
no radius server-account
```

### Command Mode

Global Configuration Mode

### Example

Enable the accounting feature:

```
T3700G-28TQ(config)#radius server-account
```

## show dot1x global

### Description

The **show dot1x global** command is used to display the global configuration of 801.X.

### Syntax

```
show dot1x global
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configuration of 801.X globally:

```
T3700G-28TQ(config)#show dot1x global
```

## show dot1x interface

### Description

The **show dot1x interface** command is used to display all ports or the specified port's configuration information of 801.X.

### Syntax

```
show dot1x interface [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number. Display the configuration of all the ports by default.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of 801.X for Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#show dot1x interface gigabitEthernet 1/0/20
```

Display the configuration information of 801.X for all Ethernet ports:

```
T3700G-28TQ(config)#show dot1x interface
```

## show radius accounting

### Description

The **show radius accounting** command is used to display the configuration of the accounting server.

### Syntax

```
show radius accounting
```



**Command Mode**

Privileged EXEC Mode and Any Configuration Modes

**Example**

Display the configuration of the accounting server:

```
T3700G-28TQ(config)#show radius accounting
```

## show radius authentication

**Description**

The **show radius authentication** command is used to display the configuration of the RADIUS authentication server.

**Syntax**

```
show radius authentication
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the configuration of the RADIUS authentication server:

```
T3700G-28TQ(config)#show radius authentication
```

## Chapter 18 System Log Commands

The log information will record the settings and operation of the switch respectively for you to monitor operation status and diagnose malfunction.

### logging buffer

#### Description

The **logging buffer** command is used to store the system log messages to an internal buffer. To disable the log buffer function, please use the **no logging buffer** command. Local Log is the system log information saved in the switch. It has two output channels, that is, it can be saved to two different positions, log buffer and log flash memory. The log buffer indicates the RAM for saving system log and the information in the log buffer can be got by [show logging buffer](#) command. It will be lost when the switch is restarted.

#### Syntax

```
logging buffer
no logging buffer
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the system log buffer:

```
T3700G-28TQ(config)#logging buffer
```

### logging buffer level

#### Description

The **logging buffer level** command is used to configure the severity level and the status of the configuration input to the log buffer. To return to the default configuration, please use **no logging buffer level** command.

#### Syntax

```
logging buffer level level
no logging buffer level
```

## Parameter

*level* — Severity level of the log information output to each channel. There are 8 severity levels marked with values 0-7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be output. By default, it is 7 indicating that all the log information will be saved in the log buffer.

## Command Mode

Global Configuration Mode

## Example

Set the severity level as 6:

```
T3700G-28TQ(config)#logging buffer level 6
```

# logging file flash

## Description

The **logging file flash** command is used to store the log messages in a file in the flash on the switch. To disable the log file flash function, please use **no logging file flash** command. The log file flash indicates the flash sector for saving system log. The information in the log file of the flash will not be lost after the switch is restarted and can be got by the [show logging flash](#) command.

## Syntax

**logging file flash**

**no logging file flash**

## Command Mode

Global Configuration Mode

## Example

Enable the log file flash function:

```
T3700G-28TQ(config)#logging file flash
```

## logging file flash frequency

### Description

The **logging file flash frequency** command is used to specify the frequency to synchronize the system log file in the log buffer to the flash. To resume the default synchronizing frequency, please use the **no logging file flash frequency** command.

### Syntax

```
logging file flash frequency { periodic periodic | immediate }  
no logging file flash frequency
```

### Parameter

*periodic* — The frequency to synchronize the system log file in the log buffer to the flash, ranging from 1 to 48 hours. By default, the synchronization process takes place every 24 hours.

**immediate** — The system log file in the buffer will be synchronized to the flash immediately. This option will reduce the life of the flash and is not recommended.

### Command Mode

Global Configuration Mode

### Example

Specify the log file synchronization frequency as 10 hours:

```
T3700G-28TQ(config)#logging file flash frequency 10
```

## logging file flash level

### Description

The **logging file flash level** command is used to specify the system log message severity level. Messages with a severity level equal to or higher than this value will be stored to the flash. To restore to the default level, please use **no logging file flash level** command.

### Syntax

```
logging file flash level level  
no logging file flash level
```

## Parameter

*level* — Severity level of the log message. There are 8 severity levels marked with values 0-7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be saved to the flash. By default, it is 2 indicating that the log message marked with 0-2 will be saved in the log flash.

## Command Mode

Global Configuration Mode

## Example

Save the log messages with their severities equal or higher than 7 to the flash :

```
T3700G-28TQ(config)#logging file flash level 7
```

# logging host index

## Description

The **logging host index** command is used to configure the syslog server hosts to receive logging messages. To clear the configuration of the specified Log Host, please use **no logging host index** command. Log Host is to receive the system log from other devices. You can remotely monitor the settings and operation status of other devices through the log host.

## Syntax

```
logging host index idx host-ip level
```

```
no logging host index idx
```

## Parameter

*idx* — The index of the log host. The switch supports 4 log hosts.

*host-ip* — The IP for the log host.

*level* — The severity level of the log information sent to each log host. There are 8 severity levels marked with values 0-7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be sent to the corresponding log host. By default, it is 6 indicating that the log information marked with 0-6 will be sent to the log host.

## Command Mode

Global Configuration Mode

## Example

Set the log host's index as 2, IP address as 192.168.0.148 and the severity level as 5:

```
T3700G-28TQ(config)#logging host index 2 192.168.0.148 5
```

## copy logging flash tftp

### Description

The **copy logging flash tftp** command is used save the log file in the flash to the TFTP server.

### Syntax

```
copy logging flash tftp ip-address ip-address filename file-name [ unit-id ]
```

### Parameter

*ip-address* — The address of the TFTP server to receive the log file.

*file-name* — The name of the file to save the syslog.

*unit-id* — Specify the unit ID of the switch in the stack. By default, the syslog of all the units in the stack will be saved.

### Command Mode

Global Configuration Mode

### Example

Save the unit 1's system log file to the TFTP server 192.168.0.148 with the name log.txt:

```
T3700G-28TQ(config)# copy logging flash tftp ip-address 192.168.0.148
filename log.txt 1
```

## clear logging

### Description

The **clear logging** command is used to clear the syslog in the log buffer and log flash in the specified unit or the whole stack.

### Syntax

```
clear logging [ buffer | flash ] [ unit unit-id]
```

### Parameter

`buffer | flash` — The output channels: buffer and flash. Clear the information of the two channels, by default.

`unit-id` — The unit in which the syslog will be cleared. If not specified, all the syslog in the stack will be cleared.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Clear the syslog in the log buffer of all the switches in the stack::

```
T3700G-28TQ(config)#clear logging buffer
```

## show logging local-config

### Description

The **show logging local-config** command is used to display the configuration of the Local Log including the log buffer and the log file, the synchronization frequency etc.

### Syntax

```
show logging local-config
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of the Local Log:

```
T3700G-28TQ(config)#show logging local-config
```

## show logging loghost

### Description

The **show logging loghost** command is used to display the configuration of the log host.

### Syntax

```
show logging loghost [index]
```

### Parameter

*index* — The index of the log host whose configuration will be displayed.  
Display the configuration of all the log hosts by default.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of the log host 2:

```
T3700G-28TQ(config)#show logging loghost 2
```

## show logging buffer

### Description

The **show logging buffer** command is used to display the log information in the log buffer according to the severity level in the specified unit or the whole stack.

### Syntax

```
show logging buffer [ level level ] [ unit unit-id ]
```

### Parameter

*level* — Severity level. There are 8 severity levels marked with values 0-7. The information of levels with priority not lower than the select level will display. Display all the log information in the log buffer by default.

*unit* — Specify the unit whose log information in the log buffer will be displayed. The log information in the log buffers of the whole stack will be displayed by default.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the log information from level 0 to level 5 in the log buffer of unit 2:

```
T3700G-28TQ(config)#show logging buffer level 5 unit 2
```



## show logging flash

### Description

The **show logging flash** command is used to display the log information in the log file according to the severity level in the specified unit or the whole stack.

### Syntax

```
show logging flash [ level level ] [ unit unit-id ]
```

### Parameter

*level* — Severity level. There are 8 severity levels marked with values 0-7. The information of levels with priority not lower than the select level will display. Display all the log information in the log file by default.

*unit* — Specify the unit whose log information in the log file will be displayed. The log information in the log files of the whole stack will be displayed by default.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the log information with the level marked 0-3 in the log file of unit 2:

```
T3700G-28TQ(config)#show logging flash level 3 unit 2
```

## Chapter 19 SSH Commands

SSH (Security Shell) can provide the unsecured remote management with security and powerful authentication to ensure the security of the management information.

### ip ssh server

#### Description

The **ip ssh server** command is used to enable SSH function. To disable the SSH function, please use **no ip ssh server** command.

#### Syntax

```
ip ssh server
no ip ssh server
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the SSH function:

```
T3700G-28TQ(config)#ip ssh server
```

### ip ssh version

#### Description

The **ip ssh version** command is used to enable the SSH protocol version. To disable the protocol version, please use **no ip ssh version** command.

#### Syntax

```
ip ssh version { v1 | v2 }
no ip ssh version { v1 | v2 }
```

#### Parameter

v1 | v2 — The SSH protocol version to be enabled. They represent SSH v1 and SSH v2 respectively.

## Command Mode

Global Configuration Mode

## Example

Enable SSH v2:

```
T3700G-28TQ(config)#ip ssh version v2
```

# ip ssh timeout

## Description

The **ip ssh timeout** command is used to specify the idle-timeout time of SSH. To restore to the factory defaults, please use **no ip ssh timeout** command.

## Syntax

**ip ssh timeout** *value*

**no ip ssh timeout**

## Parameter

*value* — The Idle-timeout time. During this period, the system will automatically release the connection if there is no operation from the client. It ranges from 1 to 120 in seconds. By default, this value is 120 seconds.

## Command Mode

Global Configuration Mode

## Example

Specify the idle-timeout time of SSH as 100 seconds:

```
T3700G-28TQ(config)#ip ssh timeout 100
```

# ip ssh max-client

## Description

The **ip ssh max-client** command is used to specify the maximum number of the connections to the SSH server. To return to the default configuration, please use **no ip ssh max-client** command.

## Syntax

**ip ssh max-client** *num*

**no ip ssh max-client**

### Parameter

*num* — The maximum number of the connections to the SSH server. It ranges from 1 to 5. By default, this value is 5.

### Command Mode

Global Configuration Mode

### Example

Specify the maximum number of the connections to the SSH server as 3:

```
T3700G-28TQ(config)#ip ssh max-client 3
```

## ip ssh download

### Description

The **ip ssh download** command is used to download the SSH key file from TFTP server.

### Syntax

```
ip ssh download { v1 | v2 } key-file ip-address ip-addr
```

### Parameter

*v1 | v2* — Select the type of SSH key to download, v1 represents SSH-1, v2 represents SSH-2.

*key-file* — The name of the key-file which is selected to download. The length of the name ranges from 1 to 25 characters. The key length of the downloaded file must be in the range of 256 to 3072 bits.

*ip-addr* — The IP address of the TFTP server.

### Command Mode

Global Configuration Mode

### Example

Download an SSH-1 type key file named ssh-key from TFTP server with the IP address 192.168.0.148:

```
T3700G-28TQ(config)#ip ssh download v1 ssh-key ip-address
192.168.0.148
```

## remove public-key

### Description

The **remove public-key** command is used to remove the SSH public key from the switch.

### Syntax

```
remove public-key { v1 | v2 }
```

### Parameter

v1 | v2 — Select the type of SSH public key, v1 represents SSH-1, v2 represents SSH-2.

### Command Mode

Privileged EXEC Mode

### Example

Remove the SSH-1 type public key from the switch:

```
T3700G-28TQ# remove public-key v1
```

## show ip ssh

### Description

The **show ip ssh** command is used to display the global configuration of SSH and the SSH public key.

### Syntax

```
show ip ssh
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global configuration of SSH and the SSH public key:

```
T3700G-28TQ(config)#show ip ssh
```

## Chapter 20 SSL Commands

SSL (Secure Sockets Layer), a security protocol, is to provide a secure connection for the application layer protocol(e.g. HTTP) based on TCP. Adopting asymmetrical encryption technology, SSL uses key pair to encrypt/decrypt information. A key pair refers to a public key (contained in the certificate) and its corresponding private key. By default the switch has a certificate (self-signed certificate) and a corresponding private key. The Certificate/Key Download function enables the user to replace the default key pair.

### ip http secure-server

#### Description

The **ip http secure-server** command is used to enable the SSL function globally on the switch. To disable the SSL function, please use **no ip http secure-server** command. Only the SSL function is enabled, a secure HTTPS connection can be established.

#### Syntax

```
ip http secure-server
no ip http secure-server
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the SSL function:

```
T3700G-28TQ(config)#ip http secure-server
```

### ip http secure-server download certificate

#### Description

The **ip http secure-server download certificate** command is used to download a certificate to the switch from TFTP server.

#### Syntax

```
ip http secure-server download certificate ssl-cert ip-address ip-addr
```

### Parameter

*ssl-cert* — The name of the SSL certificate which is selected to download to the switch. The length of the name ranges from 1 to 25 characters. The certificate must be BASE64 encoded.

*ip-addr* — The IP address of the TFTP server.

### Command Mode

Global Configuration Mode

### Example

Download an SSL certificate named *ssl-cert* from TFTP server with the IP address of 192.168.0.146:

```
T3700G-28TQ(config)#ip http secure-server download certificate ssl-cert
ip-address 192.168.0.146
```

## ip http secure-server download key

### Description

The **ip http secure-server download key** command is used to download an SSL key to the switch from TFTP server.

### Syntax

```
ip http secure-server download key ssl-key ip-address ip-addr
```

### Parameter

*ssl-key* — The name of the SSL key which is selected to download to the switch. The length of the name ranges from 1 to 25 characters. The key must be BASE64 encoded.

*ip-addr* — The IP address of the TFTP server.

### Command Mode

Global Configuration Mode

### Example

Download an SSL key named *ssl-key* from TFTP server with the IP address of 192.168.0.146:

```
T3700G-28TQ(config)#ip http secure-server download key ssl-key  
ip-address 192.168.0.146
```

## show ip http secure-server

### Description

The **show ip http secure-server** command is used to display the global configuration of SSL.

### Syntax

```
show ip http secure-server
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global configuration of SSL:

```
T3700G-28TQ(config)#show ip http secure-server
```



## Chapter 21 MAC Address Commands

MAC Address configuration can improve the network security by configuring the Port Security and maintaining the address information by managing the Address Table.

### mac address-table static

#### Description

The **mac address-table static** command is used to add the static MAC address entry. To remove the corresponding entry, please use **no mac address-table static** command. The static address can be added or removed manually, independent of the aging time. In the stable networks, the static MAC address entries can facilitate the switch to reduce broadcast packets and enhance the efficiency of packets forwarding remarkably.

#### Syntax

```
mac address-table static mac-addr vid vid interface { fastEthernet port |
gigabitEthernet port | ten-gigabitEthernet port }
no mac address-table static { mac-addr | vid vid | mac mac-addr vid vid |
interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet
port } }
```

#### Parameter

*mac-addr* — The MAC address of the entry you desire to add.

*vid* — The VLAN ID number of your desired entry. It ranges from 1 to 4094.

*port* — The Fast/Gigabit Ethernet port number.

#### Command Mode

Global Configuration Mode

#### Example

Add a static Mac address entry to bind the MAC address 00:02:58:4f:6c:23, VLAN1 and Gigabit Ethernet port 1/0/1 together:

```
T3700G-28TQ(config)#mac address-table static 00:02:58:4f:6c:23 vid 1
interface gigabitEthernet 1/0/1
```

Delete the static address entry whose VLAN id is 1:

```
T3700G-28TQ(config)#no mac address-table static vid 1
```

Delete the static address entry whose MAC address is 00:02:58:4f:6c:23:

```
T3700G-28TQ(config)#no mac address-table static 00:02:58:4f:6c:23
```

## mac address-table aging-time

### Description

The **mac address-table aging-time** command is used to configure aging time for the dynamic address. To return to the default configuration, please use **no mac address-table aging-time** command.

### Syntax

```
mac address-table aging-time aging-time
```

```
no mac address-table aging-time
```

### Parameter

*aging-time* — The aging time for the dynamic address. The value of it can be 0 or ranges from 10 to 630 seconds. When 0 is entered, the Auto Aging function is disabled. It is 300 seconds by default.

### Command Mode

Global Configuration Mode

### Example

Configure the aging time as 500 seconds:

```
T3700G-28TQ(config)#mac address-table aging-time 500
```

## mac address-table filtering

### Description

The **mac address-table filtering** command is used to add the filtering address entry. To delete the corresponding entry, please use **no mac address-table filtering** command. The filtering address function is to forbid the undesired package to be forwarded. The filtering address can be added or removed manually, independent of the aging time.

## Syntax

```

mac address-table filtering mac-addr vid vid
no mac address-table filtering { [mac-addr] [vid vid] }

```

## Parameter

*mac-addr* — The MAC address to be filtered.

*vid* — The corresponding VLAN ID of the MAC address. It ranges from 1 to 4094.

## Command Mode

Global Configuration Mode

## Example

Add a filtering address entry of which VLAN ID is 1 and MAC address is 00:1e:4b:04:01:5d:

```
T3700G-28TQ(config)#mac address-table filtering 00:1e:4b:04:01:5d vid 1
```

# mac address-table max-mac-count

## Description

The **mac address-table max-mac-count** command is used to configure the Port Security. To return to the default configurations, please use **no mac address-table max-mac-count** command. Port Security is to protect the switch from the malicious MAC address attack by limiting the maximum number of the MAC addresses that can be learned on the port. The port with Port Security feature enabled will learned the MAC address dynamically. When the learned MAC address number reaches the maximum, the port will stop learning. Therefore, the other devices with the MAC address unlearned cannot access to the network via this port.

## Syntax

```

mac address-table max-mac-count { [max-number num] [mode { dynamic |
static | permanent } ] [status { disable | enable } ] }
no mac address-table max-mac-count [ max-number | mode | status ]

```

## Parameter

*num* — The maximum number of MAC addresses that can be learned on the port. It ranges from 0 to 1024. By default this value is 1024.

dynamic | static | permanent — Learn mode for MAC addresses. There are three modes, including Dynamic mode, Static mode and Permanent mode. When Dynamic mode is selected, the learned MAC address will be deleted automatically after the aging time. When Static mode is selected, the learned MAC address will be out of the influence of the aging time and can only be deleted manually. The learned entries will be cleared after the switch is rebooted. When permanent mode is selected, the learned MAC address will be out of the influence of the aging time and can only be deleted manually too. However, the learned entries will be saved even the switch is rebooted.

status — Enable or disable the Port Security function for a specified port. By default, this function is disabled.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable Port Security function for Gigabit Ethernet port 1/0/1, select Static mode as the learn mode, and specify the maximum number of MAC addresses that can be learned on this port as 30:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#mac address-table max-mac-count max-number
30 mode static status enable
```

## show mac address-table

### Description

The **show mac address-table** command is used to display the information of all address entries.

### Syntax

```
show mac address-table [ dynamic | static | filtering ]
```

### Parameter

dynamic | static | filtering — The type of your desired entry. By default all the entries are displayed.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of all address entries:

```
T3700G-28TQ(config)#show mac address-table
```

# show mac address-table aging-time

## Description

The **show mac address-table aging-time** command is used to display the Aging Time of the MAC address.

## Syntax

```
show mac address-table aging-time
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the Aging Time of the MAC address:

```
T3700G-28TQ(config)#show mac address-table aging-time
```

# show mac address-table max-mac-count

## Description

The **show mac address-table max-mac-count interface** command is used to display the security configuration of an Ethernet port or of all Fast/Gigabit /ten-Gigabit Ethernet ports.

## Syntax

```
show mac address-table max-mac-count { all | interface { fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port } }
```

## Parameter

*all* — Displays the security information of all the Fast/Gigabit/ten-Gigabit Ethernet ports.

*port* — The Fast/Gigabit/ten-Gigabit Ethernet port number.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the security configuration of Gigabit Ethernet port 1/0/20:

```
T3700G-28TQ(config)#show mac address-table max-mac-count interface
gigabitEthernet 1/0/20
```

# show mac address-table interface

## Description

The **show mac address-table interface** command is used to display the address configuration of an Ethernet port.

## Syntax

```
show mac address-table interface { fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port }
```

## Parameter

*port* — The Fast/Gigabit/ten-Gigabit Ethernet port number.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the address configuration of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ(config)#show mac address-table interface gigabitEthernet
1/0/1
```

# show mac address-table count

## Description

The **show mac address-table count** command is used to display the total amount of MAC address table.

## Syntax

```
show mac address-table count [ unit unit-id ] [ vlan vlan-id ]
```

## Parameter

*unit-id* —— Specify the unit-id of the switch in the stack.

*vlan-id* —— Specify the VLAN which the switch belongs to.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the total amount of MAC address table in all the units of the stack sorted by VLAN:

```
T3700G-28TQ(config)#show mac address-table count
```

Display the total amount of MAC address table in unit 2 of the stack sorted by VLAN:

```
T3700G-28TQ(config)#show mac address-table count unit 2
```

Display the total amount of MAC address table in VLAN 1 of unit 2 of the stack:

```
T3700G-28TQ(config)#show mac address-table count unit 2 vlan 1
```

Display the total amount of MAC address table in VLAN 2 of all the units of the stack:

```
T3700G-28TQ(config)#show mac address-table count vlan 2
```

# show mac address-table address

## Description

The **show mac address-table address** command is used to display the information of a specified MAC address.

## Syntax

```
show mac address-table address mac-addr [ interface { fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port } ] [ vid vlan-id ]
```

## Parameter

*mac-addr* —— The specified MAC address.

*port* —— The Fast/Gigabit/ten-Gigabit Ethernet port number.

*vlan-id* —— Specify the VLAN which the entry belongs to.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of the MAC address 00:00:00:23:00:00 in VLAN 1:

```
T3700G-28TQ(config)#show mac address-table address 00:00:00:23:00:00  
vid 1
```

Display the information of the MAC address 00:00:00:23:00:00:

```
T3700G-28TQ(config)#show mac address-table address 00:00:00:23:00:00
```

Display the information of the MAC address 00:00:00:23:00:00 on port 1/0/20:

```
T3700G-28TQ(config)#show mac address-table address 00:00:00:23:00:00  
interface gigabitEthernet 1/0/20
```

# show mac address-table vlan

## Description

The **show mac address-table vlan** command is used to display the MAC address configuration of the specified vlan.

## Syntax

```
show mac address-table vlan vid
```

## Parameter

*vid* — The specified VLAN id.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the MAC address configuration of vlan 1:

```
T3700G-28TQ(config)#show mac address-table vlan 1
```



## Chapter 22 System Configuration Commands

System Configuration Commands can be used to configure the system information and system IP of the switch, and to reboot and reset the switch, upgrade the switch system and commands used for device diagnose, including loopback test and cable test.

### system-time manual

#### Description

The **system-time manual** command is used to configure the system time manually.

#### Syntax

```
system-time manual time
```

#### Parameter

*time* — Set the date and time manually, in the format of MM/DD/YYYY-HH:MM:SS.

#### Command Mode

Global Configuration Mode

#### Example

Configure the system time as 02/14/2012-12:30:00:

```
T3700G-28TQ(config)#system-time manual 02/14/2012-12:30:00
```

### system-time ntp

#### Description

The **system-time ntp** command is used to configure the time zone and the IP address for the NTP Server. The switch will get UTC automatically if it has connected to an NTP Server.

#### Syntax

```
system-time ntp { timezone } { ntp-server } { backup-ntp-server }  
{ fetching-rate }
```

## Parameter

*timezone* — Your local time-zone, and it ranges from UTC-12:00 to UTC+13:00.

The detailed information that each time-zone means are displayed as follow:

UTC-12:00 — TimeZone for International Date Line West.

UTC-11:00 — TimeZone for Coordinated Universal Time-11.

UTC-10:00 — TimeZone for Hawaii.

UTC-09:00 — TimeZone for Alaska.

UTC-08:00 — TimeZone for Pacific Time(US Canada).

UTC-07:00 — TimeZone for Mountain Time(US Canada).

UTC-06:00 — TimeZone for Central Time(US Canada).

UTC-05:00 — TimeZone for Eastern Time(US Canada).

UTC-04:30 — TimeZone for Caracas.

UTC-04:00 — TimeZone for Atlantic Time(Canada).

UTC-03:30 — TimeZone for Newfoundland.

UTC-03:00 — TimeZone for Buenos Aires, Salvador, Brasilia.

UTC-02:00 — TimeZone for Mid-Atlantic.

UTC-01:00 — TimeZone for Azores, Cape Verde Is.

UTC — TimeZone for Dublin, Edinburgh, Lisbon, London.

UTC+01:00 — TimeZone for Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna.

UTC+02:00 — TimeZone for Cairo, Athens, Bucharest, Amman, Beirut, Jerusalem.

UTC+03:00 — TimeZone for Kuwait, Riyadh, Baghdad.

UTC+03:30 — TimeZone for Tehran.

UTC+04:00 — TimeZone for Moscow, St.Petersburg, Volgograd, Tbilisi, Port Louis.

UTC+04:30 — TimeZone for Kabul.

UTC+05:00 — TimeZone for Islamabad, Karachi, Tashkent.

UTC+05:30 — TimeZone for Chennai, Kolkata, Mumbai, New Delhi.

UTC+05:45 — TimeZone for Kathmandu.

UTC+06:00 — TimeZone for Dhaka, Astana, Ekaterinburg.

UTC+06:30 — TimeZone for Yangon (Rangoon).

UTC+07:00 — TimeZone for Novosibirsk, Bangkok, Hanoi, Jakarta.

UTC+08:00—— TimeZone for Beijing, Chongqing, Hong Kong, Urumqi, Singapore.

UTC+09:00 —— TimeZone for Seoul, Irkutsk, Osaka, Sapporo, Tokyo.

UTC+09:30 —— TimeZone for Darwin, Adelaide.

UTC+10:00 —— TimeZone for Canberra, Melbourne, Sydney, Brisbane.

UTC+11:00 —— TimeZone for Solomon Is., New Caledonia, Vladivostok.

UTC+12:00 —— TimeZone for Fiji, Magadan, Auckland, Wellington.

UTC+13:00 —— TimeZone for Nuku'alofa, Samoa.

*ntp-server* —— The IP address for the Primary NTP Server.

*backup-ntp-server* —— The IP address for the Secondary NTP Server.

*fetching-rate* —— Specify the rate fetching time from NTP server.

## Command Mode

Global Configuration Mode

## Example

Configure the system time mode as NTP, the time zone is UTC-12:00, the primary NTP server is 133.100.9.2 and the secondary NTP server is 139.78.100.163, the fetching-rate is 11 hours:

```
T3700G-28TQ(config)# system-time ntp UTC-12:00 133.100.9.2
139.79.100.163 11
```

## system-time dst predefined

### Description

The **system-time dst predefined** command is used to select a predefined DST configuration and the configuration can be recycled.

### Syntax

**system-time dst predefined** [ USA | Australia | Europe | New-Zealand ]

### Parameter

USA | Australia | Europe | New-Zealand —— Predefined DST mode, with four options: USA, Australia, Europe and New-Zealand. By default, the setting is “Europe”.

The DST time periods which the four predefined DST mode represents are displayed as follow:

USA: Second Sunday in March, 02:00 - First Sunday in November, 02:00.

Australia: First Sunday in October, 02:00 - First Sunday in April, 03:00.

Europe: Last Sunday in March, 01:00 - Last Sunday in October, 01:00.

New Zealand: Last Sunday in September, 02:00 - First Sunday in April, 03:00.

## Command Mode

Global Configuration Mode

## Example

Configure the DST period of the switch as Europe:

```
T3700G-28TQ(config)#system-time dst predefined Europe
```

# system-time dst date

## Description

The **system-time dst date** command is used to specify the DST configuration in Date mode. This configuration is one-off in use. By default, the current year is used as the starting time. DST time periods should be within 12 months over one/two year.

## Syntax

```
system-time dst date {smonth} {sday} {stime} {syear} {emonth} {eday} {etime}  
{eyear}[offset]
```

## Parameter

*smonth* — Month to start, with the options: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

*sday* — Day to start, ranging from 1 to 31. Please mind that the number of days depends on the month.

*stime* — Time to start, in the format of hh:mm.

*syear* — Year to start, ranging from 2000 to 2099.

*emonth* — Month to end, with the options: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

*eday* — Day to end, ranging from 1 to 31. Please mind that the number of days depends on the month.

*etime* — Time to end, in the format of hh:mm.

*eyear* — Year to end, ranging from 2000 to 2099.

*offset* — Specify the time adding in minutes when Daylight Saving Time comes. The value ranges from 1 to 1440 and the default value is 60 minutes. It is optional.

## Command Mode

Global Configuration Mode

## Example

Configure the DST start time as 00:00 am on April 1<sup>st</sup> of 2013, the end time as 00:00 am on October 1<sup>st</sup> of 2013 and the offset as 30 minutes:

```
T3700G-28TQ(config)#system-time dst date Apr 1 00:00 2013 Oct 1 00:00
2013 30
```

# system-time dst recurring

## Description

The **system-time dst recurring** command is used to specify the DST configuration in recurring mode. This configuration is recurring in use. The time period is not restricted to be within one year.

## Syntax

```
system-time dst recurring {sweek} {sday} {smonth} {stime} {eweek} {eday}
{emonth} {etime} [offset]
```

## Parameter

*sweek* — Week to start, with the options: first, second, third, fourth, last.

*sday* — Day to start, with the options: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

*smonth* — Month to start, with options: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

*stime* — Time to start, in the format of: hh:mm.

*ewee*k — Week to end, with options: first, second, third, fourth, last.

*eday* — Day to end, with options: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

*emonth* — Month to end, with options: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

*etime* — Time to end, in the format of: hh:mm.

*offset* — Specify the time adding in minutes when Daylight Saving Time comes. The range of value depends and the default value is 60 minutes. It is optional.

## Command Mode

Global Configuration Mode

## Example

Specify the DST start time of the switch as 2:00 am on the first Sunday in May, the end time as 2:00 am on the last Sunday in October and the offset as 45 minutes:

```
T3700G-28TQ(config)#system-time dst recurring first Sun May 02:00 last  
Sun Oct 02:00 45
```

# hostname

## Description

The **hostname** command is used to configure the system name. To clear the system name information, please use **no hostname** command.

## Syntax

```
hostname hostname
```

```
no hostname
```

## Parameter

*hostname* — System Name, ranging from 1 to 32 characters. It is the product name by default. Here it is T3700G-28TQ.

## Command Mode

Global Configuration Mode

## Example

Configure the system name as TPLINK:

```
T3700G-28TQ(config)#hostname TPLINK
```

# location

## Description

The **location** command is used to configure the system location. To clear the system location information, please use **no location** command.

## Syntax

**location** *location*

**no location**

## Parameter

*location* — Device Location. It consists of 32 characters at most. It is SHENZHEN by default.

## Command Mode

Global Configuration Mode

## Example

Configure the system location as GUANGZHOU:

```
T3700G-28TQ(config)#location GUANGZHOU
```

# contact-info

## Description

The **contact-info** command is used to configure the system contact information. To clear the system contact information, please use **no contact-info** command.

## Syntax

**contact-info** *contact\_info*

**no contact-info**

## Parameter

*contact\_info* — Contact Information. It consists of 32 characters at most. It is www.tp-link.com by default.

## Command Mode

Global Configuration Mode

## Example

Configure the system contact information as www.tp-link.com:

```
T3700G-28TQ(config)#contact-info www.tp-link.com
```

## ip address

### Description

This **ip address** command is used to configure the IP address and IP subnet mask for the specified interface manually. The interface type includes: routed port, loopback interface and VLAN interface.

### Syntax

```
ip address { ip-addr } { mask }
```

```
no ip address
```

### Parameter

*ip-addr* — The IP address of the Layer 3 interface.

*mask* — The subnet mask of the Layer 3 interface.

### Command Mode

Interface Configuration Mode

### Example

Create the VLAN interface 2 with the IP address as 192.168.1.1 and subnet mask as 255.255.255.0:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip address 192.168.1.1 255.255.255.0
```

## ip address-alloc

### Description

The **IP address-alloc dhcp** command is used to enable the DHCP Client function or the BOOTP Protocol. When this function is enabled, the specified interface will obtain IP from DHCP Server or BOOTP server. To disable the IP obtaining function on the specified interface, please use the **no ip address** command. This command applies to the routed port and the VLAN interface.

### Syntax

```
ip address-alloc { dhcp | bootp }
```

```
no ip address
```



## Parameter

`dhcp` — Specify the Layer 3 interface to obtain IP address from the DHCP Server.

`bootp` — Specify the Layer 3 interface to obtain IP address from the BOOTP Server.

## Command Mode

Interface Configuration Mode

## Example

Enable the DHCP Client function on the Layer 3 routed port 1/0/1:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/1
```

```
T3700G-28TQ(config-if)# no switchport
```

```
T3700G-28TQ(config-if)# ip address-alloc dhcp
```

Disable the IP address obtaining function on the VLAN interface 2:

```
T3700G-28TQ(config)# interface vlan 2
```

```
T3700G-28TQ(config-if)# no ip address
```

# reset

## Description

The **reset** command is used to reset the switch's software. After resetting, all configuration of the switch will restore to the factory defaults and your current settings will be lost.

## Syntax

```
reset [ unitid ]
```

## Parameter

*unitid* — Specify the unit in the stack to reset its software. If not specified, all members software in the stack will be reset.

## Command Mode

Privileged EXEC Mode

## Example

Reset the software of all the members in the stack:

```
T3700G-28TQ#reset
```

## reboot

### Description

The **reboot** command is used to reboot the switch. To avoid damage, please don't turn off the device while rebooting.

