TP-LINK®

CLI Reference Guide

T1600G-28TS (TL-SG2424)

T1600G-52TS (TL-SG2452)

T1600G-28PS (TL-SG2424P)

T1600G-52PS (TL-SG2452P)

JetStream Gigabit Smart Switch

COPYRIGHT & TRADEMARKS

CONTENTS

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 T1600-28TS/T1600G-52TS/T1600G-28PS/T1600G-52PS JetStream Gigabit Smart Switch without any explanation. The commands in this guilde apply to these models if not specially noted, and T1600G-52TS is taken as an example model in the example commands.

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: IEEE 802.1Q VLAN Commands

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

Chapter 4: MAC-based VLAN Commands

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

Chapter 5: Protocol VLAN Commands

Provide information about the commands used for configuring Protocol VLAN.

Chapter 6: Voice VLAN Commands

Provide information about the commands used for configuring Voice VLAN.

Chapter 7: Etherchannel Commands

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

Chapter 8: User Management Commands

Provide information about the commands used for user management.

Chapter 9: HTTP and HTTPS Commands

Provide information about the commands used for configuring the HTTP and HTTPS logon.

Chapter 10: 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 11: ARP Inspection Commands

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

Chapter 12: DoS Defend Command

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

Chapter 13: System Log Commands

Provide information about the commands used for configuring system log.

Chapter 14: SSH Commands

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

Chapter 15: IEEE 802.1X Commands

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

Chapter 16: MAC Address Commands

Provide information about the commands used for Address configuration.

Chapter 17: 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 cable test.

Chapter 18: IPv6 Address Configuration Commands

Provide information about the commands used for configuring the System IPv6 addresses.

Chapter 19: Ethernet Configuration Commands

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

Chapter 20: QoS Commands

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

Chapter 21: Port Mirror Commands

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

Chapter 22: Port Isolation Commands

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

Chapter 23: Loopback Detection Commands

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

Chapter 24: ACL Commands

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

Chapter 25: PoE Commands

Provide information about the commands used for configuring PoE function.

Chapter 26: MSTP Commands

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

Chapter 27: IGMP Snooping Commands

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

Chapter 28: MLD Snooping Commands

Provide information about the commands used for configuring the MLD Snooping (Multicast Listener Discovery Snooping).

Chapter 29: SNMP Commands

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

Chapter 30: LLDP Commands

Provide information about the commands used for configuring LLDP function.

Chapter 31: ARP Commands

Provide information about the commands used for configuring the ARP (Address Resolution Protocol) functions.

Chapter 32: Static Routes Commands

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

Chapter 1   Using the CLI

1.1   Accessing the CLI

You can log on to the switch and access the CLI by logging on to the switch remotely by a Telnet or SSH connection through an Ethernet port.

1.1.1   Logon by Telnet

To log on to the switch by a Telnet connection, please take the following steps:

1. Click **Start** and type in **cmd** in the Search programs and files window and press the **Enter** button.
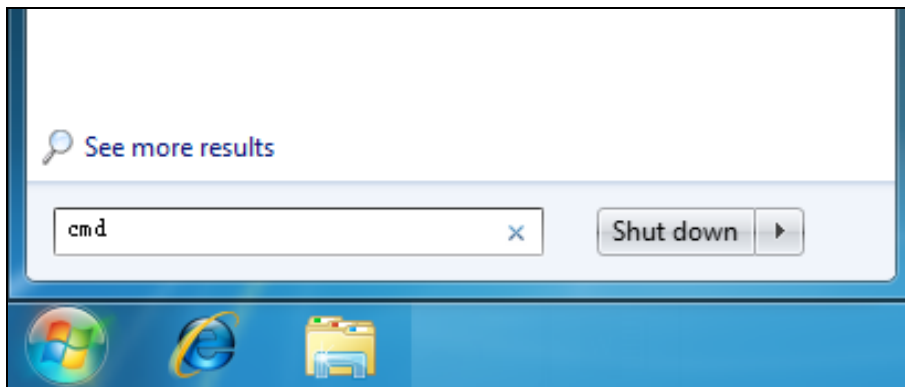
Figure 1-1 Run Window

2. Telnet the switch_IP (factory setting is 192.168.0.1) in the prompt cmd window and press **Enter**.
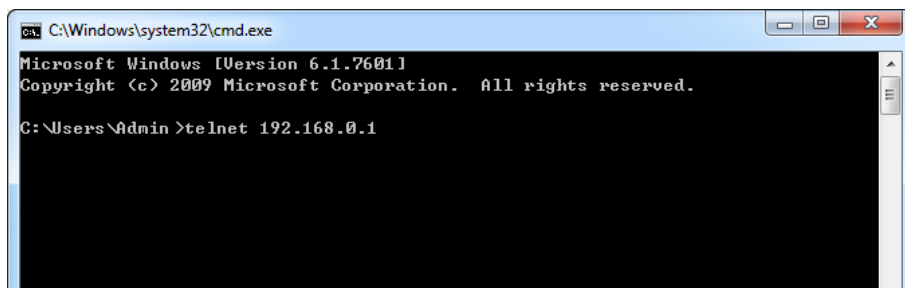
Figure 1-2 Type in the telnet command

3. Type in the User name and Password (the factory default value for both of them are admin) and press the **Enter** button to enter User EXEC Mode , which is shown as Figure 1-2.
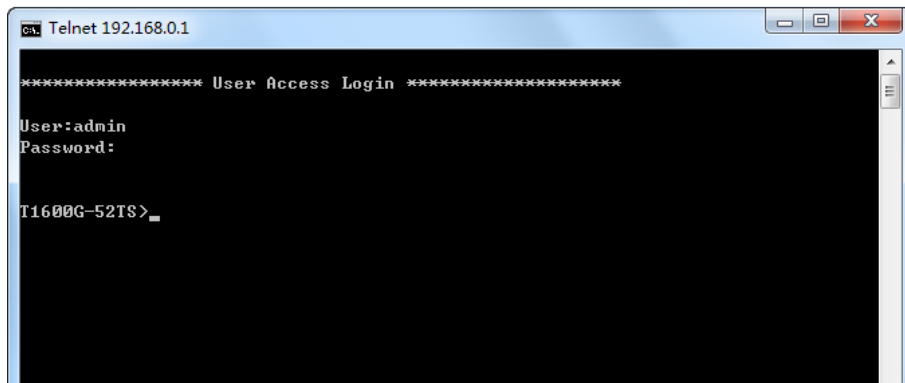
Figure 1-2 Log in the Switch

4. Type in **enable** command to enter Privileged EXEC Mode.
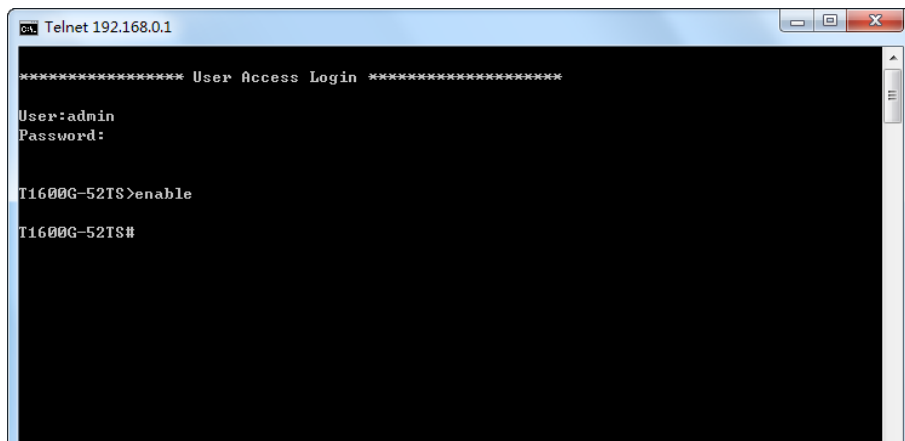
Figure 1-3 Enter into Priviledged EXEC Mode

1.1.2 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 1-4 to enable the SSH function through Telnet connection.
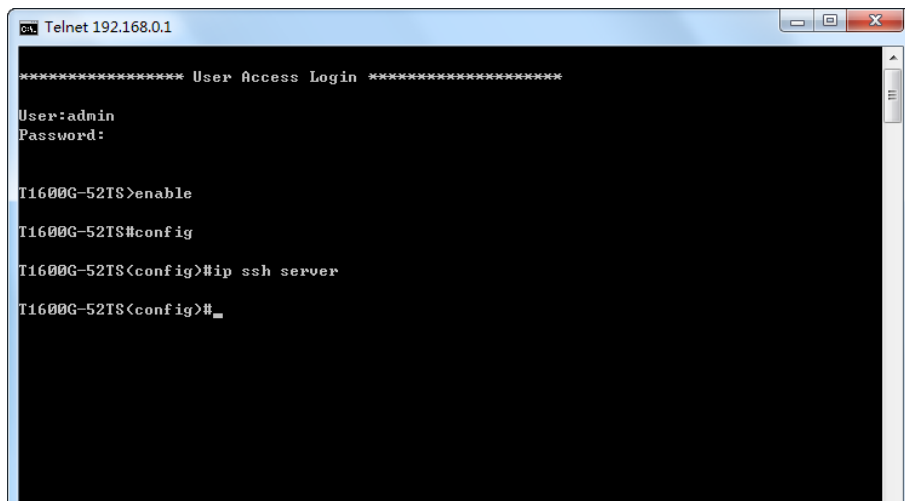
Figure 1-4 Enable SSH function

➢ **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.
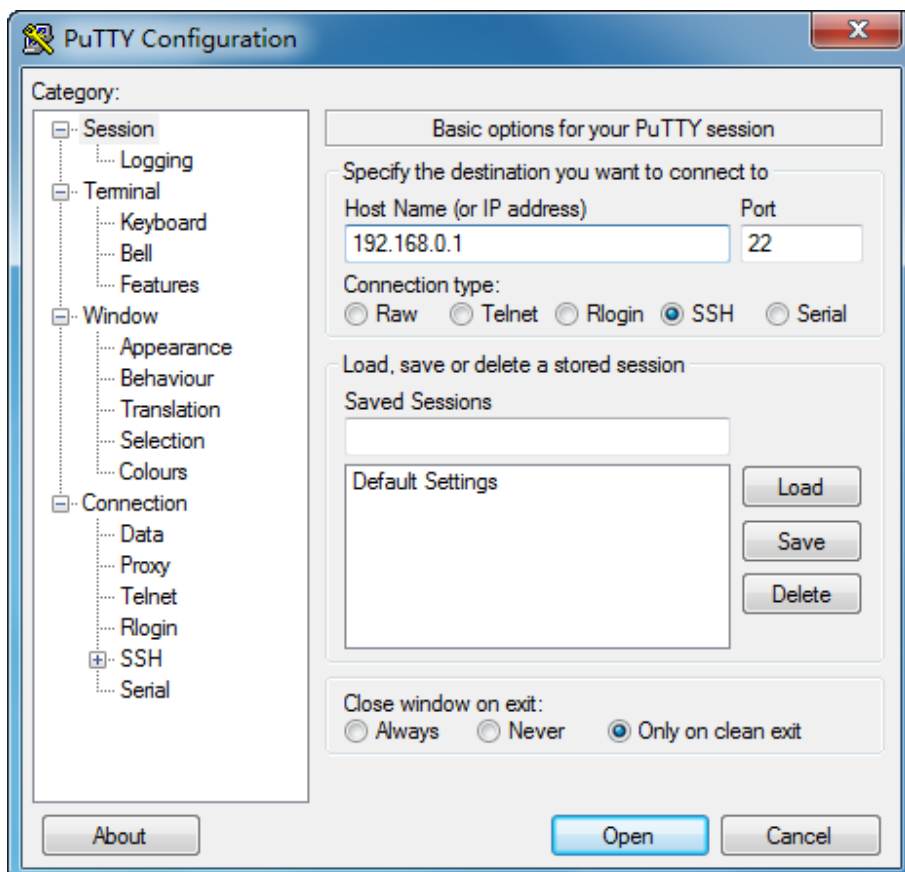
Figure 1-5 SSH Connection Config

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 enable to enter Privileged EXEC Mode, so you can continue to configure the switch.
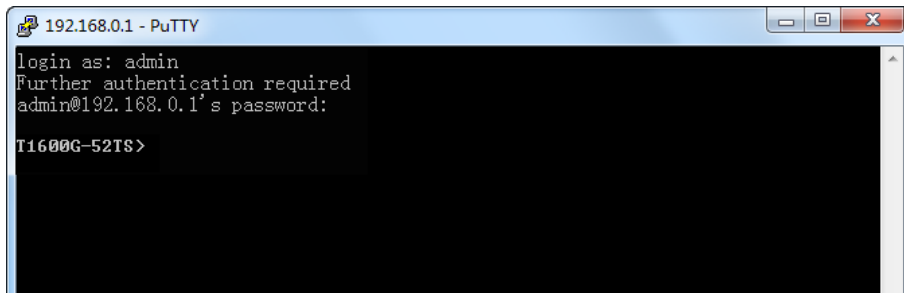
Figure 1-6 Log on the Switch

➢ **Key Authentication Mode**

1. Select the key type and key length, and generate SSH key.
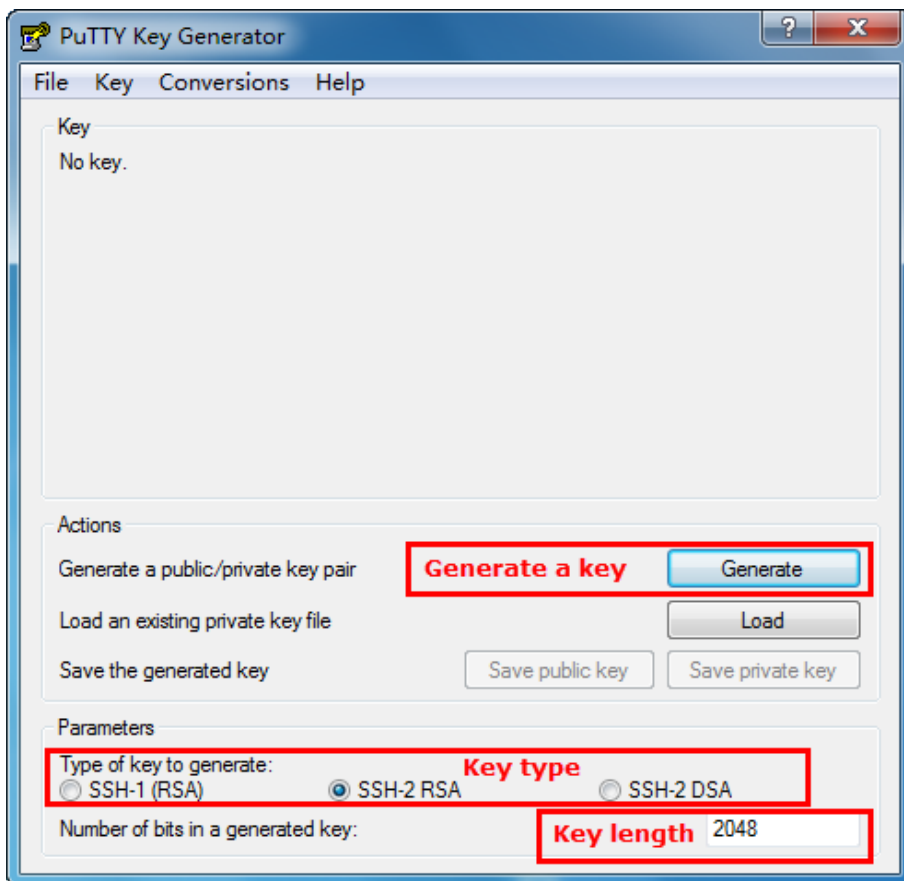
Figure 1-7 Generate SSH Key

⚠️**Note:**

1. The key length is in the range of 512 to 3072 bits.
2. During the key generation, randomly moving the mouse quickly can accelerate the key generation.