### Syntax

```
reboot [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack to reboot. If not specified, reboot all members in the stack.

### Command Mode

Privileged EXEC Mode

### Example

Reboot all members in the stack:

```
T3700G-28TQ#reboot
```

## copy running-config startup-config

### Description

The **copy running-config startup-config** command is used to save the current settings as the startup configuration file.

### Syntax

```
copy running-config startup-config [ unit-id ]
```

### Parameter

*unit-id* — Specify the unit in the stack whose current settings would be saved as the startup configuration file. If not specified, current settings of all the members in the stack will be saved as their startup configuration file.

### Command Mode

Privileged EXEC Mode

### Example

Save unit 1's current settings as the startup configuration file:

```
T3700G-28TQ#copy running-config startup-config 1
```

## copy running-config backup-config

### Description

The **copy running-config backup-config** command is used to save the current settings as the backup configuration file.

### Syntax

```
copy running-config backup-config [ unit-id ]
```

### Parameter

*unit-id* — Specify the unit in the stack whose current settings would be saved as the backup configuration file. If not specified, current settings of all the members in the stack will be saved as their backup configuration file.

### Command Mode

Privileged EXEC Mode

### Example

Save unit 1's current settings as the backup configuration file:

```
T3700G-28TQ#copy running-config backup-config 1
```

## copy running-config user-config

### Description

The **copy running-config user-config** command is used to save the current settings as the user-defined configuration file.

### Syntax

```
copy running-config user-config [ device ] { configfilename }
```

### Parameter

*device* — Specify the unit in the stack whose current settings would be saved as user-defined configuration file, in the format of *unitid:*, for example *unit1:*. If not specified, current settings of all the members in the stack will be saved as the user-defined configuration file.

*configfilename* — Specify the name of configuration file with the suffix “.cfg”, ranging from 1 to 63 characters.

## Command Mode

Privileged EXEC Mode

## Example

Save unit 1's current settings as my\_config.cfg:

```
T3700G-28TQ#copy running-config user-config unit1:my_config.cfg
```

# copy backup-config startup-config

## Description

The **backup-config startup-config** command is used to save the backup configuration file as the startup configuration file.

## Syntax

```
copy backup-config startup-config [ unit-id ]
```

## Parameter

*unit-id* — Specify the unit in the stack whose backup configuration file would be saved as the startup configuration file. If not specified, current backup configuration files all the members in the stack will be saved as their startup configuration files.

## Command Mode

Privileged EXEC Mode

## Example

Save all the members' backup configuration files as their startup configuration files in the stack:

```
T3700G-28TQ#copy backup-config startup-config
```

# copy startup-config backup-config

## Description

The **copy startup-config running-config** command is used to save the startup configuration file as the backup configuration file.

## Syntax

```
copy startup-config backup-config [ unit-id ]
```

## Parameter

*unit-id* — Specify the unit in the stack whose startup configuration file would be saved as the backup configuration file. If not specified, current startup configuration files of all the members in the stack will be saved as their backup configuration files.

## Command Mode

Privileged EXEC Mode

## Example

Save all the member's startup configuration files as the backup configuration files in the stack:

```
T3700G-28TQ#copy startup-config backup-config
```

# boot application

## Description

The **boot application** command is used to configure the image file as startup image or backup image.

## Syntax

```
boot application filename { image1 | image 2 } { startup | backup } [ unitid ]
```

```
no boot application
```

## Parameter

image1 | image2 — Specify the image file to be configured. By default, the image1.bin is the startup image and the image2.bin is the backup image.

startup | backup — Specify the property of the image, either startup image or backup image.

*unitid* — Specify the unit in the stack whose image file would be configured. If not specified, image files of all the members in the stack will be configured.

## Command Mode

Global Configuration Mode

## Example

Configure the image2.bin as the startup image in all the switches in the stack:

```
T3700G-28TQ(config)# boot application filename image2 startup
```

## boot config

### Description

The **boot config** command is used to configure the property of the system configuration file.

### Syntax

```
boot config filename filename { startup | backup | none } [ unitid ]  
no boot config
```

### Parameter

*filename* — Specify the name of the configuration file to be configured. The suffix “.cfg” is not included and the length is between 1 and 59 characters. By default the startup configuration file is config1.cfg and the backup configuration file is config2.cfg.

startup | backup | none — Specify the property of configuration file. “startup” represents the startup configuration file and “backup” represents the backup configuration file, while “none” means to clear the property of the specified configuration file.

*unitid* — Specify the unit in the stack whose configuration file would be configured. If not specified, configuration files of all the members in the stack will be configured.

### Command Mode

Global Configuration Mode

### Example

Configure the config2.cfg as the startup configuration file in all the switches in the stack:

```
T3700G-28TQ(config)# boot config filename config2 startup
```

## copy backup-config tftp

### Description

The **copy backup-config tftp** command is used to upload the backup configuration file to TFTP server.

## Syntax

```
copy backup-config tftp ip-address ip-addr filename name [ unit-id ]
```

## Parameter

*ip*—— IP address of the TFTP server.

*name* —— Specify the name for the backup configuration file which would be saved. The uploaded configuration files will be named in the format as *name\_unitid.cfg*, for example *config\_1.cfg*, *config\_2.cfg*, etc.

*unit-id* —— Specify the unit in the stack whose backup configuration file would be saved. If not specified, backup configuration files of all the members in the stack will be uploaded.

## Command Mode

Privileged EXEC Mode

## Example

Save the backup configuration files of all the members in the stack to TFTP server with the IP 192.168.0.148 and name these files as config with their unit ID as suffix:

```
T3700G-28TQ#copy backup-config tftp ip-address 192.168.0.148 filename
config
```

# copy startup-config tftp

## Description

The **copy startup-config tftp** command is used to upload the backup configuration file to TFTP server.

## Syntax

```
copy startup-config tftp ip-address ip-addr filename name [ unit-id ]
```

## Parameter

*ip-addr* —— IP address of the TFTP server.

*name* —— Specify the name for the startup configuration file which would be saved. The uploaded configuration files will be named in the format as *name\_unitid.cfg*, for example *config\_1.cfg*, *config\_2.cfg*, etc.

*unit-id* — Specify the unit in the stack whose startup configuration file would be saved. If not specified, startup configuration files of all the members in the stack will be uploaded.

### Command Mode

Privileged EXEC Mode

### Example

Save the startup configuration file of all the members in the stack to TFTP server with the IP 192.168.0.148 and name these files as config with their unit ID as suffix:

```
T3700G-28TQ#copy startup-config tftp ip-address 192.168.0.148 filename
config
```

## copy tftp backup-config

### Description

The **copy tftp backup-config** command is used to download the configuration file from TFTP server to the switch as the backup configuration file.

### Syntax

```
copy tftp backup-config ip-address ip-addr filename name [ unit-id ]
```

### Parameter

*ip-addr* — IP address of the TFTP server.

*name* — Specify the name of the configuration file which would be downloaded. The configuration file with the name *name\_unitid.cfg* will be downloaded to the switch with corresponding unit ID in the stack.

*unit-id* — Specify the unit in the stack to which the configuration file would be downloaded. If not specified, the corresponding configuration files will be downloaded to all the members in the stack as their backup configuration file.

### Command Mode

Privileged EXEC Mode



## Example

Download the configuration file named as config\_unitid to the corresponding switches in the stack as their backup configuration file from TFTP server with the IP 192.168.0.148:

```
T3700G-28TQ#copy tftp backup-config ip-address 192.168.0.148 filename
config
```

## copy tftp startup-config

### Description

The **copy tftp startup-config** command is used to download the configuration file from the TFTP server to the switch as the startup configuration file.

### Syntax

```
copy tftp startup-config ip-address ip-addr filename name [ unit-id ]
```

### Parameter

*ip-addr* — IP address of the TFTP server.

*name* — Specify the name of the configuration file which would be downloaded. The configuration file with the name *name\_unitid.cfg* will be downloaded to the switch with corresponding unit ID in the stack.

*unit-id* — Specify the unit in the stack to which the configuration file would be downloaded. If not specified, the corresponding configuration files will be downloaded to all the members in the stack as their startup configuration file.

### Command Mode

Privileged EXEC Mode

### Example

Download the configuration file named as config\_unitid to the corresponding switches in the stack as their startup configuration file from TFTP server with the IP 192.168.0.148:

```
T3700G-28TQ#copy tftp startup-config ip-address 192.168.0.148 filename
config
```

## copy image tftp-source

### Description

The **copy image tftp-source** command is used to download the image file from the TFTP server to the switch.

### Syntax

```
copy image tftp-source [ device ] { imagename } ip-address ip-addr filename
name
```

### Parameter

*device* — Specify the unit in the stack to which the image file downloaded, in the format of unitid:, for example unit1:. If not specified, the image file will be downloaded to all the members in the stack.

*imagename* — Specify the name of the image file to be stored in the switch, either image1.bin or image2.bin.

*ip-addr* — IP address of the TFTP server.

*name* — Specify the name of the image file which would be downloaded from the TFTP server. The suffix “.bin” is not included.

### Command Mode

Privileged EXEC Mode

### Example

Download the image file named as image.bin to the unit 1 in the stack as its image1.bin from TFTP server with the IP 192.168.0.148:

```
T3700G-28TQ#copy image tftp-source unit1:image1.bin ip-address
192.168.0.148 filename image
```

## copy image tftp-target

### Description

The **copy image tftp-target** command is used to upload the image file from the switch to the TFTP server.

## Syntax

```
copy image [ device] { imagename } tftp-target ip-address ip-addr filename
name
```

## Parameter

*device* — Specify the unit in the stack from which the image file is uploaded, in the format of unitid:, for example unit1:. If not specified, the image files of all members in the stack will be uploaded.

*imagename* — Specify the name of the image file to be uploaded, either image1.bin or image2.bin.

*ip-addr* — IP address of the TFTP server.

*name* — Name of the uploaded image file stored in the TFTP server. The suffix “.bin” is not included.

## Command Mode

Privileged EXEC Mode

## Example

Upload the unit1' image1.bin files to the TFTP server with the IP 192.168.0.148 and name it as image.bin:

```
T3700G-28TQ#copy image unit1:image1.bin tftp-target ip-address
192.168.0.148 filename image
```

# copy image

## Description

The **copy image** command is used to copy and save the image files inside the stack system.

## Syntax

```
copy image [ src_device ] { src_imagename } [ dst_device ] { dst_imagename }
```

## Parameter

*src\_device* — Specify the member's unit in the stack from which the image file would be copied, in the format of unitid:, for example unit1:. If not specified, the image file of the current switch will be copied.

*src\_imagename* — Specify the name of the source image file.

*dst\_device* — Specify the member's unit in the stack to which the image file would be saved, in the format of `unitid:`, for example `unit1:`. If not specified, the image file will be saved to all the members in the stack.

*dst\_imagename* — Specify the name of the image file saved in the destination switch.

### Command Mode

Privileged EXEC Mode

### Example

Copy unit 1's `image1.bin` file to unit 2 as `image2.bin`:

```
T3700G-28TQ#copy image unit1:image1.bin unit2:image2.bin
```

## remove backup-image

### Description

The **remove backup-image** command is used to delete the backup-image.

### Syntax

```
remove backup-image [ unitid ]
```

### Parameter

*unitid* — Specify the member's unit in the stack from which the backup image file would be deleted . If not specified, the backup image files of all the switches in the stack will be deleted.

### Command Mode

Privileged EXEC Mode

### Example

Delete the backup image files of all the members in the stack:

```
T3700G-28TQ# remove backup-image
```

## remove config

### Description

The **remove config** command is used to delete the configuration file.

## Syntax

```
remove config filename [ device ] { configfilename }
```

## Parameter

*device* — Specify the unit in the stack whose configuration file will be deleted, in the format of unitid:, for example unit1:. If not specified, the configuration files of all members in the stack will be deleted.

*configfilename* — Specify the name of the configuration file to be deleted, ranging from 1 to 63 characters with the suffix “.cfg” included.

## Command Mode

Privileged EXEC Mode

## Example

Delete the configuration file named config1.cfg of all the members in the stack:

```
T3700G-28TQ# remove config filename config1.cfg
```

# firmware upgrade

## Description

The **firmware upgrade** command is used to upgrade the switch system file via the TFTP server.

## Syntax

```
firmware upgrade ip-address ip-addr filename name [ unitid ]
```

## Parameter

*ip-addr* — IP address of the TFTP server.

*name* — Specify the name for the firmware file.

*unitid* — Specify the member’s unit in the stack for which the firmware file would be applied. If not specified, the firmware files of all the switches in the stack will be upgraded.

## Command Mode

Privileged EXEC Mode

## Example

Upgrade the switch system file named as firmware.bin of all the switches in the stack from the TFTP server with the IP address 192.168.0.148:

```
T3700G-28TQ#firmware upgrade ip-address 192.168.0.148 filename
firmware.bin
```

## ping

### Description

The **ping** command is used to test the connectivity between the switch and one node of the network.

### Syntax

```
ping ip_addr [-n count] [-l count] [-i count]
```

### Parameter

*ip\_addr* — The IP address of the destination node for ping test.

**-n count** — The amount of times to send test data during Ping testing. It ranges from 1 to 10. By default, this value is 4.

**-l count** — The size of the sending data during ping testing. It ranges from 1 to 1024 bytes. By default, this value is 64.

**-i count** — The interval to send ICMP request packets. It ranges from 100 to 1000 milliseconds. By default, this value is 1000.

### Command Mode

User EXEC Mode and Privileged EXEC Mode

### Example

To test the connectivity between the switch and the network device with the IP 192.168.0.131, please specify the *count* (-l) as 512 bytes and *count* (-i) as 1000 milliseconds. If there is not any response after 8 times' Ping test, the connection between the switch and the network device is failed to establish:

```
T3700G-28TQ#ping 192.168.0.131 -n 8 -l 512
```

## tracert

### Description

The **tracert** command is used to test the connectivity of the gateways during its journey from the source to destination of the test data.

## Syntax

```
tracert ip_addr [-w waitTime ] [-h maxHops ]
```

## Parameter

*ip\_addr* — The IP address of the destination device.

*waitTime* — The maximum time for the test data to wait before timeout. It ranges from 1 to 10000ms.

*maxHops* — The maximum number of the route hops the test data can pass through. It ranges from 1 to 30. By default, this value is 4.

## Command Mode

User EXEC Mode and Privileged EXEC Mode

## Example

Test the connectivity between the switch and the network device with the IP 192.168.0.131. If the destination device has not been found after 20 *maxHops*, the connection between the switch and the destination device is failed to establish:

```
T3700G-28TQ#tracert 192.168.0.131 -h 20
```

# loopback interface

## Description

The **loopback interface** command is used to test whether the port is available or not.

## Syntax

```
loopback interface { fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port } { internal | external }
```

## Parameter

*port* — The Fast/Gigabit/ten-Gigabit Ethernet port number.

*internal | external* — Loopback Type. There are two options: “internal” and “external”.

## Command Mode

User EXEC Mode and Privileged EXEC Mode

### Example

Conduct an internal-type loopback test for Gigabit Ethernet port 1/0/20:

```
T3700G-28TQ# loopback interface gigabitEthernet 1/0/20 internal
```

Conduct an external-type loopback test for Gigabit Ethernet port 20:

```
T3700G-28TQ# loopback interface gigabitEthernet 1/0/20 external
```

## show system-time

### Description

The **show system-time** command is used to display the current time system and its source.

### Syntax

```
show system-time
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the time information of the switch:

```
T3700G-28TQ#show system-time
```

## show system-time dst

### Description

The **show system-time dst** command is used to display the DST time information of the switch.

### Syntax

```
show system-time dst
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the DST time information of the switch



```
T3700G-28TQ#show system-time dst
```

## show system-time ntp

### Description

The **show system-time ntp** command is used to display the NTP mode configuration information.

### Syntax

```
show system-time ntp
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the NTP mode configuration information of the switch:

```
T3700G-28TQ#show system-time ntp
```

## show system-info

### Description

The **show system-info** command is used to display system description, system name, device location, system contact, hardware version, firmware version, system time, run time and so on.

### Syntax

```
show system-info
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the system information:

```
T3700G-28TQ#show system-info
```

## show environment

### Description

The **show environment** command is used to display system description, system name, device location, system contact, hardware version, firmware version, system time, run time and so on.

### Syntax

```
show environment{ all | fan | power | temperature } [ unitid ]
```

### Parameter

**all | fan | power | temperature** — Specify the system's running environmental status to be displayed. "all" represents all the environmental information; "fan" represents the fans' running status; "power" represents the power's running status; "temperature" represents the system's environmental temperature.

***unitid*** — Specify the unit in the stack whose environmental information will be displayed. If not specified, the environmental information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the system's running temperature of all the switches in the stack:

```
T3700G-28TQ#show environment temperature
```

## show files-in-system

### Description

The **show files-in-system** command is used to display the information of system files.

### Syntax

```
show file-in-system [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack whose system files' information will be displayed. If not specified, the system files' information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the system files' information of all the switches in the stack:

```
T3700G-28TQ#show files-in-system
```

## show image-info

### Description

The **show image-info** command is used to display the information of image files in the system.

### Syntax

```
show image-info [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack whose image files' information will be displayed. If not specified, the system image files' information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the system image files' information of all the switches in the stack:

```
T3700G-28TQ#show image-info
```

## show running-config

### Description

The **show running-config** command is used to display the current operating configuration of the system or of a specified port.

### Syntax

```
show running-config [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack to display its operating configuration. If not specified, all the members' operating configurations will be displayed in the stack.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display all the members' current operating configuration in the stack:

```
T3700G-28TQ#show running-config
```

## show boot

### Description

The **show boot** command is used to display the current boot configuration of the system.

### Syntax

```
show boot [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack whose boot configuration information will be displayed. If not specified, the boot configuration information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the system boot configuration information of all the switches in the stack:

```
T3700G-28TQ#show boot
```

## show cable-diagnostics interface

### Description

The **show cable-diagnostics interface** command is used to display the cable diagnostics of the connected Ethernet Port., which facilitates you to check the connection status of the cable connected to the Switch, locate and diagnose the trouble spot of the network.

### Syntax

```
show cable-diagnostics interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port }
```

### Parameter

*port* — The number of the port which is selected for Cable test.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Show the cable-diagnostics of Gigabit Ethernet port 20:

```
T3700G-28TQ#show cable-diagnostics interface gigabitEthernet 1/0/20
```

## show cpu-utilization

### Description

The **show cpu-utilization** command is used to display the system's CPU utilization in the last 5 seconds/1minute/5minutes.

### Syntax

```
show cpu-utilization [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack whose CPU utilization information will be displayed. If not specified, the CPU utilization information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the CPU utilization information of all the switches in the stack:

```
T3700G-28TQ#show cpu-utilization
```

## show memory-utilization

### Description

The **show memory-utilization** command is used to display the system's memory utilization in the last 5 seconds/1minute/5minutes.

### Syntax

```
show memory-utilization [ unitid ]
```

### Parameter

*unitid* — Specify the unit in the stack whose memory utilization information will be displayed. If not specified, the memory utilization information of all the switches in the stack will be displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the memory utilization information of all the switches in the stack:

```
T3700G-28TQ#show memory-utilization
```

## Chapter 23 Ethernet Configuration Commands

Ethernet Configuration Commands can be used to configure the Bandwidth Control, Negotiation Mode and Storm Control for Ethernet ports.

### interface fastEthernet

#### Description

The **interface fastEthernet** command is used to enter the interface fastEthernet Configuration Mode and configure the corresponding Fast Ethernet port.

#### Syntax

```
interface fastEthernet port
```

#### Parameter

*port* — The Fast Ethernet port number.

#### Command Mode

Global Configuration Mode

#### Example

T3700G-28TQ doesn't have any fastEthernet port.

### interface range fastEthernet

#### Description

The **interface range fastEthernet** command is used to enter the interface range fastEthernet Configuration Mode and configure multiple Fast Ethernet ports at the same time.

#### Syntax

```
interface range fastEthernet port-list
```

#### Parameter

*port-list* — The list of Fast Ethernet ports.

## Command Mode

Global Configuration Mode

## User Guidelines

Command in the **Interface Range fastEthernet** Mode is executed independently on all ports in the range. It does not effect the execution on the other ports at all if the command results in an error on one port.

## Example

T3700G-28TQ doesn't have any fastEthernet port.

# interface gigabitEthernet

## Description

The **interface gigabitEthernet** command is used to enter the interface gigabitEthernet Configuration Mode and configure the corresponding Gigabit Ethernet port.

## Syntax

```
interface gigabitEthernet port
```

## Parameter

*port* — The Fast/Gigabit Ethernet port number.

## Command Mode

Global Configuration Mode

## Example

To enter the Interface gigabitEthernet Configuration Mode and configure Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
```

# interface range gigabitEthernet

## Description

The **interface range gigabitEthernet** command is used to enter the interface range gigabitEthernet Configuration Mode and configure multiple Gigabit Ethernet ports at the same time.



## Syntax

```
interface range gigabitEthernet port-list
```

## Parameter

*port-list* — The list of Gigabit Ethernet ports.

## Command Mode

Global Configuration Mode

## User Guidelines

Command in the **Interface Range gigabitEthernet** Mode is executed independently on all ports in the range. It does not affect the execution on the other ports at all if the command results in an error on one port.

## Example

To enter the Interface Range gigabitEthernet Configuration Mode, and configure Gigabit Ethernet ports 10, 11 and 18 at the same time by adding them to one port-list:

```
T3700G-28TQ(config)# interface range gigabitEthernet 1/0/10-11,1/0/18
```

# interface ten-gigabitEthernet

## Description

The **interface ten-gigabitEthernet** command is used to enter the interface ten-gigabitEthernet Configuration Mode and configure the corresponding Ten Gigabit Ethernet port.

## Syntax

```
interface ten-gigabitEthernet port
```

## Parameter

*port* — The Ten Gigabit Ethernet port number.

## Command Mode

Global Configuration Mode

## Example

To enter the Interface gigabitEthernet Configuration Mode and configure Ten-Gigabit Ethernet port 25:

```
T3700G-28TQ(config)#interface ten-gigabitEthernet 1/0/25
```

# interface range ten-gigabitEthernet

## Description

The **interface range ten-gigabitEthernet** command is used to enter the interface range ten-gigabitEthernet Configuration Mode and configure multiple Ten Gigabit Ethernet ports at the same time.

## Syntax

```
interface range ten-gigabitEthernet port-list
```

## Parameter

*port-list* — The list of Ten Gigabit Ethernet ports.

## Command Mode

Global Configuration Mode

## User Guidelines

Command in the **Interface Range ten-gigabitEthernet** Mode is executed independently on all ports in the range. It does not affect the execution on the other ports at all if the command results in an error on one port.

## Example

To enter the Interface Range ten-gigabitEthernet Configuration Mode, and configure Ten Gigabit Ethernet ports 25 and 26 at the same time by adding them to one port-list:

```
T3700G-28TQ(config)# interface range ten-gigabitEthernet 1/0/25-26
```

## description

### Description

The **description** command is used to add a description to the Ethernet port. To clear the description of the corresponding port, please use **no description** command.

### Syntax

**description** *string*

**no description**

### Parameter

*string* — Content of a port description, ranging from 1 to 16 characters.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Add a description Port #5 to Gigabit Ethernet port 1/0/5:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
```

```
T3700G-28TQ(config-if)#description Port#5
```

## shutdown

### Description

The **shutdown** command is used to disable an Ethernet port. To enable this port again, please use **no shutdown** command.

### Syntax

**shutdown**

**no shutdown**

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Disable Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
T3700G-28TQ(config-if)#shutdown
```

# flow-control

## Description

The **flow-control** command is used to enable the flow-control function for a port. To disable the flow-control function for this corresponding port, please use **no flow-control** command. With the flow-control function enabled, the Ingress Rate and Egress Rate can be synchronized to avoid packet loss in the network.

## Syntax

**flow-control**

**no flow-control**

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the flow-control function for Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
T3700G-28TQ(config-if)#flow-control
```

## duplex

### Description

The **duplex** command is used to configure the Duplex Mode for an Ethernet port. To return to the default configuration, please use **no duplex** command.

### Syntax

```
duplex { auto | full | half }  
no duplex
```

### Parameter

auto | full | half — The duplex mode of the Ethernet port. There are three options: auto-negotiation mode, full-duplex mode and half-duplex mode. By default the Gigabit Ethernet port is auto-negotiation mode and the Ten Gigabit Ethernet port is full-duplex mode.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the Duplex Mode as full-duplex for Gigabit Ethernet port 1/0/20:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20  
T3700G-28TQ(config-if)#duplex full
```

## speed

### Description

The **speed** command is used to configure the Speed Mode for an Ethernet port. To return to the default configuration, please use **no speed** command.

### Syntax

```
speed { 10 | 100 | 1000 | 10000 | auto }  
no speed
```

### Parameter

10 | 100 | 1000 | 10000 | auto — The speed mode of the Ethernet port. There are four options: 10Mbps, 100Mbps, 1000Mbps, 10000Mbps and Auto negotiation mode. By default, the gigabitEthernet port works in Auto negotiation mode and the ten-gigabitEthernet port works in 10000Mbps mode.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the Speed Mode as 100Mbps for Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/20
T3700G-28TQ(config-if)#speed 100
```

## storm-control broadcast

### Description

The **storm-control broadcast** command is used to enable the broadcast control function. To disable the broadcast control function, please use **no storm-control broadcast** command. Broadcast control function allows the switch to filter broadcast in the network. If the transmission rate of the broadcast packets exceeds the set bandwidth, the packets will be automatically discarded to avoid network broadcast storm.

### Syntax

```
storm-control broadcast rate
no storm-control broadcast
```

### Parameter

*rate* — Specify the bandwidth for receiving broadcast packets on the port. The packet traffic exceeding the bandwidth will be discarded. Range: 1 to 1000000 kbps for the gigabit port, 1 to 10000000 kbps for the ten-gigabit port.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the broadcast control function for Gigabit Ethernet port 1/0/5 and set the bandwidth for receiving broadcast packets as 256 kbps:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#storm-control broadcast 256
```

# storm-control multicast

## Description

The **storm-control multicast** command is used to enable the multicast control function. To disable the multicast control function, please use **no storm-control multicast** command. Multicast control function allows the switch to filter multicast in the network. If the transmission rate of the multicast packets exceeds the set bandwidth, the packets will be automatically discarded to avoid network broadcast storm.

## Syntax

```
storm-control multicast rate
no storm-control multicast
```

## Parameter

*rate* — Select the bandwidth for receiving multicast packets on the port. The packet traffic exceeding the bandwidth will be discarded. Range: 1 to 1000000 kbps for the gigabit port, 1 to 10000000 kbps for the ten-gigabit port.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the multicast control function for Gigabit Ethernet port 1/0/5 and set the bandwidth for receiving multicast packets as 256 kbps:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#storm-control multicast 256
```

## storm-control unicast

### Description

The **storm-control unicast** command is used to enable the unicast control function. To disable the unicast control function, please use **no storm-control unicast** command. Unicast control function allows the switch to filter UL frame in the network. If the transmission rate of the UL frames exceeds the set bandwidth, the packets will be automatically discarded to avoid network broadcast storm.

### Syntax

```
storm-control unicast rate
no storm-control unicast
```

### Parameter

*rate* — Select the bandwidth for receiving UL-Frame on the port. The packet traffic exceeding the bandwidth will be discarded. Range: 1 to 1000000 kbps for the gigabit port, 1 to 10000000 kbps for the ten-gigabit port.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the unicast control function for Gigabit Ethernet port 1/0/5 and set the bandwidth for receiving UL-Frame as 256 kbps:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#storm-control unicast 256
```



## bandwidth

### Description

The **bandwidth** command is used to configure the bandwidth limit for an Ethernet port. To disable the bandwidth limit, please use **no bandwidth** command.

### Syntax

```
bandwidth { [ingress ingress-rate] [egress egress-rate] }
```

```
no bandwidth { all | ingress | egress }
```

### Parameter

*ingress-rate* — Specify the bandwidth for receiving packets. Range: 1-100000 kbps for the megaport, 1-1000000 kbps for the gigaport, 1 to 10000000 kbps for the ten-gigabit port.

*egress-rate* — Specify the bandwidth for sending packets. Range:1-100000 kbps for the megaport, 1-1000000 kbps for the gigaport, 1 to 10000000 kbps for the ten-gigabit port.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the ingress-rate as 5120kbps and egress-rate as 1024kbps for Gigabit Ethernet port 5:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#bandwidth ingress 5120 egress 1024
```

## clear counters

### Description

The **clear counters** command is used to clear the statistic information of all the Ethernet ports.

## Syntax

```
clear counters
```

## Command Mode

Global Configuration Mode

## Example

Clear the statistic information of all Ethernet ports

```
T3700G-28TQ(config)#clear counters
```

# show interface status

## Description

The **show interface status** command is used to display the connective-status of an Ethernet port.

## Syntax

```
show interface status [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ]
```

## Parameter

*port* —The Fast/Gigabit/Ten-Gigabit Ethernet port number or port list.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the connective-status of all Ethernet ports:

```
T3700G-28TQ(config)#show interface status
```

Display the connective-status of Gigabit Ethernet port 1:

```
T3700G-28TQ(config)#show interface status gigabitEthernet 1/0/1
```

# show interface counters

## Description

The **show interface counters** command is used to display the statistic information of an Ethernet port.

## Syntax

```
show interface counters [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

## Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number. By default, the statistic information of all ports is displayed.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the statistic information of all Ethernet ports:

```
T3700G-28TQ(config)#show interface counters
```

Display the statistic information of Gigabit Ethernet port 20:

```
T3700G-28TQ(config)#show interface counters gigabitEthernet 1/0/20
```

# show interface configuration

## Description

The **show interface configuration** command is used to display the configurations of an Ethernet port, including Port-status, Flow Control, Negotiation Mode and Port-description.

## Syntax

```
show interface configuration [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

## Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number or port list.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configurations of all Ethernet ports:

```
T3700G-28TQ(config)#show interface configuration
```

## show storm-control

### Description

The **show storm-control** command is used to display the storm-control information of an Ethernet port.

### Syntax

```
show storm-control [ interface { fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port } ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number or port list.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the storm-control information of port Gigabit Ethernet port 1/0/20:

```
T3700G-28TQ(config)#show storm-control interface gigabitEthernet 1/0/20
```

## show bandwidth

### Description

The **show bandwidth** command is used to display the bandwidth-limit information of Ethernet port.

### Syntax

```
show bandwidth [ interface { fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port } ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number or port list.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the bandwidth-limit information of Gigabit Ethernet port 1/0/20:

```
T3700G-28TQ(config)#show bandwidth interface gigabitEthernet 1/0/20
```

## Chapter 24 QoS Commands

QoS (Quality of Service) function is used to optimize the network performance. It provides you with network service experience of a better quality.

### qos

#### Description

The **qos** command is used to configure CoS (Class of Service) based on port. To return to the default configuration, please use **no qos** command.

#### Syntax

**qos** *cos-id*

**no qos**

#### Parameter

*cos-id* — The priority of port. It ranges from 0 to 7, which represent CoS0-CoS7 respectively. By default, the priority is 0.

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

#### User Guidelines

Port priority is one property of the port. When the port priority is specified, the data will be classified into the egress queue based on the CoS value of the ingress port and the mapping relation between the CoS and TC in IEEE 802.1P.

#### Example

Configure the priority of port 5 as 3:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
```

```
T3700G-28TQ(config-if)#qos 3
```

## qos dscp

### Description

The **qos dscp** command is used to enable the mapping relation between DSCP Priority and TC egress queue. To disable the mapping relation, please use **no qos dscp** command.

### Syntax

```
qos dscp
no qos dscp
```

### Command Mode

Global Configuration Mode

### User Guidelines

DSCP (DiffServ Code Point) is a new definition to IP ToS field given by IEEE. DSCP priorities are mapped to the corresponding 802.1p priorities. IP datagram will be classified into the egress queue based on the mapping relation between DSCP priority and TC egress queue.

### Example

Enable the mapping relation between DSCP Priority and egress queue:

```
T3700G-28TQ(config)#qos dscp
```

## qos queue cos-map

### Description

The **qos queue cos-map** command is used to configure the mapping relation between IEEE 802.1P priority tag/IEEE 802.1Q tag, CoS value and the TC egress queue. To return to the default configuration, please use **no qos queue cos-map** command. When 802.1P Priority is enabled, the packets with 802.1Q tag are mapped to different priority levels based on 802.1P priority mode. The untagged packets are mapped based on port priority mode.

### Syntax

```
qos queue cos-map tag/cos-id tc-id
no qos queue cos-map
```

### Parameter

*tag/cos-id* — The 8 priority levels defined by IEEE 802.1P or the priority level the packets with tag are mapped to, which ranges from CoS 0 to CoS 7.

*tc-id* — The egress queue the packets with tag are mapped to. It ranges from 0 to 7, which represents TC queue from TC0 to TC7 respectively.

### Command Mode

Global Configuration Mode

### User Guidelines

1. By default, the mapping relation between tag/cos and the egress queue is: 0-TC2, 1-TC0, 2-TC1, 3-TC3, 4-TC4, 5-TC5, 6-TC6, 7-TC7.
2. Among the priority levels TC0-TC7, the bigger value, the higher priority.

### Example

Map CoS 5 to TC 2.:

```
T3700G-28TQ(config)#qos queue cos-map 5 2
```

## qos queue dscp-map

### Description

The **qos queue dscp-map** command is used to configure the mapping relation between DSCP Priority and the TC egress queue. To return to the default configuration, please use **no qos queue dscp-map** command. DSCP (DiffServ Code Point) is a new definition to IP ToS field given by IEEE. This field is used to divide IP datagram into 64 priorities. When DSCP Priority is enabled, IP datagram are mapped to different priority levels based on DSCP priority mode; non-IP datagram with IEEE 802.1Q tag are mapped to different priority levels based on IEEE 802.1P priority mode if IEEE 802.1P Priority is enabled; the untagged non-IP datagram are mapped based on port priority mode.

### Syntax

```
qos queue dscp-map dscp-list cos-pri
```

```
no qos queue dscp-map
```

### Parameter

*dscp-list* — List of DSCP value. One or several DSCP values can be typed using comma to separate. Use a hyphen to designate a range of values, for instance, 1,4-7,11 indicates choosing 1,4,5,6,7,11. The DSCP value ranges from 0 to 63.

*cos-pri* — The cos priority the packets with tag are mapped to. It ranges from 0 to 7, which represents CoS0 to CoS7 respectively.



## Command Mode

Global Configuration Mode

## User Guidelines

1. By default, the mapping relation between tag and the CoS Priority is:  
(0-7)-CoS0, (8-15)-CoS1, (16-23)-CoS2, (24-31)-CoS3, (32-39)-CoS4, (40-47)-CoS5, (48-55)-CoS6, (56-63)-CoS7.
2. Among the priority levels CoS0-CoS7, the bigger value, the higher priority.

## Example

Map DSCP values 10-12 to CoS 2:

```
T3700G-28TQ(config)#qos queue dscp-map 10-12 2
```

# qos queue mode

## Description

The **qos queue mode** command is used to configure the Schedule Mode. To return to the default configuration, please use **no qos queue mode** command. When the network is congested, the program that many packets complete for resources must be solved, usually in the way of queue scheduling. The switch will control the forwarding sequence of the packets according to the priority queues and scheduling algorithms you set. On this switch, the priority levels are labeled as TC0, TC1, TC2 ... TC7.

## Syntax

```
qos queue mode { sp | wrr | sp+wrr | equ }
```

```
no qos queue mode
```

## Parameter

sp — Strict-Priority Mode. In this mode, the queue with higher priority will occupy the whole bandwidth. Packets in the queue with lower priority are sent only when the queue with higher priority is empty.

wrr — Weight Round Robin Mode. In this mode, packets in all the queues are sent in order based on the weight value for each queue. The weight value ratio of TC0, TC1, TC2, TC3, TC4, TC5, TC6 and TC7 is 1:2:4:8:16:32:64:128.

sp+wrr — Strict-Priority + Weight Round Robin Mode. In this mode, the switch provides two scheduling groups, SP group and WRR group. Queues in SP group and WRR group are scheduled strictly based on Strict-Priority mode while

the queues inside WRR group follow the WRR mode. In SP + WRR mode, TC7 is the SP group; TC0 to TC6 belong to the WRR group and the weight value ratio of TC0 to TC6 is 1:2:4:8:16:32:64. In this way, when scheduling queues, the switch allows TC7 to occupy the whole bandwidth following the SP mode and TC0 to TC6 in the WRR group will take up the bandwidth according to their ratio 1:2:4:8:16:32:64.

equ — Equal-Mode. In this mode, all the queues occupy the bandwidth equally. The weight value ratio of all the queues is 1:1:1:1:1:1:1.

### Command Mode

Global Configuration Mode

### Example

Specify the Schedule Mode as Weight Round Robin Mode:

```
T3700G-28TQ(config)#qos queue mode wrr
```

## show qos interface

### Description

The **show qos interface** command is used to display the configuration of QoS based on port priority.

### Syntax

```
show qos interface [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port]
```

### Parameter

*port* — The Fast/Gigabit/ten-Gigabit Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of QoS for Gigabit Ethernet port 1/0/5:

```
T3700G-28TQ#show qos interface gigabitEthernet 1/0/5
```

## show qos cos-map

### Description

The **show qos cos-map** command is used to display the configuration of IEEE802.1P Priority and the mapping relation between cos-id and tc-id.

## Syntax

```
show qos cos-map
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configuration of IEEE 802.1P Priority and the mapping relation between cos-id and tc-id:

```
T3700G-28TQ#show qos cos-map
```

# show qos dscp-map

## Description

The **show qos dscp-map** command is used to display the configuration of DSCP Priority.

## Syntax

```
show qos dscp-map
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configuration of DSCP Priority:

```
T3700G-28TQ#show qos dscp-map
```

# show qos queue mode

## Description

The **show qos queue mode** command is used to display the schedule rule of the egress queues.

## Syntax

```
show qos queue mode
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the schedule rule of the egress queues:

```
T3700G-28TQ#show qos queue mode
```

## show qos status

### Description

The **show qos status** command is used to display the status of IEEE 802.1P priority and DSCP priority.

### Syntax

```
show qos status
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the status of IEEE 802.1P priority and DSCP priority:

```
T3700G-28TQ#show qos status
```

## Chapter 25 Port Mirror Commands

Port Mirror refers to the process of forwarding copies of packets from one port to a monitoring port. Usually, the monitoring port is connected to data diagnose device, which is used to analyze the monitored packets for monitoring and troubleshooting the network.

### monitor session destination interface

#### Description

The **monitor session destination interface** command is used to configure the monitoring port. Each monitor session has only one monitoring port. To change the monitoring port, please use the **monitor session destination interface** command by changing the port value. To delete the corresponding monitor session configuration, please use **no monitor session** command.

#### Syntax

```
monitor session session_num destination interface { fastEthernet port |
gigabitEthernet port | ten-gigabitEthernet port }
no monitor session session_num
```

#### Parameter

*session\_num* — The monitor session number, the value of which is 1.  
*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

#### Command Mode

Global Configuration Mode

#### Example

Create monitor session 1 and configure Gigabit Ethernet port 1/0/1 as the monitoring port:

```
T3700G-28TQ(config)#monitor session 1 destination interface
gigabitEthernet 1/0/1
```

Delete the monitor session 1:

```
T3700G-28TQ(config)#no monitor session 1
```

## monitor session source interface

### Description

The **monitor session source interface** command is used to configure the monitored port. To delete the corresponding monitored port, please use **no monitor session source interface** command.

### Syntax

```
monitor session session_num source interface { fastEthernet port-list | gigabitEthernet port-list | ten-gigabitEthernet port-list } mode
```

```
no monitor session session_num source interface { fastEthernet port-list | gigabitEthernet port-list | ten-gigabitEthernet port-list } mode
```

### Parameter

*session\_num* — The monitor session number, the value of which is 1.

*port-list* — List of monitored port. It is multi-optional.

*mode* — The monitor mode. There are three options: rx, tx and both. Rx (ingress monitoring mode), means the incoming packets received by the monitored port will be copied to the monitoring port. TX (egress monitoring mode), indicates the outgoing packets sent by the monitored port will be copied to the monitoring port. Both (ingress and egress monitoring), presents the incoming packets received and the outgoing packets sent by the monitored port will both be copied to the monitoring port.

### Command Mode

Global Configuration Mode

### User Guidelines

1. Monitored ports number is not limited, but it can't be the monitoring port at the same time.
2. Whether the monitoring port and monitored ports are in the same VLAN or not is not demanded strictly.
3. The monitoring port cannot be link-aggregation member.

### Example

Create monitor session 1, then configure Gigabit Ethernet port 4, 5, 7 as monitored ports and enable ingress monitoring:

```
T3700G-28TQ(config)#monitor session 1 source interface gigabitEthernet
1/0/4-5,1/0/7 rx
```

Delete the Gigabit Ethernet port 4 in monitor session 1 and its configuration:

```
T3700G-28TQ(config)#no monitor session 1 source interface
gigabitEthernet 1/0/4 rx
```

## show monitor session

### Description

The **show monitor session** command is used to display the configuration of port monitoring.

### Syntax

```
show monitor session [session_num]
```

### Parameter

*session\_num* — The monitor session number, the value of which is 1.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the monitoring configuration of monitor session 1:

```
T3700G-28TQ(config)#show monitor session 1
```

## Chapter 26 Port isolation Commands

Port Isolation provides a method of restricting traffic flow to improve the network security by forbidding the port to forward packets to the ports that are not on its forwarding port list.

### port isolation

#### Description

The **port isolation** command is used to configure the forward port list of a port, so that this port can only communicate with the ports on its port list. To delete the corresponding configuration, please use **no port isolation** command.

#### Syntax

```
port isolation { [fa-forward-list fa-forward-list ] [gi-forward-list gi-forward-list]
ten-gi-forward-list ten-gi-forward-list }
no port isolation
```

#### Parameter

*fa-forward-list* — Configure Fast Ethernet ports to the forward port list. It is optional.

*gi-forward-list* — Configure Gigabit Ethernet ports to the forward port list. It is optional.

*ten-gi-forward-list* — Configure Gigabit Ethernet ports to the forward port list. It is optional.

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

#### Example

Set Gigabit Ethernet ports 1/0/15-17 to the forward port list of Gigabit Ethernet 1/0/8:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/8
```

```
T3700G-28TQ(config-if-range)#port isolation gi-forward-list 1/0/15-17
```

Set all the Ethernet ports to forward port list of Gigabit Ethernet port 1/0/2, namely restore to the default setting:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
```



```
T3700G-28TQ(config-if-range)#no port isolation
```

## show port isolation

### Description

The **show port isolation** command is used to display the forward port list of a port.

### Syntax

```
show port isolation interface [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ]
```

### Parameter

*port* — The number of Ethernet port you want to show its forward port list, in the format of 1/0/2.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the forward-list of Gigabit Ethernet port 1/0/3:

```
T3700G-28TQ#show port isolation interface gigabitEthernet 1/0/3
```

Display the forward-list of all Ethernet ports:

```
T3700G-28TQ#show port isolation interface
```

## Chapter 27 Loopback Detection Commands

With loopback detection feature enabled, the switch can detect loops using loopback detection packets. When a loop is detected, the switch will display an alert or further block the corresponding port according to the configuration.

### loopback-detection(global)

#### Description

The **loopback-detection** command is used to enable the loopback detection function globally. To disable it, please use **no loopback detection** command.

#### Syntax

**loopback-detection**

**no loopback-detection**

#### Command Mode

Global Configuration Mode

#### Example

Enable the loopback detection function globally:

```
T3700G-28TQ(config)# loopback-detection
```

### loopback-detection interval

#### Description

The **loopback-detection interval** command is used to define the interval of sending loopback detection packets from switch ports to network, aiming at detecting network loops periodically.

#### Syntax

**loopback-detection interval** *interval-time*

#### Parameter

*interval-time* — The interval of sending loopback detection packets. It ranges from 1 to 1000 seconds. By default, this value is 30 seconds.

## Command Mode

Global Configuration Mode

## Example

Specify the interval-time as 50 seconds:

```
T3700G-28TQ(config)# loopback-detection interval 50
```

# loopback-detection recovery-time

## Description

The **loopback-detection recovery-time** command is used to configure the time after which the blocked port would automatically recover to normal status.

## Syntax

```
loopback-detection recovery-time recovery-time
```

## Parameter

*recovery-time* — The time after which the blocked port would automatically recover to normal status, and the loopback detection would restart. It is integral times of detection interval, ranging from 1 to 100 and the default value is 3.

## Command Mode

Global Configuration Mode

## Example

Configure the recovery-time as 3 times of detection interval:

```
T3700G-28TQ(config)# loopback-detection recovery-time 3
```

# loopback-detection(interface)

## Description

The **loopback-detection** command is used to enable the loopback detection function of the specified port. To disable it, please use **no loopback-detection** command.

## Syntax

```
loopback-detection
```

```
no loopback-detection
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the loopback detection function of ports 1-3:

```
T3700G-28TQ(config)# interface range gigabitEthernet 1/0/1-3
T3700G-28TQ(config-if-range)# loopback-detection
```

# loopback-detection config

## Description

The **loopback-detection config** command is used to configure the process-mode and recovery-mode for the ports by which the switch copes with the detected loops.

## Syntax

```
loopback-detection config [ process-mode { alert | port-based } ]
[ recovery-mode { auto | manual } ]
```

## Parameter

alert | port-based — The mode how the switch processes the detected loops. Alert: When a loop is detected, display an alert. Port based: When a loop is detected, display an alert and block the port.

auto | manual — The mode how the blocked port recovers to normal status. Auto: Block status can be automatically removed after recovery time. Manual: Block status can only be removed manually.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the loopback detection process-mode as port-based and recovery-mode as manual for port 2:

```
T3200G-28TQ(config)# interface gigabitEthernet 1/0/2
```

```
T3700G-28TQ(config-if)# loopback-detection config process-mode  
port-based recovery-mode manual
```

## loopback-detection recover

### Description

The **loopback-detection recover** command is used to remove the block status of selected ports, thus recovering the blocked ports to normal status.

### Syntax

```
loopback-detection recover
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Recover the blocked port 2 to normal status:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2  
T3700G-28TQ(config-if)# loopback-detection recover
```

## show loopback-detection global

### Description

The **show loopback-detection global** command is used to display the global configuration of loopback detection function such as loopback detection global status, loopback detection interval and loopback detection recovery time.

### Syntax

```
show loopback-detection global
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global configuration of loopback detection function:

```
T3700G-28TQ# show loopback-detection global
```

## show loopback-detection interface

### Description

The **show loopback-detection interface** command is used to display the configuration of loopback detection function and the status of the specified Ethernet port.

### Syntax

```
show loopback-detection interface [ gigabitEthernet port ]
```

### Parameter

*port* — The Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of loopback detection function and the status of all ports:

```
T3700G-28TQ# show loopback-detection interface
```

Display the configuration of loopback detection function and the status of port 5:

```
T3700G-28TQ# show loopback-detection interface gigabitEthernet 1/0/5
```

## Chapter 28 ACL Commands

ACL (Access Control List) is used to filter data packets by configuring a series of match conditions, operations and time ranges. It provides a flexible and secured access control policy and facilitates you to control the network security.

### time-range

#### Description

The **time-range** command is used to add Time-Range. To delete the corresponding Time-Range, please use **no time-range** command. A time-range based ACL enables you to implement ACL control over packets by differentiating the time-ranges. A time-range can be specified in each rule in an ACL. The rule takes effect only when the specified time-range is configured and the system time is within the time-range.

#### Syntax

```
time-range name  
no time-range name
```

#### Parameter

*name* — The Time-Range name, ranging from 1 to 16 characters.

#### Command Mode

Global Configuration Mode

#### Example

Add a time-range named tSeg1:

```
T3700G-28TQ (config)# time-range tSeg1
```

### absolute

#### Description

The **absolute** command is used to configure a time-range into an absoluteness mode. To delete the corresponding Absoluteness Mode time-range, please use **no absolute** command.

#### Syntax

```
absolute start start-date end end-date
```

**no absolute**

### Parameter

*start-date* — The start date in Absoluteness Mode, in the format of MM/DD/YYYY. By default, it is 01/01/1970.

*end-date* — The end date in Absoluteness Mode, in the format of MM/DD/YYYY. By default, it is 12/31/2099. The Absoluteness Mode will be disabled if the start date and end date are both in default value.

### Command Mode

Time-range Configuration Mode

### Example

Configure the time-range tSeg1 with time from May 5, 2012 to Oct. 5, 2012:

```
T3700G-28TQ(config)# time-range tSeg1
T3700G-28TQ(config-time-range)# absolute start 05/05/2012 end
10/05/2012
```

## periodic

### Description

The **periodic** command is used to configure the time-range into periodic mode. To delete the corresponding Periodic Mode time-range, please use **no periodic** command. To delete the corresponding Periodic Mode week-date time-range, please use **no periodic week-date** command. To delete the corresponding Periodic Mode time-slice time-range, please use **no periodic time-slice** command.

### Syntax

```
periodic [week-date week-day] [time-slice1 time-slice] [time-slice2 time-slice]
[time-slice3 time-slice] [time-slice4 time-slice]
```

**no periodic**

**no periodic week-date**

**no periodic time-slice**

### Parameter

*week-day* — Periodic Mode, in the format of 1-3,6 or daily, weekend, weekdays. 1-3, 6 represent Monday, Tuesday, Wednesday and Saturday; daily represents every day; weekend represents weekend and weekdays represents working day. By default, the Periodic Mode is disabled.



*time-slice* — Create the time-slice, in the format of HH:MM-HH:MM.

### Command Mode

Time-range Configuration Mode

### Example

Configure the time-range tSeg1 with time from 8:30 to 12:00 at weekend:

```
T3700G-28TQ(config)#time-range tSeg1
T3700G-28TQ(config-time-range)#periodic week-date weekend time-slice1
08:30-12:00
```

## holiday

### Description

The **holiday** command is used to configure the time-range into Holiday Mode under Time-range Create Configuration Mode. To delete the corresponding Holiday Mode time-range, please use **no holiday** command.

### Syntax

**holiday**

**no holiday**

### Command Mode

Time-range Configuration Mode

### Example

Configure the time-range tSeg1 into Holiday Mode:

```
T3700G-28TQ(config)#time-range tSeg1
T3700G-28TQ(config-time-range)#holiday
```

## holiday(global)

### Description

The **holiday** command is used to define a holiday. To delete the corresponding holiday, please use **no holiday** command.

### Syntax

**holiday** *name start-date start-date end-date end-date*

**no holiday**

**Parameter**

*name* — The holiday name, ranging from 1 to 16 characters.

*start-date* — The start date of the holiday, in the format of MM/DD, for instance, 05/01.

*end-date* — The end date of the holiday, in the format of MM/DD, for instance, 05/03.

**Command Mode**

Global Configuration Mode

**Example**

Define National Day, configuring the start date as October 1st, and the end date as October 3rd:

```
T3700G-28TQ(config)#holiday nationalday start-date 10/01 end-date 10/03
```

## access-list create

**Description**

The **access-list create** command is used to create standard-IP ACL and extend-IP ACL.

**Syntax**

```
access-list create acl-id
```

**Parameter**

*acl-id* — ACL ID, ranging from 500 to 2499. 500-1499 must be Standard-IP ACL, and 1500-2499 must be Extend-IP ACL.

**Command Mode**

Global Configuration Mode

**Example**

Create a standard-IP ACL whose ID is 1234:

```
T3700G-28TQ(config)#access-list create 1234
```

## mac access-list

**Description**

The **mac access-list** command is used to create MAC ACL. To set the detailed configurations for a specified MAC ACL, please use **mac access-list** command

to access Mac Access-list Configuration Mode. To delete the MAC ACL, please use **no mac access-list**.

### Syntax

```
mac access-list acl-id
no mac access-list acl-id
```

### Parameter

*acl-id* — ACL ID, ranging from 0 to 499.

### Command Mode

Global Configuration Mode

### Example

Create a MAC ACL whose ID is 23:

```
T3700G-28TQ(config)#mac access-list 23
```

## access-list standard

### Description

The **access-list standard** command is used to add Standard-IP ACL rule. To delete the corresponding rule, please use **no access-list standard** command. Standard-IP ACLs analyze and process data packets based on a series of match conditions, which can be the source IP addresses and destination IP addresses carried in the packets.

### Syntax

```
access-list standard acl-id rule rule-id {deny | permit} [sip source-ip smask
source-ip-mask] [dip destination-ip dmask destination-ip-mask] [tseg
time-segment ]
no access-list standard acl-id rule rule-id
```

### Parameter

*acl-id* — The desired Standard-IP ACL for configuration.

*rule-id* — The rule ID.

deny — The operation to discard packets.

permit — The operation to forward packets. It is the default value.

*source-ip* — The source IP address contained in the rule.

*source-ip-mask* — The source IP address mask. It is required if you typed the source IP address.

*destination-ip* — The destination IP address contained in the rule.

*destination-ip-mask* — The destination IP address mask. It is required if you typed the destination IP address.

*time-segment* — The time-range for the rule to take effect. By default, it is not limited.

## Command Mode

Global Configuration Mode

## Example

Create a Standard-IP ACL whose ID is 1200, and add Rule 10 for it. In the rule, the source IP address is 192.168.0.100, the source IP address mask is 255.255.255.0, the time-range for the rule to take effect is tSeg1, and the packets match this rule will be forwarded by the switch:

```
T3700G-28TQ(config)#access-list create 1200
T3700G-28TQ(config)#access-list standard 1200 rule 10 permit sip
192.168.0.100 smask 255.255.255.0 tseg tSeg1
```

## access-list extended

### Description

The **access-list extended** command is used to add Extended-IP ACL rule. To delete the corresponding rule, please use **no access-list extended** command.

### Syntax

```
access-list extended acl-id rule rule-id {deny | permit} [sip source-ip smask
source-ip-mask] [dip destination-ip dmask destination-ip-mask] [tseg
time-segment] [dscp dscp] [s-port s-port] [d-port d-port] [tcpflag tcpflag]
[protocol protocol] [tos tos] [pre pre]
```

```
no access-list extended acl-id rule rule-id
```

### Parameter

*acl-id* — The desired Extended-IP ACL for configuration.

*rule-id* — The rule ID.

deny — The operation to discard packets.

permit — The operation to forward packets. It is the default value.

*source-ip* — The source IP address contained in the rule.

*source-ip-mask* — The source IP address mask. It is required if you typed the source IP address.

*destination-ip* — The destination IP address contained in the rule.

*destination-ip-mask* — The destination IP address mask. It is required if you typed the destination IP address.

*time-segment* — The time-range for the rule to take effect. By default, it is not limited.

*dscp* — Specify the dscp value, ranging from 0 to 63.

*s-port* — The source port number.

*d-port* — The destination port number.

*tcpflag* — Specify the flag value when using TCP protocol.

*protocol* — Configure the value of the matching protocol.

*tos* — Enter the IP ToS contained in the rule.

*pre* — Enter the IP Precedence contained in the rule.

## Command Mode

Global Configuration Mode

## Example

Create an Extended-IP ACL whose ID is 2220, and add Rule 10 for it. In the rule, the source IP address is 192.168.0.100, the source IP address mask is 255.255.255.0, the time-range for the rule to take effect is tSeg1, and the packets match this rule will be forwarded by the switch:

```
T3700G-28TQ(config)#access-list create 2220
T3700G-28TQ(config)#access-list extended 2220 rule 10 permit sip
192.168.0.100 smask 255.255.255.0 tseg tSeg1
```

## rule

### Description

The **rule** command is used to configure MAC ACL rule. To delete the corresponding rule, please use **no rule** command.

### Syntax

```
rule rule-id {deny | permit} [smac source-mac smask source-mac-mask ]
[dmac destination-mac dmask destination-mac-mask ] [type ethernet-type] [pri
user-pri] [tseg time-segment]
```

`no rule rule-id`

### Parameter

*rule-id* — The rule ID.

`deny` — The operation to discard packets.

`permit` — The operation to forward packets. By default, it is “permit”.

*source-mac* — The source MAC address contained in the rule.

*source-mac-mask* — The source MAC address mask. It is required if you typed the source MAC address.

*destination-mac* — The destination MAC address contained in the rule.

*destination-mac-mask* — The destination MAC address mask. It is required if you typed the destination MAC address.

*ethernet-type* — EtherType contained in the rule, in the format of 4-hex number.

*user-pri* — The user priority contained in the rule, ranging from 0 to 7. By default, it is not limited.

*time-segment* — The time-range for the rule to take effect. By default, it is not limited.

### Command Mode

Mac Access-list Configuration Mode

### Example

Create a MAC ACL whose ID is 20, and add Rule 10 for it. In the rule, the source MAC address is 00:01:3F:48:16:23, the source MAC address mask is ff: ff: ff: ff:ff:00, the user priority is 5, the time-range for the rule to take effect is tSeg1, and the packets match this rule will be forwarded by the switch:

```
T3700G-28TQ(config)#mac access-list 20
T3700G-28TQ(config-mac-acl)#rule 10 permit smac 00:01:3F:48:16:23
smask ff: ff: ff: ff:ff:00 pri 5 tseg tSeg1
```

## access-list policy name

### Description

The **access-list policy name** command is used to add Policy. To delete the corresponding Policy, please use **no access-list policy name** command. A Policy is used to control the data packets those match the corresponding ACL

rules by configuring ACLs and actions together for effect. The operations here include stream mirror, stream condition, QoS Remarking and redirect.

### Syntax

**access-list policy name** *name*

**no access-list policy name** *name*

### Parameter

*name* — The Policy Name, ranging from 1 to 16 characters.

### Command Mode

Global Configuration Mode

### Example

Add a Policy named policy1:

```
T3700G-28TQ(config)#access-list policy name policy1
```

## access-list policy action

### Description

The **access-list policy action** command is used to add ACLs and create actions for the policy. To set the detailed configuration of actions for a policy, please use **access-list policy action** command to access Action Configuration Mode. To delete the corresponding actions, please use **no access-list policy action** command.

### Syntax

**access-list policy action** *policy-name acl-id*

**no access-list policy action** *policy-name acl-id*

### Parameter

*policy-name* — The Policy Name, ranging from 1 to 16 characters.

*acl-id* — The ID of the ACL to which the above policy is applied.

### Command Mode

Global Configuration Mode

### Example

Add ACL whose ID is 1200 to policy1 and create an action for them:

```
T3700G-28TQ(config)#access-list policy action policy1 1200
```

## redirect interface

### Description

The **redirect interface** command is used to configure Direction function of policy action for specified ports.

### Syntax

```
redirect interface { fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port }
```

### Parameter

*port* — The Destination Port of Redirect. The data packets matching the corresponding ACL will be forwarded to the specific port. By default, it is All Ports.

### Command Mode

Action Configuration Mode

### Example

Edit the actions for policy1. Forward the data packets matching ACL 1200 in the policy to Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#access-list policy action policy1 1200
T3700G-28TQ(config-action)#redirect interface gigabitEthernet 1/0/2
```

## s-condition

### Description

The **s-condition** command is used to configure Stream Condition function of policy action.

### Syntax

```
s-condition rate rate osd {none | discard}
```

### Parameter

*rate* — The rate of Stream Condition, ranging from 0 to 10000000kbps.

*osd* — Out of Band disposal of Stream Condition. It is the disposal way of the data packets those are transmitted beyond the rate. There are two options, “none” and “discard”. By default, the option is “none”.

### Command Mode

Action Configuration Mode



## Example

Edit the actions for policy1. For the data packets matching ACL 1200 in the policy, if the rate beyond 1000kbps, they will be discarded by the switch:

```
T3700G-28TQ(config)#access-list policy action policy1 1200
T3700G-28TQ(config-action)#s-condition rate 1000 osd discard
```

## s-mirror

### Description

The **s-mirror** command is used to configure Stream Mirror function of policy action to the specified port.

### Syntax

```
s-mirror interface { fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port }
```

### Parameter

*port* — The Mirror Port number of Stream Mirror.

### Command Mode

Action Configuration Mode

### Example

Edit the actions for policy1. Specify the mirror port as Gigabit Ethernet port 1/0/2 for the data packets matching ACL 1200:

```
T3700G-28TQ(config)#access-list policy action policy1 1200
T3700G-28TQ(config-action)#s-mirror interface gigabitEthernet 1/0/2
```

## qos-remark

### Description

The **qos-remark** command is used to configure QoS function of policy action.

### Syntax

```
qos-remark dscp dscp priority priority
no qos-remark
```

### Parameter

*dscp* — DSCP of QoS Remark. Specify the DSCP region for the data packets matching the corresponding ACL. DSCP ranges from 0 to 63. By default, it is not limited.

*priority* — Local Priority of QoS Remark. Specify the local priority for the data packets matching the corresponding ACL. Local Priority ranges from 0 to 7.

### Command Mode

Action Configuration Mode

### Example

Edit the actions for policy1. For the data packets matching ACL 1200, specify the DSCP region as 30 and local priority 2:

```
T3700G-28TQ(config)#access-list policy action policy1 1200
```

```
T3700G-28TQ(config-action)# qos-remark dscp 30 priority 2
```

## access-list bind(interface)

### Description

The **access-list bind** command is used to bind a policy to a specified port. To cancel the bind relation, please use **no access-list bind** command.

### Syntax

```
access-list bind policy-name
```

```
no access-list bind policy-name
```

### Parameter

*policy-name* — The name of the policy desired to bind.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Bind policy1 to Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
```

```
T3700G-28TQ(config-if)#access-list bind policy1
```

## access-list bind(vlan)

### Description

The **access-list bind** command is used to bind a policy to a VLAN. To cancel the bind relation, please use **no access-list bind** command.

## Syntax

```
access-list bind policy-name  
no access-list bind policy-name
```

## Parameter

*policy-name* — The name of the policy desired to bind.

## Command Mode

Interface VLAN Mode

## Example

Bind policy1 to VLAN 2:

```
T3700G-28TQ(config)#interface vlan 2  
T3700G-28TQ(config-if)#access-list bind policy1
```

# show time-range

## Description

The **show time-range** command is used to display the configuration of time-range.

## Syntax

```
show time-range
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the configuration of Time-Range:

```
T3700G-28TQ#show time-range
```

# show holiday

## Description

The **show holiday** command is used to display the defined holidays.

## Syntax

```
show holiday
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the defined holidays:

```
T3700G-28TQ#show holiday
```

## show access-list

### Description

The **show access-list** command is used to display configuration of ACL.

### Syntax

```
show access-list [acl-id]
```

### Parameter

*acl-id* — The ID of the ACL selected to display the configuration.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of the MAC ACL whose ID is 20:

```
T3700G-28TQ#show access-list 20
```

## show access-list policy

### Description

The **show access-list policy** command is used to display the information of a specified policy.

### Syntax

```
show access-list policy [name]
```

### Parameter

*name* — The Policy Name desired to show.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of a policy named policy1:

```
T3700G-28TQ#show access-list policy policy1
```

## show access-list bind

### Description

The **show access-list bind** command is used to display the configuration of Policy bind.

### Syntax

```
show access-list bind
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of Policy bind:

```
T3700G-28TQ#show access-list bind
```

## Chapter 29 MSTP Commands

MSTP (Multiple Spanning Tree Protocol), compatible with both STP and RSTP and subject to IEEE 802.1s, can disbranch a ring network. STP is to block redundant links and backup links as well as optimize paths.

### spanning-tree(global)

#### Description

The **spanning-tree** command is used to enable STP function globally. To disable the STP function, please use **no spanning-tree** command.

#### Syntax

**spanning-tree**  
**no spanning-tree**

#### Command Mode

Global Configuration Mode

#### Example

Enable the STP function:

```
T3700G-28TQ(config)#spanning-tree
```

### spanning-tree(interface)

#### Description

The **spanning-tree** command is used to enable STP function for a port. To disable the STP function, please use **no spanning-tree** command.

#### Syntax

**spanning-tree**  
**no spanning-tree**

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

#### Example

Enable the STP function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#spanning-tree
```

## spanning-tree common-config

### Description

The **spanning-tree common-config** command is used to configure the parameters of the ports for comparison in the CIST and the common parameters of all instances. To return to the default configuration, please use **no spanning-tree common-config** command. CIST (Common and Internal Spanning Tree) is the spanning tree in a switched network, connecting all devices in the network.

### Syntax

```
spanning-tree common-config [port-priority priority] [ext-cost ext-cost]
[int-cost int-cost] [portfast {enable | disable}] [point-to-point {auto | open |
close}]
no spanning-tree common-config
```

### Parameter

*priority* — Port Priority, which must be multiple of 16 ranging from 0 to 240. By default, the port priority is 128. Port Priority is an important criterion on determining if the port connected to this port will be chosen as the root port. In the same condition, the port with the highest priority will be chosen as the root port. The lower value has the higher priority.

*ext-cost* — External Path Cost, which is used to choose the path and calculate the path costs of ports in different MST regions. It is an important criterion on determining the root port. The lower value has the higher priority. It ranges from 0 to 2000000. By default, it is 0 which is mean auto.

*int-cost* — Internal Path Cost, which is used to choose the path and calculate the path costs of ports in an MST region. It is an important criterion on determining the root port. The lower value has the higher priority. By default, it is automatic. It ranges from 0 to 2000000. By default, it is 0 which is mean auto.

*portfast* — Enable/ Disable Edge Port. By default, it is disabled. The edge port can transit its state from blocking to forwarding rapidly without waiting for forward delay.

*point-to-point* — The P2P link status, with auto, open and close options. By default, the option is auto. If the two ports in the P2P link are root port or

designated port, they can transit their states to forwarding rapidly to reduce the unnecessary forward delay.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the STP function of Gigabit Ethernet port 1/0/1, and configure the Port Priority as 64, ExtPath Cost as 100, IntPath Cost as 100, and then enable Edge Port:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#spanning-tree common-config port-priority 64
ext-cost 100 int-cost 100 portfast enable point-to-point open
```

## spanning-tree mode

### Description

The **spanning-tree mode** command is used to configure the STP mode of the switch. To return to the default configurations, please use **no spanning-tree mode** command.

### Syntax

```
spanning-tree mode {stp | rstp | mstp}
no spanning-tree mode
```

### Parameter

stp — Spanning Tree Protocol, the default value.  
rstp — Rapid Spanning Tree Protocol  
mstp — Multiple Spanning Tree Protocol

### Command Mode

Global Configuration Mode

### Example

Configure the spanning-tree mode as “mstp”:

```
T3700G-28TQ(config)#spanning-tree mode mstp
```



## spanning-tree mst configuration

### Description

The **spanning-tree mst configuration** command is used to access MST Configuration Mode from Global Configuration Mode, as to configure the VLAN-Instance mapping, region name and revision level. To return to the default configuration of the corresponding Instance, please use **no spanning-tree mst configuration** command.

### Syntax

```
spanning-tree mst configuration
no spanning-tree mst configuration
```

### Command Mode

Global Configuration Mode

### Example

Enter into the MST Configuration Mode:

```
T3700G-28TQ(config)#spanning-tree mst configuration
```

## instance

### Description

The **instance** command is used to configure the VLAN-Instance mapping. To remove the VLAN-instance mapping or disable the corresponding instance, please use **no instance** command. When an instance is disabled, the related mapping VLANs will be removed.

### Syntax

```
instance instance-id vlan vlan-id
no instance instance-id [vlan vlan-id]
```

### Parameters

*instance-id* — Instance ID, ranging from 1 to 8.

*vlan-id* — The VLAN ID selected to mapping with the corresponding instance.

### Command Mode

MST Configuration Mode

### Example

Map the VLANs 1-100 to Instance 1:

```
T3700G-28TQ(config)#spanning-tree mst configuration
```

```
T3700G-28TQ(config-mst)#instance 1 vlan 1-100
```

Disable Instance 1, namely remove all the mapping VLANs 1-100:

```
T3700G-28TQ(config)#spanning-tree mst configuration
```

```
T3700G-28TQ(config-mst)#no instance 1
```

Remove VLANs 1-50 in mapping VLANs 1-100 for Instance 1:

```
T3700G-28TQ(config)#spanning-tree mst configuration
```

```
T3700G-28TQ(config-mst)#no instance 1 vlan 1-50
```

## name

### Description

The **name** command is used to configure the region name of MST instance.

### Syntax

```
name name
```

### Parameters

*name* — The region name, used to identify MST region. It ranges from 1 to 32 characters.

### Command Mode

MST Configuration Mode

### Example

Configure the region name of MST as “region1”:

```
T3700G-28TQ(config)#spanning-tree mst configuration
```

```
T3700G-28TQ(config-mst)#name region1
```

## revision

### Description

The **revision** command is used to configure the revision level of MST instance.

### Syntax

```
revision revision
```

## Parameters

*revision* — The revision level for MST region identification, ranging from 0 to 65535.