2. After the key is successfully generated, please save the public key and private key to a TFTP server.
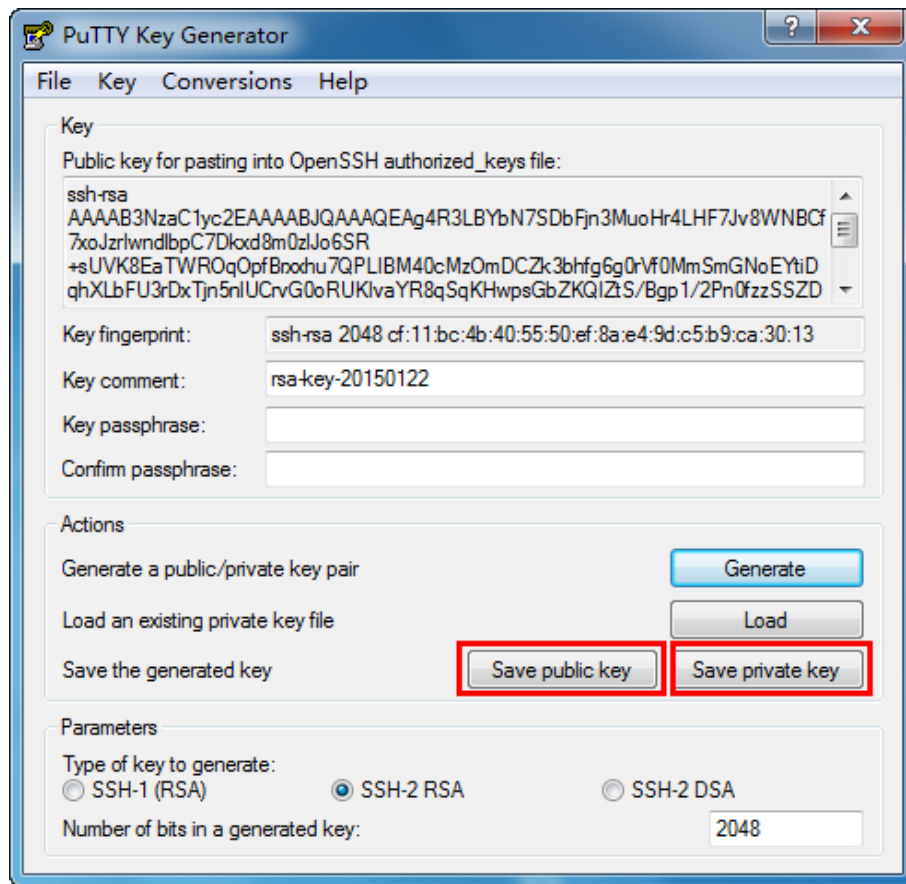
Figure 1-8 Save the Generated Key

3. Log on to the switch by Telnet and download the public key file from the TFTP server to the switch, as the following figure shows:
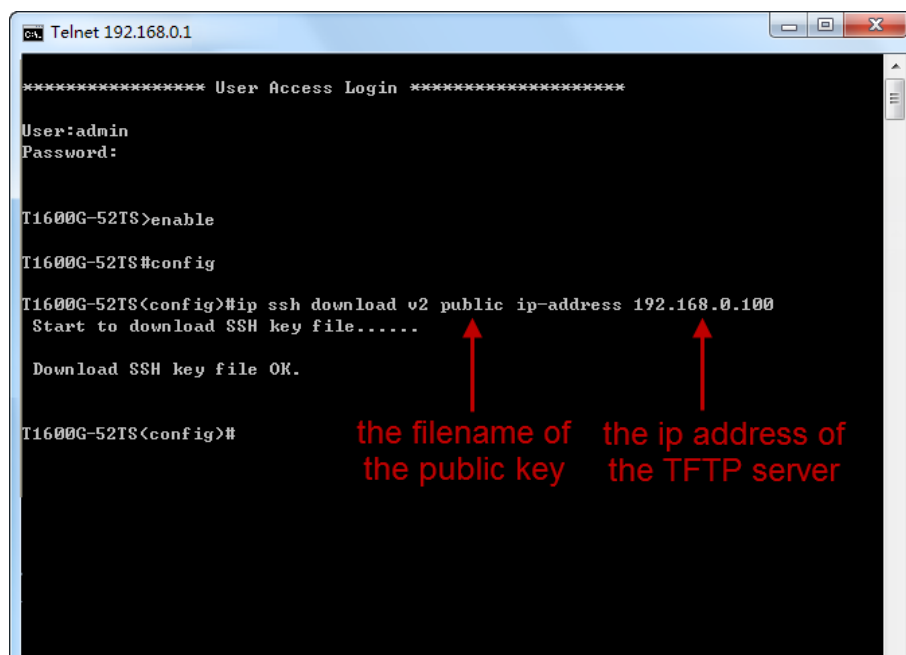
Figure 1-9 Download the Public Key

4. After the public key is downloaded, please log on to the interface of PuTTY and enter the IP address for login.
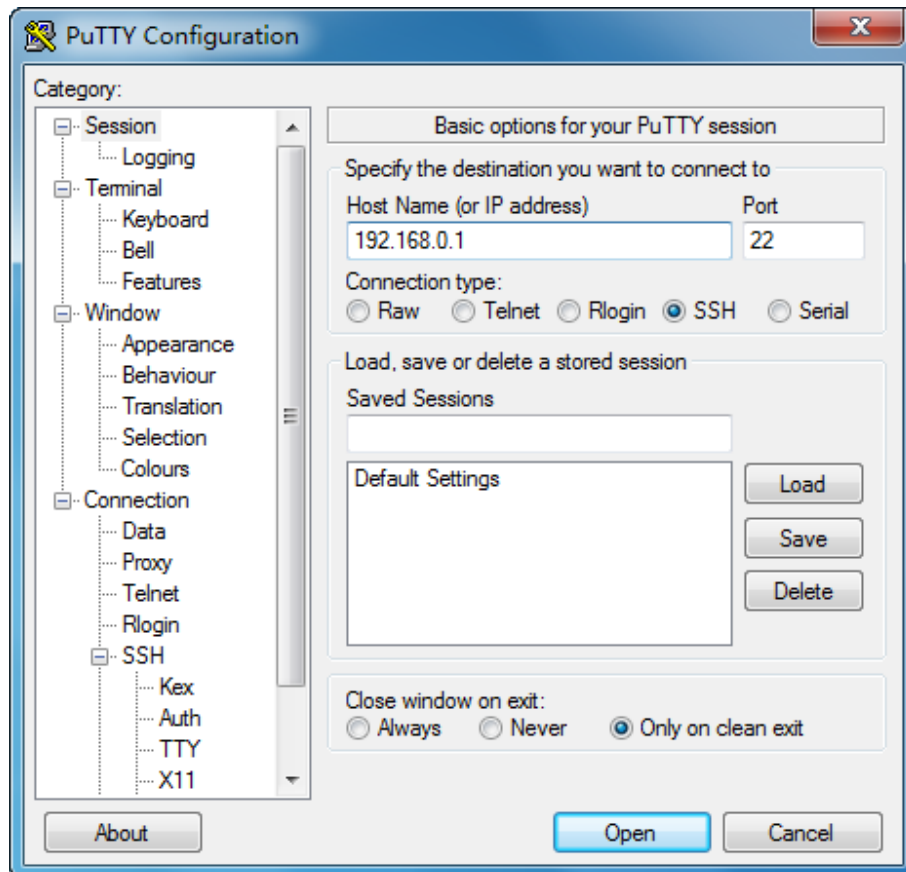
Figure 1-10 SSH Connection Config

5. Click **Browse** to download the private key file to SSH client software and click **Open**.
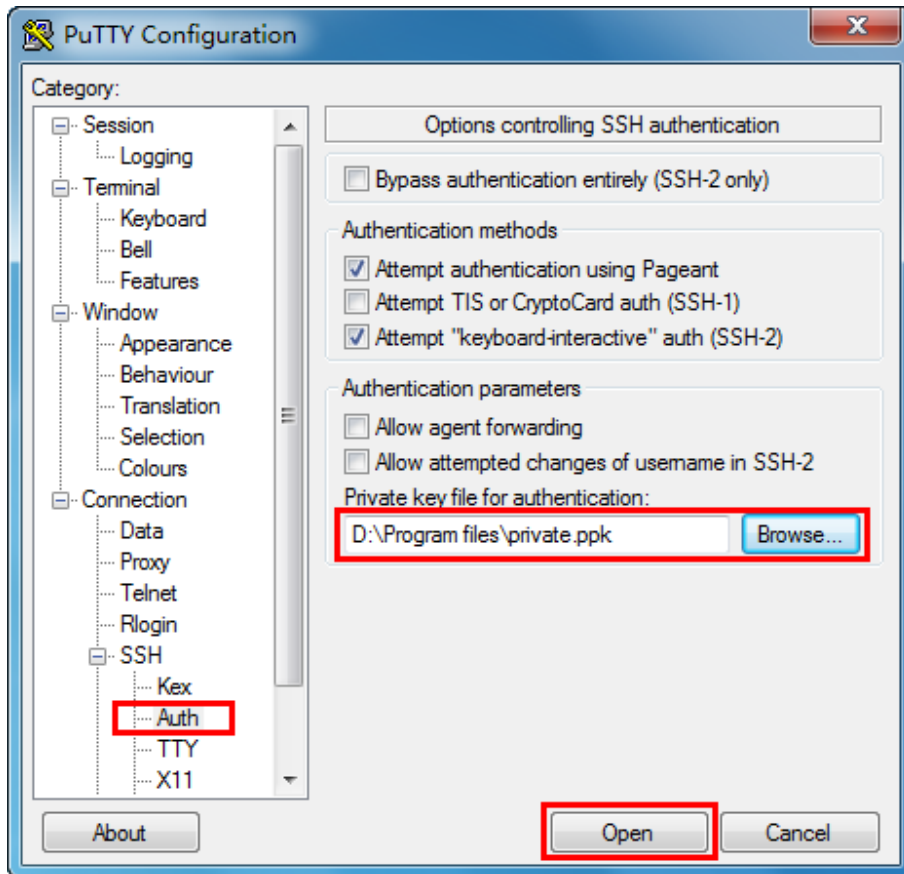
Figure 1-11 Download the Private Key

6. 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.
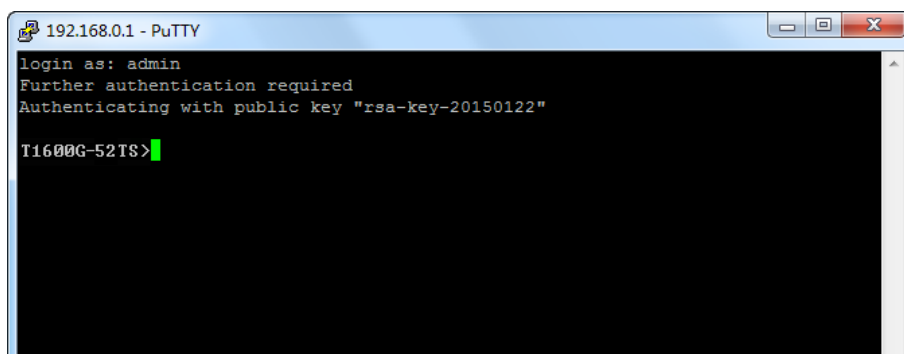
Figure 1-12 Log on the Switch

1.2   CLI Command Modes

The CLI is divided into different command modes: User EXEC Mode, Privileged EXEC Mode, Global Configuration Mode, Interface Configuration Mode and VLAN Configuration Mode. Interface Configuration Mode can also be divided into Interface Ethernet, Interface link-aggregation and some other modes, which is shown as the following diagram.
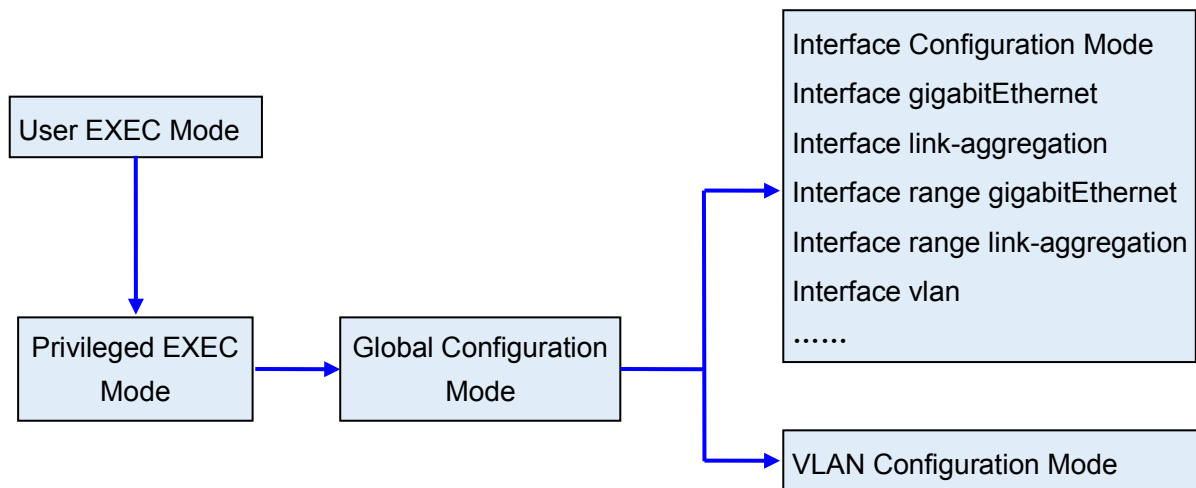
The following table gives detailed information about the Accessing path, Prompt of each mode and how to exit the current mode and access the next mode.

Mode	Accessing Path	Prompt	Logout or Access the next mode
User EXEC Mode	Primary mode once it is connected with the switch.	**T1600G-52TS>**	Use the **exit** command to disconnect the switch. Use the **enable** command to access Privileged EXEC mode.
Privileged EXEC Mode	Use the **enable** command to enter this mode from User EXEC mode.	**T1600G-52TS#**	Enter the **exit** command to return to User EXEC mode. Enter **configure** command to access Global Configuration mode.
Global Configuration Mode	Use the **configure** command to enter this mode from Privileged EXEC mode.	**T1600G-52TS#**	Use the **exit** or the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Use the **interface gigabitEthernet** *port* or **interface range gigabitEthernet** *port-list* command to access interface Configuration mode. Use the **vlan** *vlan-list* to access VLAN Configuration mode.

Mode	Accessing Path	Prompt	Logout or Access the next mode
Interface Configuration Mode	Layer 2 Interface: Use the **interface gigabitEthernet** *port,* **interface port-channel** *lagid* or **interface range gigabitEthernet** *port-list* command to enter this mode from Global Configuration mode.	**T1600G-52TS (config-if)#** or **T1600G-52TS(config-if-range)#**	Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** or the **#** command to return to Global Configuration mode. A port number must be specified in the **interface** command.
Interface Configuration Mode	Layer 3 Interface: Use the **no switchport** command to enter Routed Port mode from Interface Configuration mode. Use the **interface vlan** *vlan-id* command to enter VLAN Interface mode from Global Configuration mode. Use the **interface loopback** *id* command to enter Loopback Interface mode from Global Configuration mode.	**T1600G-52TS (config-if)#** or **T1600G-52TS(config-if-range)#**	Use the **switchport** command to switch to the Layer 2 interface mode. Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** or the **#** command to return to Global Configuration mode.
VLAN Configuration Mode	Use the **vlan** *vlan-list* command to enter this mode from Global Configuration mode.	**T1600G-52TS (config-vlan)#**	Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** command or the **#** 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 Telnet/SSH 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: Configure parameters for an Ethernet port, such as Duplex-mode, flow control status.

  b). Interface range 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 vlan: Configure parameters for the vlan-port.

- **VLAN Configuration Mode**: In this mode, users can create a VLAN and add a specified port to the VLAN.

3. Some commands are global, that means they can be performed in all modes:

- **show**: display all information of switch, for example: statistic information, port information, VLAN information.

- **history**: Display 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 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 default case, no password is needed. 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: **mode** {dynamic | static | permanent}

➢ 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 " < > , \ & can not 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 enter 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,1/0/1,1/0/3-5,1/0/7 indicates choosing port 1/0/1,1/0/3,1/0/4,1/0/5,1/0/7.

Chapter 2   User Interface

2.1   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:

T1600G-52TS>enable

Enter password：

T1600G-52TS#

2.2   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:

T1600G-52TS(config)# service password-encryption

2.3 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 digits, English letters (case sensitive), underlines and sixteen special characters (!$%'()*,-./[]{|}). 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

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

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

T1600G-52TS(config)#enable password 0 admin

2.4 enable secret

Description

The **enable secret** command is used to set a secret password, which is using an MD5 encryption algorithm, 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 digits, English letters (case sensitive), underlines and sixteen special characters (!$%'()*,-./[]{|}). 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 if you re-enter this mode.

Command Mode

Global Configuration Mode

User Guidelines

If both the **enable password** and **enable secret** are defined, you must enter the password set in **enable secret**.

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.

T1600G-52TS(config)#enable secret 0 admin

2.5 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:

T1600G-52TS# configure
T1600G-52TS(config)#

2.6 exit

Description

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

Syntax

exit

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

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

T1600G-52TS(config-if)# exit
T1600G-52TS(config)#exit
T1600G-52TS#

2.7 end

Description

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

Syntax

end

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Return to Privileged EXEC Mode from Interface Configuration Mode:

T1600G-52TS(config-if)#end
T1600G-52TS#

2.8 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:

T1600G-52TS (config)# history

1 history

2.9 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:

T1600G-52TS(config)#history clear

Chapter 3 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.

3.1 vlan

Description

The **vlan** command is used to create IEEE 802.1Q VLAN and enter 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 —— Specify IEEE 802.1Q 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:

T1600G-52TS(config)# vlan 2-10,100

Delete VLAN 2:

T1600G-52TS(config)# no vlan 2

3.2 interface vlan

Description

The **interface vlan** command is used to create VLAN Interface and enter Interface VLAN Mode. To delete VLAN Interface, please use **no interface vlan** command.

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:

T1600G-52TS(config)# interface vlan 2

3.3 name

Description

The **name** command is used to assign a description 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 name of VLAN 2 as "group1":

T1600G-52TS(config)# vlan 2

T1600G-52TS(config-vlan)# name group1

3.4 switchport general allowed vlan

Description

The **switchport general allowed vlan** command is used to add the desired General port to IEEE 802.1Q VLAN and specify the port's type. To delete the corresponding VLAN(s), please use **no switchport general allowed vlan** command.

Syntax

switchport general allowed vlan *vlan-list* { tagged | untagged }

no switchport general allowed vlan *vlan-list*

Parameter

vlan-list —— Specify IEEE 802.1Q VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional.

tagged | untagged —— Egress rule，untagged or tagged. Tagged: All packets forwarded by the port are tagged. The packets contain VLAN information. Untagged: Packets forwarded by the port are untagged.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Add port 4 it to VLAN 2 and configure the type of port 1/0/4 as tagged:

T1600G-52TS(config)# interface gigabitEthernet 1/0/4

T1600G-52TS(config-if)# switchport general allowed vlan 2 tagged

3.5   switchport pvid

Description

The **switchport pvid** command is used to configure the PVID for the switch ports.

Syntax

switchport pvid *vlan-id*

Parameter

vlan-id —— VLAN ID, ranging from 1 to 4094.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Specify the PVID of port 1/0/2 as 2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# switchport pvid 2

3.6 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:

T1600G-52TS(config)# show vlan summary

3.7 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:

T1600G-52TS(config)# show vlan brief

3.8 show vlan

Description

The **show vlan** command is used to display the 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. It is multi-optional. Using the **show vlan** command without parameter displays the detailed information of all VLANs.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the information of vlan 5:

T1600G-52TS(config)# show vlan id 5

3.9   show interface switchport

Description

The **show interface switchport** command is used to display the IEEE 802.1Q VLAN configuration information of the specified port/LAG.

Syntax

show interface switchport [**gigabitEthernet** *port* | **port-channel** *lagid*]

Parameter

port —— The port number.
lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the VLAN configuration information of all ports and LAGs:

T1600G-52TS(config)# show interface switchport

Chapter 4   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.

4.1   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":

T1600G-52TS(config)#mac-vlan   mac-address 00:11:11:01:01:12 **vlan** 2 **description** TP

4.2   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:

T1600G-52TS(config)#interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)#mac-vlan

4.3 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:

T1600G-52TS(config)#show mac-vlan all

4.4 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:

T1600G-52TS(config)#show mac-vlan interface

Chapter 5   Protocol VLAN Commands

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

5.1   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:

T1600G-52TS(config)#protocol-vlan template name TP **frame ether_2 ether-type** 2024

5.2 protocol-vlan vlan

Description

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

Syntax

protocol-vlan vlan *vlan-id* { **template** *template-idx* }

no protocol-vlan vlan *group-idx*

Parameter

vlan-vid —— 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:

T1600G-52TS(config)# protocol-vlan vlan 2 **template** 3

5.3 protocol-vlan

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 1/0/20 to protocol group 1:

T1600G-52TS(config)#interface gigabitEthernet 1/0/20

T1600G-52TS(config-if)#protocol-vlan group 1

5.4 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:

T1600G-52TS(config)# show protocol-vlan template

5.5 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:

T1600G-52TS(config)# show protocol-vlan vlan

Chapter 6   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.

6.1   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:

T1600G-52TS(config)# voice vlan 10

6.2   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.

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 minutes and the default value is 1440 minutes.

Command Mode

Global Configuration Mode

Example

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

T1600G-52TS(config)# voice vlan aging 1

6.3　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.

Syntax

voice vlan priority *pri*

no voice vlan priority

Parameter

pri —— Priority, ranging from 0 to 7, and the default value is 6.

Command Mode

Global Configuration Mode

Example

Configure the priority of the Voice VLAN as 5:

T1600G-52TS(config)# voice vlan priority 5

6.4　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** *descript*]

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 00:11:11:11:11:11 and the mask address FF:FF:FF:00:00:00:

T1600G-52TS(config)#voice vlan mac-address 00:11:11:11:11:11 **mask** FF:FF:FF:00:00:00 **description** TP-Phone

6.5   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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

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

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# switchport voice vlan mode auto

6.6 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

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

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# switchport voice vlan security

6.7 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:

T1600G-52TS(config)# show voice vlan

6.8 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:

T1600G-52TS(config)# show voice vlan oui

6.9 show voice vlan switchport

Description

The **show voice vlan switchport** command is used to display the Voice VLAN configuration information of a specified port/LAG.

Syntax

show voice vlan switchport [**gigabitEthernet** *port* | **port-channel** *lagid*]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the Voice VLAN configuration information of all ports and LAGs:

T1600G-52TS(config)# show voice vlan switchport

Display the Voice VLAN configuration information of port 1/0/2:

T1600G-52TS(config)# show voice vlan switchport gigabitEthernet 1/0/2

Chapter 7   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.

7.1   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 6.

on —— Enable the static LAG.

active —— Enable the active LACP mode.

passive —— Enable the passive LACP mode.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Add ports 2-4 to EtherChannel Group 1 and enable the static LAG:

T1600G-52TS(config)# interface range gigabitEthernet 1/0/2-4

T1600G-52TS(config-if-range)# channel-group 1 **mode** on

7.2 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-mac | dst-mac | src-dst-mac | src-ip | dst-ip | src-dst-ip }

no port-channel load-balance

Parameter

src-mac —— The source MAC address. When this option is selected, the Aggregate Arithmetic will be based on the source MAC address of the packets.

dst-mac —— The destination MAC address. When this option is selected, the Aggregate Arithmetic will be based on the destination MAC address of the packets.

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

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

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-ip":

T1600G-52TS(config)# port-channel load-balance src-dst-ip

7.3　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:

T1600G-52TS(config)# lacp system-priority 1024

7.4　lacp port-priority

Description

The **lacp port-priority** command is used to configure the LACP port priority for specified ports. 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 gigabitEthernet / interface range gigabitEthernet)

Example

Configure the LACP port priority as 1024 for ports 1-3:

T1600G-52TS(config)# interface range gigabitEthernet 1/0/1-3

T1600G-52TS(config-if-range)# lacp port-priority 1024

Configure the LACP port priority as 2048 for port 4:

T1600G-52TS(config)# interface gigabitEthernet 1/0/4

T1600G-52TS(config-if)# lacp port-priority 2048

7.5   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 6. 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:

T1600G-52TS(config)# show etherchannel 1 detail

7.6   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:

T1600G-52TS(config)# show etherchannel load-balance

7.7 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 6. 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:

T1600G-52TS(config)# show lacp 1 internal

7.8 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:

T1600G-52TS(config)# show lacp sys-id

Chapter 8   User Management 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.

8.1   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 on the Web without the right to edit and modify. Guest users cannot access the switch via Telnet or SSH. 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 digits, English letters (case sensitive), underlines and sixteen special characters (!$%'()*,-./[]{|}).

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

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

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

T1600G-52TS(config)#user name tplink **privilege** admin **password** 0 admin

8.2   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. This command uses the MD5 encryption.

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 on the Web without the right to edit and modify. Guest users cannot access the switch via Telnet or SSH. 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 digits, English letters (case sensitive), underlines and sixteen special characters (!$%'()*,-./[]{|}). The password will be saved to the configuration file using the MD5 encrypted algorithm.

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 (password)** and **user name (secret)** 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.

T1600G-52TS(config)#user name tplink **privilege** admin **secret** 0 admin

8.3   user access-control ip-based

Description

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

Syntax

user access-control ip-based { *ip-addr ip-mask* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control

Parameter

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

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

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

Command Mode

Global Configuration Mode

Example

Enable the access-control of the user whose IP address is 192.168.0.148:

T1600G-52TS(config)# user access-control ip-based 192.168.0.148 255.255.255.255

8.4 user access-control mac-based

Description

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

Syntax

user access-control mac-based { *mac-addr* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control

Parameter

mac-addr —— The source MAC address. Only the user with this MAC address is allowed to access the switch.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

Command Mode

Global Configuration Mode

Example

Configure that only the user whose MAC address is 00:00:13:0A:00:01 is allowed to access the switch:

T1600G-52TS(config)# user access-control mac-based 00:00:13:0A:00:01

8.5 user access-control port-based

Description

The **user access-control port-based** command is used to limit the ports for accessing. Only the users connected to these ports you set here are allowed to

login. To cancel the user access limit, please use **no user access-control** command.

Syntax

user access-control port-based interface { **gigabitEthernet** *port* | **range gigabitEthernet** *port-list* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control

Parameter

port —— The Ethernet port number.

port-list ——The list group of Ethernet ports, in the format of 1/0/1-4. You can appoint 5 ports at most.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

Command Mode

Global Configuration Mode

Example

Configure that only the users connected to ports 10/2-6 are allowed to access the switch:

T1600G-52TS(config)# user access-control port-based interface range gigabitEthernet 1/0/2-6

8.6 telnet

Description

The **telnet enable** command is used to enable the Telnet function. To disable the Telnet function, please use the **telnet disable** command. This function is enabled by default.

Syntax

telnet enable

telnet disable

Command Mode

Global Configuration Mode

Example

Disable the Telnet function:

```
T1600G-52TS(config)# telnet disable
```

8.7   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:

```
T1600G-52TS(config)# show user account-list
```

8.8   show user configuration

Description

The **show user configuration** command is used to display the security configuration information of the user authentication information and the access interface.

Syntax

show user configuration

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the security configuration information of the users:

```
T1600G-52TS(config)# show user configuration
```

8.9 show telnet-status

Description

The **show telnet-status** command is used to display the configuration information of the Telnet function.

Syntax

show telnet-status

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display whether the Telnet function is enabled:

T1600G-52TS(config)# show telnet-status

Chapter 9   HTTP and HTTPS Commands

With the help of HTTP (HyperText Transfer Protocol) or HTTPS (Hyper Text Transfer Protocol over Secure Socket Layer), you can manage the switch through a standard browser.

HTTP is the protocol to exchange or transfer hypertext.

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.

9.1   ip http server

Description

The **ip http server** command is used to enable the HTTP server within the switch. To disable the HTTP function, please use **no ip http server** command. This function is enabled by default. The HTTP and HTTPS server function cannot be disabled at the same time.

Syntax

ip http server

no ip http server

Command Mode

Global Configuration Mode

Example

Disable the HTTP function:

T1600G-52TS(config)# no ip http server

9.2   ip http max-users

Description

The **ip http max-users** command is used to configure the maximum number of users that are allowed to connect to the HTTP server. To cancel this limitation, please use **no ip http max-users** command.

Syntax

    ip http max-users *admin-num guest-num*

    no ip http max-users

Parameter

    admin-num —— The maximum number of the users logging on to the HTTP server 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 logging on to the HTTP server 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 the Admin and Guest users logging on to the HTTP server as 5 and 3:

    T1600G-52TS(config)# ip http max-users 5 3

9.3   ip http session timeout

Description

    The **ip http session timeout** command is used to configure the connection timeout of the HTTP server. To restore to the default timeout time, please use **no ip http session timeout** command.

Syntax

    ip http session timeout *minutes*

    no ip http session timeout

Parameter

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

Command Mode

    Global Configuration Mode

Example

Configure the timeout time of the HTTP server connection as 15 minutes:

T1600G-52TS(config)# ip http session timeout 15

9.4 ip http secure-server

Description

The **ip http secure-server** command is used to enable the HTTPS server within the switch. To disable the HTTPS function, please use **no ip http secure-server** command. This function is enabled by default. The HTTP and HTTPS server function cannot be disabled at the same time.

Syntax

ip http secure-server

no ip http secure-server

Command Mode

Global Configuration Mode

Example

Disable the HTTPS function:

T1600G-52TS(config)# no ip http secure-server

9.5 ip http secure-protocol

Description

The **ip http secure-protocol** command is used to configure the SSL protocol version. To restore to the default SSL version, please use **no ip http secure-protocol** command. By default, the switch supports SSLv3 and TLSv1.

Syntax

ip http secure-protocol { [ssl3] [tls1] }

no ip http secure-protocol

Parameter

ssl3 —— The SSL 3.0 protocol.

tls1 ——　The TLS 1.0 protocol

Command Mode

Global Configuration Mode

Example

Configure the protocol of SSL connection as SSL 3.0:

T1600G-52TS(config)# ip http secure-protocol ssl3

9.6 ip http secure-ciphersuite

Description

The **ip http secure-ciphersuite** command is used to configure the cipherSuites over the SSL connection supported by the switch. To restore to the default ciphersuite types, please use **no ip http secure-ciphersuite** command.

Syntax

ip http secure-ciphersuite { [3des-ede-cbc-sha] [rc4-128-md5] [rc4-128-sha] [des-cbc-sha] }

no ip http secure-ciphersuite

Parameter

[3des-ede-cbc-sha] [rc4-128-md5] [rc4-128-sha] [des-cbc-sha] —— Specify the encryption algorithm and the digest algorithm to use on an SSL connection. By default, the switch supports all these ciphersuites.

Command Mode

Global Configuration Mode

Example

Configure the ciphersuite to be used for encryption over the SSL connection as 3des-ede-cbc-sha:

T1600G-52TS(config)# ip http secure-ciphersuite 3des-ede-cbc-sha

9.7 ip http secure-max-users

Description

The **ip http secure-max-users** command is used to configure the maximum number of users that are allowed to connect to the HTTPS server. To cancel this limitation, please use **no ip http secure-max-users** command.

Syntax

ip http secure-max-users *admin-num guest-num*

no ip http secure-max-users

Parameter

admin-num —— The maximum number of the users logging on to the HTTPS server as Admin, ranging from 1 to 16. The total number of Admin and Guest should be no more than 16.

guest-num —— The maximum number of the users logging on to the HTTPS server as Guest, ranging from 0 to 15.The total number of Admin and Guest should be no more than 16.

Command Mode

Global Configuration Mode

Example

Configure the maximum number of the Admin and Guest users logging on to the HTTPS server as 5 and 3:

T1600G-52TS(config)# ip http secure-max-users 5 3

9.8 ip http secure-session timeout

Description

The **ip http secure-session timeout** command is used to configure the connection timeout of the HTTPS server. To restore to the default timeout time, please use **no ip http secure-session timeout** command.

Syntax

ip http secure-session timeout *minutes*

no ip http secure-session timeout

Parameter

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

Command Mode

Global Configuration Mode

Example

Configure the timeout time of the HTTPS server connection as 15 minutes:

T1600G-52TS(config)# ip http secure-session timeout 15

9.9   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. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

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:

T1600G-52TS(config)# ip http secure-server download certificate ssl-cert **ip-address** 192.168.0.146

Download an SSL Certificate named ssl-cert from TFTP server with the IP address of fe80::1234

T1600G-52TS(config)# ip http secure-server download certificate ssl-cert **ip-address** fe80::1234

9.10 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. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

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:

T1600G-52TS(config)# ip http secure-server download key ssl-key **ip-address** 192.168.0.146

Download an SSL key named ssl-key from TFTP server with the IP address of fe80::1234

T1600G-52TS(config)# ip http secure-server download key ssl-key **ip-address** fe80::1234

9.11 show ip http configuration

Description

The **show ip http configuration** command is used to display the configuration information of the HTTP server, including status, session timeout, access-control, max-user number and the idle-timeout, etc.

Syntax

show ip http configuration

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration information of the HTTP server:

T1600G-52TS(config)# show ip http configuration

9.12 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:

T1600G-52TS(config)# show ip http secure-server

Chapter 10 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 to filter the packets.

10.1 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 gigabitEthernet** *port* { none | arp-detection } [**forced-source** {arp-scanning | dhcp-snooping}]

no ip source binding 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 ——The protect type for the entry. "none" indicates applying none; "arp-detection" indicates ARP detection.