## Command Mode

MST Configuration Mode

## Example

Configure the revision level of MST as 100:

```
T3700G-28TQ(config)#spanning-tree mst configuration
T3700G-28TQ(config-mst)#revision 100
```

# spanning-tree mst instance

## Description

The **spanning-tree mst instance** command is used to configure the priority of MST instance. To return to the default value of MST instance priority, please use **no spanning-tree mst instance** command.

## Syntax

**spanning-tree mst instance** *instance-id* **priority** *priority*

**no spanning-tree mst instance** *instance-id* **priority**

## Parameter

*instance-id* — Instance ID, ranging from 1 to 8.

*priority* — MSTI Priority, which must be multiple of 4096 ranging from 0 to 61440. By default, it is 32768. MSTI priority is an important criterion on determining if the switch will be chosen as the root bridge in the specific instance.

## Command Mode

Global Configuration Mode

## Example

Enable the MST Instance 1 and configure its priority as 4096:

```
T3700G-28TQ(config)#spanning-tree mst instance 1 priority 4096
```

## spanning-tree mst

### Description

The **spanning-tree mst** command is used to configure MST Instance Port. To return to the default configuration of the corresponding Instance Port, please use **no spanning-tree mst** command. A port can play different roles in different spanning tree instance. You can use this command to configure the parameters of the ports in different instance IDs as well as view status of the ports in the specified instance.

### Syntax

```
spanning-tree mst instance instance-id { [port-priority priority] [cost cost] }
no spanning-tree mst instance instance-id
```

### Parameter

*instance-id* — Instance ID, ranging from 1 to 8.

*priority* — Port Priority, which must be multiple of 16 ranging from 0 to 240. By default, it is 128. Port Priority is an important criterion on determining if the port will be chosen as the root port by the device connected to this port.

*cost* — Path Cost, ranging from 0 to 2000000. The lower value has the higher priority. Its default value is 0 meaning “auto”.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Configure the priority of Gigabit Ethernet port 1/0/1 in MST Instance 1 as 64, and path cost as 2000:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#spanning-tree mst instance 1 port-priority 64 cost
2000
```

## spanning-tree priority

### Description

The **spanning-tree priority** command is used to configure the bridge priority. To return to the default value of bridge priority, please use **no spanning-tree priority** command.

### Syntax

**spanning-tree priority** *priority*

**no spanning-tree priority**

### Parameter

*priority* — Bridge priority, ranging from 0 to 61440. The priority must be an integral multiple of 4096 and it is 32768 by default.

### Command Mode

Global Configuration Mode

### Example

Configure the bridge priority as 4096:

```
T3700G-28TQ(config)#spanning-tree priority 4096
```

## spanning-tree tc-defend

### Description

The **spanning-tree tc-defend** command is used to configure the TC Protect of Spanning Tree globally. To return to the default configuration, please use **no spanning-tree tc-defend** command. A switch removes MAC address entries upon receiving TC-BPDUs. If a malicious user continuously sends TC-BPDUs to a switch, the switch will be busy with removing MAC address entries, which may decrease the performance and stability of the network.

### Syntax

**spanning-tree tc-defend threshold** *threshold period period*

**no spanning-tree tc-defend**

### Parameter

*threshold* — TC Threshold, ranging from 1 to 100 packets. By default, it is 20. TC Threshold is the maximum number of the TC-BPDUs received by the switch in a TC Protect Cycle.

*period* — TC Protect Cycle, ranging from 1 to 10 in seconds. By default, it is 5.

## Command Mode

Global Configuration Mode

## Example

Configure TC Threshold as 30 packets and TC Protect Cycle as 10 seconds:

```
T3700G-28TQ(config)#spanning-tree tc-defend threshold 30 period 10
```

# spanning-tree timer

## Description

The **spanning-tree timer** command is used to configure forward-time, hello-time and max-age of Spanning Tree. To return to the default configurations, please use **no spanning-tree timer** command.

## Syntax

```
spanning-tree timer { [forward-time forward-time] [hello-time hello-time]  
[max-age max-age] }
```

```
no spanning-tree timer
```

## Parameter

*forward-time* — Forward Delay, which is the time for the port to transit its state after the network topology is changed. Forward Delay ranges from 4 to 30 in seconds and it is 15 by default. Otherwise,  $2 * (\text{Forward Delay} - 1) \geq \text{Max Age}$ .

*hello-time* — Hello Time, which is the interval to send BPDU packets, and used to test the links. Hello Time ranges from 1 to 10 in seconds and it is 2 by default. Otherwise,  $2 * (\text{Hello Time} + 1) \leq \text{Max Age}$ .

*max-age* — The maximum time the switch can wait without receiving a BPDU before attempting to reconfigure, ranging from 6 to 40 in seconds. By default, it is 20.

## Command Mode

Global Configuration Mode

## Example

Configure forward-time, hello-time and max-age for Spanning Tree as 16 seconds, 3 seconds and 22 seconds respectively:

```
T3700G-28TQ(config)#spanning-tree timer forward-time 16 hello-time 3  
max-age 22
```

## spanning-tree hold-count

### Description

The **spanning-tree hold-count** command is used to configure the maximum number of BPDU packets transmitted per Hello Time interval. To return to the default configurations, please use **no spanning-tree hold-count** command.

### Syntax

**spanning-tree hold-count** *value*

**no spanning-tree hold-count**

### Parameter

*value* — The maximum number of BPDU packets transmitted per Hello Time interval, ranging from 1 to 20 in pps. By default, it is 5.

### Command Mode

Global Configuration Mode

### Example

Configure the hold-count of STP as 8pps:

```
T3700G-28TQ(config)#spanning-tree hold-count 8
```

## spanning-tree max-hops

### Description

The **spanning-tree max-hops** command is used to configure the maximum number of hops that occur in a specific region before the BPDU is discarded. To return to the default configurations, please use **no spanning-tree max-hops** command.

### Syntax

**spanning-tree max-hops** *value*

**no spanning-tree max-hops**

### Parameter

*value* — The maximum number of hops that occur in a specific region before the BPDU is discarded, ranging from 1 to 40 in hop. By default, it is 20.

### Command Mode

Global Configuration Mode

## Example

Configure the max-hops of STP as 30:

```
T3700G-28TQ(config)#spanning-tree max-hops 30
```

## spanning-tree bpdudfilter

### Description

The **spanning-tree bpdudfilter** command is used to enable the BPDU filter function for a port. With the function enabled, the port can be prevented from receiving and sending any BPDU packets. To disable the BPDU filter function, please use **no spanning-tree bpdudfilter** command.

### Syntax

```
spanning-tree bpdudfilter
```

```
no spanning-tree bpdudfilter
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the BPDU filter function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
```

```
T3700G-28TQ(config-if)#spanning-tree bpdudfilter
```

## spanning-tree bpduguard

### Description

The **spanning-tree bpduguard** command is used to enable the BPDU protect function for a port. With the BPDU protect function enabled, the port will set itself automatically as ERROR-PORT when it receives BPDU packets, and the port will disable the forwarding function for a while. To disable the BPDU protect function, please use **no spanning-tree bpduguard** command.

### Syntax

```
spanning-tree bpduguard
```

```
no spanning-tree bpduguard
```



## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the BPDU protect function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#spanning-tree bpduguard
```

# spanning-tree guard loop

## Description

The **spanning-tree guard loop** command is used to enable the Loop Protect function for a port. Loop Protect is to prevent the loops in the network brought by recalculating STP because of link failures and network congestions. To disable the Loop Protect function, please use **no spanning-tree guard loop** command.

## Syntax

```
spanning-tree guard loop
no spanning-tree guard loop
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable the Loop Protect function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#spanning-tree guard loop
```

# spanning-tree guard root

## Description

The **spanning-tree guard root** command is used to enable the Root Protect function for a port. With the Root Protect function enabled, the root bridge will set itself automatically as ERROR-PORT when receiving BPDU packets with

higher priority, in order to maintain the role of root bridge. To disable the Root Protect function, please use **no spanning-tree guard root** command.

### Syntax

**spanning-tree guard root**

**no spanning-tree guard root**

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the Root Protect function for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
```

```
T3700G-28TQ(config-if)#spanning-tree guard root
```

## spanning-tree guard tc

### Description

The **spanning-tree guard tc** command is used to enable the TC Protect of Spanning Tree function for a port. To disable the TC Protect of Spanning Tree function, please use **no spanning-tree guard tc** command. A switch removes MAC address entries upon receiving TC-BPDUs. If a malicious user continuously sends TC-BPDUs to a switch, the switch will be busy with removing MAC address entries, which may decrease the performance and stability of the network. With the Protect of Spanning Tree function enabled, you can configure the number of TC-BPDUs in a required time, so as to avoid the process of removing MAC addresses frequently.

### Syntax

**spanning-tree guard tc**

**no spanning-tree guard tc**

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the TC Protect of Spanning Tree for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#spanning-tree guard tc
```

## spanning-tree mcheck

### Description

The **spanning-tree mcheck** command is used to enable MCheck.

### Syntax

```
spanning-tree mcheck
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable MCheck for Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)#spanning-tree mcheck
```

## show spanning-tree active

### Description

The **show spanning-tree active** command is used to display the active information of spanning-tree.

### Syntax

```
show spanning-tree active
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the active information of spanning-tree:

```
T3700G-28TQ(config)#show spanning-tree active
```

## show spanning-tree bridge

### Description

The **show spanning-tree bridge** command is used to display the bridge parameters.

### Syntax

**show spanning-tree bridge** [forward-time | hello-time | hold-count | max-age | max-hops | mode | priority | state]

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the bridge parameters:

```
T3700G-28TQ(config)#show spanning-tree bridge
```

## show spanning-tree interface

### Description

The **show spanning-tree interface** command is used to display the spanning-tree information of all ports or a specified port.

### Syntax

**show spanning-tree interface** [fastEthernet *port* | gigabitEthernet *port* | ten-gigabitEthernet *port*] [edge | ext-cost | int-cost | mode | p2p | priority | role | state | status]

### Parameter

*port* — The Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the spanning-tree information of all ports:

```
T3700G-28TQ(config)#show spanning-tree interface
```

Display the spanning-tree information of Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#show spanning-tree interface gigabitEthernet 1/0/2
```

Display the spanning-tree mode information of Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ(config)#show spanning-tree interface gigabitEthernet 1/0/2
mode
```

## show spanning-tree interface-security

### Description

The **show spanning-tree interface-security** command is used to display the protect information of all ports or a specified port.

### Syntax

```
show spanning-tree interface-security [fastEthernet port | gigabitEthernet
port | ten-gigabitEthernet port] [bpdufilter | bpduguard | loop | root | tc |
tc-defend]
```

### Parameter

*port* — The Ethernet port number.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the protect information of all ports:

```
T3700G-28TQ(config)#show spanning-tree interface-security
```

Display the protect information of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ(config)#show spanning-tree interface-security
gigabitEthernet 1/0/1
```

Display the interface security bpdufilter information:

```
T3700G-28TQ(config)# show spanning-tree interface-security bpdufilter
```

## show spanning-tree mst

### Description

The **show spanning-tree mst** command is used to display the related information of MST Instance.

## Syntax

```
show spanning-tree mst {configuration [digest] | instance instance-id
[interface [fastEthernet port | gigabitEthernet port | ten-gigabitEthernet
port] ] }
```

## Parameter

*instance-id* — Instance ID desired to show, ranging from 1 to 8.

*port* — The Ethernet port number.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the region information and mapping information of VLAN and MST Instance:

```
T3700G-28TQ(config)#show spanning-tree mst configuration
```

Display the related information of MST Instance 1:

```
T3700G-28TQ(config)#show spanning-tree mst instance 1
```

Display all the ports information of MST Instance 1:

```
T3700G-28TQ(config)#show spanning-tree mst instance 1 interface
```

## Chapter 30 IGMP Snooping Commands

IGMP Snooping (Internet Group Management Protocol Snooping) is a multicast control mechanism running on Layer 2 switch. It can effectively prevent multicast groups being broadcasted in the network.

### ip igmp snooping(global)

#### Description

The **ip igmp snooping** command is used to configure IGMP Snooping globally. To disable the IGMP Snooping function, please use **no ip igmp snooping** command.

#### Syntax

**ip igmp snooping**  
**no ip igmp snooping**

#### Command Mode

Global Configuration Mode

#### Example

Enable IGMP Snooping function:

```
T3700G-28TQ(config)#ip igmp snooping
```

### ip igmp snooping(interface)

#### Description

The **ip igmp snooping** command is used to enable the IGMP Snooping function for the desired port. To disable the IGMP Snooping function, please use **no ip igmp snooping** command.

#### Syntax

**ip igmp snooping**  
**no ip igmp snooping**

#### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable IGMP Snooping function of Gigabit Ethernet port 23:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/23
T3700G-28TQ(config-if)#ip igmp snooping
```

## ip igmp snooping immediate-leave

### Description

The **ip igmp snooping immediate-leave** command is used to configure the Fast Leave function for port. To disable the Fast Leave function, please use **no ip igmp snooping immediate-leave** command.

### Syntax

```
ip igmp snooping immediate-leave
no ip igmp snooping immediate-leave
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the Fast Leave function for Gigabit Ethernet port 1/0/3:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/3
T3700G-28TQ(config-if)#ip igmp snooping immediate-leave
```

## ip igmp snooping drop-unknown

### Description

The **ip igmp snooping drop-unknown** command is used to process the unknown multicast as “discard”. To disable the operation of processing the unknown multicast as “discard”, please use **no ip igmp snooping drop-unknown** command.

### Syntax

```
ip igmp snooping drop-unknown
no ip igmp snooping drop-unknown
```



## Command Mode

Global Configuration Mode

## Example

Specify the operation of processing unknown multicast as “discard”:

```
T3700G-28TQ(config)#ip igmp snooping drop-unknown
```

# ip igmp snooping vlan-config

## Description

The **ip igmp snooping vlan-config** command is used to enable VLAN IGMP Snooping function or to modify IGMP Snooping parameters, and to create static multicast IP entry. To disable the VLAN IGMP Snooping function, please use **no ip igmp snooping vlan-config** command.

## Syntax

```
ip igmp snooping vlan-config vlan-list [ rtime router-time | mtime member-time | ltime leave-time | rport interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port } ]
```

```
ip igmp snooping vlan-config vlan-id static ip interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port }
```

```
no ip igmp snooping vlan-config vlan-id list
```

```
no ip igmp snooping vlan-config vlan-id static ip
```

## Parameter

*vlan-list* — The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

*router-time* — Router Port Time. Within this time, if the switch does not receive IGMP query message from the router port, it will consider this port is not a router port any more. Router Port Time ranges from 60 to 600 in seconds. By default, it is 300 seconds.

*member-time* — Member Port Time. Within this time, if the switch does not receive IGMP report message from the member port, it will consider this port is not a member port any more. Member Port Time ranges from 60 to 600 in seconds. By default, it is 260 seconds.

*leave-time* — Leave Time, which is the interval between the switch receiving a leave message from a host and the switch removing the host from the

multicast groups. Leave Time ranges from 1 to 30 in seconds. By default, it is 1 seconds.

*port* — Static Router Port, which is mainly used in the network with stable topology.

*vlan-id* — The VLAN ID of the multicast IP, ranging from 1 to 4094.

*ip* — The static multicast IP address.

*port-list* — The forward port list of the multicast group.

## Command Mode

Global Configuration Mode

## Example

Enable the IGMP Snooping function and modify Member Port Time as 200 seconds for VLAN1-3:

```
T3700G-28TQ(config)#ip igmp snooping vlan-config 1-3 mtime 200
```

# ip igmp snooping max-groups

## Description

The **ip igmp snooping max-groups** command is used to configure the maximum number of groups that a port can join in. The **ip igmp snooping max-groups action** is used to configure the action that the port takes when it receives an IGMP report message and the maximum number of entries is in the forwarding table. To remove the maximum group limitation and return to the default of no limitation on the specified port, please use the **no ip igmp snooping max-groups** command. To return to the default action of dropping the report, please use the **no ip igmp snooping max-groups action** command. These commands only apply to the dynamic multicast groups.

## Syntax

```
ip igmp snooping max-groups [ maxgroup ]
```

```
ip igmp snooping max-groups action { drop | replace }
```

```
no ip igmp snooping max-groups
```

```
no ip igmp snooping max-groups action
```

## Parameter

*maxgroup* — Specify the maximum numbers of groups that the port can join. It ranges from 0 to 1024 and the default value is 1024.

drop — When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the port will not join any new multicast group.

replace — When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the newly joined multicast group will replace an existing multicast group with the lowest multicast group address.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

```
T3700G-28TQ(config)#interface range gigabitEthernet 1/0/2-5
T3700G-28TQ(config-if-range)#ip igmp snooping max-groups 10
T3700G-28TQ(config-if-range)#ip igmp snooping max-groups action
replace
```

## ip igmp snooping multi-vlan-config

### Description

The **ip igmp snooping multi-vlan-config** command is used to create and configure a Multicast VLAN. To delete the corresponding Multicast VLAN, please use **no ip igmp snooping multi-vlan-config** command.

### Syntax

```
ip igmp snooping multi-vlan-config [vlan-id] { rtime router-time | mtime member-time | itime leave-time | rport interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port } }
```

```
no ip igmp snooping multi-vlan-config
```

### Parameter

*vlan-id* — The ID of the VLAN desired to modify configuration, ranging from 2 to 4094.

*router-time* — Router Port Time. Within this time, if the switch does not receive IGMP query message from the router port, it will consider this port is not a router port any more. Router Port Time ranges from 60 to 600 in seconds. By default, it is 300.

*member-time* — Member Port Time. Within this time, if the switch does not receive IGMP report message from the member port, it will consider this port is not a member port any more. Member Port Time ranges from 60 to 600 in seconds. By default, it is 260.

*leave-time* — Leave Time, which is the interval between the switch receiving a leave message from a host and the switch removing the host from the multicast groups. Leave Time ranges from 1 to 30 in seconds. By default, it is 1.

*port* — Static Router Port, which is mainly used in the network with stable topology.

### Command Mode

Global Configuration Mode

### Example

Enable Multicast VLAN 3, and configure Router Port Time as 100 seconds:

```
T3700G-28TQ(config)#ip igmp snooping multi-vlan-config 3 rtime 100
```

## ip igmp snooping querier vlan

### Description

The **ip igmp snooping querier vlan** command is used to enable the IGMP Snooping Querier function of the VLAN(s). To disable the IGMP Snooping Querier function of certain VLANs, please use **no ip igmp snooping querier vlan** command.

### Syntax

```
ip igmp snooping querier vlan vlan-id
```

```
no ip igmp snooping querier vlan vlan-id
```

### Parameter

*vlan-id* — VLAN ID, ranging from 1 to 4094.

### Command Mode

Global Configuration Mode

### Example

Enable the IGMP Snooping Querier function of VLAN1:

```
T3700G-28TQ(config)#ip igmp snooping querier vlan 1
```

## ip igmp snooping querier vlan (general query)

### Description

The **ip igmp snooping querier vlan** command is used to configure the parameters for IGMP Snooping Querier to send a general query frame. To return to the default configuration, please use **no ip igmp snooping querier vlan** command.

### Syntax

```
ip igmp snooping querier vlan vlan-id {query-interval interval |
max-response-time response-time | general-query source-ip ip-addr }
no ip igmp snooping querier vlan vlan-id { query-interval |
max-response-time | general-query source-ip }
```

### Parameter

*vlan-id* — VLAN ID, ranging from 1 to 4094.

*interval* — The time interval to send a general query frame by IGMP Snooping Querier, ranging from 10 to 300 (Seconds). By default, it is 60 seconds.

*response-time* — The maximal time for the host to respond to a general query frame, ranging from 1 to 25 (Seconds). By default, it is 10 Seconds.

*ip-addr* — The source IP of the general query frame sent by IGMP Snooping Querier. It should not be a multicast IP or a broadcast IP. By default, it is 192.168.0.1.

### Command Mode

Global Configuration Mode

### Example

For VLAN 2, specify its query-interval as 200 seconds, and the response-time as 20 seconds:

```
T3700G-28TQ(config)#ip igmp snooping querier vlan 2 query-interval 200
T3700G-28TQ(config)#ip igmp snooping querier vlan 2 max-response-time
20
```

## ip igmp snooping querier vlan (specific query)

### Description

The **ip igmp snooping querier vlan** command is used to configure the parameters for IGMP Snooping Querier to send a specific query frame. To

return to the default configuration, please use **no ip igmp snooping querier vlan** command.

### Syntax

```
ip igmp snooping querier vlan vlan-id {last-listener query-interval interval |
last-listener query-count count | special-query source-ip ip-addr }

no ip igmp snooping querier vlan vlan-id {last-listener query-interval |
last-listener query-count | special-query source-ip}
```

### Parameter

*vlan-id* — VLAN ID list, ranging from 1 to 4094.

*interval* — The time interval of sending specific query frames by IGMP Snooping Querier, ranging from 1 to 5 (Seconds). By default, it is 1. A specific query will be sent on condition that “immediate-leave” is not enabled and a leave frame is received.

*count* — The times of sending specific query frames by IGMP Snooping Querier, ranging from 1 to 5. By default, it is 2. The switch will still treat the port as group member until the specific frames number sent by the querier reaches “last-listener-query-count” and no report frame is received from the port.

*ip-addr* — The source IP of the specific query frame sent by IGMP Snooping Querier. It should not be a multicast IP or a broadcast IP. By default, it is 192.168.0.1.

### Command Mode

Global Configuration Mode

### Example

For VLAN 2, specify its last-listener-query-interval as 2:

```
T3700G-28TQ(config)#ip igmp snooping querier vlan 2 last-listener
query-interval 2
```

## show ip igmp snooping

### Description

The **show ip igmp snooping** command is used to display the global configuration of IGMP Snooping.

### Syntax

```
show ip igmp snooping
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the global configuration of IGMP Snooping:

```
T3700G-28TQ#show ip igmp snooping
```

# show ip igmp snooping interface

## Description

The **show ip igmp snooping interface** command is used to display the port configuration of IGMP.

## Syntax

```
show ip igmp snooping interface [ fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port ] { basic-config | packet-stat | max-groups}
```

```
show ip igmp snooping interface [ fastEthernet port-list | gigabitEthernet port-list | ten-gigabitEthernet port-list ] { basic-config | max-groups | packet-stat }
```

## Parameter

*port* — The Fast/Gigabit Ethernet port number. By default, the configuration of all ports is displayed.

**basic-config** | **max-groups** | **packet-stat** — The related configuration information selected to display.

*port-list* — The list group of Ethernet ports.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the IGMP basic configuration of Gigabit Ethernet port 2:

```
T3700G-28TQ#show ip igmp snooping interface gigabitEthernet 1/0/2
basic-config
```

Display the IGMP basic configuration of Gigabit Ethernet ports 2-4:

```
T3700G-28TQ#show ip igmp snooping interface gigabitEthernet 1/0/2-4
basic-config
```

## show ip igmp snooping vlan

### Description

The **show ip igmp snooping vlan** command is used to display the VLAN configuration of IGMP.

### Syntax

```
show ip igmp snooping vlan [ vlan-id ]
```

### Parameter

*vlan-id* —The VLAN ID selected to display.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the IGMP snooping configuration information of VLAN 2:

```
T3700G-28TQ#show ip igmp snooping vlan 2
```

## show ip igmp snooping multi-vlan

### Description

The **show ip igmp snooping multi-vlan** command is used to display the Multicast VLAN configuration.

### Syntax

```
show ip igmp snooping multi-vlan
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the Multicast VLAN configuration:

```
T3700G-28TQ#show ip igmp snooping multi-vlan
```

## show ip igmp snooping groups

### Description

The **show ip igmp snooping groups** command is used to display the information of all IGMP snooping groups. It can be extended to some other



commands to display the dynamic and static multicast information of a selected VLAN.

### Syntax

```
show ip igmp snooping groups [vlan vlan-id] [count | dynamic | dynamic count | static | static count]
```

### Parameter

*vlan-id* —The VLAN ID selected to display the information of all multicast items.

count— The numbers of all multicast groups.

dynamic— Display dynamic multicast groups.

dynamic count— The numbers of all dynamic multicast groups.

static— Display static multicast groups.

static count— The numbers of all static multicast groups.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of all IGMP snooping groups:

```
T3700G-28TQ#show ip igmp snooping groups
```

Display all the multicast entries in VLAN 5:

```
T3700G-28TQ(config)#show ip igmp snooping groups vlan 5
```

Display the count of multicast entries in VLAN 5:

```
T3700G-28TQ(config)#show ip igmp snooping groups vlan 5 count
```

## show ip igmp snooping querier

### Description

The **show ip igmp snooping querier** command is used to display the configurations of IGMP Snooping Querier of the specified VLAN.

### Syntax

```
show ip igmp snooping querier [ vlan vlan-id ]
```

**Parameter**

*vlan-id* — Specify the ID of the VLAN to display the configurations of its IGMP Snooping Querier. If not specified, the IGMP Snooping Querier configurations of all VLANs will be displayed.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the configurations of IGMP Snooping Querier of VLAN 2:

```
T3700G-28TQ(config)# show ip igmp snooping querier vlan 2
```

## Chapter 31 SNMP Commands

SNMP (Simple Network Management Protocol) functions are used to manage the network devices for a smooth communication, which can facilitate the network administrators to monitor the network nodes and implement the proper operation.

### snmp-server

#### Description

The **snmp-server** command is used to enable the SNMP function. By default, it is disabled. To return to the default configuration, please use **no snmp-server** command.

#### Syntax

```
snmp-server  
no snmp-server
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the SNMP function:

```
T3700G-28TQ(config)#snmp-server
```

### snmp-server view

#### Description

The **snmp-server view** command is used to add View. To delete the corresponding View, please use **no snmp-server view** command. The OID (Object Identifier) of the SNMP packets is used to describe the managed objects of the switch, and the MIB (Management Information Base) is the set of the OIDs. The SNMP View is created for the SNMP management station to manage MIB objects.

#### Syntax

```
snmp-server view name mib-oid {include | exclude}  
no snmp-server view name mib-oid
```

### Parameter

*name* — The entry name of View, ranging from 1 to 16 characters. Each View can include several entries with the same name.

*mib-oid* — MIB Object ID. It is the Object Identifier (OID) for the entry of View, ranging from 1 to 61 characters.

*include | exclude* — View Type, with “include” and “exclude” options. They represent the view entry can/cannot be managed by the SNMP management station individually.

### Command Mode

Global Configuration Mode

### Example

Add a View named view1, configuring the OID as 1.3.6.1.6.3.20, and this OID can be managed by the SNMP management station:

```
T3700G-28TQ(config)#snmp-server view view1 1.3.6.1.6.3.20 include
```

## snmp-server group

### Description

The **snmp-server group** command is used to manage and configure the SNMP group. To delete the corresponding SNMP group, please use **no snmp-server group** command. SNMP v3 provides the VACM (View-based Access Control Model) and USM (User-Based Security Model) mechanisms for authentication. The users in the SNMP Group can manage the device via the Read View, Write View and Notify View. And the authentication mode and the privacy mode guarantee the high security for the communication between the management station and the managed device.

### Syntax

```
snmp-server group name [smode { v1 | v2c | v3 }] [slev { noAuthNoPriv | authNoPriv | authPriv }] [read read-view] [write write-view] [notify notify-view]
```

```
no snmp-server group name smode { v1 | v2c | v3 } slev { noAuthNoPriv | authNoPriv | authPriv }
```

### Parameter

*name* — The SNMP Group name, ranging from 1 to 16 characters. The Group Name, Security Model and Security Level compose the identifier of the SNMP Group. These three items of the Users in one group should be the same.

*smode* — Security Model, with v1, v2c and v3 options. They represent SNMP v1, SNMP v2c and SNMP v3.

*slev* — The Security Level of SNMP v3 Group. There are three options, including *noAuthNoPriv* (no authorization and no encryption), *authNoPriv* (authorization and no encryption) and *authPriv* (authorization and encryption). By default, the Security Level is *noAuthNoPriv*. There is no need to configure this in SNMP v1 Model and SNMP v2c Model.

*read* — Read-only view. The management access is restricted to read-only, and changes cannot be made to the assigned SNMP View.

*write* — Write-only view. The management access is writing only and changes can be made to the assigned SNMP View. The View defined both as the Read View and the Write View can be read and modified.

*notify* — Notify view. The management station software can receive trap messages of the assigned SNMP view generated by the Switch's SNMP agent.

## Command Mode

Global Configuration mode

## Example

Add group 1, and configure the Security Model as SNMP v3, the security level as *authNoPriv*, the management access to the assigned View *viewDefault* as read-write, besides the trap messages sent by View *viewDefault* can be received by Management station:

```
T3700G-28TQ(config)#snmp-server group group1 smode v3 slev
authNoPriv read viewDefault write viewDefault notify viewDefault
```

Delete Group group 1:

```
T3700G-28TQ(config)#no snmp-server group group1 smode v3 slev
authNoPriv
```

## snmp-server user

### Description

The **snmp-server user** command is used to add User. To delete the corresponding User, please use **no snmp-server user** command. The User in

an SNMP Group can manage the switch via the management station software. The User and its Group have the same security level and access right.

## Syntax

```
snmp-server user name { local | remote } group-name [smode { v1 | v2c | v3 }]
[slev { noAuthNoPriv | authNoPriv | authPriv }] [cmode { none | MD5 | SHA }]
[cpwd confirm-pwd] [emode { none | DES }] [epwd encrypt-pwd]
no snmp-server user name
```

## Parameter

*name* — User Name, ranging from 1 to 16 characters.

local | remote — User Type, with local and remote options. Local indicates that the user is connected to a local SNMP engine, while remote indicates that the user is connected to a remote SNMP engine.

*group-name* — The Group Name of the User. The User is classified to the corresponding Group according to its Group Name, Security Model and Security Level.

smode — The Security Model of the User, with v1, v2c and v3 options. By default, the option is v1. The Security Model of the User must be the same with that of the Group which the User belongs to.

slev — The Security Level of SNMP v3 Group. There are three options, including noAuthNoPriv (no authorization and no encryption), authNoPriv (authorization and no encryption) and authPriv (authorization and encryption). By default, the option is noAuthNoPriv. The Security Level of the User must be the same with that of the Group which the User belongs to.

cmode — The Authentication Mode of the SNMP v3 User, with “none”, “MD5” and “SHA” options. “None” indicates no authentication method is used, “MD5” indicates the port authentication is performed via HMAC-MD5 algorithm and “SHA” indicates the port authentication is performed via SHA (Secure Hash Algorithm). SHA authentication mode has a higher security than MD5 mode. By default, the Authentication Mode is “none”.

*confirm-pwd* — Authentication Password, ranging from 1 to 16 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

emode — The Privacy Mode of the SNMP v3 User, with “none” and “DES” options. “None” indicates no privacy method is used, and “DES” indicates DES encryption method is used. By default, the Privacy Mode is none.

*encrypt-pwd* — Privacy Password, ranging from 1 to 16 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

### Command Mode

Global Configuration Mode

### Example

Add Local User admin to Group group2, and configure the Security Model of the user as v3, the Security Level of the group as authPriv, the Authentication Mode of the user as MD5, the Authentication Password as 11111, the Privacy Mode as DES, and the Privacy Password as 22222:

```
T3700G-28TQ(config)#snmp-server user admin local group2 smode v3 slew
authPriv cmode MD5 cpwd 11111 emode DES epwd 22222
```

## snmp-server community

### Description

The **snmp-server community** command is used to add Community. To delete the corresponding Community, please use **no snmp-server community** command. SNMP v1 and SNMP v2c adopt community name authentication. The community name can limit access to the SNMP agent from SNMP network management station, functioning as a password.

### Syntax

```
snmp-server community name { read-only | read-write } [ mib-view ]
no snmp-server community name
```

### Parameter

*name* — Community Name, ranging from 1 to 16 characters.

read-only | read-write — The access rights of the community, with “read-only” and “read-write” options.

*mib-view* — The MIB View for the community to access. By default, it is viewDefault.

### Command Mode

Global Configuration Mode

### Example

Add community public, and the community has read-write management right to View viewDefault:

```
T3700G-28TQ(config)#snmp-server community public read-write
viewDefault
```

## snmp-server host

### Description

The **snmp-server host** command is used to add Notification. To delete the corresponding Notification, please use **no snmp-server host** command. With the Notification function enabled, the switch can initiatively report to the management station about the important events that occur on the Views, which allows the management station to monitor and process the events in time.

### Syntax

```
snmp-server host ip udp-port user-name [ smode { v1 | v2c | v3 } ] [slev
{ noAuthNoPriv | authNoPriv | authPriv }] [type { trap | inform }] [retries retries ]
[timeout timeout ]
```

```
no snmp-server host ip user-name
```

### Parameter

*ip* — The IP address of the management Host.

*udp-port* — UDP port, which is used to send notifications. The UDP port functions with the IP address for the notification sending. By default, it is 162.

*user-name* — The User name of the management station.

*smode* — The Security Model of the management station, with v1, v2c and v3 options. By default, the option is v1.

*slev* — The Security Level of SNMP v3 Group. There are three options, including noAuthNoPriv (no authorization and no encryption), authNoPriv (authorization and no encryption) and authPriv (authorization and encryption). By default, the option is “noAuthNoPriv”.

*type* — The type of the notifications, with trap and inform options. Trap indicates traps are sent, while inform indicates informs are sent. The inform type has a higher security than the trap type and resend and timeout need to be configured if you select this option. You can only select the trap type in Security Model v1. By default, the type of the notifications is “trap”.

*retries* — The amount of times the switch retries an inform request, ranging from 1 to 255. The switch will resend the inform request if it doesn't get the response from the management station during the Timeout interval, and it will



terminate resending the inform request if the resending times reach the specified Retry times.

*timeout* — The maximum time for the switch to wait for the response from the management station before resending a request, ranging from 1 to 3600 in seconds.

### Command Mode

Global Configuration Mode

### Example

Add a Notification entry, and configure the IP address of the management Host as 192.168.0.146, the UDP port as 162, the User name of the management station as admin, the Security Model of the management station as v2c, the type of the notifications as inform, the maximum time for the switch to wait as 1000 seconds, and the retries time as 100:

```
T3700G-28TQ(config)#snmp-server host 192.168.0.146 162 admin smode
v2c type inform retries 100 timeout 1000
```

## snmp-server engineID

### Description

The **snmp-server engineID** command is used to configure the local and remote engineID of the switch. To restore to the default setting, please use **no snmp-server engineID** command.