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

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:

T1600G-52TS(config)#ip   source   binding   host1   192.168.0.1 00:00:00:00:00:01 vlan 2 interface gigabitEthernet 1/0/5 arp-detection

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

T1600G-52TS(config)#no ip source binding index 5

10.2 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:

T1600G-52TS(config)#ip dhcp snooping

10.3 ip dhcp snooping vlan

Description

The **ip dhcp snooping vlan** command is used to enable DHCP Snooping function on a specified VLAN. To disable DHCP Snooping function on this VLAN, please use **no ip dhcp snooping vlan** command.

Syntax

ip dhcp snooping vlan *vlan-range*

no ip dhcp snooping vlan *vlan-range*

Parameter

vlan-range —— Specify the VLANs to enable the DHCP snooping function, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Example

Enable the DHCP Snooping function on VLAN 1,4,6-7:

T1600G-52TS(config)#ip dhcp snooping vlan 1,4,6-7

10.4 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:

T1600G-52TS(config)#ip dhcp snooping information option

10.5 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:

T1600G-52TS(config)#ip dhcp snooping information strategy replace

10.6 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:

T1600G-52TS(config)#ip dhcp snooping information remote-id tplink

10.7 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 on a specified port/LAG. 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 32 characters at most.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable and configure the customized sub-option Circuit ID for the Option 82 as "tplink" on port 1/0/1:

T1600G-52TS(config)#interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)#ip dhcp snooping information circuit-id tplink

10.8 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)#ip dhcp snooping trust

10.9 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)#ip dhcp snooping mac-verify

10.10 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)#ip dhcp snooping limit rate 20

10.11 ip dhcp snooping decline rate

Description

The **ip dhcp snooping decline rate** command is used to enable the Decline Protect feature and configure the rate limit on DHCP Decine packets. The excessive DHCP Decline packets will be discarded. To disable the Decline Protect feature, please use **no ip dhcp snooping decline rate** command.

Syntax

ip dhcp snooping decline rate *value*

no ip dhcp snooping decline rate

Parameter

value —— Specify the rate limit of DHCP Decline packets, and the optional values are 0, 5, 10, 15, 20, 25 and 30 (units:packet/second). It default value is 0, which stands for "disable".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Configure the rate limit of DHCP Decline packets as 20 packets per second on Gigabit Ethernet port 1/0/2:

T1600G-52TS(config)#interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)#ip dhcp snooping decline 20

10.12   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

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

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

T1600G-52TS(config)#show ip source binding

10.13   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:

T1600G-52TS#show ip dhcp snooping

10.14   show ip dhcp snooping interface

Description

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

Syntax

show ip dhcp snooping interface [**gigabitEthernet** *port* | **port-channel** *lagid*]

Parameters

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the DHCP Snooping configuration of all Ethernet ports and LAGs:

T1600G-52TS#show ip dhcp snooping interface

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

T1600G-52TS#show ip dhcp snooping interface gigabitEthernet 1/0/5

Chapter 11   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.

11.1 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:

T1600G-52TS(config)#ip arp inspection

11.2 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 and 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 gigabitEthernet / interface range gigabitEthernet)

Example

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

T1600G-52TS(config)#interface range gigabitEthernet 1/0/2-5

T1600G-52TS(config-if-range)#ip arp inspection trust

11.3 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 gigabitEthernet / interface range gigabitEthernet)

Example

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

T1600G-52TS(config)#interface range gigabitEthernet 1/0/2-6

T1600G-52TS(config-if-range)#ip arp inspection

11.4 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 gigabitEthernet / interface range gigabitEthernet)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)#ip arp inspection limit-rate 50

11.5 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 gigabitEthernet / interface range gigabitEthernet)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)#ip arp inspection recover

11.6 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:

T1600G-52TS(config)#show ip arp inspection

11.7 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 [**gigabitEthernet** *port*]

Parameter

port ——The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of Gigabit Ethernet port 1/0/1:

T1600G-52TS(config)#show ip arp inspection interface gigabitEthernet 1/0/1

Display the configuration of all Ethernet ports:

T1600G-52TS(config)#show ip arp inspection interface

11.8 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:

T1600G-52TS(config)#show ip arp inspection statistics

11.9 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:

T1600G-52TS(config)#clear ip arp inspection statistics

Chapter 12 DoS Defend Commands

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.

12.1 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:

T1600G-52TS(config)#ip dos-prevent

12.2 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 | win-nuke }

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

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.

win-nuke —— winNuke attack.

Command Mode

Global Configuration Mode

Example

Enable the DoS Defend Type named Land attack:

T1600G-52TS(config)#ip dos-prevent type land

12.3 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:

T1600G-52TS(config)#show ip dos-prevent

Chapter 13 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.

13.1 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:

T1600G-52TS(config)#logging buffer

13.2 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 6 indicating that the log information with level 0-6 will be saved in the log buffer.

Command Mode

Global Configuration Mode

Example

Set the severity level as 5:

T1600G-52TS(config)#logging buffer level 5

13.3 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. This function is disabled by default. 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:

T1600G-52TS(config)#logging file flash

13.4 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:

T1600G-52TS(config)#logging file flash frequency periodic 10

13.5 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 3 indicating that the log message marked with 0~3 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 :

T1600G-52TS(config)#logging file flash level 7

13.6 logging host index

Description

The **logging host index** command is used to configure the Log Host. 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 at most.

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

Enable log host 2 and set its IP address as 192.168.0.148, the level 5:

T1600G-52TS(config)# logging host index 2 192.168.0.148 5

13.7 logging monitor

Description

The **logging monitor** command is used to display the system logs on the terminal devices. To disable logging to the terminal, please use **no logging monitor** command. This function is enabled by default.

Syntax

logging monitor

no logging monitor

Command Mode

Global Configuration Mode

Example

Disable logging to the terminal devices:

T1600G-52TS(config)# no logging monitor

13.8 logging monitor level

Description

The **logging monitor level** command is used to limit messages logged to the terminal devices. System logs no higher than the set threshold level will be displayed on the terminal devices. To restore the threshold level to default value, please use **no logging monitor level** command.

Syntax

logging monitor level *level*

no logging monitor level

Parameter

level —— Severity level of the log information output to the terminal devices. 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 to the terminal devices. By default, it is 5 indicating that all the log information between level 0-5 will be output to the terminal devices.

Command Mode

Global Configuration Mode

Example

Set the severity level as 7:

T1600G-52TS(config)# logging monitor level 7

13.9 clear logging

Description

The **clear logging** command is used to clear the information in the log buffer and log file.

Syntax

clear logging [buffer | flash]

Parameter

buffer | flash —The output channels: buffer and flash. Clear the information of the two channels, by default.

Command Mode

Global Configuration Mode

Example

Clear the information in the log file:

T1600G-52TS(config)# clear logging buffer

13.10   show logging local-config

Description

The **show logging local-config** command is used to display the configuration of the Local Log output to the terminal, the log buffer and the log file.

Syntax

show logging local-config

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of the Local Log:

T1600G-52TS(config)# show logging local-config

13.11 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,
ranging from 1 to 4. 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:

T1600G-52TS(config)# show logging loghost 2

13.12 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.

Syntax

show logging buffer [**level** *level*]

Parameter

*leve*l —— 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.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the log information from level 0 to level 5 in the log buffer:

T1600G-52TS(config)# show logging buffer level 5

13.13 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.

Syntax

show logging flash [**level** *level*]

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.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the log information with the level marked 0~3 in the log file:

T1600G-52TS(config)# show logging flash level 3

Chapter 14   SSH Commands

SSH (Security Shell) can provide the unsecured remote management with security and powerful authentication to ensure the security of the management information.

14.1 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:

T1600G-52TS(config)# ip ssh server

14.2 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:

T1600G-52TS(config)# ip ssh version v2

14.3 ip ssh algorithm

Description

The **ip ssh algorithm** command is used to configure the algorithm in SSH function. To disable the specified algorithm, please use **no ip ssh algorithm** command.

Syntax

ip ssh algorithm { AES128-CBC | AES192-CBC | AES256-CBC | Blowfish-CBC | Cast128-CBC | 3DES-CBC | HMAC-SHA1 | HMAC-MD5 }

no ip ssh algorithm

Parameter

AES128-CBC | AES192-CBC | AES256-CBC | Blowfish-CBC | Cast128-CBC | 3DES-CBC | HMAC-SHA1 | HMAC-MD5 —— Specify the SSH algorithm.

Command Mode

Global Configuration Mode

Example

Specify the SSH algorithm as AES128-CBC:

T1600G-52TS(config)# ip ssh algorithm AES128-CBC

14.4 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 30 seconds:

T1600G-52TS(config)# ip ssh timeout 30

14.5 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:

T1600G-52TS(config)# ip ssh max-client 3

14.6 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 512 to 3072 bits.

ip-addr —— The IP address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

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:

T1600G-52TS(config)# ip ssh download v1 ssh-key **ip-address** 192.168.0.148

Download an SSH-1 type key file named ssh-key from TFTP server with the IP address fe80::1234:

T1600G-52TS(config)# ip ssh download v1 ssh-key **ip-address** fe80::1234

14.7 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:

T1600G-52TS# remove public-key v1

14.8 show ip ssh

Description

The **show ip ssh** command is used to display the global configuration of SSH.

Syntax

show ip ssh

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the global configuration of SSH:

T1600G-52TS(config)# show ip ssh

Chapter 15 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.

15.1 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:

T1600G-52TS(config)#dot1x system-auth-control

15.2 dot1x handshake

Description

The **dot1x handshake** command is used to enable the handshake feature. The handshake feature is used to detect the connection status between the TP-LINK 802.1x supplicant and the switch. Please disable the handshake feature if you are using a non-TP-LINK 802.1x-compliant client software. This feature is enabled by default.

Syntax

dot1x handshake

no dot1x handshake

Command Mode

Global Configuration Mode

Example

Disable the 802.1X handshake function:

T1600G-52TS(config)# no dot1x handshake

15.3 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". To restore to the default 802.1x authentication method, please use **no dot1x auth-method** command.

Syntax

dot1x auth-method { pap | eap }

no dot1x auth-method

Parameter

pap | eap ——Authentication Methods.

pap: EAP termination mode. IEEE 802.1X authentication system uses extensible authentication protocol (EAP) to exchange information between the switch and the client. The EAP packets are terminated at the switch and repackaged in the Password Authentication Protocol (PAP) packets, and then transferred to the RADIUS server.

eap: EAP relay mode. 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 are encapsulated in the advanced protocol (such as RADIUS) packets and transmitted to the authentication server.

Command Mode

Global Configuration Mode

Example

Configure the Authentication Method of IEEE 802.1X as "pap":

T1600G-52TS(config)#dot1x auth-method pap

15.4 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 sources.

Command Mode

Global Configuration Mode

Example

Enable the Guest VLAN function for VLAN 5:

T1600G-52TS(config)#dot1x guest-vlan 5

15.5 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:

T1600G-52TS(config)#dot1x quiet-period

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

T1600G-52TS(config)#dot1x quiet-period 5

15.6 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:

T1600G-52TS(config)#dot1x timeout server-timeout 5

15.7 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:

T1600G-52TS(config)#dot1x max-reauth-req 5

15.8 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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable the IEEE 802.1X function for the Gigabit Ethernet port 1/0/1:

T1600G-52TS(config)#interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)#dot1x

15.9 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 gigabitEthernet / interface range gigabitEtherne)

Example

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

T1600G-52TS(config)#interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)#dot1x guest-vlan

15.10　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 gigabitEthernet / interface range gigabitEthernet)

Example

Configure the Control Mode for Gigabit Ethernet port 1/0/20 as "authorized-force":

T1600G-52TS(config)#interface gigabitEthernet 1/0/20

T1600G-52TS(config-if)#dot1x port-control authorized-force

15.11   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 gigabitEthernet / interface range gigabitEthernet)

Example

Configure the Control Type for Gigabit Ethernet port 1/0/20 as "port-based":

T1600G-52TS(config)#interface gigabitEthernet 1/0/20

T1600G-52TS(config-if)#dot1x port-method port-based

15.12   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 tplink:

T1600G-52TS(config)#radius auth-pri 10.20.1.100 **auth-key** tplink

15.13   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:

T1600G-52TS(config)#radius server-account

15.14 show dot1x global

Description

The **show dot1x global** command is used to display the global configuration of 802.1X.

Syntax

show dot1x global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of 802.1X globally:

T1600G-52TS(config)#show dot1x global

15.15 show dot1x interface

Description

The **show dot1x interface** command is used to display all ports or the specified port's configuration information of 802.1X.

Syntax

show dot1x interface   [**gigabitEthernet** *port*] [**port-channel** *lagid*]

Parameter

port —— The Ethernet port number. If not specified, the information of all the ports will be displayed.

lagid —— The ID of the LAG. If not specified, the information of all the LAGs will be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration information of 802.1X for Gigabit Ethernet port 1/0/20:

T1600G-52TS(config)#show dot1x interface gigabitEthernet 1/0/20

Display the configuration information of 802.1X for all Ethernet ports:

T1600G-52TS(config)#show dot1x interface

15.16   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:

T1600G-52TS(config)#show radius accounting

15.17   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:

T1600G-52TS(config)#show radius authentication

Chapter 16 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.

16.1 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 gigabitEthernet** *port*

no mac address-table static { *mac-addr* | **vid** *vid* | *mac-addr* **vid** *vid* | **interface 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 Ethernet port number of your desired entry.

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 port 1 together:

T1600G-52TS(config)# mac address-table static 00:02:58:4f:6c:23 **vid** 1 **interface gigabitEthernet** 1/0/1

16.2 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 by default.

Command Mode

Global Configuration Mode

Example

Configure the aging time as 500 seconds:

T1600G-52TS(config)# mac address-table aging-time 500

16.3 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:

T1600G-52TS(config)# mac address-table filtering 00:1e:4b:04:01:5d **vid** 1

16.4 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 can not 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 64. By default this value is 64.

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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable Port Security function for port 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:

T1600G-52TS(config)# interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)# mac address-table max-mac-count max-number 30 **mode** static **status** enable

16.5 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:

T1600G-52TS(config)# show mac address-table

16.6 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:

T1600G-52TS(config)# show mac address-table aging-time

16.7 show mac address-table max-mac-count

Description

The **show mac address-table max-mac-count interface gigabitEthernet** command is used to display the security configuration of all ports or the specified port.

Syntax

show mac address-table max-mac-count { all **| interface gigabitEthernet** *port* }

Parameter

all —— Displays the security information of all the Ethernet ports.

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the security configuration of all ports:

T1600G-52TS(config)# show mac address-table max-mac-count

Display the security configuration of port 1/0/1:

T1600G-52TS(config)# show mac address-table max-mac-count interface gigabitEthernet 1/0/1

16.8 show mac address-table interface

Description

The **show mac address-table interface** command is used to display the address configuration of the specified port/LAG.

Syntax

show mac address-table interface { gigabitEthernet *port* **| port-channel** *lagid* **}**

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the address configuration of port 1/0/1:

T1600G-52TS(config)# show mac address-table interface gigabitEthernet 1/0/1

16.9 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 [**vlan** *vlan-id*]

Parameter

vlan-id —— Specify the VLAN which the MAC entries belong to.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the total MAC entry information in different VLANs:

T1600G-52TS(config)# show mac address-table count

16.10   show mac address-table address

Description

The **show mac address-table address** command is used to display the information of the specified MAC address.

Syntax

show mac address-table address *mac-addr* [**interface** { **gigabitEthernet** *port* | **port-channel** *lagid* } | **vid** *vlan-id*]

Parameter

mac-addr ——The specified MAC address.

port —— The Ethernet port number.

lagid —— The ID of the LAG.

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 00:00:00:00:23:00 in VLAN 1:

T1600G-52TS(config)#show mac address-table address 00:00:00:00:23:00

vid 1

16.11   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:

T1600G-52TS(config)# show mac address-table vlan 1

Chapter 17 System Configuration Commands

System Commands can be used to configure the System information and System IP, reboot and reset the switch, upgrade the switch system and other operations.

17.1 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, MM/DD/YYYY-HH:MM:SS

Command Mode

Global Configuration Mode

Example

Configure the system mode as manual, and the time is 12/20/2010 17:30:35

T1600G-52TS(config)# system-time manual 12/20/2010-17:30:35

17.2 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 Novosibrisk, 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, Welington.

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:

T1600G-52TS(config)#   **system-time**   **ntp**   UTC-12:00   133.100.9.2 139.79.100.163 11

17.3 system-time dst predefined

Description

The **system-time dst predefined** command is used to select a daylight saving time configuration from the predefined mode. The configuration can be used recurrently. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst predefined {USA | Australia | Europe | New-Zealand}

no system-time dst

Parameter

USA | Australia | Europe | New-Zealand —— The mode of daylight saving time. There are 4 options which are USA, Australia, Europe and New-Zealand respectively. The default value is Europe.

Following are the time ranges of each option:

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 daylight saving time as USA standard:

T1600G-52TS(config)#system-time dst predefined USA

17.4 system-time dst date

Description

The **system-time dst date** command is used to configure the one-off daylight saving time. The start date is in the current year by default. The time range of the daylight saving time must shorter than one year, but you can configure it spanning years. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst date {*smonth*} {*sday*} {*stime*} {*syear*} {*emonth*} {*eday*} {*etime*} {*eyear*}[*offset*]

no system-time dst

Parameter

smonth ——The start month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

sday —— The start day of the daylight saving time, ranging from 1 to 31. Here you should show special attention to February and the differences between a solar month and a lunar month.

stime —— The start moment of the daylight saving time, HH:MM.

syear —— The start year of the daylight saving time.

emonth —— The end month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

eday —— The end day of the daylight saving time, ranging from q to 31. Here you should show special attention to February and the differences between a solar month and a lunar month.

etime —— The end moment of the daylight saving time, HH:MM.

eyear —— The end year of the daylight saving time.

offset —— The number of minutes to add during the daylight saving time. It is 60 minutes by default.

Command Mode

Global Configuration Mode

Example

Configure the daylight saving time from zero clock, Apr 1st to zero clock Oct 1st and the offset is 30 minutes in 2015:

T1600G-52TS(config)# system-time dst date Apr 1 00:00 2015 Oct 1 00:00 2015 30

17.5 system-time dst recurring

Description

The **system-time dst recurring** command is used to configure the recurring daylight saving time. It can be configured spanning years. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst recurring {*sweek*} {*sday*} {*smonth*} {*stime*} {*eweek*} {*eday*} {*emonth*} {*etime*} [*offset*]

no system-time dst

Parameter

sweek——The start week of the daylight saving time. There are 5 values showing as follows: first, second, third, fourth, last.

sday —— The start day of the daylight saving time. There are 7 values showing as follows: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

smonth —— The start month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

stime —— The start moment of the daylight saving time, HH:MM.

eweek ——The end week of the daylight saving time. There are 5 values showing as follows: first, second, third, fourth, last.

eday —— The end day of the daylight saving time. There are 5 values showing as follows: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

emonth —— The end month of the daylight saving time. There are 12 values showing as following: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

etime —— The end moment of the daylight saving time, HH:MM.

offset —— The number of minutes to add during the daylight saving time. It is 60 minutes by default.

Command Mode

Global Configuration Mode

Example

Configure the daylight saving time from 2:00am, the first Sunday of May to 2:00am, the last Sunday of Oct and the offset is 45 minutes:

T1600G-52TS(config)# system-time dst recurring first Sun May 02:00 last Sun Oct 02:00 45

17.6 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. The length of the name ranges from 1 to 32 characters. By default, it is the device name, for example "T1600G-52TS".

Command Mode

Global Configuration Mode

Example

Configure the system name as TPLINK:

T1600G-52TS(config)# hostname TPLINK

17.7 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 SHENZHEN:

T1600G-52TS(config)# location SHENSHEN

17.8 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:

T1600G-52TS(config)# contact-info www.tp-link.com

17.9 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, port-channel interface, loopback interface and VLAN interface.

Syntax

ip address { *ip-addr* } { *mask* } [**secondary**]

no ip address [*ip-addr*] [*mask*]

Parameter

ip-addr —— The IP address of the Layer 3 interface.

mask —— The subnet mask of the Layer 3 interface.

secondary —— Specify the interface's secondary IP address. If this parameter is omitted here, the configured IP address is the interface's primary address.

Command Mode

Interface Configuration Mode

Example

Create the VLAN interface 2 with the primary IP address as 192.168.1.1/24 and secondary IP address as 192.168.2.1/24:

T1600G-52TS(config)# interface vlan 2
T1600G-52TS(config-if)# ip address 192.168.1.1 255.255.255.0
T1600G-52TS(config-if)# ip address 192.168.2.1 255.255.255.0 **secondary**

17.10   ip address-alloc

Description

The **IP address-alloc** 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, the LAG 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 Lay 3 routed port 1/0/1:

T1600G-52TS(config)# interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)# no switchport

T1600G-52TS(config-if)# ip address-alloc dhcp

Disable the IP address obtaining function on the VLAN interface 2:

T1600G-52TS(config)# interface vlan 2

T1600G-52TS(config-if)# no ip address

17.11   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

Command Mode

Privileged EXEC Mode

Example

Reset the software of the switch:

T1600G-52TS# reset

17.12   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

Command Mode

Privileged EXEC Mode

Example

Reboot the Switch:

17.13   copy running-config startup-config

Description

The **copy running-config startup-config** command is used to save the current settings.

Syntax

copy running-config startup-config

Command Mode

Privileged EXEC Mode

Example

Save current settings:

T1600G-52TS# copy running-config startup-config

17.14   copy startup-config tftp

Description

The **copy startup-config tftp** command is used to backup the configuration file to TFTP server.

Syntax

copy startup-config tftp ip-address *ip-addr* **filename** *name*

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be backup.

Command Mode

Privileged EXEC Mode

Example

Backup the configuration files to TFTP server with the IP 192.168.0.148 and name this file config.cfg:

T1600G-52TS# copy startup-config tftp ip-address 192.168.0.148 **filename** config

Backup the configuration files to TFTP server with the IP fe80::1234 and name this file config.cfg:

T1600G-52TS# copy startup-config tftp ip-address fe80::1234 **filename** config

17.15 copy tftp startup-config

Description

The **copy tftp startup-config** command is used to download the configuration file to the switch from TFTP server.

Syntax

copy tftp startup-config ip-address *ip-addr* **filename** *name*

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be downloaded.

Command Mode

Privileged EXEC Mode

Example

Download the configuration file named as config.cfg to the switch from TFTP server with the IP 192.168.0.148:

T1600G-52TS# copy tftp startup-config ip-address 192.168.0.148 **filename** config

Download the configuration file named as config.cfg to the switch from TFTP server with the IP fe80::1234

T1600G-52TS# copy tftp startup-config ip-address fe80::1234 **filename** config

17.16 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 }

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.

Command Mode

Global Configuration Mode

Example

Configure the image2.bin as the startup image:

T1600G-52TS(config)# boot application filename image2 startup

17.17   remove backup-image

Description

The **remove backup-image** command is used to delete the backup-image.

Syntax

remove backup-image

Command Mode

Privileged EXEC Mode

Example

Delete the backup image file:

T1600G-52TS# remove backup-image

17.18   firmware upgrade

Description

The **firmware upgrade** command is used to upgrade the switch's backup image file via the TFTP server. The uploaded firmware file will take place of the Backup Image, and user can chose whether to reboot the switch will the Backup Image.

Syntax

firmware upgrade **ip-address** *ip-addr* **filename** *name*

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the firmware file.

Command Mode

Privileged EXEC Mode

Example

Upgrade the switch's backup image file with the file firmware.bin in the TFTP server with the IP address 192.168.0.148, and reboot the switch with this firmware:

T1600G-52TS# firmware upgrade ip-address 192.168.0.148 **filename** firmware.bin

 It will only upgrade the backup image. Continue? (Y/N):y

 Operation OK!

 Reboot with the backup image? (Y/N): y

Upgrade the switch's backup iamge file with the file firmware.bin in the TFTP server with the IP address fe80::1234, but do not reboot the switch:

T1600G-52TS# firmware upgrade ip-address fe80::1234 **filename** firmware.bin

 It will only upgrade the backup image. Continue? (Y/N):y

 Operation OK!

 Reboot with the backup image? (Y/N): n

17.19 ping

Description

The **ping** command is used to test the connectivity between the switch and one node of the network.

Syntax

ping [ip | ipv6] { *ip_addr* } [**-n** *count*] [**-l** *count*] [**-i** *count*]

Parameter

ip —— The type of the IP address for ping test should be IPv4.

ipv6 —— The type of the IP address for ping test should be IPv6.

ip_addr —— The IP address of the destination node for ping test. If the parameter ip/ipv6 is not selected, both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

-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:

T1600G-52TS# ping 192.168.0.131 **–n** 8 **–l** 512

To test the connectivity between the switch and the network device with the IP fe80::1234, 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:

T1600G-52TS# ping fe80::1234 **–n** 8 **–l** 512

17.20   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 | ipv6] *ip_addr* [*maxHops*]

Parameter

ip —— The type of the IP address for tracert test should be IPv4.

ipv6 —— The type of the IP address for tracert test should be IPv6.

ip_addr —— The IP address of the destination device. If the parameter ip/ipv6 is not selected, both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

maxHops —— The maximum number of the route hops the test data can pass though. 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:

T1600G-52TS# tracert 192.168.0.131 20

Test the connectivity between the switch and the network device with the IP fe80::1234. If the destination device has not been found after 20 *maxHops*, the connection between the switch and the destination device is failed to establish:

T1600G-52TS# tracert fe80::1234 20

17.21   show system-info

Description

The **show system-info** command is used to display System Description, Device 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:

T1600G-52TS# show system-info

17.22   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

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the system image files' information:

T1600G-52TS# show image-info

17.23   show boot

Description

The **show boot** command is used to display the boot configuration of the system.

Syntax

show boot

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the system boot configuration information:

T1600G-52TS# show boot

17.24   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**

Command Mode

> Privileged EXEC Mode and Any Configuration Mode

Example

> Display the system current operating configuration:

> **T1600G-52TS# show running-config**

17.25 show startup-config

Description

> The **show startup-config** command is used to display the current configuration saved in the switch. These configuration settings will not be lost the next time you reboot the switch.

Syntax

> **show startup-config**

Command Mode

> Privileged EXEC Mode and Any Configuration Mode

Example

> Display the saved configuration:

> **T1600G-52TS# show startup-config**

17.26 show system-time

Description

> The **show system-time** command is used to display the time information of the switch.

Syntax

> **show system-time**

Command Mode

> Privileged EXEC Mode and Any Configuration Mode

Example

> Display the time information of the switch

> **T1600G-52TS# show system-time**

17.27   show system-time dst

Description

The **show system-time dst** command is used to display the DST (Daylight Saving Time) information of the switch.

Syntax

show system-time dst

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the DST information of the switch

T1600G-52TS# show system-time dst

17.28   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:

T1600G-52TS# show system-time ntp

17.29 show cable-diagnostics interface gigabitEthernet

Description

The **show cable-diagnostics interface gigabitEthernet** 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 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 port 3:

T1600G-52TS# show cable-diagnostics interface gigabitEthernet 1/0/3

17.30   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

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the CPU utilization information of the switch:

T1600G-52TS# show cpu-utilization

17.31   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

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the memory utilization information of the switch:

T1600G-52TS# show memory-utilization

Chapter 18   IPv6 Address Configuration Commands

The IPv6 address configuration commands are provided in the Interface Configuration Mode, which includes the routed port, the LAG and the VLAN interface. Enter the configuration mode of these Layer 3 interfaces and configure their IPv6 parameters.

18.1 ipv6 enable

Description

This command is used to enable the IPv6 function on the speicified Layer 3 interface. IPv6 function should be enabled before the IPv6 address configuration management. By default it is enabled on VLAN interface 1. IPv6 function can only be enabled on one Layer 3 interface at a time.

If the IPv6 function is disabled, the corresponding IPv6 netstack and IPv6-based modules will be invalid, for example SSHv6, SSLv6, TFTPv6 etc. To disable the IPv6 function, please use **no ipv6 enable** command.

Syntax

ipv6 enable

no ipv6 enable

Command Mode

Interface Configuration Mode

Example

Enable the IPv6 function on the VLAN interface 1：

T1600G-52TS(config)# interface vlan 1

T1600G-52TS(config-if)# ipv6 enable

18.2 ipv6 address autoconfig

Description

This command is used to enable the automatic configuration of the ipv6 link-local address. The switch has only one ipv6 link-local address, which can be configured automatically or manually. The general ipv6 link-local address has the prefix as fe80::/10. IPv6 routers cannot forward packets that have link-local source or destination addresses to other links. The autuconfigured ipv6 link-local address is in EUI-64 format. To verify the uniqueness of the link-local address, the manually configured ipv6 link-local address will be deleted when the autoconfigured ipv6 link-local address takes effect.

Syntax

> **ipv6 address autoconfig**

Configuration Mode

> Interface Configuration Mode

Example

> Enable the automatic configuration of the ipv6 link-local address on VLAN interface 1:

> **T1600G-52TS(config)# interface vlan** 1
>
> **T1600G-52TS(config-if)# ipv6 address autoconfig**

18.3 ipv6 address link-local

Description

> The **ipv6 address link-local** command is used to configure the ipv6 link-local address manually on a specified interface. To delete the configured link-local address, please use **no ipv6 address link-local** command.

Syntax

> **ipv6 address** *ipv6-addr* **link-local**
>
> **no ipv6 address** *ipv6-addr* **link-local**

Parameter

> *ipv6-addr* —— The link-local address of the interface. It should be a standardized IPv6 address with the prefix fe80::/10, otherwise this command will be invalid.

Configuration Mode

> Interface Configuration Mode

Example

> Configure the link-local address as fe80::1234 on the VLAN interface 1:

> **T1600G-52TS(config)# interface vlan** 1
>
> **T1600G-52TS(config-if)# ipv6 address** fe80::1234 **link-local**

18.4 ipv6 address dhcp

Description

> The **ipv6 address dhcp** command is used to enable the DHCPv6 Client function. When this function is enabled, the Layer 3 interface will try to obtain IP from DHCPv6 server. To delete the allocated IP from DHCPv6 server and

disable the DHCPv6 Client function, please use **no ipv6 address dhcp** command.

Syntax

ipv6 address dhcp

no ipv6 address dhcp

Configuration Mode

Interface Configuration Mode

Example

Enable the DHCP Client function on VLAN interface 1:

T1600G-52TS(config)# interface vlan 1

T1600G-52TS(config-if)# ipv6 address dhcp

18.5 ipv6 address ra

Description

This command is used to configure the interface's global IPv6 address according to the address prefix and other configuration parameters from its received RA(Router Advertisement) message. To disable this function, please use **no ipv6 address ra** command.

Syntax

ipv6 address ra

no ipv6 address ra

Configuration Mode

Interface Configuration Mode

Example

Enable the automatic ipv6 address configuration function to obtain IPv6 address through the RA message on VLAN interface 1:

T1600G-52TS(config)# interface vlan 1

T1600G-52TS(config-if)# ipv6 address ra

18.6 ipv6 address eui-64

Description

This command is used to manually configure a global IPv6 address with an extended unique identifier (EUI) in the low-order 64 bits on the interface. Specify only the network prefix. The last 64 bits are automatically computed from the switch MAC address. To remove an EUI-64 IPv6 address from the interface, please use the **no ipv6 address eui-64** command.

Syntax

ipv6 address *ipv6-addr* **eui-64**

no ipv6 address *ipv6-addr* **eui-64**

Parameter

ipv6-addr —— Global IPv6 address with 64 bits network prefix, for example 3ffe::/64.

Configuration Mode

Interface Configuration Mode

Example

Configure an EUI-64 global address on the interface with the network prefix 3ffe::/64:

T1600G-52TS(config)# interface vlan 1

T1600G-52TS(config-if)# ipv6 address 3ffe::/64 **eui-64**

18.7 ipv6 address

Description

This command is used to manually configure a global IPv6 address on the interface. To remove a global IPv6 address from the interface, please use **no ipv6 address** command.

Syntax

ipv6 address *ipv6-addr*

no ipv6 address *ipv6-addr*

Parameter

ipv6-addr —— Global IPv6 address with network prefix, for example 3ffe::1/64.

Configuration Mode

Interface Configuration Mode

Example

Configure the global address 3001::1/64 on VLAN interface 1:

T1600G-52TS(config)# interface vlan 1

T1600G-52TS(config-if)# ipv6 address 3001::1/64

18.8 show ipv6 interface

Description

This command is used to display the configured ipv6 information of the management interface, including ipv6 function status, link-local address and global address, ipv6 multicast groups etc.

Syntax

show ipv6 interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ipv6 information of the management interface:

T1600G-52TS(config)# show ipv6 interface

Chapter 19 Ethernet Configuration Commands

Ethernet Configuration Commands can be used to configure the Bandwidth Control, Negotiation Mode and Storm Control for Ethernet ports.

19.1 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 Ethernet port number.