### Syntax

```
snmp-server engineID { [local local-engineID] [remote remote-engineID] }
no snmp-server engineID
```

### Parameter

*local* — Local Engine ID for local clients. The Engine ID is a unique alphanumeric string used to identify the SNMP engine on the switch. Its length ranges from 10 to 64 hexadecimal characters, which must be even number meanwhile.

*remote* — Remote Engine ID for the switch. The Engine ID is a unique alphanumeric string used to identify the SNMP engine on the remote device which receives informs from the switch. Its length ranges from 10 to 64 hexadecimal characters, which must be even number meanwhile.

## Command Mode

Global Configuration Mode

## Example

Specify the local engineID as 1234567890, and the remote engineID as abcdef123456:

```
T3700G-28TQ(config)#snmp-server engineID local 1234567890 remote
abcdef123456
```

# snmp-server traps snmp

## Description

The **snmp-server traps snmp** command is used to enable SNMP standard traps which include four types: linkup, linkdown, warmstart and coldstart. To disable the sending of SNMP standard traps, please use **no snmp-server traps snmp** command.

## Syntax

```
snmp-server traps snmp [ linkup | linkdown | warmstart | coldstart ]
```

```
no snmp-server traps snmp [ linkup | linkdown | warmstart | coldstart ]
```

## Parameter

linkup — Enable linkup trap. It is sent when port status changes from linkdown to linkup. By default, it is enabled.

linkdown — Enable linkdown trap. It is sent when port status changes from linkup to linkdown. By default, it is enabled.

warmstart — Enable warmstart trap. It is sent upon SNMP function reboot. By default, it is enabled.

coldstart — Enable coldstart trap. It is sent upon switch reboot. By default, it is enabled.

## Command Mode

Global Configuration Mode

## Example

Enable SNMP standard linkup trap for the switch:

```
T3700G-28TQ(config)# snmp-server traps snmp linkup
```

## snmp-server traps link-status

### Description

The **snmp-server traps link-status** command is used to enable SNMP link status trap for the specified port. To disable the sending of SNMP link status trap, please use **no snmp-server traps link-status** command.

### Syntax

**snmp-server traps link-status**

**no snmp-server traps link-status**

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable SNMP link status trap for port 1/0/3:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/3
TL- SG3424P(config-if)# snmp-server traps link-status
```

## snmp-server traps

### Description

The **snmp-server traps** command is used to enable SNMP extended traps. To disable the sending of SNMP extended traps, please use **no snmp-server traps** command.

### Syntax

**snmp-server traps** { bandwidth-control | cpu | flash | ipaddr-change | lldp | loopback-detection | storm-control | spanning-tree | memory }

**no snmp-server traps** { bandwidth-control | cpu | flash | ipaddr-change | lldp | loopback-detection | storm-control | spanning-tree | memory }

### Parameter

**bandwidth-control** — Enable bandwidth-control trap. It is sent when the rate limit function is enabled and the bandwidth exceeds the predefined value.

**cpu** — Allow CPU-related trap. It is sent when CPU usage exceeds the predefined threshold. By default, the CPU usage threshold of the switch is 80%.

flash — Enable flash trap. It is sent when flash is modified during operations such as backup, reset, firmware upgrade, configuration import, etc.

ipaddr-change — Enable ipaddr-change trap. It is sent when IP address is changed such as user manually modifies the IP address or the switch obtains a new IP address from DHCP.

Ildp — Enable Ildp trap. It is sent when the port's neighbor changes.

loopback-detection — Enable loopback-detection trap. It is sent when the switch detects loopback or loopback is cleared.

storm-control — Enable storm-control trap. It is sent when the multicast or broadcast rate exceeds the predefined value.

spanning-tree — Enable spanning-tree trap. It is sent when the port forwarding status changes or the port receives TCN packet or packet with TC flag.

memory — Enable memory trap. It is sent when CPU usage exceeds 80%.

### Command Mode

Global Configuration Mode

### Example

Enable SNMP extended bandwidth-control trap for the switch:

```
T3700G-28TQ(config)# snmp-server traps bandwidth-control
```

## snmp-server traps mac

### Description

The **snmp-server traps mac** command is used to enable SNMP extended MAC address-related traps which include four types: new, full, learn-mode-change and max-learned. To disable the sending of SNMP extended MAC address related traps, please use **no snmp-server traps mac** command.

### Syntax

```
snmp-server traps mac [ new | full | learn-mode-change | max-learned ]
```

```
no snmp-server traps mac [ new | full | learn-mode-change | max-learned ]
```

### Parameter

new — Enable new MAC address trap. It is sent when the switch learns new MAC address including dynamic address, static address and filter address.

full — Enable MAC address table trap. It is sent when the MAC address table is full.

learn-mode-change — Enable MAC address learn-mode-change trap. It is sent when MAC address learning mode of the switch changes.

max-learned — Enable MAC address max-learned trap. It is sent when the amount of learned MAC address reaches the limit which is configured in port security module.

### Command Mode

Global Configuration Mode

### Example

Enable all SNMP extended MAC address-related traps for the switch:

```
T3700G-28TQ(config)# snmp-server traps mac
```

Enable new MAC address trap only for the switch:

```
T3700G-28TQ(config)# snmp-server traps mac new
```

## snmp-server traps vlan

### Description

The **snmp-server traps vlan** command is used to enable SNMP extended VLAN-related traps which include two types: create and delete. To disable this function, please use **no snmp-server traps vlan** command.

### Syntax

```
snmp-server traps vlan [ create | delete ]
```

```
no snmp-server traps vlan [create | delete ]
```

### Parameter

create — Enable VLAN-created trap. It is sent when new VLAN is created successfully.

delete — Enable VLAN-deleted traps. It is sent when VLAN is deleted successfully.

### Command Mode

Global Configuration Mode

### Example

Enable all SNMP extended VLAN-related traps for the switch:

```
T3700G-28TQ(config)# snmp-server traps vlan
```

Enable VLAN-created trap only for the switch:

```
T3700G-28TQ(config)# snmp-server traps vlan create
```

## rmon history

### Description

The **rmon history** command is used to configure the history sample entry. To return to the default configuration, please use **no rmon history** command. RMON (Remote Monitoring), basing on SNMP architecture, functions to monitor the network. History Group is one of the commonly used RMON Groups. After a history group is configured, the switch collects network statistics information periodically, based on which the management station can monitor network effectively.

### Syntax

```
rmon history index interface { fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port } [ interval seconds ] [ owner owner-name ]  
no rmon history index
```

### Parameter

*index* — The index number of the entry, ranging from 1 to 12, in the format of 1-3,5.

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

*seconds* — The interval to take samplings from the port, ranging from 10 to 3600 in seconds. By default, it is 1800.

*owner-name* — The owner of the history sample entry, ranging from 1 to 16 characters. By default, it is "monitor".

### Command Mode

Global Configuration Mode

### Example

Configure the sample port as 1/0/2 and the sample interval as 100 seconds for the entry 1-3:

```
T3700G-28TQ(config)#rmon history 1-3 interface gigabitEthernet 1/0/2  
interval 100 owner owner1
```

## rmon event

### Description

The **rmon event** command is used to configure the entries of SNMP-RMON Event. To return to the default configuration, please use **no rmon event** command. Event Group, as one of the commonly used RMON Groups, is used to define RMON events. Alarms occur when an event is detected.

### Syntax

```
rmon event index { [ user user-name ] [ description descript ] [ type {none | log | notify | log-notify } ] [ owner owner-name ] }
```

```
no rmon event index
```

### Parameter

*index* — The index number of the event entry, ranging from 1 to 12. You can only select one entry for each command.

*user-name* — The name of the User to which the event belongs, ranging from 1 to 16 characters. By default, it is “public”.

*descript* — The description of the event, ranging from 1 to 16 characters. By default, it is empty.

*type* — The event type, with “none”, “log”, “notify” and “both” options. “None” indicates no processing, “log” indicates logging the event, “notify” indicates sending trap messages to the management station, and “both” indicates logging the event and sending trap messages to the management station.

*owner-name* — The owner of the event entry, ranging from 1 to 16 characters. By default, it is “monitor”.

### Command Mode

Global Configuration Mode

### Example

Configure the user name of entry 1, 2, 3 and 4 as user1, the description of the event as “description1”, the type of event as log and the owner of the event as “owner1”:

```
T3700G-28TQ(config)#rmon event 1-4 user user1 description description1
type log owner owner1
```

## rmon alarm

### Description

The **rmon alarm** command is used to configure SNMP-RMON Alarm Management. To return to the default configuration, please use **no rmon alarm** command. Alarm Group is one of the commonly used RMON Groups. RMON alarm management allows monitoring the specific alarm variables. When the value of a monitored variable exceeds the threshold, an alarm event is generated, which triggers the switch to act in the set way.

### Syntax

```
rmon alarm index { stats-index sindex } [ alarm-variable { revbyte | revpkt |
bpkt | mpkt | crc-lign | undersize | oversize | jabber | collision | 64 | 65-127 |
128-511 | 512-1023 | 1024-10240 } ] [ s-type { absolute | delta} ]
[ rising-threshold r-hold ] [ rising-event-index r-event] [ falling-threshold
f-hold] [ falling-event-index f-event] [ a-type {rise | fall | all} ] [ owner
owner-name ] [ interval interval]
```

```
no rmon alarm index
```

### Parameter

*index* — The index number of the Alarm Management entry, ranging from 1 to 12, in the format of 1-3,5.

*sindex* — Specify the statistics index.

alarm-variable — The alarm variable. By default, the option is revbyte.

s-type — Sample Type, which is the sampling method for the selected variable and comparing the value against the thresholds. There are two options, absolute and delta. Absolute indicates comparing the values directly with the thresholds at the end of the sampling interval. Delta indicates subtracting the last sampled value from the current value, and then comparing the difference in the values with the threshold. By default, the Sample Type is absolute.

*r-hold* — The rising counter value that triggers the Rising Threshold alarm, ranging from 1 to 2147483647. By default, it is 100.

*r-event* — Rise Event, which is the index of the corresponding event which will be triggered if the sampled value is larger than the Rising Threshold. It ranges from 1 to 12.

*f-hold* — The falling counter value that triggers the Falling Threshold alarm, ranging from 1 to 2147483647. By default, it is 100.



*f-event* — Fall Event, which is the index of the corresponding event which will be triggered if the sampled value is lower than the Falling Threshold. It ranges from 1 to 12.

*a-type* — Alarm Type, with rise, fall and all options. Rise indicates that the alarm event will be triggered when the sampled value exceeds the Rising Threshold, fall indicates that the alarm event will be triggered when the sampled value is under the Falling Threshold, and all indicates that the alarm event will be triggered either the sampled value exceeds the Rising Threshold or is under the Falling Threshold. By default, the Alarm Type is all.

*owner-name* — The owner of the entry, ranging from 1 to 16 characters. By default, it is monitor.

*interval* — The alarm interval time, ranging from 10 to 3600 in seconds. By default, it is 1800.

## Command Mode

Global Configuration Mode

## Example

Configure rmon alarm entries 1-3 binding with statistics entry 2, the owners as owner1 and the alarm intervals as 100 seconds:

```
T3700G-28TQ(config)#rmon alarm 1-3 stats-index 2 owner owner1 interval
100
```

## rmon statistics

### Description

The **rmon statistics** command is used to configure the entries of SNMP-RMON statistics. To delete the corresponding entry, please use **no rmon statistics** command. The maximum supported entries are 1000.

### Syntax

```
rmon statistics index interface { fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port } [ owner owner-name] [ status { underCreation |
valid }]
```

```
no rmon statistics index
```

### Parameter

*index* — The index number of the statistics entry, ranging from 1 to 65535, in the format of 1-3,5.

*port* — The statistics port number, in the format of 1/0/1.

*owner-name* — The creator of the event entry, ranging from 1 to 16 characters. By default, it is “monitor”.

*status* — The status of the statistics entry, either “underCreation” or “valid”. “underCreation” means this entry won’t take effect until it is modified to “valid”; “valid” means this entry takes effect immediately after it is created.

### Command Mode

Global Configuration Mode

### Example

Configure the statistics entries 1-3 with the statistics port as 1/0/1, owner as owner1 and status as valid:

```
T3700G-28TQ(config)#rmon statistics 1-3 interface gigabitEthernet 1/0/1
owner owner1 status valid
```

## show snmp-server

### Description

The **show snmp-server** command is used to display SNMP configuration globally.

### Syntax

```
show snmp-server
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display SNMP configuration globally:

```
T3700G-28TQ#show snmp-server
```

## show snmp-server view

### Description

The **show snmp-server view** command is used to display the View table.

### Syntax

```
show snmp-server view
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the View table:

```
T3700G-28TQ#show snmp-server view
```

## show snmp-server group

**Description**

The **show snmp-server group** command is used to display the Group table.

**Syntax**

```
show snmp-server group
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the Group table:

```
T3700G-28TQ#show snmp-server group
```

## show snmp-server user

**Description**

The **show snmp-server user** command is used to display the User table.

**Syntax**

```
show snmp-server user
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the User table:

```
T3700G-28TQ#show snmp-server user
```

## show snmp-server community

### Description

The **show snmp-server community** command is used to display the Community table.

### Syntax

```
show snmp-server community
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the Community table:

```
T3700G-28TQ#show snmp-server community
```

## show snmp-server host

### Description

The **show snmp-server host** command is used to display the Host table.

### Syntax

```
show snmp-server host
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the Host table:

```
T3700G-28TQ#show snmp-server host
```

## show snmp-server engineID

### Description

The **show snmp-server engineID** command is used to display the engineID of the SNMP.

### Syntax

```
show snmp-server engineID
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the engineID:

```
T3700G-28TQ#show snmp-server engineID
```

## show rmon history

### Description

The **show rmon history** command is used to display the configuration of the history sample entry.

### Syntax

```
show rmon history [index]
```

### Parameter

*index* — The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all history sample entries is displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of all history sample entries:

```
T3700G-28TQ#show rmon history
```

## show rmon event

### Description

The **show rmon event** command is used to display the configuration of SNMP-RMON Event.

### Syntax

```
show rmon event [index]
```

### Parameter

*index* — The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all SNMP-RMON enabled entries is displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the Event configuration of entry1-4:

```
T3700G-28TQ#show rmon event 1-4
```

## show rmon alarm

### Description

The **show rmon alarm** command is used to display the configuration of the Alarm Management entry.

### Syntax

```
show rmon alarm [index]
```

### Parameter

*index* — The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all Alarm Management entries is displayed.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration of the Alarm Management entry 1-2:

```
T3700G-28TQ#show rmon alarm 1-2
```

## show rmon statistics

### Description

The **show rmon statistics** command is used to display the configuration of the specified statistics entry.

### Syntax

```
show rmon statistics [index]
```

**Parameter**

*index* — The index number of the statistics entry selected to display the configuration, ranging from 1 to 65535. By default, the configuration of all statistics entries is displayed.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the configuration of the statistics entry 1:

```
T3700G-28TQ#show rmon statistics 1
```

## Chapter 32 LLDP Commands

LLDP function enables network devices to advertise their own device information periodically to neighbors on the same LAN. The information of the LLDP devices in the LAN can be stored by its neighbor in a standard MIB, so it is possible for the information to be accessed by a Network Management System (NMS) using SNMP.

### Ildp

#### Description

The **ildp** command is used to enable LLDP function. To disable the LLDP function, please use **no ildp** command.

#### Syntax

```
ildp
no ildp
```

#### Command Mode

Global Configuration Mode

#### Example

Enable LLDP function globally:

```
T3700G-28TQ(config)#ildp
```

### Ildp hold-multiplier

#### Description

The **ildp hold-multiplier** command is used to configure the Hold Multiplier parameter. The aging time of the local information in the neighbor device is determined by the actual TTL value used in the sending LLDPDU.  $TTL = \text{Hold Multiplier} * \text{Transmit Interval}$ . To return to the default configuration, please use **no ildp hold-multiplier** command.

#### Syntax

```
ildp hold-multiplier multiplier
no ildp hold-multiplier
```



**Parameter**

*multiplier* — Configure the Hold Multiplier parameter. It ranges from 2 to 10. By default, it is 4.

**Command Mode**

Global Configuration Mode

**Example**

Specify Hold Multiplier as 5:

```
T3700G-28TQ(config)#lldp hold-multiplier 5
```

## Ildp timer

**Description**

The **lldp timer** command is used to configure the parameters about transmission. To return to the default configuration, please use **no lldp timer** command.

**Syntax**

```
lldp timer { tx-interval tx-interval | tx-delay tx-delay | reinit-delay reinit-delay | notify-interval notify-interval | fast-count fast-count }
```

```
no lldp timer { tx-interval | tx-delay | reinit-delay | notify-interval | fast-count }
```

**Parameter**

*tx-interval* — Configure the interval for the local device to transmit LLDPDU to its neighbors. The value ranges from 5 to 32768 and the default value is 30 seconds.

*tx-delay* — Configure a value from 1 to 8192 in seconds to specify the time for the local device to transmit LLDPDU to its neighbors after changes occur so as to prevent LLDPDU being sent frequently. By default, it is 2 seconds.

*reinit-delay* — This parameter indicates the amount of delay from when LLDP status becomes "disable" until re-initialization will be attempted. The value ranges from 1 to 10 and the default value is 3.

*notify-interval* — Specify the interval of Trap message which will be sent from local device to network management system. The value ranges from 5 to 3600 and the default value is 5 seconds.

*fast-count* — When the port's LLDP state transforms from Disable (or Rx\_Only) to Tx&Rx (or Tx\_Only), the fast start mechanism will be enabled, that is, the transmit interval will be shorten to a second, and several LLDPDUs will

be sent out (the number of LLDPDU equals this parameter). The value ranges from 1 to 10 and the default value is 3.

### Command Mode

Global Configuration Mode

### Example

Specify the Transmit Interval of LLDPDU as 45 seconds and Trap message to NMS as 120 seconds:

```
T3700G-28TQ(config)#lldp timer tx-interval 45
T3700G-28TQ(config)#lldp timer notify-interval 120
```

## Ildp receive

### Description

The **lldp receive** command is used to enable the designated port to receive LLDPDU. To disable the function, please use **no lldp receive** command.

### Syntax

```
lldp receive
no lldp receive
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable Gigabit Ethernet port 1/0/1 to receive LLDPDU:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#lldp receive
```

## Ildp transmit

### Description

The **lldp transmit** command is used to enable the designated port to transmit LLDPDU. To disable the function, please use **no lldp transmit** command.

### Syntax

```
lldp transmit
```

**no lldp transmit**

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable Gigabit Ethernet port 1/0/1 to transmit LLDPDU:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#lldp transmit
```

## lldp snmp-trap

### Description

The **lldp snmp-trap** command is used to enable the port's SNMP notification. If enabled, the port will notify the trap event to network management system. To disable the ports' SNMP notification, please use **no lldp snmp-trap** command.

### Syntax

```
lldp snmp-trap
no lldp snmp-trap
```

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the SNMP notification for Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)#lldp snmp-trap
```

## lldp tlv-select

### Description

The **lldp tlv-select** command is used to configure TLVs to be included in outgoing LLDPDU. To exclude TLVs, please use **no lldp tlv-select** command. By default, All TLVs are included in outgoing LLDPDU.

## Syntax

```
lldp tlv-select { [ port-description ] [ system-capability ] [ system-description ]
[ system-name ] [ management-address ] [ port-vlan ] [ protocol-vlan ]
[ vlan-name ] [ link-aggregation ] [ mac-phy-cfg ] [ max-frame-size ] [ power ]
[ all ] }
```

```
no lldp tlv-select { [ port-description ] [ system-capability ] [ system-description ]
[ system-name ] [ management-address ] [ port-vlan ] [ protocol-vlan ]
[ vlan-name ] [ link-aggregation ] [ mac-phy-cfg ] [ max-frame-size ] [ power ]
[ all ] }
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Exclude “management-address” and “port-vlan-id” TLVs in LLDPDU outgoing from Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/1
```

```
T3700G-28TQ(config-if)# no lldp tlv-select management-address port-vlan
```

# lldp med-fast-count

## Description

The **lldp med-fast-count** command is used to configure the number of the LLDP-MED frames that will be sent out. When LLDP-MED fast start mechanism is activated, multiple LLDP-MED frames will be transmitted based on this parameter. The default value is 4. To return to the default configuration, please use **no lldp med-fast-count** command.

## Syntax

```
lldp med-fast-count count
```

```
no lldp med-fast-count
```

## Parameter

*count* — Configure the Fast Start Count parameter. It ranges from 1 to 10. By default, it is 4.

## Command Mode

Global Configuration Mode

## Example

Specify Fast Start Count as 5:

```
T3700G-28TQ(config)# lldp med-fast-count 5
```

## lldp med-status

### Description

The **lldp med-status** command is used to enable the LLDP-MED feature for the corresponding port. After the LLDP-MED feature is enabled, the port's Admin Status will be changed to Tx&Rx. To disable the LLDP-MED feature for the corresponding port, please use **no lldp med-status** command.

### Syntax

**lldp med-status**

**no lldp med-status**

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

### Example

Enable the LLDP-MED feature for port 1/0/2:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
```

```
T3700G-28TQ(config-if)# lldp med-status
```

## lldp med-tlv-select

### Description

The **lldp med-tlv-select** command is used to configure LLDP-MED TLVs to be included in outgoing LLDPDU for the corresponding port. To exclude LLDP-MED TLVs, please use **no lldp med-tlv-select** command. By default, All TLVs are included in outgoing LLDPDU.

### Syntax

**lldp med-tlv-select** { [inventory-management] [location] [network-policy] [power-management] [all] }

**no lldp med-tlv-select** { [inventory-management] [location] [network-policy] [power-management] [all] }

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Exclude “network policy” and “inventory” TLVs in LLDPDU outgoing from port 1/0/2:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)# no lldp med-tlv-select network-policy inventory-
management
```

# Ildp med-location

## Description

The lldp med-location command is used to configure the Location Identification TLV's content in outgoing LLDPDU of the port.

## Syntax

```
lldp med-location { emergency-number identifier | civic-address [ [ language
language ] [ province-state province-state ] [ county county ] [ city city ] [ street
street ] [ house-number house-number ] [ name name ] [ postal-zipcode
postal-zipcode ] [ room-number room-number ] [ post-office-box post-office-box ]
[ additional additional ] [ country-code country-code ] [ what { dhcp-server |
endpoint | switch } ] ] }
```

## Parameter

**emergency-number** — Emergency Call Service ELIN identifier, which is used during emergency call setup to a traditional CAMA or ISDN trunk-based PSAP. The length of this field ranges from 10 to 25 characters.

**civic-address** — The civic address is defined to reuse the relevant sub-fields of the DHCP option for civic Address based Location Configuration Information as specified by IETF.

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Configure the civic address in the Location Identification TLV's content in outgoing LLDPDU of port 1/0/2. Configure the language as English and city as London:

```
T3700-28TQ (config)# interface gigabitEthernet 1/0/2
T3700-28TQ(config-if)# lldp med-location civic-address language English
city London
```

## show lldp

### Description

The **show lldp** command is used to display the global configuration of LLDP.

### Syntax

```
show lldp
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global configuration of LLDP:

```
T3700G-28TQ#show lldp
```

## show lldp interface

### Description

The **show lldp interface** command is used to display LLDP configuration of the corresponding port. By default, the LLDP configuration of all the ports will be displayed.

### Syntax

```
show lldp interface [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the LLDP configuration of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ#show lldp interface gigabitEthernet 1/0/1
```

## show lldp local-information interface

**Description**

The **show lldp local-information interface** command is used to display the LLDP information of the corresponding port. By default, the LLDP information of all the ports will be displayed.

**Syntax**

```
show lldp local-information interface [ fastEthernet port | gigabitEthernet
port | ten-gigabitEthernet port ]
```

**Parameter**

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the LLDP information of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ#show lldp local-information interface gigabitEthernet 1/0/1
```

## show lldp neighbor-information interface

**Description**

The **show lldp neighbor-information interface** command is used to display the neighbor information of the corresponding port. By default, the neighbor information of all the ports will be displayed.

**Syntax**

```
show lldp neighbor-information interface [ fastEthernet port |
gigabitEthernet port | ten-gigabitEthernet port ]
```



**Parameter**

*port* — The Fast/Gigabit/Ten-gigabit Ethernet port number.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the neighbor information of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ#show lldp neighbor-information interface gigabitEthernet
1/0/1
```

## show lldp traffic interface

**Description**

The **show lldp traffic interface** command is used to display the LLDP statistic information between the local device and neighbor device of the corresponding port. By default, the LLDP statistic information of all the ports will be displayed.

**Syntax**

```
show lldp traffic interface [ fastEthernet port | gigabitEthernet port |
ten-gigabitEthernet port ]
```

**Parameter**

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the LLDP statistic information of Gigabit Ethernet port 1/0/1:

```
T3700G-28TQ#show lldp traffic interface gigabitEthernet 1/0/1
```

## Chapter 33 Cluster Commands

Cluster Management function enables a network administrator to manage the scattered devices in the network via a management device. After a commander switch is configured, management and maintenance operations intended for the member devices in a cluster is implemented by the commander device.

### cluster ndp

#### Description

The **cluster ndp** command is used to configure NDP globally. To disable the cluster NDP function, please use **no cluster ndp** command. NDP (Neighbor Discovery Protocol) is used to discover the information of the directly connected neighbor devices to support cluster establishing. An NDP-enabled device sends NDP packets regularly to neighbor devices as well as receives NDP packets from neighbor devices. An NDP packet carries the aging time, which indicates the period of the receiving devices to keep the NDP packet.

#### Syntax

```
cluster ndp
```

```
cluster ndp timer { [hello hello-time ] [aging aging-time] }
```

```
no cluster ndp
```

```
no cluster ndp timer { [hello hello-time ] [aging aging-time] }
```

#### Parameter

*hello-time* — Hello Time, which is the interval to send NDP packets. Hello Time ranges from 5 to 254 in seconds. By default, it is 60. Hello Time should be smaller than Aging Time.

*aging-time* — Aging Time, which is the period for the neighbor switch to keep the NDP packets from this switch. Aging Time ranges from 5 to 255 in seconds. By default, it is 180.

#### Command Mode

Global Configuration Mode

#### Example

Enable NDP function globally, and configure Aging Time as 120 seconds, Hello Time as 50 seconds:

```
T3700G-28TQ(config)#cluster ndp
T3700G-28TQ(config)#cluster ndp timer hello 50 aging 120
```

## cluster ndp

### Description

The **cluster ndp** command is used to configure NTDP globally. To disable the cluster NTDP function, please use **no cluster ndp** command. NTDP (Neighbor Topology Discovery Protocol) is used to collect the NDP information and neighboring connection information of each device in a specific network range. It provides the commander switch with the information of devices which can join the cluster and collects topology information of devices within the specified hops.

### Syntax

```
cluster ndp
```

```
cluster ndp timer { [interval-time time] [hop-delay value] [port-delay value] }
```

```
cluster ndp hop hop-value
```

```
no cluster ndp
```

```
no cluster ndp timer { [interval-time time] [hop-delay value] [port-delay value] }
```

```
no cluster ndp hop hop-value
```

### Parameter

*time* — NTDP Interval Time, which is the interval to collect topology information. NTDP Interval Time ranges from 1 to 60 in minutes. By default, it is 1.

**hop-delay** *value* — NTDP Hop Delay, which is the time between the switch receiving NTDP request packets and the switch forwarding NTDP request packets for the first time. NTDP Hop Delay ranges from 1 to 1000 in milliseconds. By default, it is 200.

**port-delay** *value* — NTDP Port Delay, which is the time between the port forwarding NTDP request packets and its adjacent port forwarding NTDP request packets over. NTDP Port Delay ranges from 1 to 100 in milliseconds. By default, it is 20.

*hop-value* — NTDP Hops, which is the hop count the switch topology collects. NTDP Hops ranges from 1 to 16. By default, it is 3.

### Command Mode

Global Configuration Mode

## Example

Enable NTDP function globally, and specify NTDP Hops as 5, NTDP Interval Time as 30 minutes:

```
T3700G-28TQ(config)#cluster ntdp
T3700G-28TQ(config)#cluster ntdp timer interval-timer 30
T3700G-28TQ(config)#cluster ntdp hop 5
```

## cluster explore

### Description

The **cluster explore** command is used to collect the topology information manually.

### Syntax

```
cluster explore
```

### Command Mode

Global Configuration Mode

### Example

Collect the topology information manually:

```
T3700G-28TQ(config)#cluster explore
```

## cluster

### Description

The **cluster** command is used to configure cluster functions of a specified port.

### Syntax

```
cluster [ndp { disable | enable }] [ntdp { disable | enable }]
```

### Parameter

ndp — Enable/ Disable NDP function for the port. By default, it is enabled.

ntdp — Enable/ Disable NTDP function for the port. By default, it is enabled.

### Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Enable NDP and NTDP function for Gigabit Ethernet port 1/0/5:

```
T3700G-28TQ(config)#interface gigabitEthernet 1/0/5
T3700G-28TQ(config-if)#cluster ndp enable ntdp enable
```

## cluster ip pool

### Description

The **cluster ip pool** command is used to create a new cluster. If no specified cluster name is set through **cluster commander** command, the newly created cluster will be named the system default name “tplink-cluster”.

### Syntax

```
cluster ip pool ip mask
```

### Parameter

*ip* — The cluster IP address pool.

*mask* — The cluster IP address mask.

### Command Mode

Global Configuration Mode

### Example

Create a cluster and configure its IP address pool as 192.168.10.1-192.168.0.254:

```
T3700G-28TQ(config)#cluster ip pool 192.168.10.1 255.255.255.0
```

## cluster commander

### Description

The **cluster commander** command is used to specify the cluster name, and you can only specify the cluster name before you create the cluster.

### Syntax

```
cluster commander name
```

### Parameter

*name* — The cluster name, ranging from 1 to 16 characters.

### Command Mode

Global Configuration Mode

## Example

Configure the newly created cluster name as tp:

```
T3700G-28TQ(config)#cluster commander tp
```

## cluster manage

### Description

The **cluster manage** command is used to configure the hold time and interval to send handshake packets of the cluster. To return to the default configuration, please use **no cluster manage** command.

### Syntax

```
cluster manage [ holdtime hold-time | timer interval-time ]
```

```
no cluster manage [ holdtime | timer ]
```

### Parameter

*hold-time* — Hold Time, which is the time for the switch to keep the cluster information. Hold Time ranges from 1 to 255 in seconds. It is 20 by default.

*interval-time* — Interval Time, which is the interval to send handshake packets. Interval Time ranges from 1 to 255 in seconds. It is 20 by default.

### Command Mode

Global Configuration Mode

### Example

Specify the Hold Time and Interval Time of the cluster as 50 seconds:

```
T3700G-28TQ(config)#cluster manage holdtime 50
```

```
T3700G-28TQ(config)#cluster manage timer 50
```

## cluster member

### Description

The **cluster member** command is used to add member switch. To delete the corresponding member, please use **no cluster member** command. The add/delete operations of member switches should be implemented by the commander switch according to the MAC address.

### Syntax

```
cluster member {mac-address mac-address}
```

```
no cluster member {mac-address mac-address}
```

### Parameter

*mac-address* — The MAC address of the member switch desired to join in or to be deleted from the cluster.

### Command Mode

Global Configuration Mode

### Example

Add the switch whose MAC address is 0e:3f:4g:5e:6d:7b to the cluster:

```
T3700G-28TQ(config)#cluster member mac address 0e:3f:4g:5e:6d:7b
```

## cluster candidate

### Description

The **cluster candidate** command is used to specify the current switch as candidate switch. This command is invalid for the member switch in the cluster.

### Syntax

```
cluster candidate
```

### Command Mode

Global Configuration Mode

### Example

Specify the current switch as candidate switch:

```
T3700G-28TQ(config)#cluster candidate
```

## cluster individual

### Description

The **cluster individual** command is used to specify the current switch as individual switch.

### Syntax

```
cluster individual
```

### Command Mode

Global Configuration Mode

### Example

Specify the current switch as individual switch:

```
T3700G-28TQ(config)#cluster individual
```

## cluster management-vlan

### Description

The **cluster management-vlan** command is used to specify the VLAN to manage the clusters.

### Syntax

```
cluster management-vlan vlan-id
```

### Parameter

*vlan-id* — Specify the cluster-management VLAN ID.

### Command Mode

Global Configuration Mode

### Example

Specify VLAN 2 as the VLAN to manage the clusters:

```
T3700G-28TQ(config)#cluster management-vlan 2
```

## clear ndp statistics

### Description

The **clear ndp statistics** command is used to clear statistics about NDP messages on the specified port(s).

### Syntax

```
clear ndp statistics [ interface { fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port } ]
```

### Parameter

*port* — Specify the Ethernet port number. The NDP statistics of all ports will be cleared if the port number is not specified here.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Clear the statistics of the NDP messages on all the ports of the switch:

```
T3700G-28TQ(config)#clear ndp statistics
```



## show cluster ndp

### Description

The **show cluster ndp** command is used to display the NDP information.

### Syntax

```
show cluster ndp [ interface [ fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port ] ]
```

### Parameter

*port* — Specify the Ethernet port number. The NDP information of all ports will be displayed if the port number is not specified here.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global NDP information of the switch:

```
T3700G-28TQ(config)#show cluster ndp
```

Display the NDP information of all the ports of the switch:

```
T3700G-28TQ(config)#show cluster ndp interface
```

## show cluster neighbor

### Description

The **show cluster neighbor** command is used to display the cluster's neighbor information.

### Syntax

```
show cluster neighbor
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the cluster's neighbor information:

```
T3700G-28TQ(config)#show cluster neighbor
```

## show cluster ntdp

### Description

The **show cluster ntdp** command is used to display NTDP configuration information.

### Syntax

```
show cluster ntdp [ interface [fastEthernet port | gigabitEthernet port | ten-gigabitEthernet port ] | device-list { detail | summary } ]
```

### Parameter

*port* — The Fast/Gigabit/Ten-Gigabit Ethernet port number. By default, the configuration of all Fast / Gigabit/Ten-Gigabit Ethernet ports is displayed.