Command Mode

Global Configuration Mode

Example

To enter the Interface gigabitEthernet Configuration Mode and configure port 2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

19.2 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 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 ports 1, 2, 3, 6, 7 and 9 at the same time by adding them to one port-list:

T1600G-52TS(config)# interface range gigabitEthernet 1/0/1-3,1/0/6-7,1/0/9

19.3 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Add a description Port _5 to port 1/0/5:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)# description Port_5

19.4 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Disable port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# shutdown

19.5 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the flow-control function for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# flow-control

19.6 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.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Configure the Duplex Mode as full-duplex for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# duplex full

19.7 jumbo

Description

The **jumbo** command is used to allow the jumbo frame to pass through this port. To disable this feature, please use **no jumbo** command. This feature is disabled by default.

Syntax

jumbo

no jumbo

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Allow jumbo frame on port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# jumbo

19.8 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 | auto }

no speed

Parameter

10 | 100 | 1000 | auto —— The speed mode of the Ethernet port. There are four options: 10Mbps, 100Mbps, 1000Mbps and Auto negotiation mode (default).

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Configure the Speed Mode as 100Mbps for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# speed 100

19.9 storm-control pps

Description

The **storm-control pps** command is used to configure the storm control mode as pps(packets per second) on an interface. To disable the pps mode, please use **no storm-control pps** command.

Syntax

storm-control pps

no storm-control pps

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

User Guidelines

This command should be used along with the **storm-control** command to enable the storm control function and specify the detailed parameters in pps mode.

Example

Set the storm control mode as pps on port 1/0/5:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)# storm-control pps

19.10   storm-control

Description

The **storm-control** command is used to enable the broadcast, multicast, or unicast strom control function and to set threshold levels on an interface. To disable the storm control function, please use **no storm-control** command.

Syntax

storm-control { broadcast | multicast | unicast } { kbps | ratio | pps } { *rate* }
no storm-control { broadcast | multicast | unicast }

Parameter

broadcast | multicast | unicast —— Enable broadcast/multicast/unicast storm control on the interface.

kbps | ratio | pps —— Specify the storm control type.

kbps: Specify the threshold in kbits per second.

ratio: Specify the threshold as a percentage of the bandwidth.

pps: Specify the threshold in packets per second.

rate —— Specify the bandwidth for receiving packets on the port. The specified type of packet traffic exceeding the bandwidth will be discarded. For kbps, the rate ranges from 1 to 10000000 kbps. For ratio, the rate ranges from 1 to 100 percent. For pps, the rate ranges from 1 to 1488000 packets per second.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

User Guidelines

Before you configure the storm-control type as kbps or ratio, pelease ensure that the port is not in pps mode.

Example

Configure the broadcast storm control rate as 1000 kbps on port 1/0/5:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)# storm-control broadcast kbps 1000

19.11 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: 1-1000000Kbps for the gigaport.

egress-rate —— Specify the bandwidth for sending packets. Range: 1-1000000Kbps for the gigaport.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Configure the ingress-rate as 5120Kbps and egress-rate as 1024Kbps for port 1/0/5:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)# bandwidth ingress 5120 **egress** 1024

19.12 clear counters

Description

The **clear counters** command is used to clear the statistics information of all the Ethernet ports and LAGs.

Syntax

clear counters

clear counters interface [**gigabitEthernet** *port*] [**port-channel** *lagid*]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Clear the statistic information of all ports and LAGs:

T1600G-52TS(config)# clear counters

19.13   show interface status

Description

The **show interface status** command is used to display the connection status of the Ethernet port/LAG.

Syntax

show interface status [**gigabitEthernet** *port*] [**port-channel** *lagid*]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG..

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the connection status of all ports and LAGs:

T1600G-52TS(config)# show interface status

Display the connection status of port 1/0/1:

T1600G-52TS(config)# show interface status gigabitEthernet 1/0/1

19.14   show interface counters

Description

The **show interface counters** command is used to display the statistics information of all ports/LAGs.

Syntax

show interface counters [**gigabitEthernet** *port*] [**port-channel** *lagid*]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the statistics information of all Ethernet ports and LAGs:

T1600G-52TS(config)# show interface counters

Display the statistics information of port 1/0/2:

T1600G-52TS(config)# show interface counters gigabitEthernet 1/0/2

19.15   show interface configuration

Description

The **show interface configuration** command is used to display the configurations of all ports and LAGs, including Port-status, Flow Control, Negotiation Mode and Port-description.

Syntax

show interface configuration [**gigabitEthernet** *port*] [**port-channel** *lagid*]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configurations of all Ethernet ports and LAGs:

T1600G-52TS(config)# show interface configuration

Display the configurations of port 1/0/2:

T1600G-52TS(config)# show interface configuration gigabitEthernet 1/0/2

19.16   show storm-control

Description

The **show storm-control** command is used to display the storm-control information of Ethernet ports.

Syntax

show storm-control interface [**gigabitEthernet** *port-list*] [**port-channel** *lagid-list*]

Parameter

port-list ——The list of Ethernet ports.

lagid-list —— The list of LAGs.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the storm-control information of port 1/0/4-7:

T1600G-52TS(config)# show storm-control interface gigabitEthernet 1/0/4-7

19.17   show bandwidth

Description

The **show bandwidth** command is used to display the bandwidth-limit information of Ethernet ports.

Syntax

show bandwidth interface [**gigabitEthernet** *port-list*] [**port-channel** *lagid-list*]

Parameter

port-list ——The list of Ethernet ports.

lagid-list —— The list of LAGs.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the bandwidth-limit information of port 1/0/4:

T1600G-52TS(config)# show bandwidth interface gigabitEthernet 1/0/4

Chapter 20   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.

20.1 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

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 1/0/5 as 3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)# qos 3

20.2 qos dscp

Description

The **qos dscp** command is used to enable the mapping relation between DSCP Priority and CoS value. 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 CoS value.

Example

Enable the mapping relation between DSCP Priority and CoS value:

T1600G-52TS(config)# qos dscp

20.3 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 TC0 toTC7 respectively.

Command Mode

Global Configuration Mode

User Guidelines

1. By default, the mapping relation between tag/cos and the egress queue is: 0/CoS 0-TC1, 1/CoS 1-TC0, 2/CoS 2-TC2, 3/CoS 3-TC3, 4/CoS 4-TC4, 5/CoS 5-TC5, 6/CoS 6-TC6, 7/CoS 7-TC7.

2. Among the priority levels TC0-TC7, the bigger value, the higher priority.

Example

Map CoS 5 to TC 2:

T1600G-52TS(config)# qos queue cos-map 5 2

20.4 qos queue dscp-map

Description

The **qos queue dscp-map** command is used to configure the mapping relation between DSCP Priority and the CoS value. 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-id* }

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-id —— The priority level the packets with tag are mapped to, which ranges from CoS 0 to CoS 7.

Command Mode

Global Configuration Mode

User Guidelines

By default, the mapping relation between tag and the egress queue is: (0-7)-CoS 0, (8-15)-CoS 1, (16-23)-CoS 2, (24-31)-CoS 3, (32-39)-CoS 4, (40-47)-CoS 5, (48-55)-CoS 6, (56-63)-CoS 7.

Example

Map DSCP values 10-12 to CoS 2:

T1600G-52TS(config)# qos queue dscp-map 10-12 2

20.5 qos queue mode

Description

The **qos queue mode** command is used to configure the Schedule Mode. To return to the default Equal-Mode, 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 | spwrr | 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 values of TC0, TC1, TC2, TC3, TC4, TC5,TC6 and TC7 are customized in **qos queue weight** command and their default values are 1, 2, 4, 8, 16, 32, 64 and 127 respectively.

spwrr —— Strict-Priority + Weight Round Robin Mode. In this mode, the switch provides two scheduling groups, SP group and WRR group. SP group is processed prior to WRR group. Queues in SP group are scheduled strictly based on Strict-Priority mode while the queues inside WRR group follow the WRR mode. In SP+WRR mode, TC7 and the queue with its weight value set as 0 are in the SP group; other queues, with none-zero weight value, belong to the WRR group and the weight value can be customized in **qos queue weight**

command. The weight values of TC0, TC1, TC2, TC3, TC4, TC5 and TC6 are 1, 2, 4, 8, 16, 32 and 64 respectively, while the value of TC7 is 0 and non-configurable.

equ —— Equal-Mode. In this mode, all the queues occupy the bandwidth equally. The weight value ratio of all the queues is 1:1:1:1:1:1:1:1

Command Mode

Global Configuration Mode

Example

Specify the Schedule Mode as Weight Round Robin Mode:

T1600G-52TS(config)# qos queue mode wrr

20.6 qos queue weight

Description

The **qos queue weight** command is used to configure weight value of each queue after the Schedule Mode is specified as WRR or SP+WRR. 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, TC3, TC4, TC5,TC6 and TC7.

Syntax

qos queue weight { *tc-id* } { *weight-value* }

Parameter

tc-id —— The ID of the TC queue, ranging from 0 to 7.

weight-value —— Configure the weight value of the specified TC queue.

When the schedule mode is specified as WRR, the weight value ranges from 1 to 127. The 8 queues will take up the bandwidth according to their ratio. The default values of TC0, TC1, TC2, TC3, TC4, TC5,TC6 and TC7 are 1, 2, 4, 8, 16, 32, 64 and 127 respectively.

When the schedule mode is specified as SP+WRR, the weight value ranges from 0 to 127. TC7 and the queue with its weight value set as 0 are in the SP group; other queues, with none-zero weight value, belong to the WRR group. In this SP+WRR scheduling mode, the queues in the SP group is scheduled preferentially (TC6>TC5>TC4>TC3>TC2>TC1>TC0 in strict priority). When there is no packets to be sent in the SP group, the queues in the WRR group will be scheduled according to the weight value of each queue. The default weight

values of TC0, TC1, TC2, TC3, TC4, TC5 and TC6 are 1, 2, 4, 8, 16, 32 and 64 respectively, while the value of TC7 is 0 and non-configurable.

Command Mode

Global Configuration Mode

Example

Specify the Schedule Mode as Weight Round Robin Mode, with the weight values of TC0, TC1, TC2 and TC3 as 4, 7, 15 and 24:

T1600G-52TS(config)# qos queue mode wrr

T1600G-52TS(config)# qos queue weight 0 4

T1600G-52TS(config)# qos queue weight 1 7

T1600G-52TS(config)# qos queue weight 2 15

T1600G-52TS(config)# qos queue weight 3 24

20.7 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 [**gigabitEthernet** *port-list*] [**port-channel** *lagid-list*]

Parameter

port-list ——The list of Ethernet ports.

lagid-list —— The list of LAGs.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of QoS for all ports and LAGs:

T1600G-52TS# show qos interface

Display the configuration of QoS for ports 1/0/1-4:

T1600G-52TS# show qos interface gigabitEthernet 1/0/1-4

20.8 show qos cos-map

Description

The **show qos cos-map** command is used to display the configuration of IEEE 802.1P 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:

T1600G-52TS# show qos cos-map

20.9 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:

T1600G-52TS# show qos dscp-map

20.10   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:

T1600G-52TS# show qos queue mode

20.11 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:

T1600G-52TS# show qos status

Chapter 21　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.

21.1 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. The **no monitor session** command is used to delete the corresponding monitoring port or monitor session.

Syntax

monitor session *session_num* **destination interface gigabitEthernet** *port*

no monitor session *session_num* **destination interface gigabitEthernet** *port*

no monitor session *session_num*

Parameter

session_num —— The monitor session number, can only be specified as 1.

port —— The monitoring port number.

Command Mode

Global Configuration Mode

Example

Create monitor session 1 and configure port 1/0/1 as the monitoring port:

T1600G-52TS(config)#　monitor　session 1 **destination　interface gigabitEthernet** 1/0/1

Delete the monitoring port 1/0/2 from monitor session 1：

T1600G-52TS(config)# no　monitor　session 1 **destination　interface gigabitEthernet** 1/0/2

Delete the monitor session 1:

T1600G-52TS(config)# no monitor session 1

21.2 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 gigabitEthernet** *port-list mode*

no monitor session *session_num* **source interface gigabitEthernet** *port-list mode*

Parameter

session_num —— The monitor session number, can only be specified as 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. The monitoring port is corresponding to current interface configuration mode.

2. Monitored ports number is not limited, but it can't be the monitoring port at the same time.

3. Whether the monitoring port and monitored ports are in the same VLAN or not is not demanded strictly.

4. The monitoring port and monitored ports cannot be link-aggregation member.

Example

Create monitor session 1, then configure port 4, 5, 7 as monitored port and enable ingress monitoring:

T1600G-52TS(config)# monitor session 1 **source interface gigabitEthernet** 1/0/4-5,1/0/7 rx

Delete port 4 in monitor session 1 and its configuration:

T1600G-52TS(config)# no monitor session 1 **source interface gigabitEthernet** 1/0/4 rx

21.3 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, can only be specified as 1. It is optional.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the monitoring configuration of monitor session 1:

T1600G-52TS(config)# show monitor session 1

Chapter 22　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.

22.1　port isolation

Description

The **port isolation** command is used to configure the forward port/LAG list of a port/LAG, so that this port/LAG can only communicate with the ports/LAGs on its list. To delete the corresponding configuration, please use **no port isolation** command.

Syntax

port isolation { [**gi-forward-list** *gi-forward-list*] [**po-forward-list** *po-forward-list*] }

no port isolation

Parameter

gi-forward-list —— The list of Ethernet ports.

po-forward-list —— The list of LAGs.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set port 1, 2, 4 and LAG 2 to the forward list of port 1/0/5:

T1600G-52TS(config)# interface gigabitEthernet 1/0/5

T1600G-52TS(config-if)#　port　isolation　gi-forward-list　1/0/1-2,1/0/4 **po-forward-list** 2

Set all Ethernet ports and LAGs to forward list of port 1/0/2, namely restore to the default setting:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# no port isolation

22.2 show port isolation interface

Description

The **show port isolation interface** command is used to display the forward port list of a port/LAG.

Syntax

show port isolation interface [**gigabitEthernet** *port* | **port-channel** *lagid*]

Parameter

port —— The number of Ethernet port you want to show its forward port list, in the format of 1/0/2.

lagid —— The ID of LAG you want to show its forward port list, ranging from 1 to 6.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the forward-list of port 1/0/2:

T1600G-52TS# show port isolation interface gigabitEthernet 1/0/2

Display the forward-list of all Ethernet ports and LAGs:

T1600G-52TS# show port isolation interface

Chapter 23 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.

23.1 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:

T1600G-52TS(config)# loopback-detection

23.2 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.

Command Mode

Global Configuration Mode

Example

Specify the interval-time as 50 seconds:

T1600G-52TS(config)# loopback-detection interval 50

23.3 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:

T1600G-52TS(config)# loopback-detection recovery-time 3

23.4 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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable the loopback detection function of ports 1-3:

T1600G-52TS(config)# interface range gigabitEthernet 1/0/1-3

T1600G-52TS(Config-if-range)# loopback-detection

23.5 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

process-mode —— 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.

recovery-mode —— 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 gigabitEthernet / interface range gigabitEthernet)

Example

Configure the loopback detection process-mode as port-based and recovery-mode as manual for port 2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# loopback-detection config process-mode port-based **recovery-mode** manual

23.6 loopback-detection recover

Description

The **loopback-detection recover** command is used to remove the block status of selected ports, recovering the blocked ports to normal status,

Syntax

loopback-detection recover

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Recover the blocked port 2 to normal status:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# loopback-detection recover

23.7 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:

T1600G-52TS# show loopback-detection global

23.8 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:

T1600G-52TS# show loopback-detection interface

Display the configuration of loopback detection function and the status of port 5:

T1600G-52TS# show loopback-detection interface gigabitEthernet 1/0/5

Chapter 24 ACL Commands

24.1 access-list create

Description

The **access-list create** command is used to create standard-IP ACL and extend-IP ACL.

Syntax

access-list create *access-list-num*

Parameter

access-list-num —— ACL ID, ranging from 500 to 2499. The ID range of Standard-IP ACL ranges is 500-1499 and the Extend-IP ACL is 1500-2499.

Command Mode

Global Configuration Mode

Example

Create a standard-IP ACL whose ID is 523:

T1600G-52TS(config)# access-list create 523

24.2 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 *access-list-num*

no mac access-list *access-list-num*

Parameter

access-list-num —— ACL ID, ranging from 0 to 499.

Command Mode

Global Configuration Mode

Example

Create a MAC ACL whose ID is 23:

T1600G-52TS(config)# mac access-list 23

24.3 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*]

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.