**device-list** — To display the device table of NTDP.

**detail** — The detailed information of the device-list.

**summary** — The device-list information in summary.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global information of NTDP:

```
T3700G-28TQ#show cluster ntdp
```

Display the NTDP configuration of Gigabit Ethernet port 1/0/2:

```
T3700G-28TQ#show cluster ntdp interface gigabitEthernet 1/0/2
```

Display the device table of NTDP in summary:

```
T3700G-28TQ#show cluster ntdp device-list summary
```

## show cluster

### Description

When the current switch is Commander Switch, the **show cluster** command is used to display the global configuration of Cluster.

### Syntax

```
show cluster
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the global configuration of Cluster:

```
T3700G-28TQ#show cluster
```

## show cluster member

### Description

The **show cluster member** command is used to display the member information.

### Syntax

```
show cluster member
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the member information:

```
T3700G-28TQ#show cluster member
```

## Chapter 34 Static Routes Commands

### interface vlan

#### Description

This **interface vlan** command is used to create the VLAN interface. To delete the specified VLAN interface, please use the **no interface vlan** command.

#### Syntax

```
interface vlan { vid }  
no interface vlan { vid }
```

#### Parameter

*vid* — The ID of the VLAN.

#### Command Mode

Global Configuration Mode

#### Example

Create the VLAN interface 2:

```
T3700G-28TQ(config)# interface vlan 2
```

### interface loopback

#### Description

This **interface loopback** command is used to create the loopback interface. To delete the specified loopback interface, please use the **no interface loopback** command.

#### Syntax

```
interface loopback { id }  
no interface loopback { id }
```

#### Parameter

*id* — The ID of the loopback interface, ranging from 1 to 2147483647.

## Command Mode

Global Configuration Mode

## Example

Create the loopback interface 1:

```
T3700G-28TQ(config)# interface loopback 1
```

# switchport

## Description

This **switchport** command is used to switch the Layer 3 interface into the Layer 2 port. To switch the Layer 2 port into the Layer 3 routed port, please use the **no switchport** command.

## Syntax

```
switchport  
no switchport
```

## Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Example

Switch the gigabitEthernet port 1/0/9 into the routed port:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/9  
T3700G-28TQ(config-if)# no switchport
```

# shutdown

## Description

This **shutdown** command is used to shut down the specified interface. The interface type include: routed port, loopback interface and VLAN interface. To enable the specified interface, please use the **no shutdown** command.

## Syntax

```
shutdown  
no shutdown
```

## Command Mode

Interface Configuration Mode

## Example

Shut down the routed port 1/0/9 :

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/9
T3700G-28TQ(config-if)# no switchport
T3700G-28TQ(config-if)# shutdown
```

## description

### Description

This **description** command is used to add a description to the Layer 3 interface, including routed port, loopback interface and VLAN interface. To clear the description of the corresponding interface, please use the **no description** command.

### Syntax

```
description string
no description
```

### Parameter

*string* — Content of an interface description, ranging from 1 to 32 characters.

## Command Mode

Interface Configuration Mode

## Example

Add a description system-if to the routed port 1/0/9 :

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/9
T3700G-28TQ(config-if)# no switchport
T3700G-28TQ(config-if)# description system-if
```

## ip route

### Description

This **ip route** command is configure the static route. To clear the corresponding entry, please use the **no ip route** command.

## Syntax

```
ip route { dest-address } { mask } { next-hop-address } [ distance { distance } ]
```

```
no ip route { dest-address } { mask } { next-hop-address }
```

## Parameter

*dest-address* — The destination IP address.

*mask* — The subnet mask.

*next-hop-address* — The address of the next-hop.

*distance* — The distance metric of this route. The smaller the distance is, the higher the priority is.

## Command Mode

Global Configuration Mode

## Example

Create a static route with the destination IP address as 192.168.2.0, the subnet mask as 255.255.255.0 and the next-hop address as 192.168.0.2:

```
T3700G-28TQ(config)# ip route 192.168.2.0 255.255.255.0 192.168.0.2
```

# ip routing

## Description

This **ip routing** command is used to enable the Layer 3 routing function. To disable this function, please use the **no ip routing** command.

## Syntax

```
ip routing
```

```
no ip routing
```

## Command Mode

Global Configuration Mode

## Example

Disable the Layer 3 ip routing function :

```
T3700G-28TQ(config)# no ip routing
```

## show interface loopback

### Description

The **show interface loopback** command is used to display the information of the specified loopback interface.

### Syntax

```
show interface loopback number
```

### Parameter

*number* — The loopback interface number, ranging from 1 to 2147483647.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of the loopback interface 1:

```
T3700G-28TQ(config)#show interface loopback 1
```

## show interface vlan

### Description

The **show interface vlan** command is used to display the information of a specified interface VLAN.

### Syntax

```
show interface vlan vid
```

### Parameter

*vid* — The VLAN ID.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of VLAN 2:

```
T3700G-28TQ(config)#show interface vlan 2
```



## show ip interface

### Description

This **show ip interface** command is used to display the detailed information of the specified Layer 3 interface.

### Syntax

```
show ip interface { { fastEthernet | gigabitEthernet | ten-gigabitEthernet } port |  
loopback id | vlan vlan-id }
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*id* — The loopback interface ID.

*vlan-id* — The VLAN interface ID.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of the VLAN interface 2:

```
T3700G-28TQ(config)# show ip interface vlan 2
```

## show ip interface brief

### Description

This **show ip interface brief** command is used to display the summary information of the Layer 3 interfaces.

### Syntax

```
show ip interface brief
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the summary information of the Layer 3 interfaces:

```
T3700G-28TQ(config)# show ip interface brief
```

## show ip route

### Description

This **show ip route** command is used to display the route entries of the specified type.

### Syntax

```
show ip route { static | connected | rip | ospf }
```

### Parameter

static | connected | rip | ospf — Specify the route type.

static: The static routes.

connected: The connected routes.

rip: The routes generated from the RIP protocol.

ospf: The routes generated from the OSPF protocol.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the static routes:

```
T3700G-28TQ(config)# show ip route static
```

## show ip route specify

### Description

This **show ip route specify** command is used to display the invalid routing information to the specified IP address or network segments.

### Syntax

```
show ip route specify { ip } [ mask ] [ longer-prefix ]
```

### Parameter

*ip* — Specify the destination IP address.

*mask* — Specify the destination IP address together with the parameter *ip*.

**longer-mask** — Specify the destination subnets that match the network segment determined by the *ip* and *mask* parameters.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the shortest route to 192.168.0.100:

```
T3700G-28TQ(config)# show ip route specify 192.168.0.100
```

Look up the route entry with the destination as 192.168.0.0/24:

```
T3700G-28TQ(config)# show ip route specify 192.168.0.0 255.255.255.0
```

Display the routes to all the subnets that belongs to 192.168.0.0/16:

```
T3700G-28TQ(config)# show ip route specify 192.168.0.0 255.255.0.0  
longer-prefix
```

# show ip route summary

## Description

This **show ip route summary** command is used to display the summary information of the route entries classified by their sources.

## Syntax

```
show ip route summary
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the summary information of route entries:

```
T3700G-28TQ(config)# show ip route summary
```

## Chapter 35 DHCP Server

DHCP (Dynamic Host Configuration Protocol) is a network configuration protocol for hosts on TCP/IP networks, and it provides a framework for distributing configuration information to hosts. DHCP server assigns IP addresses from specified address pools on a switch or router to DHCP clients and manages them.

### service dhcp

#### Description

The **service dhcp** command is used to enable DHCP service globally, including DHCP Server and DHCP Relay function. To disable DHCP service, please use **no service dhcp** command.

#### Syntax

```
service dhcp
no service dhcp
```

#### Command Mode

Global Configuration Mode

#### Example

Enable DHCP service globally:

```
T3700G-28TQ(config)# service dhcp
```

### ip dhcp server exclude-address

#### Description

The **ip dhcp server exclude-address** command is used to specify the reserved IP addresses which are forbidden to allocate, such as the gateway address, the network segment broadcast address, the server address etc. To delete the reserved IP addresses, please use **no ip dhcp server exclude-address** command.

#### Syntax

```
ip dhcp server exclude-address start-ip-address end-ip-address
no ip dhcp server exclude-address start-ip-addr end-ip-address
```

#### Parameter

*start-ip-address* — Specify the start IP address of the reserved IP pool.

*end-ip-address* — Specify the end IP address of the reserved IP pool. Only one IP address will be reserved if the end IP address and the start IP address are the same.

### Command Mode

Global Configuration Mode

### Example

Set the reserved IP addresses from 192.168.1.1 to 192.168.1.9:

```
T3700G-28TQ(config)# ip dhcp server exclude-address 192.168.1.1
192.168.1.9
```

## ip dhcp server pool

### Description

The **ip dhcp server pool** command is used to create the address pool of DHCP Server and enter the dhcp configuration mode. To delete the address pool, please use **no ip dhcp server pool** command.

### Syntax

```
ip dhcp server pool pool-name
no ip dhcp server pool pool-name
```

### Parameter

*pool-name* — Specify the address pool name, ranging from 1 to 8 characters.

### Command Mode

Global Configuration Mode

### Example

Create the address pool of name POOL1:

```
T3700G-28TQ(config)# ip dhcp server pool POOL1
```

## ip dhcp server ping timeout

### Description

The **ip dhcp server ping timeout** command is used to specify the timeout of PING process. To resume the default value, please use **no ip dhcp server ping timeout** command.

### Syntax

```
ip dhcp server ping timeout value
```

**no ip dhcp server ping timeout**

### Parameter

*value* — Specify the timeout value, ranging from 100 to 10000ms. The default value is 100ms.

### Command Mode

Global Configuration Mode

### Example

Set the timeout of PING as 200ms:

```
T3700G-28TQ(config)# ip dhcp server ping timeout 200
```

## ip dhcp server ping packets

### Description

The **ip dhcp server ping packets** command is used to specify the number of PING packets sent. If this value is set to 0, the PING process will be disabled.

### Syntax

**ip dhcp server ping packets** *num*

### Parameter

*num* — Specify the PING packets' number, ranging from 0 to 10.

### Command Mode

Global Configuration Mode

### Example

Specify the PING packets' number as 2:

```
T3700G-28TQ(config)# ip dhcp server ping packets 2
```

## network

### Description

The **network** command is used to specify the address and subnet of the network pool.

### Syntax

**network** *network-address subnet-mask*

### Parameter

*network-address* — Specify the network address of the pool, with the format A.B.C.D. All the IP addresses in the same subnet are allocatable except the reserved addresses and specific addresses.

*subnet-mask* — Specify the subnet mask of the pool, with the format A.B.C.D.

### Command Mode

DHCP Configuration Mode

### Example

Specify the address pool “product” as 192.168.1.0 255.255.255.0:

```
T3700G-28TQ(config)# ip dhcp server pool product
T3700G-28TQ(config-dhcp)# network 192.168.1.0 255.255.255.0
```

## lease

### Description

The **lease** command is used to specify the lease time of the address pool.

### Syntax

**lease** *lease-time*

### Parameter

*lease-time* — Specify the lease time of the pool, ranging from 1 to 2880 minutes. The default value is 120 minutes.

### Command Mode

DHCP Configuration Mode

### Example

Specify the lease time of address pool “product” as 10 minutes:

```
T3700G-28TQ(config)# ip dhcp server pool product
T3700G-28TQ(config-dhcp)# lease 10
```

## address hardware-address

### Description

The **address hardware-address** command is used to reserve the static address bound with hardware address in the address pool. To delete the binding, please use **no address hardware-address**.

## Syntax

```
address ip-address hardware-address hardware-address hardware-type
{ ethernet | ieee802 }
no address ip-address
```

## Parameter

*ip-address* — Specify the static binding IP address.

*hardware-address* — Specify the hardware address, in the format XX:XX:XX:XX:XX:XX.

ethernet | ieee802 — Specify the hardware type.

## Command Mode

DHCP Configuration Mode

## Example

Reserve the IP address 192.168.0.10 in the address pool “product” for the device with the MAC address as 5e:4c:a6:31:24:01 and the hardware type as ethernet:

```
T3700G-28TQ(config)# ip dhcp server pool product
T3700G-28TQ(config-dhcp)# address 192.168.0.10 hardware-address
5e:4c:a6:31:24:01 hardware-type ethernet
```

# address client-identifier

## Description

The **address client-identifier** command is used to specify the static address bound with client ID in the address pool. To delete the binding, please use **no address** command.

## Syntax

```
address ip-address client-identifier client-id [ascii]
no address ip-address
```

## Parameter

*ip-address* — Specify the static binding IP address.

*client-id* — Specify the client ID, in the format of hex value.

**ascii** — The client ID is entered with ascii characters.

## Command Mode

DHCP Configuration Mode



## Example

Reserve the IP address 192.168.0.10 in the address pool “product” for the device with the client ID as abc in ascii:

```
T3700G-28TQ(config)# ip dhcp pool product
T3700G-28TQ(dhcp-config)# address 192.168.0.10 client-identifier abc
ascii
```

## default-gateway

### Description

The **default-gateway** command is used to specify the default gateway of the address pool. To delete the configuration, please use **no default-gateway**.

### Syntax

```
default-gateway gateway-list
no default-gateway
```

### Parameter

*gateway-list* — Specify the gateway list, with the format of A.B.C.D,E.F.G.H. At most 8 gateways can be configured, separated by comma.

### Command Mode

DHCP Configuration Mode

### Example

Specify the address pool product’s default gateways as 192.168.0.1 and 192.168.1.1:

```
T3700G-28TQ(config)# ip dhcp server pool product
T3700G-28TQ(dhcp-config)# default-gateway 192.168.0.1,192.168.1.1
```

## dns-server

### Description

The **dns-server** command is used to specify the DNS server of the address pool. To delete this configuration, please use **no dns-server** command.

### Syntax

```
dns-server dns-list
no dns-server
```

### Parameter

*dns-list* — Specify the DNS server list, with the format of A.B.C.D,E.F.G.H. At most 8 DNS servers can be configured, separated by comma.

### Command Mode

DHCP Configuration Mode

### Example

Specify the address pool's DNS servers as 192.168.0.1 and 192.168.1.1:

```
T3700G-28TQ(config)# ip dhcp server pool product
```

```
T3700G-28TQ(config-dhcp)# dns-server 192.168.0.1,192.168.1.1
```

## show ip dhcp server status

### Description

The **show ip dhcp server status** command is used to display the status of the DHCP service.

### Syntax

```
show ip dhcp server status
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the status of DHCP service:

```
T3700G-28TQ(config)# show ip dhcp server status
```

## show ip dhcp server statistics

### Description

The **show ip dhcp server statistics** command is used to display the DHCP packets received and sent by DHCP server.

### Syntax

```
show ip dhcp server statistics
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the statistics of DHCP packets received and sent by the DHCP server:

```
T3700G-28TQ(config)# show ip dhcp server statistics
```

## show ip dhcp server pool

### Description

The **show ip dhcp server pool** command is used to display the configuration of the address pool.

### Syntax

```
show ip dhcp server pool
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configured address pool:

```
T3700G-28TQ(config)# show ip dhcp server pool
```

## show ip dhcp server excluded-address

### Description

The **show ip dhcp server excluded-address** command is used to display the configuration of reserved addresses.

### Syntax

```
show ip dhcp server excluded-address
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configured reserved addresses:

```
T3700G-28TQ(config)# show ip dhcp server excluded-address
```

## show ip dhcp server manual-binding

### Description

The **show ip dhcp server manual-binding** command is used to display the configuration of static binding address.

### Syntax

```
show ip dhcp server manual-binding
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configured static binding address:

```
T3700G-28TQ(config)# show ip dhcp server manual-binding
```

## show ip dhcp server binding

### Description

The **show ip dhcp server binding** command is used to display the binding entries.

### Syntax

```
show ip dhcp server binding [ ip ip-address ]
```

### Parameter

*ip-address* — Specify the binding IP address.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the address binding entries:

```
T3700G-28TQ(config)# show ip dhcp server binding
```

## clear ip dhcp server statistics

### Description

The **clear ip dhcp server statistics** command is used to clear the statistics information of DHCP packets.

**Syntax**

```
clear ip dhcp server statistics
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Clear the packet statistics:

```
T3700G-28TQ(config)# clear ip dhcp server statistics
```

## clear ip dhcp server binding

**Description**

The **clear ip dhcp server binding** command is used to clear the binding information.

**Syntax**

```
clear ip dhcp server binding [ ip-address ]
```

**Parameter**

*ip-address* — Specify the binding IP address.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Clear all the binding addresses:

```
T3700G-28TQ(config)# clear ip dhcp server binding
```

## Chapter 36 DHCP Relay

A DHCP Relay is a Layer 3 device that forwards DHCP packets between clients and servers. DHCP Relay forward requests and replies between clients and servers when they are not on the same physical subnet.

### ip helper-address

#### Description

The **ip helper-address** command is used to add DHCP Server address to the Layer 3 interface. To delete the server address, please use **no ip helper-address** command.

#### Syntax

```
ip helper-address ip-address  
no ip helper-address [ ip-address ]
```

#### Parameter

*ip-address* — DHCP Server address.

#### Command Mode

Interface Configuration Mode

#### Example

Add DHCP Server address 192.168.2.1 to interface VLAN 1:

```
T3700G-28TQ(config)# interface vlan 1  
T3700G-28TQ (config-if)# ip helper-address 192.168.2.1
```

### ip dhcp relay information

#### Description

The **ip dhcp relay information** command is used to enable option 82 support in DHCP Relay. To disable this function, please use **no ip dhcp relay information** command.

#### Syntax

```
ip dhcp relay information  
no ip dhcp relay information
```

## Command Mode

Global Configuration Mode

## Example

Enable option 82 support in DHCP Relay:

```
T3700G-28TQ(config)# ip dhcp relay information
```

# ip dhcp relay information policy

## Description

The **ip dhcp relay information policy** command is used to specify the policy when receiving DHCP request packets with Option 82 field. To resume the default policy, please use **no ip dhcp relay information policy** command.

## Syntax

```
ip dhcp relay information policy [ drop | keep | replace ]  
no ip dhcp relay information policy
```

## Parameter

drop | keep | replace — Specify the policy. The default policy is keep.

drop: Discard the packet with the Option 82 field.

keep: Keep the Option 82 field in the packet.

replace: Replace the option 82 field with the system option defined by the switch.

## Command Mode

Global Configuration Mode

## Example

Specify the option 82 policy as replace to replace the Option 82 field with the local parameter on receiving the DHCP request packet:

```
T3700G-28TQ(config)# ip dhcp relay information policy replace
```

# ip dhcp relay information custom

## Description

The **ip dhcp relay information custom** command is used to enable the Option 82 customization function. To disable this function, please use **no ip dhcp relay information custom** command.

## Syntax

```
ip dhcp relay information custom
```

**no ip dhcp relay information custom**

### Command Mode

Global Configuration Mode

### Example

Enable Option 82 customization:

```
T3700G-28TQ(config)# ip dhcp relay information custom
```

## ip dhcp relay information circuit-id

### Description

The **ip dhcp relay information circuit-id** command is used to specify the custom circuit ID when option 82 customization is enabled. To clear the circuit ID, please use **no ip dhcp relay information circuit-id** command.

### Syntax

```
ip dhcp relay information circuit-id circuitID  
no ip dhcp relay information circuit-id
```

### Parameter

*circuitID* — Specify the circuit ID, ranging from 1 to 63 characters.

### Command Mode

Global Configuration Mode

### Example

Specify the circuit ID as "TP-LINK":

```
T3700G-28TQ(config)# ip dhcp relay information circuit-id TP-LINK
```

## ip dhcp relay information remote-id

### Description

The **ip dhcp relay information remote-id** command is used to specify the custom remote ID when option 82 customization is enabled. To clear the remote ID, please use **no ip dhcp relay information remote-id** command.

### Syntax

```
ip dhcp relay information remote-id remoteID  
no ip dhcp relay information remote-id
```

### Parameter

*remoteID* — Specify the remote ID, ranging from 1 to 63 characters.



**Command Mode**

Global Configuration Mode

**Example**

Specify the remote ID as "TP-LINK":

```
T3700G-28TQ(config)# ip dhcp relay information remote-id TP-LINK
```

## show ip dhcp relay

**Description**

The **show ip dhcp relay** command is used to display the configuration of DHCP Relay.

**Syntax**

```
show ip dhcp relay
```

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the configuration of DHCP Relay:

```
T3700G-28TQ(config)# show ip dhcp relay
```

## Chapter 37 Proxy ARP Commands

The switch uses Proxy ARP to help hosts learn MAC addresses of hosts on other networks or subnets.

### ip proxy-arp

#### Description

The **ip proxy-arp** command is used to enable Proxy ARP function on the specified VLAN interface or routed port. To disable IGMP function on this interface, please use **no ip proxy-arp** command.

#### Syntax

```
ip ip proxy-arp
no ip proxy-arp
```

#### Command Mode

Interface Configuration Mode

#### Example

Enable the Proxy ARP function on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip proxy-arp
```

Enable the Proxy ARP function on routed port 1/0/2:

```
T3700G-28TQ(config)# interface gigabitEthernet 2
T3700G-28TQ(config-if)# no switchport
T3700G-28TQ(config-if)# ip proxy-arp
```

### ip proxy-arp enable default-route

#### Description

The **ip proxy-arp enable default-route** command is used to enable the default-route-searching function when searching for the ARP proxy. To disable the default-route-checking function, please use **no ip proxy-arp enable default-route** command.

## Syntax

```
ip proxy-arp enable default-route  
no ip proxy-arp enable default-route
```

## Command Mode

Global Configuration Mode

## Example

Enable the default-route-searching function when searching for the ARP proxy:

```
T3700G-28TQ(config)# ip proxy-arp enable default-route
```

# show ip proxy-arp

## Description

The **show ip proxy-arp** command is used to display the Proxy ARP status.

## Syntax

```
show ip proxy-arp
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the Proxy ARP status:

```
T3700G-28TQ(config)# show ip proxy-arp
```

## Chapter 38 IGMP Commands

Internet Group Management Protocol (IGMP) is used between hosts on a LAN and the routers on this LAN to track the multicast groups of which hosts are multicast members.

### ip igmp

#### Description

The **ip igmp** command is used to enable IGMP function on the specified interface. To disable IGMP function on this interface, please use **no ip igmp** command.

#### Syntax

```
ip igmp
no ip igmp
```

#### Command Mode

Interface Configuration Mode

#### Example

Enable the IGMP function on Interface VLAN 2:

```
T3700G-28TQ(config)#interface vlan 2
T3700G-28TQ(config-if)#ip igmp
```

### ip igmp version

#### Description

The **ip igmp version** command is used to configure the version of IGMP on specified interface. To restore to the default IGMPv2, please use **no ip igmp version** command.

#### Syntax

```
ip igmp version { 1 | 2 | 3 }
no ip igmp version
```

#### Parameter

1 | 2 | 3 — Specify the version of the IGMP. The default version is 2.

## Command Mode

Interface Configuration Mode

## Example

Configure the IGMP version as version 3 on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp version 3
```

# ip igmp last-member-query-count

## Description

The **ip igmp last-member-query-count** command is used to configure the number of Specific Query Messages that the switch sends on specified interface. To restore to the default value on this interface, please use **no ip igmp last-member-query-count** command.

## Syntax

```
ip igmp last-member-query-count count
no ip igmp last-member-query-count
```

## Parameter

*count* — Specify the number of Specific Query Messages that the switch sends, ranging from 1 to 20. The default value is 2.

## Command Mode

Interface Configuration Mode

## Example

Configure the number of Specific Query Messages that the switch sends as 3 on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp last-member-query-count 3
```

# ip igmp last-member-query-interval

## Description

The **ip igmp last-member-query-interval** command is used to configure the interval of Specific Query Messages that the switch sends on specified interface.

To restore to the default value on this interface, please use **no ip igmp last-member-query-interval** command.

### Syntax

```
ip igmp last-member-query-interval interval  
no ip igmp last-member-query-interval
```

### Parameter

*interval* — Specify the interval of Specific Query Messages that the switch sends, ranging from 1 to 5 seconds. The default value is 1 second.

### Command Mode

Interface Configuration Mode

### Example

Configure the interval of Specific Query Messages that the switch sends as 2 seconds on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2  
T3700G-28TQ(config-if)# ip igmp last-member-query-interval 2
```

## ip igmp querier-timeout

### Description

The **ip igmp querier-timeout** command is used to configure the existing time of the non-querier on specified interface. To restore to the default value on this interface, please use **no igmp querier-timeout** command.

### Syntax

```
ip igmp querier-timeout time  
no ip igmp querier-timeout
```

### Parameter

*time* — Specify the existing time of the non-querier, ranging from 6 to 300 seconds. The default value is 120 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the existing time of non-querier as 100 seconds on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp querier-timeout 100
```

## ip igmp query-interval

### Description

The **ip igmp query-interval** command is used to configure the interval of General Query Messages that the switch sends on specified interface. To restore to the default value on this interface, please use **no ip igmp query-interval** command.

### Syntax

```
ip igmp query-interval interval
no ip igmp query-interval
```

### Parameter

*interval* — Specify the interval of General Query Messages that the switch sends, ranging from 1 to 3600 seconds. The default value is 60 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the interval of General Query Messages that the switch sends as 50 seconds on interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp query-interval 50
```

## ip igmp query-max-response-time

### Description

The **ip igmp query-max-response-time** command is used to specify the max response time to the General Query message on specified interface. To restore to the default value on this interface, please use **no igmp query-max-response-time** command.

### Syntax

```
ip igmp query-max-response-time time
no ip igmp query-max-response-time
```

### Parameter

*time* — Specify the max response time to the General Query message, ranging from 1 to 25 seconds. The default value is 10 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the max response time to the General Query message as 5 seconds on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp query-max-response-time 5
```

## ip igmp require-router-alert

### Description

The **ip igmp require-router-alert** command is used to configure to check the router-alert option of the IGMP messages on specified interface. To disable this check function on this interface, please use **no ip igmp require-router-alert** command.

### Syntax

```
ip igmp require-router-alert
no ip igmp require-router-alert
```

### Command Mode

Interface Configuration Mode

### Example

Check the router-alert option of the IGMP messages on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp require-router-alert
```

## ip igmp robustness

### Description

The **ip igmp robustness** used to configure the existing time of the non-querier on specified interface. To restore to the default value on this interface, please use **no ip igmp robustness** command.



## Syntax

```
ip igmp robustness robustness  
no ip igmp robustness
```

## Parameter

*robustness* — Specify the robustness of IGMP, ranging from 1 to 255. The default value is 2.

## Command Mode

Interface Configuration Mode

## Example

Configure the robustness of IGMP as 3 on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2  
T3700G-28TQ(config-if)# ip igmp robustness 3
```

# ip igmp send-router-alert

## Description

The **ip igmp sender-router-alert** is used to configure the sending IGMP messages to carry the router-alert option on specified interface. To disable this function on this interface, please use **no ip igmp send-router-alert** command. This function is enabled by default.

## Syntax

```
ip igmp send-router-alert  
no ip igmp send-router-alert
```

## Command Mode

Interface Configuration Mode

## Example

Configure the sending IGMP messages to carry the router-alert option on interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2  
T3700G-28TQ(config-if)# ip igmp send-router-alert
```

## ip igmp startup-query-interval

### Description

The **ip igmp startup-query-interval** command is used to configure the interval of Startup Query Messages that the switch sends on specified interface. To restore to the default value on this interface, please use **no ip igmp startup-query-interval** command.

### Syntax

```
ip igmp startup-query-interval interval  
no ip igmp startup-query-interval
```

### Parameter

*interval* — Specify the interval of Startup Query Messages that the switch sends, ranging from 1 to 300 seconds. The default value is 15 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the interval of Startup Query Messages that the switch sends as 10 seconds on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2  
T3700G-28TQ(config-if)# ip igmp query-interval 10
```

## ip igmp startup-query-count

### Description

The **ip igmp startup-query-count** command is used to configure the number of Startup Query Messages that the switch sends on specified interface. To restore to the default value on this interface, please use **no ip igmp startup-query-count** command.

### Syntax

```
ip igmp startup-query-count count  
no ip igmp startup-query-count
```

## Parameter

*count* — Specify the number of Startup Query Messages that the switch sends, ranging from 1 to 20. The default value is 2.

## Command Mode

Interface Configuration Mode

## Example

Configure the number of Startup Query Messages that the switch sends as 3 on Interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp last-member-query-count 3
```

# ip igmp static-group (interface vlan)

## Description

The **ip igmp static-group** command is used to configure the static multicast group on specified interface VLAN. To delete the corresponding multicast source and group on this interface VLAN, please use **no ip igmp static-group** command.

## Syntax

```
ip igmp static-group group-address interface { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port-list [ source source-address ]
no ip igmp static-group
```

## Parameter

*group-address* — The multicast address, ranging from 224.0.1.0-239.255.255.255

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type.

*port-list* — List of the forwarding ports, in the format of 1/0/1 or 1/0/5-8.

*source-address* — The source of the static multicast group. It is a unicast address.

## Command Mode

Interface Configuration Mode (interface vlan)

## Example

Configure the forwarding ports of the static multicast group 225.1.1.1 as 1/0/1-3 on Interface VLAN 2, and it will receive traffic only from the multicast source 192.168.1.1:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp static-group 225.1.1.1 interface
gigabitEthernet 1/0/1-3 source 192.168.1.1
```

Configure the forwarding ports of the static multicast group 225.1.1.2 as 1/0/7-9 on Interface VLAN 2, and it will receive traffic from all sources:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip igmp static-group 225.1.1.2 interface
gigabitEthernet 1/0/7-9
```

## ip igmp static-group (routed port)

### Description

The **ip igmp static-group** command is used to configure the static multicast group on specified routed port. To delete the corresponding multicast source and group on this routed port, please use **no ip igmp static-group** command.

### Syntax

```
ip igmp static-group group-address [ source source-address ]
no ip igmp static-group
```

### Parameter

*group-address* — The multicast address, ranging from 224.0.1.0-239.255.255.255

*source-address* — The source of the static multicast group. It is a unicast address.

### Command Mode

Interface Configuration Mode (routed port)

### Example

Add the forwarding port 1/0/2 to the static multicast group 225.1.1.1, and it will receive traffic only from the multicast source 192.168.1.1:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if) no switchport
T3700G-28TQ(config-if)# ip igmp static-group 225.1.1.1 source 192.168.1.1
```

Add the forwarding port 1/0/2 to the static multicast group 225.1.1.2, and it will receive traffic from all sources:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if) no switchport
T3700G-28TQ(config-if)# ip igmp static-group 225.1.1.2
```

## ip igmp profile

### Description

The **ip igmp profile** command is used to create the configuration profile. To delete the corresponding profile, please use **no ip igmp profile** command.

### Syntax

```
ip igmp profile id
no ip igmp profile id
```

### Parameter

*id* — Specify the id of the configuration profile, ranging from 1 to 999.

### Command Mode

Global Configuration Mode

### Example

Create the profile 1:

```
T3700G-28TQ(config)# ip igmp profile 1
```

## deny

### Description

The **deny** command is used to configure the filtering mode of profile as deny.

### Syntax

```
deny
```

### Command Mode

Profile Configuration Mode

### Example

Configure the filtering mode of profile 1 as deny:

```
T3700G-28TQ(config)# ip igmp profile 1
T3700G-28TQ(config-igmp-profile)#deny
```

## permit

### Description

The **permit** command is used to configure the filtering mode of profile as permit.

### Syntax

```
permit
```

### Command Mode

Profile Configuration Mode

### Example

Configure the filtering mode of profile 1 as permit:

```
T3700G-28TQ(config)# ip igmp profile 1
T3700G-28TQ(config-igmp-profile)#permit
```

## range

### Description

The **range** command is used to configure the range of the profile's filtering multicast address. To delete the corresponding filtering multicast address, please use **no range** command.

### Syntax

```
range start-ip [end-ip]
no range start-ip [end-ip]
```

### Parameter

*start-ip* — The start filtering multicast IP address.

*end-ip* — The end filtering multicast IP address.

### Command Mode

Profile Configuration Mode

## Example

Configure one of the filter multicast address entry as range 225.1.1.1 to 226.3.2.1 in profile 1:

```
T3700G-28TQ(config)# ip igmp profile 1
T3700G-28TQ(config-igmp-profile)#range 225.1.1.1 226.3.2.1
```

## ip igmp filter

### Description

The **ip igmp filter** command is used to bind a profile to the specified Ethernet port or routed port. To delete the profile-port binding entry, please use **no ip igmp filter** command.

### Syntax

```
ip igmp filter profile-id
no ip igmp filter profile-id
```

### Parameter

*profile-id* — Specify the profile ID to be bound.

### Command Mode

Interface Configuration Mode

### Example

Bind profile 1 to the gigabitEthernet 1/0/1:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)# ip igmp filter 1
```

Bind profile 1 to the routed port 1/0/1:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/1
T3700G-28TQ(config-if)# no switchport
T3700G-28TQ(config-if)# ip igmp filter 1
```

## ip igmp max-groups

### Description

The **ip igmp max-groups** command is used to configure the maximum number of groups that a port can join in. The **ip igmp max-groups action** is used to configure the action that the port takes when it receives an IGMP report

message and the maximum number of entries is in the forwarding table. To remove the maximum group limitation and return to the default of no limitation on the specified port, please use the **no ip igmp max-groups** command. To return to the default action of dropping the report, please use the **no ip igmp max-groups action** command. These commands only apply to the dynamic multicast groups.

## Syntax

**ip igmp max-groups** *max-group*

**no ip igmp max-groups** *max-group*

**ip igmp max-groups action** { drop | replace}

**no ip igmp max-groups action** { drop | replace}

## Parameter

*max-group* — Specify the maximum number of the dynamic multicast groups that a port can join. It ranges from 0 to 4294967294.

drop — When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the port will not join any new multicast group.

replace — When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the newly joined multicast group will replace an existing multicast group with the lowest multicast group address.

## Command Mode

Interface Configuration Mode

## Example

Specify the maximum number of the dynamic multicast groups that the gigabitEthernet port 1/0/2 can join as 100 and the newly joined multicast group will replace an existing multicast group with the lowest multicast group address:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)# ip igmp max-groups 100
T3700-28TQ(config-if)#ip igmp max-groups action replace
```

Specify the maximum number of the dynamic multicast groups that the routed port 1/0/2 can join as 100 and the newly joined multicast group will replace an existing multicast group with the lowest multicast group address:

```
T3700G-28TQ(config)# interface gigabitEthernet 1/0/2
T3700G-28TQ(config-if)# no switchport
T3700G-28TQ(config-if)# ip igmp max-groups 100
```



```
T3700-28TQ(config-if)#ip igmp max-groups action replace
```

## show ip igmp profile

### Description

The **show ip igmp profile** command is used to display the configuration information of all the profiles or a specific profile.

### Syntax

```
show ip igmp profile [ id ]
```

### Parameter

*id* — Specify the ID of the profile.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of all profiles:

```
T3700G-28TQ(config)# show ip igmp profile
```

## show ip igmp groups

### Description

The **show ip igmp groups** command is used to display the information of all the dynamic multicast groups or the specified multicast group.

### Syntax

```
show ip igmp groups [group-address] [ detail ]
```

### Parameter

*group-address* — Specify the multicast group address.

**detail** — The detailed information of the dynamic multicast groups.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the configuration information of all the dynamic multicast groups:

```
T3700G-28TQ(config)# show ip igmp groups
```

## show ip igmp groups interface

### Description

The **show ip igmp groups interface** command is used to display the information of all the dynamic multicast groups on the specified port.

### Syntax

```
show ip igmp groups interface { fastEthernet | gigabitEthernet |  
ten-gigabitEthernet } port [ detail ]
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — Specify the port type.

port — Specify the port number.

detail — The detailed information of the dynamic multicast groups.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of the dynamic multicast groups on the gigabitEthernet 1/0/1:

```
T3700G-28TQ(config)# show ip igmp groups interface gigabitEthernet 1/0/1  
detail
```

## show ip igmp groups interface vlan

### Description

The **show ip igmp groups interface vlan** command is used to display the information of all the dynamic multicast groups on the specified Interface.

### Syntax

```
show ip igmp groups interface vlan vlan-id [ detail ]
```

### Parameter

vlan-id — Specify the interface VLAN ID.

detail — The detailed information of the

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of the dynamic multicast groups on interface VLAN 1:

```
T3700G-28TQ(config)# show ip igmp groups interface vlan 1
```

# show ip igmp groups static

## Description

The **show ip igmp groups static** command is used to display the information of all the static multicast groups.

## Syntax

```
show ip igmp groups static [ detail ]
```

## Parameter

**detail** — The detailed information of all the static multicast groups.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the information of all the static multicast groups:

```
T3700G-28TQ(config)# show ip igmp groups static
```

# show ip igmp groups static interface

## Description

The **show ip igmp groups static interface** command is used to display the information of all the static multicast groups on the specified port.

## Syntax

```
show ip igmp groups static interface { fastEthernet | gigabitEthernet | ten-gigabitEthernet } port [ detail ]
```

## Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — Specify the port type.

port — Specify the port number.

**detail** — The detailed information of the static multicast groups.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the detailed information of the static multicast groups on the gigabitEthernet 1/0/1:

```
T3700G-28TQ(config)# show ip igmp groups static interface gigabitEthernet
1/0/1 detail
```

## show ip igmp groups static interface vlan

### Description

The **show ip igmp groups static interface vlan** command is used to display the information of all the dynamic multicast groups on the specified Interface VLAN.

### Syntax

```
show ip igmp groups static interface vlan vlan-id [ detail ]
```

### Parameter

*vlan-id* — Specify the interface VLAN ID.

**detail** — The detailed information of the dynamic multicast groups.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of the static multicast groups on interface VLAN 1:

```
T3700G-28TQ(config)# show ip igmp groups static interface vlan 1
```

## show ip igmp groups port-info (dynamic)

### Description

The **show ip igmp groups port-info** command is used to display the information of the layer 2 forwarding ports of all the dynamic multicast groups or in the specified VLAN.

**Syntax**

```
show ip igmp groups port info [ vlan vlan-id ]
```

**Parameter**

*vlan-id* — Specify the VLAN ID.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the information of the layer 2 forwarding ports of all the dynamic multicast groups:

```
T3700G-28TQ(config)# show ip igmp groups port-info
```

## show ip igmp interface

**Description**

The **show ip igmp interface** command is used to display the IGMP configuration information on the specified port.

**Syntax**

```
show ip igmp interface { fastEthernet | gigabitEthernet | ten-gigabitEthernet }  
port [ detail | statistic | max-groups ]
```

**Parameter**

fastEthernet | gigabitEthernet | ten-gigabitEthernet — Specify the port type.

*port* — Specify the port number.

detail — The detailed information of the IGMP configuration on the specified port.

statistic — The IGMP packet statistics received on the specified port.

max-groups — The maximum number of the multicast groups on the specified port.

**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

**Example**

Display the statistics of the IGMP packets received on the gigabitEthernet 1/0/1:

```
T3700G-28TQ(config)# show ip igmp interface gigabitEthernet 1/0/1 statistic
```

## show ip igmp interface vlan

### Description

The **show ip igmp interface vlan** command is used to display the IGMP configuration information on the specified interface VLAN.

### Syntax

```
show ip igmp interface vlan vlan-id [ detail | statistic]
```

### Parameter

*vlan-id* — Specify the interface VLAN ID.

detail — The detailed information of the IGMP configuration on the specified interface VLAN.

statistic — The IGMP packet statistics received on the specified interface VLAN.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the IGMP configuration information on the Interface VLAN 2:

```
T3700G-28TQ(config)# show ip igmp interface vlan 2
```

## show ip igmp interface loopback

### Description

The **show ip igmp interface loopback** command is used to display the IGMP configuration information on the specified interface loopback.

### Syntax

```
show ip igmp interface loopback loopback-id [ detail | statistic ]
```

### Parameter

*loopback-id* — Specify the interface loopback ID.

detail — The detailed information of the IGMP configuration on the specified interface loopback.

statistic — The IGMP packet statistics received on the specified interface loopback.

## **Command Mode**

Privileged EXEC Mode and Any Configuration Mode

## **Example**

Display the detailed IGMP configuration information of the interface loopback 1:

```
T3700G-28TQ(config)# show ip igmp interface loopback 1 detail
```

## Chapter 39 PIM Commands

The Protocol Independent Multicast (PIM) protocol is multicast routing protocol which uses unicast routing information to perform the multicast forwarding function in the three-layer network. PIM can operate in dense mode or sparse mode.

### ip multicast-routing

#### Description

The **ip multicast-routing** command is used to enable ip multicast routing function. To disable the ip multicast routing function and delete all the multicast routing entries, please use **no ip multicast-routing** command.

#### Syntax

```
ip multicast-routing
no ip multicast-routing
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the IP multicast routing function globally:

```
T3700G-28TQ(config)#ip multicast-routing
```

### ip pim

#### Description

The **ip pim** command is used to enable PIM function on the specified interface. To disable the PIM function on this interface, please use **no ip pim** command.

#### Syntax

```
ip pim {dense-mode | sparse-mode}
no ip pim [dense-mode | sparse-mode]
```

#### Parameter

dense-mode — enable PIM with dense mode on the specified interface.

sparse-mode — enable PIM with sparse mode on the specified interface.



## Command Mode

Interface Configuration Mode

## Example

Enable PIM dense mode on interface VLAN 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip pim dense-mode
```

## ip pim sg-expiry-timer

### Description

The **ip pim sg-expiry-timer** command is used to specify the expiry time for routing entries. To restore to the default timer, please use **no ip pim sg-expiry-timer** command.

### Syntax

```
ip pim sg-expiry-timer timer
no pim sg-expiry-timer
```

### Parameter

*timer* — The expiry time for the routing entries. It ranges from 60 to 65535 seconds and the default value is 210 seconds.

## Command Mode

Global Configuration Mode

## Example

Configure the expiry time for the routing entries as 60s:

```
T3700G-28TQ(config)# ip pim sg-expiry-timer 60
```

## ip pim spt-threshold infinity

### Description

The **ip pim spt-threshold infinity** command is used to configure all the sources for the specified group to use the shared tree, never switching to the source tree. To enable the leaf router to switch to the source tree as soon as it receives the first multicast data packet, please use the **no ip pim spt-threshold infinity** command.

## Syntax

```
ip pim spt-threshold infinity
no ip pim spt-threshold infinity
```

## Command Mode

Global Configuration Mode

## Example

Configure all the sources never switch to the source tree:

```
T3700G-28TQ(config)# ip pim spt-threshold infinity
```

# ip pim bsr-candidate interface

## Description

The **ip pim bsr-candidate** command is used to configure the candidate BSR on specified interface. To disable the candidate BSR, please use **no ip pim bsr-candidate** command.

## Syntax

```
ip pim bsr-candidate interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | loopback id | vlan vlan-id } [ hash-mask-length
mask-len ] [ priority pri ]
no ip pim bsr-candidate
```

## Parameter

**fastEthernet | gigabitEthernet | ten-gigabitEthernet** — The port type of the interface.

**port** — The port number.

**id** — The interface loopback ID.

**vlan-id** — The interface VLAN ID.

**mask-len** — Hash function mask length, ranging from 0 to 32.

**pri** — The priority of the BSR, ranging from 0 to 255.

## Command Mode

Global Configuration Mode

## Example

Configure the candidate BSR on interface VLAN 2:

```
T3700G-28TQ(config)# ip pim bsr-candidate interface vlan 2 hash-
mask-length 10 priority 20
```

## ip pim rp-candidate interface

### Description

The **ip pim rp-candidate** command is used to configure the candidate RP on specific interface. To disable the candidate RP on this interface, please use **no ip pim rp-candidate** command.

### Syntax

```
ip pim rp-candidate interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | loopback id | vlan vlan-id } [ priority pri ] [ interval
interval ]
```

```
no ip pim rp-candidate interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | loopback id | vlan vlan-id }
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*id* — The interface loopback ID.

*vlan-id* — The interface VLAN ID.

*pri* — The priority of the RP, ranging from 0 to 255.

*interval* — The interval of RP advertisement interval. It ranges from 1 to 255 seconds.

### Command Mode

Global Configuration Mode

### Example

Configure the candidate RP on interface VLAN 2 with the priority as 20 and the interval of RP advertisement interval as 70s:

```
T3700G-28TQ(config)# ip pim rp-candidate interface vlan 2 priority 20
interval 70
```

## ip pim rp-address

### Description

The **ip pim rp-address** command is used to configure the static RP. To disable the static RP, please use **no ip pim rp-address** command.

### Syntax

```
ip pim rp-address ip-addr [ override ]
```

```
no ip pim rp-address ip-addr
```

### Parameter

*ip-addr* — Specify the IP address of the static RP.

**override** — The RP configured with this command prevails if there is a conflict between the RP configured with this command and one learned by BSR.

### Command Mode

Global Configuration Mode

### Example

Configure the IP address of the static RP as 20.20.20.2:

```
T3700G-28TQ(config)# ip pim rp-address 20.20.20.2
```

## ip pim bsr-border

### Description

The **ip pim bsr-border** command is used to configure the border of the BSR packet on each interface that connects to other bordering PIM domains. To disable the border of BSR on this interface, please use **no ip pim bsr-border** command.

### Syntax

```
ip pim bsr-border
```

```
no ip pim bsr-border
```

### Command Mode

Interface Configuration Mode

### Example

Configure the BSR border on VLAN interface 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip pim bsr-border
```

## ip pim dr-priority

### Description

The **ip pim dr-priority** command is used to configure the priority of DR. To restore to the default value of DR priority, please use **no ip pim dr-priority** command.

### Syntax

```
ip pim dr-priority pri
no ip pim dr-priority
```

### Parameter

*pri* — Specify the priority of DR, ranging from 0 to 4294967294. The default value is 1.

### Command Mode

Interface Configuration Mode

### Example

Configure the DR priority on interface VLAN 2 as 100:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip pim dr-priority 100
```

## ip pim join-prune-interval

### Description

The **ip pim join-prune-interval** command is used to configure the interval of join/prune packet. To restore to the default value, please use **no ip pim join-prune-interval** command.

### Syntax

```
ip pim join-prune-interval interval
no ip pim join-prune-interval
```

### Parameter

*interval* — Specify the interval of join/prune packet. It ranges from 1 to 18724 seconds. The default value is 60 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the interval of join/prune packet as 100s on vlan interface 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip pim join-prune-interval 100
```

## ip pim query-interval

### Description

The **ip pim query-interval** command is used to configure the interval of Hello packet. To restore to the default value of Hello packet interval, please use **no ip pim query-interval** command.

### Syntax

```
ip pim query-interval interval
no ip pim query-interval
```

### Parameter

*interval* — Specify the interval of Hello packet. It ranges from 1 to 18725 seconds, and the default is 30 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the interval of Hello packet of 100s on VLAN interface 2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip pim query-interval 100
```

## show ip multicast

### Description

The **show ip multicast** command is used to display the IP multicast information.

### Syntax

```
show ip multicast
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display ip multicast information:

```
T3700G-28TQ(config)# show ip multicast
```

## show ip mroute

### Description

The **show ip mroute** command is used to display the IP multicast routing table.

### Syntax

```
show ip mroute [ [ group ip-addr ] [ source ip-addr ] | incoming-interface  
interface-id ]
```

### Parameter

**group** *ip-addr* — Specify the multicast group IP address.

**source** *ip-addr* — Specify the multicast source IP address.

**incoming-interface** *interface-id* — Specify the incoming interface id of the multicast group.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display all IP multicast routing entries:

```
T3700G-28TQ(config)# show ip mroute
```

## show ip pim interface

### Description

The **show ip pim interface** command is used to display the specified PIM interface information. Using the **show ip pim interface** command without parameters displays the detailed information of all the PIM interfaces.

### Syntax

```
show ip pim interface [{ fastEthernet | gigabitEthernet | ten-gigabitEthernet }  
port | loopback id | vlan vlan-id ]
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*id* — The interface loopback ID.

*vlan-id* — The interface VLAN ID, ranging from 1 to 4094.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of all PIM interfaces:

```
T3700G-28TQ(config)# show ip pim interface
```

## show ip pim neighbor

### Description

The **show ip pim neighbor** command is used to display PIM neighbor information.

### Syntax

```
show ip pim neighbor [ interface [ { fastEthernet | gigabitEthernet |  
ten-gigabitEthernet } port | vlan vlan-id ] ]
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.



*port* — The port number.

*vlan-id* — The interface VLAN ID.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of all the PIM neighbors:

```
T3700G-28TQ(config)# show ip pim neighbor
```

## show ip pim bsr-router

### Description

The **show ip pim bsr-router** command is used to display the candidate BSR and RP information.

### Syntax

```
show ip pim bsr-router
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the BSR and RP settings:

```
T3700G-28TQ(config)# show ip pim bsr-router
```

## show ip pim rp

### Description

The **show ip pim rp** command is used to display the RP information of the specified multicast group.

### Syntax

```
show ip pim rp ip-addr [ mapping ]
```

### Parameter

*ip-addr* — Specify the multicast group address of the desired RP.

**mapping** — Display the active RPs that are cached with associated multicast routing entries.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the RP information of all the multicast groups:

```
T3700G-28TQ(config)# show ip pim rp
```

# show ip pim rp-hash

## Description

The **show ip pim rp-hash** command is used to display the hash result of specified multicast group.

## Syntax

```
show ip pim rp-hash ip-addr
```

## Parameter

*ip-addr* — Specify the multicast group address.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the RP hash result of multicast group 224.1.1.2:

```
T3700G-28TQ(config)# show ip pim rp-hash 224.1.1.2
```

## Chapter 40 Static Multicast Routing Commands

Multicast routing table uses the RPF (Reverse Path Forwarding) mechanism to determine the upstream and downstream neighbors basing on the unicast route and the static multicast route. The RPF feature checks the multicast routing entries and ensures the correct forwarding paths of the multicast packets. Static multicast routing entry works to change or to connect the RPF routes, and provides important basis for the RPF check.

### ip mroute

#### Description

The **ip mroute** command is used to add or modify the static multicast routing entries. To delete the specified entry, please use **no ip mroute** command.

#### Syntax

```
ip mroute { source-address } { mask } { rpf-address } [ distance ]
no ip mroute { source-address } { mask }
```

#### Parameter

*source-address* — The IP address of the multicast source, in the format as 192.168.0.1.

*mask* — The mask of the multicast source IP address.

*rpf-address* — The interface of the specified RPF entry.

*distance* — The managing parameter of the static multicast routing entry, ranging from 0 to 255. If the value of the static multicast routing entry is smaller than that of other RPF entries, then the static multicast routing entry will take effect. The default value is 0.

#### Command Mode

Global Configuration Mode

#### Example

Add a static multicast routing entry with the source address as 192.168.0.1, mask as 255.255.255.255, rpf-address as 192.168.1.1 and distance as 1:

```
T3700G-28TQ(config)#ip mroute 192.168.0.1 255.255.255.255 192.168.1.1 1
```

## show ip mroute static

### Description

The **show ip mroute** command is used to display all the static multicast routing entries.

### Syntax

```
show ip mroute static
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Displays all the static multicast routing entries:

```
T3700G-28TQ(config)# show ip mroute static
```

## Chapter 41 VRRP Commands

The Virtual Router Redundancy protocol is designed to handle default router failures by providing a scheme to dynamically elect a backup router. The driving force was to minimize “black hole” periods due to the failure of the default gateway router during which all traffic directed towards it is lost until the failure is detected. Though static configuration of default routes is popular, such an approach is susceptible to a single point of failure when the default router fails. VRRP advocates the concept of a “virtual router” associated with one or more IP addresses that serve as default gateways. In the event that the VRRP router controlling these IP addresses (formally known as the Master) fails, the group of IP addresses and the default forwarding role is taken over by a Backup VRRP router.

### vrrp vrid

#### Description

This command is used to enable the VRRP protocol on an interface and designates a virtual router ID for it. To disable VRRP protocol of a specified virtual router on an interface, please use **no vrrp vrid** command

#### Syntax

```
vrrp vrid vrid  
no vrrp vrid vrid
```

#### Parameter

*vrid* — The virtual router ID which has an integer value range from 1 to 255.

#### Command Mode

Interface Configuration Mode

#### Example

Enable the VRRP protocol on interface VLAN 3 and specify the vrid as 4:

```
T3700G-28TQ(config)#interface vlan 3  
T3700G-28TQ(config-if)#vrrp vrid 4
```

## vrrp vrid virtual-ip

### Description

This command is used to add a virtual IP for the virtual router. Up to 5 IP addresses can be configured to a virtual router. To delete the corresponding virtual IP, please use **no vrrp vrid virtual-ip** command.

### Syntax

```
vrrp vrid vrid virtual-ip virtual-ip  
no vrrp vrid vrid virtual-ip virtual-ip
```

### Parameter

*vrid* — The virtual router ID.

*virtual-ip* — The IP address configured to the virtual router, which must be in the same subnet with the interface.

### Command Mode

Interface Configuration Mode

### Example

Add an IP address as 192.168.0.7 for vrid 4 on interface VLAN 3:

```
T3700G-28TQ(config)#interface vlan 3  
T3700G-28TQ(config-if)#vrrp vrid 4 virtual-ip 192.168.0.7
```

## vrrp vrid description

### Description

This command is used to configure or modify the description for the virtual router.

### Syntax

```
vrrp vrid vrid description description
```

### Parameter

*vrid* — The virtual router ID.

*description* —String to describe the virtual router, which contains 8 characters at most, composing digits, English letters and under dashes only.

## Command Mode

Interface Configuration Mode

## Example

Name the vrid 4 as vr4 on interface VLAN 3:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 description vr4
```

## vrrp vrid priority

### Description

This command is used to set the priority value for the virtual router configured on a specified interface. To restore to the default priority, please use **no vrrp vrid priority** command.

### Syntax

```
vrrp vrid vrid priority pri
no vrrp vrid vrid priority
```

### Parameter

*vrid* — The virtual router ID.

*pri* — Priority, ranging from 1 to 254. By default, the priority value is 100.

## Command Mode

Interface Configuration Mode

## Example

Configure the priority for the interface VLAN 3 as 123 in vrid 4:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 priority 123
```

## vrrp vrid timer-advertise

### Description

This command sets the frequency, in seconds, that an interface on the specified virtual router sends a virtual router advertisement. To restore the advertisement interval to default value for an interface, please use **no vrrp vrid timer-advertise** command.

## Syntax

```
vrrp vrid vrid timer-advertise adver-interval
no vrrp vrid vrid timer-advertise
```

## Parameter

*vrid* — The virtual router ID.

*adver-interval* — Advertisement interval, ranging from 1 to 255 in seconds. By default, it's 1 second.

## Command Mode

Interface Configuration Mode

## Example

Configure the advertisement interval for the interface VLAN 3 as 12 seconds in vrid 4:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 timer-advertise 12
```

# vrrp vrid preempt-mode

## Description

This command sets the preemption mode and the delay time for the virtual router configured on a specified interface. To set non-preempt mode for the virtual router configured on a specified interface, please use **no vrrp vrid preempt-mode** command. The virtual router is in non-preempt mode by default.

## Syntax

```
vrrp vrid vrid preempt-mode [ timer-delay delay-value ]
no vrrp vrid vrid preempt-mode
```

## Parameter

*vrid* — The virtual router ID.

*delay-value* — The time that a backup router has to wait for before setting itself as the master when the current master is considered to be unavailable. It ranges from 0 to 255 in seconds. By default, it's 0.

## Command Mode

Interface Configuration Mode



## Example

Enable the preempt Mode and configure the delay time as 12 seconds for the interface VLAN 3 in vrid 4:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 preempt-mode timer-delay 12
```

## vrrp vrid authentication-mode

### Description

This command is used to configure the authorization mode for the virtual router configured on a specified interface. To restore to the default authorization mode for the virtual router on the specified interface, please use **no vrrp vrid authentication-mode** command.

### Syntax

```
vrrp vrid vrid authentication-mode { simple | md5 } { [ 0 ] password | 7 encrypted-password }
```

```
no vrrp vrid vrid authentication-mode
```

### Parameter

*vrid* — The virtual router ID.

simple | md5 — Authentication mode. By default, it's none and no authentication will be performed. "simple" means authentication will be performed using a text password. "md5" means authentication will be performed via a text password and MD5 algorithm. This authentication mode has a higher security than Simple mode.

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 8 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Interface Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the authentication Mode as md5 and configure the key as 123 for the interface VLAN 3 in vrid 4:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 authentication-mode md5 123
```

# vrrp vrid track interface

## Description

This command is used to add tracked interfaces for the virtual router. To disable the track function on the specified interface, please use **no vrrp vrid track interface vlan** command.

## Syntax

```
vrrp vrid vrid track interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | vlan vlan-id } [ reduce-priority pri ]
no vrrp vrid vrid track interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | vlan vlan-id }
```

## Parameter

*vrid* — The virtual router ID.

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*vlan-id* — The interface VLAN ID.

*pri* — The priority decrement for the tracking interface. The valid range is 1 – 254. The default value is 10.

## Command Mode

Interface Configuration Mode

## Example

Configure the tracked interface as vlan2 and the priority decrement as 10 for the tracking interface:

```
T3700G-28TQ(config)#interface vlan 3
T3700G-28TQ(config-if)#vrrp vrid 4 track interface vlan vlan2
reduce-priority 10
```

## clear vrrp statistics

### Description

This command is used to clear all the statistics about vrrp on the switch.

### Syntax

```
clear vrrp statistics
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Clear all the statistics about vrrp on the switch:

```
T3700G-28TQ(config)# clear vrrp statistics
```

## show vrrp

### Description

This command is used to display the basic configuration information of all the virtual routers or a specified virtual router.

### Syntax

```
show vrrp [ vrid vrid ][ interface {{ fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | vlan vlan-id ]]
```

### Parameter

*vrid* — The virtual router ID.

*fastEthernet | gigabitEthernet | ten-gigabitEthernet* — The port type of the interface.

*port* — The port number.

*vlan-id* — The interface VLAN ID.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the vrrp information of virtual router 4 on interface VLAN 3:

```
T3700G-28TQ(config)# show vrrp vrid 4 interface vlan 3
```

# show vrrp statistics

## Description

This command is used to display the statistics of a virtual router on a specified interface or all the virtual routers on the switch.

## Syntax

```
show vrrp statistics [ vrid vrid ][ interface {{ fastEthernet | gigabitEthernet | ten-gigabitEthernet } port | vlan vlan-id }]
```

## Parameter

*vrid* — The virtual router ID.

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*vlan-id* — The interface VLAN ID.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the statistics of virtual router 4 on interface 3:

```
T3700G-28TQ(config)# show vrrp statistics vrid 4 interface vlan 3
```

## Chapter 42 RIP Commands

The Routing Information Protocol (RIP) is an interior gateway protocol (IGP) created for use in small and homogeneous networks. It is a distance-vector routing protocol that uses broadcast User Datagram Protocol (UDP) data packets to exchange routing information.

### router rip

#### Description

The **router rip** command is used to enable the RIP function and enter router configuration mode. To disable the RIP function, please use **no router rip** command.

#### Syntax

```
router rip
no router rip
```

#### Command Mode

Global Configuration Mode

#### Example

Enable the RIP function and enter router configuration mode.

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)#
```

### network

#### Description

The **network** command is used to enable RIP function on interfaces of the desired network. To disable the RIP protocol on these interfaces, please use **no network** command.

#### Syntax

```
network network number
no network network number
```

### Parameter

*network number* —The network number of the network, in the format of 192.168.0.0.

### Command Mode

Router Configuration Mode (router rip)

### Example

Enable RIP function on interfaces of the network 192.168.0.0:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# network 192.168.0.0
```

## version

### Description

The **version** command is used to specify the RIP version globally. By default, the switch sends RIPv1 packets and receives both RIPv1 and RIPv2 packets. To return to the default configuration, please use **no version** command.

### Syntax

```
version { 1 | 2 }
```

```
no version
```

### Parameter

1 — Send and receive RIPv1 packets.

2 — Send and receive RIPv2 packets.

### Command Mode

Router Configuration Mode (router rip)

### Example

Specify the RIP version as RIPv2:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# version 2
```

## timer basic

### Description

The **timer basic** command is used to configure the RIP protocol timers.

### Syntax

```
timer basic { update update-value | timeout timeout-value | garbage-collect  
garbage-collect-value }
```

### Parameter

*update-value* — Specify the interval between route updates, ranging from 1 to 100 in seconds. By default, it is 30 seconds.

*timeout-value* — Specify the route aging time, ranging from 1 to 300 in seconds. By default, it is 180 seconds.

*garbage-collect-value* — Specify the interval between the routing entry is invalidated or marked as unreachable and is removed from the routing table. By default, it is 120 seconds.

### Command Mode

Router Configuration Mode (router rip)

### Example

Configure the update timer as 80 seconds:

```
T3700G-28TQ(config)# router rip  
T3700G-28TQ(config-router)# timer basic update 80
```

## distance

### Description

The **distance** command is used to configure the distance for RIP routes.

### Syntax

```
distance distance
```

### Parameter

*distance* — Set the administrative distance for RIP, ranging from 1 to 255. By default, it is 120.

## Command Mode

Router Configuration Mode (router rip)

## Example

Configure the administrative distance of RIP as 20:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# distance 20
```

## auto-summary

### Description

The **auto-summary** command is used to enable the Auto Summary mode for RIPv2. In Auto Summary mode, groups of adjacent routes will be summarized into single entries, in order to reduce the total number of entries. To disable the Auto Summary mode, please use **no auto-summary** command.

### Syntax

```
auto-summary
no auto-summary
```

### Command Mode

Router Configuration Mode (router rip)

### Example

Configure the RIP version as RIPv2 and disable its Auto Summary mode:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# version 2
T3700G-28TQ(config-router)# no auto-summary
```

## default-metric

### Description

The **default-metric** command is used to configure the default metric of redistributed routes. If a router runs RIP and other routing protocols, you can configure RIP to redistribute external routes. To return to the default configuration, please use **no default-metric** command.



## Syntax

**default-metric** *metric*  
**no default-metric**

## Parameter

*metric* — Specify the default metric, ranging from 1 to 15. By default, it is 1.

## Command Mode

Router Configuration Mode (router rip)

## Example

Configure the default metric of RIP as 5:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# default-metric 5
```

# redistribute

## Description

The **redistribute** command is used to enable RIP to redistribute external routes. By default, it is disabled. To return to the default configuration, please use **no redistribute** command.

## Syntax

**redistribute** { static | ospf } **metric** *metric-value*  
**no redistribute** { static | ospf } **metric**

## Parameter

*static* — Enable RIP to redistribute the external static routes.  
*ospf* — Enable RIP to redistribute the external OSPF routes.  
*metric-value* — Configure the metric for the added external route.

## Command Mode

Router Configuration Mode (router rip)

## Example

Enable RIP to redistribute the external static routes and specify the metric as 5:

```
T3700G-28TQ(config)# router rip
T3700G-28TQ(config-router)# redistribute static metric 5
```

## passive-interface

### Description

The **passive-interface** command is used to suppress the sending of update messages through the specified interface. To activate the interface, please use **no passive-interface** command.

### Syntax

```
passive-interface interface { interface-type } { interface-number }
```

```
no passive-interface interface { interface-type } { interface-number }
```

### Parameter

*interface-type* — Type of the interface, including fastEthernet, gigabitEthernet, ten-gigabitEthernet, loopback and VLAN.

*interface-number* — Number of the interface.

### Command Mode

Router Configuration Mode (router rip)

### Example

Suppress the sending of update messages through the interface VLAN 1:

```
T3700G-28TQ(config)# router rip
```

```
T3700G-28TQ(config-router)# passive-interface interface vlan 1
```

## ip rip receive version

### Description

The **ip rip receive version** command is used to specify the RIP receive version on the desired interface. To return to the default configuration, please use **no ip receive version** command. The interfaces use the global configuration (configured with [version](#) command) before you specify its own RIP send/receive version.

### Syntax

```
ip rip receive version [1|2]
```

```
no ip rip receive version
```

### Parameter

1 | 2 — Specify the RIP receive version. By default, it receives both version 1 and version 2 packets.

### Command Mode

Interface Configuration Mode

### Example

Configure the interface VLAN2 to receive RIPv1 packets only:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip receive version 1
```

## ip rip send version

### Description

The **ip rip send version** command is used to specify the RIP send version on the desired interface. To return to the default configuration, please use **no ip rip send version** command. The interfaces use the global configuration (configured with [version](#) command) before you specify its own RIP send/receive version.

### Syntax

```
ip rip send version {1 | 2}
no ip rip send version
```

### Parameter

1 | 2 — Specify the RIP send version. By default, it sends version 1 packets.

### Command Mode

Interface Configuration Mode

### Example

Configure the interface VLAN2 to send RIPv2 packets only:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip send version 2
```

## ip rip v2-broadcast

### Description

The **ip rip v2-broadcast** command is used to configure the desired interface to send RIPv2 packets via broadcast. By default, interfaces send RIPv2 packets via multicast, and the multicast IP address is 224.0.0.9. To return to the default configuration, please use **no ip rip v2-broadcast** command.

### Syntax

```
ip rip v2-broadcast
no ip rip v2-broadcast
```

### Command Mode

Interface Configuration Mode

### Example

Configure the interface VLAN2 to send RIPv2 packets via broadcast:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip v2-broadcast
```

## ip rip authentication-mode

### Description

The **ip rip authentication-mode** command is used to configure the authentication mode of RIP on the desired interface. By default, the authentication mode is none.

### Syntax

```
ip rip authentication-mode { simple | md5 key-id } { [ 0 ] password | 7
encrypted-password }
ip rip authentication-mode none
```

### Parameter

**simple | md5 *key-id*** — Specify the stack's authentication mode. "simple" means authentication will be performed using a text password. "md5" means authentication will be performed via a text password and MD5 algorithm. Specify

the key ID if you choose the MD5 authentication mode. The key ID ranges from 1 to 255.

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — A string from 1 to 16 alphanumeric characters or symbols. The password is case sensitive and cannot contain spaces and question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

*none* — Configure the authentication mode as none.

## Command Mode

Interface Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the RIP authentication mode of interface VLAN2 as simple, and specify its key as 123:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip authentication-mode simple 123
```

# ip rip poison-reverse

## Description

The **ip rip poison-reverse** command is used to enable poison reverse function on the desired interface. To disable the poison reverse function, please use **no ip rip poison-reverse** command.

## Syntax

**ip rip poison-reverse**

```
no ip rip poison-reverse
```

### Command Mode

Interface Configuration Mode

### Example

Enable poison reverse function on the interface VLAN2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip poison-reverse
```

## ip rip split-horizon

### Description

The **ip rip split-horizon** command is used to enable split horizon function on the desired interface. To disable the split horizon function, please use **no ip rip split-horizon** command.

### Syntax

```
ip rip split-horizon
no ip rip split-horizon
```

### Command Mode

Interface Configuration Mode

### Example

Enable split horizon function on the interface VLAN2:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip rip split-horizon
```

## show ip rip

### Description

The **show ip rip** command is used to display the RIP configurations.

### Syntax

```
show ip rip [ interface | database [ specify ip-address mask ] ]
```

## Parameter

**interface** — Display the RIP interface basic information.

**database** — Display the RIP routing table. To display the routing information of a specified RIP interface, please specify its IP address and subnet mask.

*ip-address* — The IP address of which you desire to show the routing information.

*mask* — The subnet mask of which you desire to show the routing information.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the RIP routing information of the network 192.168.1.0/24:

```
T3700G-28TQ(config)# show ip rip database specify 192.168.1.0  
255.255.255.0
```

## Chapter 43 OSPF Commands

OSPF is an Interior Gateway Protocol (IGP) designed expressly for IP networks, supporting IP subnetting and tagging of externally derived routing information. OSPF also allows packet authentication and uses IP multicast when sending and receiving packets.

### router ospf

#### Description

The **router ospf** command is used to create an OSPF routing process and enter the router configuration mode. Each OSPF routing process is an independent instance running the OSPF protocol, and they work separately. To delete the specified OSPF routing process, please use the **no router ospf** command.

#### Syntax

```
router ospf process-id  
no router ospf process-id
```

#### Parameter

*process-id* — Process ID, ranging from 1 to 65535. Five processes can be created at most.

#### Command mode

Global Configuration Mode

#### Example

Create an OSPF routing process with the process ID as 1:

```
T3700G-28TQ(config)# router ospf 1
```

### router-id

#### Description

The **router-id** command is used to configure the router ID. The **no router-id** command is used to delete the configured router ID. If no router ID is configured manually or the configured router ID is deleted, the highest IP address among all loopback interfaces will be chosen as the router ID.



## Syntax

**router-id** *router-id*  
**no router-id**

## Parameter

*router-id* — The route ID in the format of dotted decimal notation. 0.0.0.0 is illegal.

## Command mode

Router Configuration Mode

## Example

Configure the router ID of OSPF routing process 1 as 1.1.1.1:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# router-id 1.1.1.1
```

# network

## Description

The **network** command is used to configure the network of a specified area. All the interfaces fallen into the configured network will belong to this area. To delete the specified network and its corresponding interfaces from this area, please use the **no network** command.