Command Mode

Global Configuration Mode

Example

Create a Standard-IP ACL whose ID is 520, 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, and the packets match this rule will be forwarded by the switch:

T1600G-52TS(config)# access-list create 520

24.4 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*] [**s-port** *s-port*] [**d-port** *d-port*] [**protocol** *protocol*]

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.

s-port —— The source port number.

d-port —— The destination port number.

protocol —— Configure the value of the matching protocol.

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, and the packets match this rule will be forwarded by the switch:

T1600G-52TS(config)# access-list create 2220

T1600G-52TS(config)# access-list extended 2220 **rule** 10 permit **sip** 192.168.0.100 **smask** 255.255.255.0

24.5 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*]

no rule *rule-id*

Parameter

rule-id —— The rule ID.

deny —— The operation to discard packets.

permit ——The operation to forward packets. It is the default value.

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.

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 11:11:11:11:11:00, and the packets match this rule will be forwarded by the switch:

T1600G-52TS(config)# mac access-list 20

T1600G-52TS(config-mac-acl)# rule 10 permit **smac** 00:01:3F:48:16:23

smask 11:11:11:11:11:00

24.6 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:

T1600G-52TS(config)# access-list policy name policy1

24.7 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 120 to policy1 and create an action for them:

T1600G-52TS(config)# access-list policy action policy1 120

24.8 access-list bind acl

Description

The **access-list bind acl** command is used to bind an ACL to the specified port. To cancel the bind relation, please use **no access-list bind acl** command.

Syntax

access-list bind acl *acl-id*

no access-list bind acl *acl-id*

Parameter

acl-id —— The ID of the ACL desired to bind.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Bind ACL 100 to port 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# access-list bind acl 100

24.9 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Bind policy1 to port 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# access-list bind policy1

24.10   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:

T1600G-52TS(config)# interface vlan 2

T1600G-52TS(config-if)# access-list bind policy1

24.11   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:

24.12   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:

T1600G-52TS(config)# show access-list policy policy1

24.13   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:

T1600G-52TS(config)# show access-list bind

Chapter 25   PoE Commands

⚠ Note: Only T1600G-28PS and T1600G-52PS support PoE function.

PoE (Power over Ethernet) technology describes a system to transmit electrical power along with data to remote devices over standard twisted-pair cable in an Ethernet network. It is especially useful for supplying power to IP telephones, wireless LAN access points, cameras and so on.

A time-range based PoE enables you to implement PoE power supply by differentiating the time-ranges.

25.1 power inline consumption (global)

Description

The **power inline consumption** command is used to configure the max power the PoE switch can supply globally.

Syntax

power inline consumption *power-limit*

Parameter

power-limit ——The max power the PoE switch can supply. For T1600G-28PS it ranges from 1 to 192W, and for T1600G-52PS it ranges from 1 to 384W.

Command Mode

Global Configuration Mode

Example

Configure the max power the PoE switch can supply as 160W:

T1600G-52PS(config)# power inline consumption 160

25.2 power profile

Description

The **power profile** command is used to create a PoE profile for the switch. To delete the configured PoE profile configuration, please use **no power profile** command. PoE Profile is a short cut for the configuration of the PoE port. In a PoE profile, the PoE status, PoE priority and power limit are configured. You can specify a PoE profile for each PoE port individually.

Syntax

power profile *name* [**supply** { enable | disable } [**priority** { low | middle | high }
[**consumption** { *power-limit* | auto | class1 | class2 | class3 | class4 }]]]

no power profile *name*

Parameter

name —— The PoE profile name, ranging from 1 to 16 characters. If the name
being assigned contains spaces then put it inside double quotes.

supply —— The PoE status of the port in the profile. By default, the PoE status
is "enable".

priority —— The PoE priority of the port in the profile. The priority levels include
"high", "middle" and "low" in descending order. When the supply power exceeds
the system power limit, the PD linked to the port with lower priority will be
disconnected. By default, the PoE priority is "low".

consumption —— The max power the port in the profile can supply. There are
six options: "power-limit", "auto", "class1", "class2", "class3" and "class4".
"power-limit" indicates you can manually enter a value. It ranges from 1 to 300.
The value is in the unit of 0.1 watt. For instance, if you want to configure the max
power as 5w, you should enter 50. "auto" indicates the value is assigned
automatically by the PoE switch. "class1" represents 4w. "class2" represents 7w.
"class3" represents 15.4w. "class4" represents 30w.

Command Mode

Global Configuration Mode

Example

Create a PoE profile named "IP Camera" whose PoE status is "enable", PoE
priority is "low" and the power limit is "5w":

T1600G-52PS(config)# power profile "IP Camera" **supply** enable **priority**
low **consumption** 50

25.3 power time-range

Description

The **power time-range** command is used to create PoE time-range for the switch
and enter Power Time-range Configuration Mode. After a PoE time-range is
created, you need to specify the date and time which has three mode options:
absolute, periodic and holiday. A PoE time-range is the intersection of absolute
time-range and periodic time-range with holiday included or excluded. To delete

the corresponding PoE time-range configuration, please use **no power time-range** command. The PoE time-range determines the power supply time of the switch. You can specify a PoE time-range for each PoE port individually.

Syntax

power time-range *name*

no power time-range *name*

Parameter

name —— The PoE time-range name, ranging from 1 to 16 characters.

Command Mode

Global Configuration Mode

Example

Create a PoE time-range named "tRange1" for the switch:

T1600G-52PS(config)# power time-range tRange1

25.4 absolute

Description

The **absolute** command is used to create an absolute mode time-range for the Time-range of the switch. The Time-range takes affect only when both Absolute Time and Periodic Time are in effect.

Repeat this command to create multiple absolute time-ranges. Up to 7 absolute time-ranges can be created in one Time-range, and their union is the Absolute Time-range.

If no absolute time range is configured, the absolute time range takes effect from January 1, 2000 00:00 to December 31, 2099 24:00.

To delete the corresponding absolute time-range, please use **no absolute** command.

Syntax

absolute from *start-date* **to** *end-date*

no absolute [*index*]

Parameter

start-date —— The start date in Absolute Mode, in the format of MM/DD/YYYY-HH:MM.

end-date —— The end date in Absolute Mode, in the format of MM/DD/YYYY-HH:MM.

index —— Specify the index of the absolute time-range to delete. If not specified, all absolute time-ranges will be deleted.

Command Mode

Power Time-range Configuration Mode

Example

Create an absolute mode time-range for the PoE of the switch and specify the date extending from 08:00 on May 5th, 2012 to 22:00 on Oct. 5th, 2012:

T1600G-52PS(config)# power time-range tRange1

T1600G-52PS(config-time-range)# absolute from 05/05/2012-08:00 **to**

10/05/2012-22:00

25.5 periodic

Description

The **periodic** command is used to create a periodic mode time-range for the PoE time-range of the switch. The periodic time-range reccurs every week. The Time-range takes affect only when both Absolute Time and Periodic Time are in effect.

Repeat this command to create multiple periodic time-ranges. Up to 7 periodic time-ranges can be created in one Time-range, and their union is the Periodic Time-range.

If no periodic time range is configured, the periodic time range takes effect all the time from Monday to Sunday.

To delete the corresponding periodic mode time-range configuration, please use **no periodic** command.

Syntax

periodic start *start-time* **end** *end-time* **day-of-the-week** *day-of-the-week*

no periodic [*index*]

Parameter

start-date —— The start time in the day in periodic mode, in the format of HH:MM.

end-date —— The end time in the day in periodic mode, in the format of HH:MM.

day-of-the-week —— Specify the days included in a week, ranging from 1-7, in the format as 1,3-4.

index —— Specify the index of the periodic time-range to delete. If not specified, all periodic time-ranges will be deleted.

Command Mode

Power Time-range Configuration Mode

Example

Configure the Time-range named "tRange2" with two periodic time-ranges: one is from 08:00 to 18:00 during Monday to Friday, the other is from 10:00 to 16:00 during the weekends:

T1600G-52PS(config)# power time-range tRange2

T1600G-52PS(config-time-range)# periodic start 08:00 **end** 18:00

day-of-the-week 1-5

T1600G-52PS(config-time-range)# periodic start 10:00 **end** 16:00

day-of-the-week 6-7

25.6 power holiday

Description

The **power holiday** command is used to create PoE holiday for the switch. To delete the corresponding PoE holiday configuration, please use **no power holiday** command.

Syntax

power holiday *name* **start-date** *start-date* **end-date** *end-date*

no power holiday *name*

Parameter

name —— The PoE holiday name, ranging from 1 to 16 characters.

start-date —— The start date of the PoE holiday, in the format of MM/DD, for instance, 05/01.

end-date ——The end date of the PoE holiday, in the format of MM/DD, for instance, 05/03.

Command Mode

Global Configuration Mode

Example

Create a PoE holiday named "LaborDay", and configure the start date as October 1st and the end date as October 3rd:

T1600G-52PS(config)# **power holiday** LaborDay **start-date** 05/01 **end-date** 05/03

25.7 holiday

Description

The **holiday** command is used to configure holiday mode for the Time-range of the switch. The holiday will be excluded from the Time-range you created if the Holiday mode is Exclude.

Syntax

holiday { exclude | include }

Parameter

exclude ——The final Time range will be the intersection of the Absolute Time and the Periodic Time, with Holiday excluded.

include —— The Holiday has no effect on the Time-range, which means the final Time-range will be the intersection of the Absolute Time and Periodic Time.

Command Mode

Power Time-range Configuration Mode

Example

Create a holiday mode time-range for the PoE time-range named "tRange3" and configure PoE time-range of the switch excludes the PoE holiday:

T1600G-52PS(config)# power time-range tRange3

T1600G-52PS(config-time-range)# holiday exclude

25.8 power inline consumption (interface)

Description

The **power inline consumption** command is used to configure the power limit the corresponding port can supply.

Syntax

power inline consumption { *power-limit* | auto | class1 | class2 | class3 | class4 }

Parameter

consumption —— The max power the port in the profile can supply. There are six options: "power-limit", "auto", "class1", "class2", "class3" and "class4". "power-limit" indicates you can manually enter a value. It ranges from 1 to 300. The value is in the unit of 0.1 watt. For instance, if you want to configure the max

power as 5w, you should enter 50. "auto" indicates the value is assigned automatically by the PoE switch. "class1" represents 4w. "class2" represents 7w. "class3" represents 15.4w. "class4" represents 30w.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the power limit as "5w" for port 2:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# power inline consumption 50

25.9 power inline priority

Description

The **power inline priority** command is used to configure the PoE priority for the corresponding port

Syntax

power inline priority { low | middle | high }

Parameter

priority ——The PoE priority of the port. The priority levels include "high", "middle" and "low" in descending order. When the supply power exceeds the system power limit, the PD linked to the port with lower priority will be disconnected. By default, the priority level is "low".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the PoE priority as "low" for port 2:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# power inline priority low

25.10　power inline supply

Description

The **power inline supply** command is used to configure the PoE status of the corresponding port.

Syntax

power inline supply { enable | disable }

Parameter

enable | disable —— The PoE status of the port. By default, the PoE status is "enable".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Enable the PoE feature for port 2:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# power inline supply enable

25.11　power inline profile

Description

The **power inline profile** command is used to bind a PoE profile to the corresponding port. To cancel the bind relation, please use **no power inline profile** command.

Syntax

power inline profile *name*

no power inline profile

Parameter

name —— The name of the PoE profile to be bound to the port. If the name being assigned contains spaces then put it inside double quotes.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Bind the PoE profile named "IP Camera" to port 2:

> **T1600G-52PS(config)# interface gigabitEthernet** 1/0/2
>
> **T1600G-52PS(config-if)# power inline profile** "IP Camera"

25.12　power inline time-range

Description

The **power inline time-range** command is used to bind a PoE time-range to the corresponding port. To cancel the bind relation, please use **no power inline time-range** command.

Syntax

power inline time-range *name*

no power inline time-range

Parameter

name —— The name of the PoE time-range to be bound to the port.

Command Mode

Interface Configuration Mode

Example

Bind the PoE time-range named "tRange2" to port 2:

> **T1600G-52PS(config)# interface gigabitEthernet** 1/0/2
>
> **T1600G-52PS(config-if)# power inline time-range** tRange2

25.13　show power inline

Description

The **show power inline** command is used to display the global PoE information of the system.

Syntax

show power inline

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the PoE information of the system:

T1600G-52PS# show power inline

25.14   show power inline configuration interface

Description

The **show power inline configuration interface** command is used to display the PoE configuration of the certain port.

Syntax

show power inline configuration interface [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the PoE configuration of all ports:

T1600G-52PS# show power inline configuration interface

25.15   show power inline information interface

Description

The **show power inline information** command is used to display the PoE information of the certain port.

Syntax

show power inline information interface [**gigabitEthernet** port]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the PoE information of all ports:

T1600G-52PS# show power inline information interface

25.16   show power profile

Description

The **show power profile** command is used to display the defined PoE profile.

Syntax

show power profile

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the defined PoE profile:

T1600G-52PS# show power profile

25.17   show power holiday

Description

The **show power holiday** command is used to display the defined PoE holiday.

Syntax

show power holiday

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the defined PoE holiday:

T1600G-52PS# show power holiday

25.18   show power time-range

Description

The **show power time-range** command is used to display the configuration of PoE time-range.

Syntax

show power time-range [*name*]

Parameter

name —— The PoE time-range name, ranging from 1 to 16 characters. All PoE time-range configurations will be displayed if not specified.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of PoE time-range:

T1600G-52PS# show power time-range

Chapter 26 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.

26.1 debug spanning-tree

Description

The **debug spanning-tree** command is used to enable debuggning of spanning-tree activities. To disable the debugging function, please use **no debug spanning-tree** command.

Syntax

debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

no debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

Parameters

all —— Display all the spanning-tree debug messages.

bpdu receive —— Display the debug messages of the received spanning-tree bridge protocol data unit (BPDU).

bpdu transmit —— Display the debug messages of the sent spanning-tree BPDU.

cmpmsg —— Display the message priority debug messages.

errors —— Display the MSTP error debug messages.

flush —— Display the address table flushing debug messages.

init —— Display the data structure initialization debug messages.

migration —— Display the version migration debug messages.

proposals —— Display the MSTP handshake debug messages.

roles —— Display the MSTP interface role switchling debug messages.

state —— Display the MSTP interface state change debug messages.

tc —— Display the MSTP topology event debug messages.

Command Mode

Privileged EXEC Mode

Example

Display all the spanning-tree debug messages:

T1600G-52TS# debug spanning-tree all

26.2 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:

T1600G-52TS(config)# spanning-tree

26.3 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the STP function for port 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# spanning-tree

26.4 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** *pri*] [**ext-cost** *ext-cost*] [**int-cost** *int-cost*] [**portfast** { enable | disable }] [**point-to-point** { auto | open | close }]

no spanning-tree common-config

Parameter

pri —— 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 o 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 o 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the STP function of port 1, and configure the Port Priority as 64, ExtPath Cost as 100, IntPath Cost as 100, and then enable Edge Port:

T1600G-52TS(config)# interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)# spanning-tree common-config port-priority 64

ext-cost 100 **int-cost** 100 **portfast** enable **point-to-point** open

26.5 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:

T1600G-52TS(config)# spanning-tree mode mstp

26.6 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:
>
> **T1600G-52TS(config)# spanning-tree mst configuration**
>
> **T1600G-52TS(Config-mst)#**

26.7 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:
>
> **T1600G-52TS(config)# spanning-tree mst configuration**
>
> **T1600G-52TS(config-mst)# instance** 1 **vlan** 1-100
>
> Disable Instance 1, namely remove all the mapping VLANs 1-100:
>
> **T1600G-52TS(config)# spanning-tree mst configuration**
>
> **T1600G-52TS(config-mst)# no instance** 1

Remove VLANs 1-50 in mapping VLANs 1-100 for Instance 1:

T1600G-52TS(config)# spanning-tree mst configuration

T1600G-52TS(config-mst)# no instance 1 **vlan** 1-50

26.8 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":

T1600G-52TS(config)# spanning-tree mst configuration

T1600G-52TS(config-mst)# name region1

26.9 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:

T1600G-52TS(config)# spanning-tree mst configuration

26.10 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** *pri*

no spanning-tree mst instance *instance-id* **priority**

Parameter

instance-id —— Instance ID, ranging from 1 to 8.

pri —— 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:

T1600G-52TS(config)# spanning-tree mst instance 1 **priority** 4096

26.11 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** *pri*] | [**cost** *cost*]}

no spanning-tree mst instance *instance-id*

Parameter

instance-id —— Instance ID, ranging from 1 to 8.

pri —— 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 200000. The lower value has the higher priority. Its default value is 0 meaning "auto".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Configure the priority of port 1 in MST Instance 1 as 64, and path cost as 2000:

T1600G-52TS(config)# interface gigabitEthernet 1/0/1

T1600G-52TS(config-if)# spanning-tree mst instance 1 **port-priority** 64 **cost** 2000

26.12 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 *pri*

no spanning-tree priority

Parameter

pri —— Bridge priority, ranging from 0 to 61440. It is 32768 by default.