## Syntax

**network** *ip-address wildcard-mask area area-id*  
**no network** *ip-address wildcard-mask area area-id*

## Parameter

*ip-address* — The IP address of the network.

*wildcard-mask* — The wildcard mask of the network (such as 0.0.0.255). The subnet mask is also compatible (such as 255.0.0.0).

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

## Command Mode

Router Configuration Mode

## Example

Configure the network 192.168.0.0/24 in the area 0.0.0.0:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# network 192.168.0.0 255.255.255.0 area
0.0.0.0
```

## summary-address

### Description

The **summary-address** command is used to configure a summary route. To restore the optional parameters to default values, please use the **no summary-address** with corresponding parameters. To delete the specified summary route, please use **no summary-address** without any optional parameters. By default, no external routes will be aggregated.

Use the **summary-address** command to summary the imported Type-5 LSA routes in the range of aggregation address if the router you are configured is an ASBR (Autonomous System Boundary Router).

With the **summary-address** command configured, the ASBR (Autonomous System Border Router) will advertise a summary route that covers the networks in the range to its neighbor routers. While with **no summary-address** command configured, the previously aggregated external routes will be advertised again.

### Syntax

```
summary-address ip-address mask [[tag tag] [nssa-only] | not-advertise ]
no summary-address ip-address mask [[tag tag] [nssa-only] | not-advertise ]
```

### Parameter

*ip-address* — The IP address of the summary route.

*mask* — The subnet mask of the summary route, in the format of dotted decimal notation.

*tag* — The identifier of the summary route, which can be used by the routing strategy to control the advertisement of the routes. It ranges from 0 to 4294967295 and the default value is 0.

**nssa-only** — The summary route will only be advertised to the NSSA. If not specified, the summary route will be advertised to the normal areas and the NSSA.

**not-advertise**—The summary route will not be advertised. If not specified, the summary route will be advertised.

### Command Mode

Router Configuration Mode

### Example

Configure the summary route 192.168.0.0/16 which can only be advertised to the NSSA:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# summary-address 192.168.0.0 255.255.0.0
nssa-only
```

## maximum-paths

### Description

The **maximum-paths** command is used to configure the maximum number of the equal-cost multipath routings. To restore to default value, please use the **no maximum-paths** command.

### Syntax

```
maximum-paths number
no maximum-paths
```

### Parameter

*number* — The maximum number of the equal-cost multipath routings, ranging from 1 to 32. The default value is 5.

### Command Mode

Router Configuration Mode

### Example

Configure the maximum number of the equal-cost multipath routings as 2:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# maximum-paths 2
```

## redistribute

### Description

The **redistribute** command is used to configure the ASBR to redistribute the external routes from other routing protocols to the OSPF domain in type-5 LSAs. To cancel this redistribution, please use the **no redistribute** command without any optional parameters. To restore the certain optional parameters to default values, please use the **no redistribute** command with corresponding parameters.

### Syntax

```
redistribute { static | rip | ospf process-id } [ metric cost ] [ metric-type type ]  
[ tag tag ] [ nssa-only ]
```

```
no redistribute { static | rip | ospf process-id } [ metric cost ] [ metric-type  
type ] [ tag tag ] [ nssa-only ]
```

### Parameter

**static** — Specify the external route type as static.

**rip** — Specify the external route type as RIP.

*process-id* — The ospf routing process ID, ranging from 1 to 65535.

*cost* — The cost of the external routes, ranging from 1 to 16777214. Its default value is defined in the command **default-metric**.

*type* — The type of the external routes, either 1 or 2. The default value is 2.

*tag* — The identifier of the summary route, which can be used by the routing strategy to control the advertisement of the routes. It ranges from 0 to 4294967295 and the default value is 0.

**nssa-only** — The summary route will only be advertised to the NSSA. If not specified, the summary route will be advertised to the normal areas and the NSSA.

### Command Mode

Router Configuration Mode

## Example

Redistribute the RIP routes from the external and advertise them as type 1 external routes in the OSPF domain.

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# redistribute rip metric-type 1
```

## default-metric

### Description

The **default-metric** command is used to configure the default cost of the redistributing external route. To restore to the default value, please use the **no default-metric** command.

### Syntax

```
default-metric cost
no default-metric
```

### Parameter

*cost* — The default cost of the redistributing external route, ranging from 1 to 16777214. Its default value is 20.

### Command Mode

Router Configuration Mode

### Example

Configure the default cost of the redistributing external route as 12:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# default-metric 12
```

## default-information originate

### Description

The **default-information originate** command is used to advertise the default route as AS-External LSA. To cancel the advertisement of the default route, please use the **no default-information originate** command without any optional parameters. To restore the certain parameters to default values, please

use the **no default-information originate** command with corresponding parameters.

### Syntax

```
default-information originate [ always ] [ metric cost ] [ metric-type type ]
no default-information originate [ always ] [ metric cost ] [ metric-type
type ]
```

### Parameter

**always** — OSPF will advertise the default route whether there is default route is the IP routing table or not. If the parameter is not configured, OSPF will advertise the default route only when there is default route in the IP routing table.

**cost**—The default cost of the default route, ranging form 1 to 16777214. Its default value is 1.

**type** — The type of the external routes, either 1 or 2. The default value is 2.

### Command Mode

Router Configuration Mode

### Example

Configure OSPF to advertise the default route whether there is default route is the IP routing table or not:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# default-information originate always
```

## auto-cost

### Description

The **auto-cost** command is used to enable the auto computing function of the interface cost and configure the reference bandwidth. The interface cost is the ratio of the reference bandwidth to the interface bandwidth. To restore the reference bandwidth to default value, please use the **no auto-cost reference-bandwidth** command. To disable the auto computing function of the interface cost, please use the **no auto-cost** command without parameters.

### Syntax

```
auto-cost [ reference-bandwidth bandwidth ]
```

```
no auto-cost [ reference-bandwidth bandwidth ]
```

### Parameter

*bandwidth* — The reference bandwidth, ranging from 1 to 4294967 Mbps. Its default value is 1000Mbps.

### Command Mode

Router Configuration Mode

### Example

Enable the auto computing function of the interface cost and configure the reference bandwidth as 10000 Mbps:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# auto-cost reference-bandwidth 10000
```

## distance

### Description

The **distance** command is used to configure the OSPF administrative distance. To restore to the default distance, please use the **no distance** command. The administrative distance represents the priority of the routes. The smaller administrative distance corresponds to higher priority. When different routing protocols possess the same route to the same destination, the route with the highest priority will be selected to add to the IP routing table according to the administrative distance.

### Syntax

```
distance administrative-distance
```

```
no distance
```

### Parameter

*administrative-distance* — Routing administrative distance, ranging from 0 to 255. Its default value is 110.

### Command Mode

Router Configuration Mode

### Example

Configure the OSPF routing administrative distance as 100:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# distance 100
```

## timers throttle spf

### Description

The **timers throttle spf** command is used to configure the computing delay and interval of the SPF, thus preventing the consumption of the CPU and memory caused by frequent SPF computing. To restore to the default value, please use the **no timers throttle spf** command.

### Syntax

```
timers throttle spf spf-delay spf-holdtime
no timers throttle spf
```

### Parameter

*spf-delay*— The delay time of the SPF computing, ranging from 1 to 600 seconds. The default value is 5 seconds.

*spf-holdtime* — The minimum interval between two SPF computings, ranging from 1 to 600 seconds. The default value is 5 seconds.

### Command Mode

Router Configuration Mode

### Example

Configure the computing delay and interval of the SPF as 10 seconds:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# timers throttle spf 10 10
```

## timers lsa arrival

### Description

The **timers lsa arrival** command is used to configure the minimum interval time of the same LSA instances. The same LSA instances will be discarded without acknowledgement if their actual arriving interval is smaller than the configured interval. To restore to the default value, please use the **no timers lsa arrival** command.



## Syntax

**timers lsa arrival** *milliseconds*  
**no timers lsa arrival**

## Parameter

*milliseconds* — The minimum interval time of the same LSA instances, ranging from 0 to 600000 milliseconds. Its default value is 1000 milliseconds.

## Command Mode

Router Configuration Mode

## Example

Configure the minimum interval time of the same LSA instances as 2000 milliseconds:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# timers lsa arrival 2000
```

# compatible rfc1583

## Description

The **compatible rfc 1583** command is used to configure the OSPF's compatibility for the routing rules in the RFC 1583. To cancel the compatibility, please use the **no compatible rfc1583** command. It is compatible by default.

## Syntax

**compatible rfc1583**  
**no compatible rfc1583**

## Command Mode

Router Configuration Mode

## Example

Configure the OSPF's compatibility for the routing rules in RFC 1583:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# compatible rfc1583
```

## passive-interface

### Description

The **passive-interface** command is used to prevent an interface from sending OSPF packets. To restore to the default settings, please use **no passive-interface** command. The interface is allowed to send OSPF packets by default.

### Syntax

```
passive-interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | loopback id | vlan vlan-id }
no passive-interface { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port | loopback id | vlan vlan-id }
```

### Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interface.

*port* — The port number.

*id* — The interface loopback ID.

*vlan-id* — The interface VLAN ID.

### Command Mode

Router Configuration Mode

### Example

Prevent interface VLAN 1 from sending OSPF packets in routing process 1:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# passive-interface vlan 1
```

## passive-interface range

### Description

The **passive-interface range** command is used to prevent several interfaces from sending OSPF packets. To restore to the default settings, please use **no passive-interface** command. The interfaces are allowed to send OSPF packets by default.

## Syntax

```
passive-interface range { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port-list | loopback id-list | vlan vlan-list }
```

```
no passive-interface range { { fastEthernet | gigabitEthernet |
ten-gigabitEthernet } port-list | loopback id-list | vlan vlan-list }
```

## Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet — The port type of the interfaces.

*port-list* — The ports' number.

*id-list* — The interface loopback IDs.

*vlan-list* — The interface VLAN IDs.

## Command Mode

Router Configuration Mode

## Example

Prevent interface VLAN 1-3 from sending OSPF packets in routing process 1:

```
T3700G-28TQ(config)# router ospf 1
```

```
T3700G-28TQ(config-router)# passive-interface vlan 1-3
```

# passive-interface default

## Description

The **passive-interface default** command is used to prevent all the interfaces from sending OSPF packets. To restore to the default settings, please use **no passive-interface default** command. All the interfaces are allowed to send OSPF packets by default.

## Syntax

```
passive-interface default
```

```
no passive-interface default
```

## Command Mode

Router Configuration Mode

## Example

Prevent all the interfaces from sending OSPF packets in routing process 1:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# passive-interface default
```

## no area

### Description

The **no area** command is used to delete the specified area. Only areas containing no networks can be deleted.

### Syntax

```
no area area-id
```

### Parameter

*area-id* —The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

### Command Mode

Router Configuration Mode

### Example

Delete the OSPF area 1:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)#no area 1
```

## area description

### Description

The **area description** command is used to configure the area name. To delete the name of the specified area, please use the **no area description** command.

### Syntax

```
area area-id description descript
no area area-id description
```

### Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*descript* — The area name, ranging from 1 to 20 characters.

### Command Mode

Router Configuration Mode

### Example

Configure the name of area 0 as SOFT:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 0 description SOFT
```

## area authentication

### Description

The **area authentication** command is used to configure the authentication mode of the specified area. Interfaces in this area will be authorized using the area's authentication mode if their authentication modes are not configured manually. To restore to the default setting, please use the **no area authentication** command. It is not authorized by default.

### Syntax

```
area area-id authentication [ message-digest ]
no area area-id authentication
```

### Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

**message-digest** — MD5 authentication. If this parameter is missing, a simple authentication will be applied.

### Command Mode

Router Configuration Mode

## Example

Configure the authentication mode of area 0 as simple authentication:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 0 authentication
```

## area stub

### Description

The **area stub** command is used to define an area as a stub area. To restore the stub area to a normal one, please use the **no area stub** command.

### Syntax

```
area area-id stub [ no-summary ]
no area area-id stub [ no-summary ]
```

### Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

**no-summary** — Configure the stub area as a totally stub area, where the ABR advertises neither the destinations in other areas nor the external routes. The stub area is not a totally stub area by default.

### Command Mode

Router Configuration Mode

### Example

Configure the area 1 as a totally stub area:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 1 stub no-summary
```

## area nssa

### Description

The **area nssa** command is used to define an area as a nssa area. To restore the stub area to a normal one, please use the **no area stub** command without

any optional parameters. To restore the certain parameters to default values, please use the **no area nssa** command with corresponding parameters.

### Syntax

```
area area-id nssa [ no-redistribution ] [ no-summary ]
[ default-information-originate [ metric cost ] [ metric-type type ] ]
no area area-id nssa [ no-redistribution ] [ no-summary ]
[ default-information-originate [ metric cost ] [ metric-type type ] ]
```

### Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

**no-redistribution** — Select to not import routes into the NSSA.

**no-summary** — Select to not send summary LSAs into the NSSA.

**default-information-originate** — Select on an ABR to allow importing default route as type 7 LSAs into the NSSA.

*cost* — The default route cost with the default value as 1. It ranges from 1 to 16777214.

*type* — The default route type with the default value as 2. It is either 1 or 2.

### Command Mode

Router Configuration Mode

### Example

Configure Area 1 as a total NSSA area:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 1 nssa no-summary
```

## area default-cost

### Description

The area default-cost command is to configure the cost of default summary route sent from ABR to STUB or NSSA area.

### Syntax

```
area area-id default-cost cost
no area area-id default-cost
```

## Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*cost* — The cost value. It ranges from 1 to 16777214 and the default value is 1.

## Command Mode

Router Configuration Command

## Example

Configure the cost of default summary route sent to Area 1 as 10:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 1 default-cost 10
```

## area range

### Description

The **area range** is to configure a summary route. To delete this route, please use the **no area range** command. By default no route is summarized.

This command is only used with the ABR to summarize the route information of a certain area. The ABR only sends one summarized route of the routes in the aggregated segment to the other areas. An area can be configured with multiple summary segments, which can be aggregated by OSPF.

If the **no area range** command is configured, the formally summarized routes will be redistributed.

### Syntax

```
area area-id range ip-address mask [ cost cost ] [ not-advertise ]
no area area-id range ip-address mask [ cost cost ] [ not-advertise ]
```

### Parameter

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*ip-address* — The destination of the aggregated route.

*mask* — The network mask of the aggregated route, in the format of dotted decimal notation.



*cost*— The cost of the aggregated route, ranging from 1 to 16777214. The default value is the maximum one of all the aggregated routes.

## Command Mode

Router Configuration Mode

## Example

Configure one aggregated route 100.100.0.0/16 with the cost 10 in the Area 0:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 0 range 100.100.0.0 255.255.0.0 cost 10
```

## area virtual-link

### Description

The **area virtual-link** command is used to configure the virtual-link. To delete the configured virtual-link, please use the **no area virtual-link** without any optional parameters. To restore the certain parameters to default values, please use the **no area virtual-link** command with corresponding parameters.

### Syntax

```
area transit-area virtual-link router-id [ dead-interval dead-interval ]
[ hello-interval hello-interval ] [ retransmit-interval rtx-interval ]
[ transmit-delay trans-delay ]
no area transit-area virtual-link router-id [ dead-interval dead-interval ]
[ hello-interval hello-interval ] [ retransmit-interval rtx-interval ]
[ transmit-delay trans-delay ]
```

### Parameter

*transit-area* — The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*router-id* — The ID of the neighboring router on the opposite end of the virtual link, in the format of dotted decimal notation.

*hello-interval* — The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

*dead-interval* — The time after which the neighbor becomes invalid. It ranges from 1 to 65535 seconds and the default value is 4 times as the hello-interval.

*rtx-interval* — The retransmission interval of the LSA, DD and LSR packets. It ranges from 1 to 65535 seconds and the default value is 5 seconds.

*trans-delay* — The LSA transmission delay. It ranges from 1 to 65535 seconds and the default value is 1 seconds.

## Command Mode

Router Configuration Mode

## Example

Configure a virtual-link with the transmission area as Area 1 and the ID of the neighboring router on the other endpoint as 1.1.1.1:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 1 virtual-link 1.1.1.1
```

## area virtual-link authentication

### Description

The **area virtual-link authentication** command is used to configure the authentication type of the virtual link. The virtual link is not authenticated by default. To restore to default value, please use the **no area virtual-link authentication** command.

### Syntax

```
area transit-area virtual-link router-id authentication [ message-digest | null ]
no area transit-area virtual-link router-id authentication
```

### Parameter

*transit-area* — The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*router-id* — The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

message-digest — Configure the configuration type as MD5.

null — No authentication. By default it is no authentication.

If no authentication mode is specified here, the default mode will be simple authentication.

## Command Mode

Router Configuration Mode

## Example

Configure simple authentication as the authentication mode of a virtual-link with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 2 virtual-link 3.3.3.3 authentication
```

## Description

The **area virtual-link authentication-key** command is used to configure the simple authentication key. To delete the key, please use the **no area virtual-link authentication-key** command.

## Syntax

**area** *transit-area* **virtual-link** *router-id* **authentication-key** *key*

**no area** *transit-area* **virtual-link** *router-id* **authentication-key**

## Parameter

*transit-area* — The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*router-id* — The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

*key* — The authentication string, ranging from 1 to 8 characters.

## Command Mode

Router Configuration Mode

## Example

Configure simple authentication as the authentication mode of a virtual-link with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3, and the authentication key as 123456:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 2 virtual-link 3.3.3.3 authentication-key
123456
```

## area virtual-link authentication-key

### Description

The **area virtual-link authentication-key** command is used to configure the simple authentication key. To delete the key, please use the **no area virtual-link authentication-key** command.

### Syntax

```
area transit-area virtual-link router-id authentication-key { [ 0 ] password | 7 encrypted-password }
```

```
no area transit-area virtual-link router-id authentication-key
```

### Parameter

*transit-area* — The transition area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*router-id* — The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 8 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

### Command Mode

Router Configuration Mode

### User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the authentication mode of a virtual-link as simple authentication, with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3, and the authentication key as 123456:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 2 virtual-link 3.3.3.3 authentication-key
123456
```

## area virtual-link message-digest-key

### Description

The **area virtual-link message-digest-key** is used to configure the MD5 authentication ID and key of the virtual-link. To delete the specified configuration, please use the **no area virtual-link message-digest-key** command.

### Syntax

```
area transit-area virtual-link router-id message-digest-key id md5 { [ 0 ]
password | 7 encrypted-password }
```

```
no area transit-area virtual-link router-id message-digest-key id
```

### Parameter

*transit-area* — The transition area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*router-id* — The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

*id* — The key ID of the MD5, ranging from 1 to 255.

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 16 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Router Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the authentication mode of a virtual-link as md5 authentication, with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3, with the authentication ID as 2 and the authentication key as 123456:

```
T3700G-28TQ(config)# router ospf 1
T3700G-28TQ(config-router)# area 2 virtual-link 3.3.3.3 message-digest-
key 2 md5 123456
```

# ip ospf cost

## Description

The **ip ospf cost** is used to configure the interface cost. To restore to the default value, please use the **no ip ospf cost** command.

## Syntax

```
ip ospf cost cost
```

```
no ip ospf cost
```

## Parameter

*cost* — The interface cost, ranging from 1 to 65535. The default value is calculated according to the bandwidth.

## Command Mode

Interface Configuration Mode

## Example

Configure the cost of interface VLAN 2 as 10:

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip ospf cost 10
```

## ip ospf retransmit-interval

### Description

The **ip ospf retransmit-interval** command is used to configure the interval to retransmit the LSA, DD and LSR packets on the specified interface. To restore to default value, please use the **no ip ospf retransmit-interval** command.

### Syntax

```
ip ospf retransmit-interval interval  
no ip ospf retransmit-interval
```

### Parameter

*interval*— The retransmit interval, ranging from 1 to 65535 seconds. The default value is 5 seconds.

### Command Mode

Interface Configuration Mode

### Example

Configure the retransmission interval of interface VLAN 2 as 10 seconds:

```
T3700G-28TQ(config)# interface vlan 2  
T3700G-28TQ(config-if)# ip ospf retransmit-interval 10
```

## ip ospf transmit-delay

### Description

The **ip ospf transmit-delay** is used to configure the transmission delay of LSA on the specified interface. To restore to default value, please use the **no ip ospf transmit-delay**.

### Syntax

```
ip ospf transmit-delay delay  
no ip ospf transmit-delay
```

### Parameter

*delay*— The LSA transmission delay, ranging from 1 to 65535 seconds. The default value is 1 second.

## Command Mode

Interface Configuration Mode

## Example

Configure the LSA transmission delay of interface VLAN 2 as 2 seconds.

```
T3700G-28TQ(config)# interface vlan 2
T3700G-28TQ(config-if)# ip ospf retransmit-delay 2
```

## ip ospf priority

### Description

The **ip ospf priority** is used to configure the priority of the specified interface. To restore to the default value, please use the **no ip ospf priority** command.

### Syntax

```
ip ospf priority pri
no ip ospf priority
```

### Parameter

*pri* — The priority of the interface, ranging from 0 to 255 and the default value is 1. Interface with the priority 0 cannot be elected as DR or BDR.

## Command Mode

Interface Configuration Mode

## Example

Configure the priority of the interface VLAN 2 as 1:

```
T3700G-28TQ(config-if)# ip ospf priority 1
```

## ip ospf hello-interval

### Description

The **ip ospf hello-interval** is used to configure the hello intervals on the specified interface. To restore to the default value, please use the **no ip ospf hello-interval** command.



## Syntax

```
ip ospf hello-interval interval  
no ip ospf hello-interval
```

## Parameter

*Interval* — The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

## Command Mode

Interface Configuration Mode

## Example

Configure the interval of the hello packets sent on interface VLAN 2 as 20 seconds:

```
T3700G-28TQ(config-if)# ip ospf hello-interval 20
```

# ip ospf dead-interval

## Description

The **ip ospf dead-interval** command is used to set the number of seconds after the last device hello packet was seen before its neighbors declare the OSPF router to be down. To restore to default value, please use the **no ip ospf dead-interval** command.

## Syntax

```
ip ospf dead-interval interval  
no ip ospf dead-interval
```

## Parameter

*interval* — The neighbor's failure interval, ranging from 1 to 65535 seconds and the default is 4 times the hello interval.

## Command Mode

Interface Configuration Mode

## Example

Configure the neighbor's failure interval on interface VLAN 2 as 50 seconds:

```
T3700G-28TQ(config-if)# ip ospf dead-interval 50
```

## ip ospf authentication

### Description

The **ip ospf authentication** command is used to configure the authentication mode of the specified interface. To restore to default value, please use the **no ip ospf authentication** command.

### Syntax

```
ip ospf authentication [ message-digest ] [ null ]  
no ip ospf authentication
```

### Parameter

**message-digest**—— Specify the authentication type as MD5.

**null** —— No authentication. By default it is no authentication.

If no authentication mode is specified here, the default mode will be simple authentication.

### Command Mode

Interface Configuration Mode

### Example

Configure the authentication type of interface VLAN 2 as MD5:

```
T3700G-28TQ(config-if)# ip ospf authentication message-digest
```

## ip ospf authentication-key

### Description

The **ip ospf authentication-key** command is used to configure the key of the simple authentication. To cancel this configuration, please use the **no ip ospf authentication-key** command.

### Syntax

```
ip ospf authentication-key { [ 0 ] password | 7 encrypted-password }  
no ip ospf authentication-key
```

### Parameter

**0** —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 8 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Interface Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure the authentication mode of interface VLAN 2 as simple authentication, and the password as 123:

```
T3700G-28TQ(config)#interface vlan 2
T3700G-28TQ(config-if)# ip ospf authentication-key 123
```

# ip ospf message-digest-key

## Description

The **ip ospf message-digest-key** is used to configure the ID and password of the md5 authentication on the specified interface. To cancel the configuration, please use **no ip ospf message-digest-key** command.

## Syntax

```
ip ospf message-digest-key id md5 { [ 0 ] password | 7 encrypted-password }
no ip ospf message-digest-key id
```

## Parameter

*id* — The ID of the md5 authentication key, ranging from 1 to 255.

0 — Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

*password* — Super password, a string from 1 to 16 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

7 — Indicates a symmetric encrypted password with a fixed length will follow.

*encrypted-password* — A symmetric encrypted password with a fixed length, which you can copy from another switch configuration. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

## Command Mode

Interface Configuration Mode

## User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in [service password-encryption](#), the password in the configuration file will be displayed in the symmetric encrypted form.

## Example

Configure md5 authentication key ID as 1 and password as abc on interface VLAN 2:

```
T3700G-28TQ(config)#interface vlan 2
T3700G-28TQ(config-if)# ip ospf message-digest-key 1 md5 abc
```

# ip ospf network

## Description

The **ip ospf network** command is used to configure the network type on the specified interface. To restore to default, please use the **no ip ospf network** command.

## Syntax

```
ip ospf network { broadcast | point-to-point }
```

```
no ip ospf network
```

## Parameter

**broadcast** — The broadcast network type. It is the default value.

**point-to-point** — The point-to-point network type.

## Command Mode

Interface Configuration Mode

## Example

Configure the network type on interface VLAN 2 as broadcast::

```
T3700G-28TQ(config-if)# ip ospf network broadcast
```

# ip ospf database-filter all out

## Description

The **ip ospf database-filter all out** command is used to block the flooding of the LSA packets on the specified interface. To restore to default, please use the **no ip ospf database-filter all out** command. By default, OSPF floods new LSAs over all interfaces in the same area, except the interface on which the LSA arrives.

## Syntax

```
ip ospf database-filter all out
```

```
no ip ospf database-filter all out
```

## Command Mode

Interface Configuration Mode

## Example

Block the flooding of the LSA packets on interface VLAN 2:

```
T3700G-28TQ(config-if)# ip ospf database-filter all out
```

# ip ospf mtu-ignore

## Description

The **ip ospf mtu-ignore** command is used to ignore the MTU check in the DD exchanging process. This check is scheduled by default and the adjacency relationship will not establish if the MTUs are not matched. To restore to the default value, please use the **no ip ospf mtu-ignore** command.

## Syntax

```
ip ospf mtu-ignore
```

```
no ip ospf mtu-ignore
```

### Command Mode

Interface Configuration Mode

### Example

Configure interface VLAN 2 to ignore the MTU field check in the DD exchange process:

```
T3700G-28TQ(config-if)# ip ospf mtu-ignore
```

## clear ip ospf

### Description

The **clear ip ospf** command is used to reset the OSPF process, which will clear all the dynamic information. The **clear ip ospf process** command will reset all the OSPF processes.

### Syntax

```
clear ip ospf [ process-id ]
```

```
clear ip ospf process
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535.

### Command Mode

Privileged EXEC Mode

### Example

Reset all the OSPF processes:

```
T3700G-28TQ# clear ip ospf process
```

## show ip ospf

### Description

The **show ip ospf** is used to display the global information of the OSPF process.

## Syntax

```
show ip ospf [ process-id ]
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535. The global information of all the OSPF processes will be displayed if no process-id is specified.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the global information of all the OSPF processes:

```
T3700G-28TQ# show ip ospf
```

# show ip ospf database

## Description

The **show ip ospf database** command is used to display the LSDB. The detailed LSA information will be displayed if the LSA type is specified. The LSDB summary information will be displayed if the LSA type is not specified.

## Syntax

```
show ip ospf [ process-id ] database [ asbr-summary | external | network | nssa-external | router | summary ]
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535. The LSDBs of all processes will be displayed if no process ID is specified.

asbr-summary | external | network | nssa-external | router | summary — The LSA type.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the detailed information of router-LSA in process 1:

```
T3700G-28TQ# show ip ospf 1 database router
```

## show ip ospf interface

### Description

The **show ip ospf interface** command is used to display the interface information.

### Syntax

```
show ip ospf [ process-id ] interface [ brief | interface-name interface-number ]
```

### Parameter

*process-id* — The process ID. The information of all the processes will be displayed if process ID is not specified.

**brief**— Display the summary information of the interface.

*interface-name interface-number* — Specify the interface name and number to display the interface's detailed information.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the information of the interfaces in all the OSPF processes:

```
T3700G-28TQ# show ip ospf interface
```

## show ip ospf neighbor

### Description

The **show ip ospf neighbor** command is used to display information of the OSPF neighbor.

### Syntax

```
show ip ospf [ process-id ] neighbor [ detail | interface-name interface-number ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535. The neighbors' information of all processes will be displayed if no process ID is specified.

**detail**— The detailed information of the neighbor.



*interface-name interface-number*—Specify the interface name and number to display the neighbor's detailed information on this interface.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the neighbors' detailed information in process 1:

```
T3700G-28TQ# show ip ospf 1 neighbor detail
```

## show ip ospf request-list

### Description

The **show ip ospf request-list** command is used to display the LSA request list.

### Syntax

```
show ip ospf [ process-id ] request-list [ interface-name interface-number |  
neighbor-id ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535. The LSA request lists of all processes will be displayed if no process ID is specified.

*interface-name interface-number* — Specify the interface name and number to display the LSA request list on this interface.

*neighbor-id* — Specify the neighbor ID to display the LSA request list of this neighbor.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the LSA request lists of all OSPF processes:

```
T3700G-28TQ# show ip ospf request-list
```

## show ip ospf retransmission-list

### Description

The **show ip ospf retransmission-list** is used to display the LSA retransmission list.

### Syntax

```
show ip ospf [ process-id ] retransmission-list [ interface-name  
interface-number | neighbor-id ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535. The LSA retransmission lists of all processes will be displayed if no process ID is specified.

*interface-name interface-number*—Specify the interface name and number to display the LSA retransmission list on this interface.

*neighbor-id* — Specify the neighbor router's ID to display the LSA retransmission list of this neighbor.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display LSA retransmission lists of all the OSPF processes:

```
T3700G-28TQ# show ip ospf retransmission-list
```

## show ip ospf summary-address

### Description

The **show ip ospf summary-address** is used to display the ASBR summary routes.

### Syntax

```
show ip ospf [ process-id ] summary-address
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535. The summary routes of all processes will be displayed if no process ID is specified.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the summary routes of all processes:

```
T3700G-28TQ# show ip ospf summary-address
```

# show ip ospf virtual-links

## Description

The **show ip ospf virtual-links** is used to display the virtual links.

## Syntax

```
show ip ospf [ process-id ] virtual-links
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535. The virtual links of all processes will be displayed if no process ID is specified.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the virtual links of all the OSPF processes:

```
T3700G-28TQ# show ip ospf virtual-links
```

# show ip ospf border-routers

## Description

The **show ip ospf border-routers** is used to display the routing tables of the ABR/ASBR.

## Syntax

```
show ip ospf [ process-id ] border-routers
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535. The ABR/ASBR routing tables of all processes will be displayed if no process ID is specified.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the ABR/ASBR routing tables of all the OSPF processes:

```
T3700G-28TQ# show ip ospf border-routers
```

# show ip route ospf

## Description

The **show ip route ospf** command is used to display the OSPF routing table.

## Syntax

```
show ip route ospf [ process-id ]
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535. The routing tables of all OSPF processes will be displayed if no process ID is specified.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the routing tables of all the OSPF processes:

```
T3700G-28TQ# show ip route ospf
```

# show ip ospf area database

## Description

The **show ip ospf area database** command is used to display the LSDB of the specified area. The detailed LSA information will be displayed if the LSA type is specified. The LSDB summary information will be displayed if the LSA type is not specified.

## Syntax

```
show ip ospf process-id area area-id database [ asbr-summary | external |  
network | nssa-external | router | summary ]
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535.

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*asbr-summary* | *external* | *network* | *nssa-external* | *router* | *summary* — The LSA type.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the LSDB summary information of Area 0 in process 1:

```
T3700G-28TQ# show ip ospf 1 area 0 database
```

# show ip ospf area interface

## Description

The **show ip ospf area interface** command is used to display the interface information of the specified area.

## Syntax

```
show ip ospf process-id area area-id interface [ brief | interface-name  
interface-number ]
```

## Parameter

*process-id* — The process ID, ranging from 1 to 65535.

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

**brief** — Display the summary information of the interface.

*interface-name interface-number* — Specify the interface name and number to display the detailed information of this interface.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Example

Display the detailed information of all the interfaces of Area 0 in process 1:

```
T3700G-28TQ# show ip ospf 1 area 0 interface
```

## show ip ospf area neighbor

### Description

The **show ip ospf are neighbor** command is used to display the neighbor information of the specified area.

### Syntax

```
show ip ospf process-id area area-id neighbor [ detail | interface-name  
interface-number ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535.

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

**detail** — The detailed information of the neighbor.

*interface-name interface-number* — Specify the interface name and number to display the detailed neighbor's information on this interface.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display the summary information of the neighbors of Area 0 in process1:

```
T3700G-28TQ# show ip ospf 1 area 0 neighbor
```

## show ip ospf area request-list

### Description

The **show ip ospf area request-list** command is used to display the LSA request list of the specified area.

### Syntax

```
show ip ospf process-id area area-id request-list [ interface-name  
interface-number | neighbor-id ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535.

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*interface-name interface-number* — Specify the interface name and number to display the LSA request list on this interface.

*neighbor-id* — Specify neighbor router ID to display the LSA request list on this neighbor.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display LSA request list of Area 0 in process1:

```
T3700G-28TQ# show ip ospf 1 area 0 request-list
```

## show ip ospf area retransmission-list

### Description

The **show ip ospf area retransmission-list** command is used to display the LSA retransmission list of the specified area.

### Syntax

```
show ip ospf process-id area area-id retransmission-list [ interface-name  
interface-number | neighbor-id ]
```

### Parameter

*process-id* — The process ID, ranging from 1 to 65535.

*area-id* — The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

*interface-name interface-number* — Specify the interface name and number to display the LSA retransmission list on this interface.

*neighbor-id* — Specify neighbor router ID to display the LSA retransmission list on this neighbor.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

Display LSA retransmission list of Area 0 in process1:

```
T3700G-28TQ# show ip ospf 1 area 0 retransmission-list
```