Command Mode

Global Configuration Mode

Example

Configure the bridge priority as 4096:

T1600G-52TS(config)# spanning-tree priority 4096

26.13 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:

T1600G-52TS(config)# spanning-tree tc-defend threshold 30 **period** 10

26.14 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 * (Forward Delay - 1) >= 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 * (Hello Time + 1) <= 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:

T1600G-52TS(config)# spanning-tree timer forward-time 16 **hello-time** 3 **max-age** 22

26.15   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:

T1600G-52TS(config)# spanning-tree hold-count 8

26.16   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:

T1600G-52TS(config)# spanning-tree max-hops 30

26.17   spanning-tree bpdufilter

Description

The **spanning-tree bpdufilter** 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 bpdufilter** command.

Syntax

spanning-tree bpdufilter

no spanning-tree bpdufilter

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the BPDU filter function for port 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

26.18   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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the BPDU protect function for port 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# spanning-tree bpduguard

26.19   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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the Loop Protect function for port 2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# spanning-tree guard loop

26.20   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 ridge. 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the Root Protect function for port 2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# spanning-tree guard root

26.21   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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

> Enable the TC Protect of Spanning Tree for port 2:
>
> **T1600G-52TS(config)# interface gigabitEthernet** 1/0/2
>
> **T1600G-52TS(config-if)# spanning-tree guard tc**

26.22   spanning-tree mcheck

Description

> The **spanning-tree mcheck** command is used to enable mcheck.

Syntax

> **spanning-tree mcheck**

Command Mode

> Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

> Enable mcheck for port 2:
>
> **T1600G-52TS(config)# interface gigabitEthernet** 1/0/2
>
> **T1600G-52TS(config-if)# spanning-tree mcheck**

26.23   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

Display the active information of spanning-tree:

T1600G-52TS(config)# show spanning-tree active

26.24   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:

T1600G-52TS(config)# show spanning-tree bridge

26.25   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 [**gigabitEthernet** *port* | **port-channel** *lagid*] [edge | ext-cost | int-cost | mode | p2p | priority | role | state | status]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the spanning-tree information of all ports:

T1600G-52TS(config)# show spanning-tree interface

Display the spanning-tree information of port 1/0/2:

T1600G-52TS(config)# show spanning-tree interface gigabitEthernet 1/0/2

Display the spanning-tree mode information of port 1/0/2:

T1600G-52TS(config)# show spanning-tree interface gigabitEthernet 1/0/2

mode

26.26 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 [**gigabitEthernet** *port* | **port-channel** *lagid*] [bpdufilter | bpduguard | loop | root | tc | tc-defend]

Parameter

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the protect information of all ports:

T1600G-52TS(config)# show spanning-tree interface-security

Display the protect information of port 1:

T1600G-52TS(config)# show spanning-tree interface-security

gigabitEthernet 1/0/1

Display the interface security bpdufilter information:

T1600G-52TS(config)# show spanning-tree interface-security bpdufilter

26.27 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** [**gigabitEthernet** *port* | **port-channel** *lagid*]] }

Parameter

instance-id —— Instance ID desired to show, ranging from 1 to 8.

port —— The Ethernet port number.

lagid —— The ID of the LAG.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the region information and mapping information of VLAN and MST Instance:

T1600G-52TS(config)#show spanning-tree mst configuration

Display the related information of MST Instance 1:

T1600G-52TS(config)#show spanning-tree mst instance 1

Display all the ports information of MST Instance 1:

T1600G-52TS(config)#show spanning-tree mst instance 1 **interface**

Chapter 27   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.

27.1 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:

T1600G-52TS(config)# ip igmp snooping

27.2 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable IGMP Snooping function of port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# ip igmp snooping

27.3 ip igmp snooping rtime

Description

The **ip igmp snooping rtime** command is used to specify router port aging time globally. To restore the default timer, please use **no ip igmp snooping rtime** command.

Syntax

ip igmp snooping rtime *rtime*

no ip igmp snooping rtime

Parameter

rtime —— Specify the aging time in seconds, ranging from 60 to 600. The default aging time is 300 seconds.

Command Mode

Global Configuration Mode

Example

Specify IGMP Snooping router port aging time as 100 seconds globally:

T1600G-52TS(config)# ip igmp snooping rtime 100

27.4 ip igmp snooping mtime

Description

The **ip igmp snooping mtime** command is used to specify member port aging time globally. The default aging time is 260 seconds. To restore the default timer, please use **no ip igmp snooping mtime** command.

Syntax

ip igmp snooping mtime *mtime*

no ip igmp snooping mtime

Parameter

mtime —— Specify the aging time in seconds, ranging from 60 to 600. The default aging time is 260 seconds.

Command Mode

Global Configuration Mode

Example

Specify IGMP Snooping member port aging time as 100 seconds globally:

T1600G-52TS(config)# ip igmp snooping mtime 100

27.5 ip igmp snooping report-suppression

Description

The **ip igmp snooping report-suppression** command is used enable the IGMP report suppression function. When it is enabled, the switch forwards only the first IGMP report message per mulicast group to the Layer 3 device, and the subsequent IGMP reports from the same multicast group are discarded. To disable the IGMP report suppression function and forward all the IGMP reports to the Layer 3 device, please use **no ip igmp snooping report-suppression** command. This function is disabled by default.

Syntax

ip igmp snooping report-suppression

no ip igmp snooping report-suppression

Command Mode

Global Configuration Mode

Example

Enable the IGMP report suppression function:

T1600G-52TS(config)# ip igmp snooping report-suppression

27.6 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the Fast Leave function for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# ip igmp snooping immediate-leave

27.7 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 to process unknown multicast as discard:

T1600G-52TS(config)# ip igmp snooping drop-unknown

27.8 ip igmp snooping last-listener query-inteval

Description

The **ip igmp snooping last-listener query-inteval** command is used to specify the interval to send Specific Query Message. The default value is 1 second. To restore the default interval, please use **no ip igmp snooping last-listener query-inteval** command.

Syntax

ip igmp snooping last-listener query-inteval *interval*

no ip igmp snooping last-listener query-inteval

Parameter

interval —— Specify the interval to send Specific Query Message in seconds, ranging from 1 to 5.

Command Mode

Global Configuration Mode

Example

Specify the interval of Specific Query Message to 3 seconds:

T1600G-52TS(config)# ip igmp snooping last-listener query-inteval 3

27.9 ip igmp snooping last-listener query-count

Description

The **ip igmp snooping last-listener query-count** command is used to specify the numbers of Specific Query Message to be sent. The default value is 2. To restore the default number, please use **no ip igmp snooping last-listener query-count** command.

Syntax

ip igmp snooping last-listener query-count *num*

no ip igmp snooping last-listener query-count

Parameter

num —— Specify the numbers of Specific Query Message to be sent, ranging from 1 to 5.

Command Mode

Global Configuration Mode

Example

Specify the number of Specific Query Message to 3:

T1600G-52TS(config)# ip igmp snooping last-listener query-count 3

27.10 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. To restore the default values, please use **no ip igmp snooping vlan-config** with specified parameters.

Syntax

ip igmp snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

ip igmp snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }

no ip igmp snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

no ip igmp snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }

Parameter

vlan-id-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 0 and the global router-time will be used.

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 0 and the global member-time will be used.

port-list ——— The list of Ethernet ports.

lagid ——— The ID of the LAGs.

ip ——— The static multicast IP address.

Command Mode

Global Configuration Mode

Example

Enable the IGMP Snooping function and modify Router Port Time as 300 seconds, Member Port Time as 200 seconds for VLAN 1-3, and set the router port as 1/0/1 for VLAN 1-2:

T1600G-52TS(config)# ip igmp snooping vlan-config 1-3 **rtime** 300

T1600G-52TS(config)# ip igmp snooping vlan-config 1-3 **mtime** 200

T1600G-52TS(config)# ip igmp snooping vlan-config 1-2 **rport interface**

gigabitEthernet 1/0/1

Add static multicast IP address 225.0.0.1, which corresponds to VLAN 2, and configure the forward ports as ports 1/0/1-3:

T1600G-52TS(config)# ip igmp snooping vlan-config 2 **static** 225.0.0.1

interface gigabitEthernet 1/0/1-3

27.11　ip igmp snooping multi-vlan-config

Description

The **ip igmp snooping multi-vlan-config** command is used to create Multicast VLAN. To delete the corresponding Multicast VLAN, please use **no ip igmp snooping multi-vlan-config** command. To restore the default values, please use **no ip igmp snooping multi-vlan-config** with specified parameters.

Syntax

ip igmp snooping multi-vlan-config [*vlan-id*] [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

no ip igmp snooping multi-vlan-config [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

Parameter

vlan-id —— The ID of the multicast VLAN desired to create or modify, ranging from 2 to 4094. If not specified, the default multicast VLAN will be selected.

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 0 and the global router-time will be used.

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 0 and the global member-time will be used.

port-list —— The list of Ethernet ports.

lagid —— The ID of the LAGs.

Command Mode

Global Configuration Mode

Example

Enable Multicast VLAN 3, and configure Router Port Time as 100 seconds, Member Port Time 100 seconds, and Static Router Port port 1/0/3:

T1600G-52TS(config)# ip igmp snooping multi-vlan-config 3 **rtime** 100

T1600G-52TS(config)# ip igmp snooping multi-vlan-config 3 **mtime** 100

27.12 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 VLAN 1:

T1600G-52TS(config)#ip igmp snooping querier vlan 1

27.13 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:

T1600G-52TS(config)#ip igmp snooping querier vlan 2 **query-interval** 200

T1600G-52TS(config)#ip igmp snooping querier vlan 2 **max-response-time** 20

27.14   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 1000 and the default value is 1000.

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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

T1600G-52TS(config)#interface range gigabitEthernet 1/0/2-5

T1600G-52TS(config-if-range)#ip igmp snooping max-groups 10

T1600G-52TS(config-if-range)#ip igmp snooping max-groups action replace

27.15 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:

T1600G-52TS(config)# ip igmp profile 1

27.16 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:

T1600G-52TS(config)# ip igmp profile 1
T1600G-52TS(config-igmp-profile)#deny

27.17 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:

T1600G-52TS(config)# ip igmp profile 1
T1600G-52TS(config-igmp-profile)#permit

27.18 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. A profile contains 16 filtering IP-range entries at most.

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:

T1600G-52TS(config)# ip igmp profile 1

T1600G-52TS(config-igmp-profile)#range 225.1.1.1 226.3.2.1

27.19 ip igmp filter

Description

The **ip igmp filter** command is used to bind the specified profile to the interface. To delete the binding, please use **no ip igmp filter** command.

Syntax

ip igmp filter *profile-id*
no ip igmp filter

Parameter

profile-id —— Specify the profile ID, ranging from 1 to 999.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Bind profile 1 to interface gigabitEthernet 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# ip igmp filter 1

27.20 clear ip igmp snooping statistics

Description

The **clear ip igmp snooping statistics** command is used to clear the statistics of the IGMP packets.

Syntax

clear ip igmp snooping statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Clear the statistics of the IGMP packets:

T1600G-52TS(config)# clear ip igmp snooping statistics

27.21 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:

T1600G-52TS# show ip igmp snooping

27.22 show ip igmp snooping interface

Description

The **show ip igmp snooping interface** command is used to display the port configuration of IGMP snooping.

Syntax

show ip igmp snooping interface [**gigabitEthernet** [*port* | *port-list*]] { basic-config | max-groups | packet-stat }

show ip igmp snooping interface [**port-channel** [*lagid*]] { basic-config | max-groups }

Parameter

port —— The Ethernet port number.

port-list —— The list of Ethernet ports.

basic-config | max-groups | packet-stat —— The related configuration information selected to display.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the IGMP baisic configuration configuration of all ports and LAGs:

T1600G-52TS# show ip igmp snooping interface basic-config

Display the IGMP basic configuration of port 1/0/2:

T1600G-52TS# show ip igmp snooping interface gigabitEthernet 1/0/2 basic-config

Display the IGMP packet statistics of ports 1/0/1-4:

T1600G-52TS# show ip igmp snooping interface gigabitEthernet 1/0/1-4 packet-stat

27.23 show ip igmp snooping vlan

Description

The **show ip igmp snooping vlan** command is used to display the VLAN configuration of IGMP snooping.

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:

T1600G-52TS# show ip igmp snooping vlan 2

27.24 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:

T1600G-52TS# show ip igmp snooping multi-vlan

27.25 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* }] [*multicast_addr* | count | dynamic | dynamic count | static | static count]

Parameter

vlan-id ——The VLAN ID selected to display the information of all multicast items.

multicast_addr —— IP address of the multicast group.

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:

T1600G-52TS#show ip igmp snooping groups

Display all the multicast entries in VLAN 5:

T1600G-52TS(config)#show ip igmp snooping groups vlan 5

Display the count of multicast entries in VLAN 5:

T1600G-52TS(config)#show ip igmp snooping groups vlan 5 count

Display the dynamic multicast groups of VLAN 5

T1600G-52TS(config)#show ip igmp snooping groups vlan 5 dynamic

Display the static multicast groups of VLAN 5

T1600G-52TS(config)#show ip igmp snooping groups vlan 5 static

Display the count of dynamic multicast entries of VLAN 5

T1600G-52TS(config)#show ip igmp snooping groups vlan 5 dynamic count

Display the count of static multicast entries of VLAN 5

T1600G-52TS(config)#show ip igmp snooping groups vlan 5 static count

27.26   show ip igmp snooping querier

Description

The **show ip igmp snooping querier** command is used to display the Querier configuration of VLAN.

Syntax

show ip igmp snooping querier [**vlan** *vlan-id*]

Parameter

vlan-id ——The VLAN ID selected to display, ranging from 1 to 4094.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display all Querier information:

T1600G-52TS(config)# show ip igmp snooping querier

27.27 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, ranging from 1 to 999.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration information of all profiles:

T1600G-52TS(config)# show ip igmp profile

Chapter 28 MLD Snooping Commands

MLD Snooping (Multicast Listener Discovery Snooping) is a multicast control mechanism running on Layer 2 switch. It can effectively prevent multicast groups being broadcasted in the IPv6 network.

28.1 ipv6 mld snooping(global)

Description

The **ipv6 mld snooping** command is used to enable MLD Snooping function globally. If this function is disabled, all related MLD Snooping function would not work. To disable this function, please use **no ipv6 mld snooping** command.

Syntax

ipv6 mld snooping

no ipv6 mld snooping

Command Mode

Global Configuration Mode

Example

Enable MLD Snooping:

T1600G-52TS(config)# ipv6 mld snooping

28.2 ipv6 mld snooping(interface)

Description

The **ipv6 mld snooping** command is used to enable MLD Snooping function on the desired port. To disable this function, please use **no ipv6 mld snooping** command.

Syntax

ipv6 mld snooping

no ipv6 mld snooping

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable MLD Snooping on port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# ipv6 mld snooping

28.3 ipv6 mld snooping rtime

Description

The **ipv6 mld snooping rtime** command is used to specify router port aging time globally. To restore the default timer, please use **no ipv6 mld snooping rtime** command.

Syntax

ipv6 mld snooping rtime *rtime*

no ipv6 mld snooping rtime

Parameter

rtime —— Specify the aging time in seconds, ranging from 60 to 600. The default aging time is 300 seconds.

Command Mode

Global Configuration Mode

Example

Specify MLD Snooping router port aging time as 100 seconds globally:

T1600G-52TS(config)# ipv6 mld snooping rtime 100

28.4 ipv6 mld snooping mtime

Description

The **ipv6 mld snooping mtime** command is used to specify member port aging time globally. The default aging time is 260 seconds. To restore the default timer, please use **no ipv6 mld snooping mtime** command.

Syntax

ipv6 mld snooping mtime *mtime*

no ipv6 mld snooping mtime

Parameter

mtime —— Specify the aging time in seconds, ranging from 60 to 600. The default aging time is 260 seconds.

Command Mode

Global Configuration Mode

Example

Specify MLD Snooping member port aging time as 100 seconds globally:

T1600G-52TS(config)# ipv6 mld snooping mtime 100

28.5 ipv6 mld snooping report-suppression

Description

The **ipv6 mld snooping report-suppression** command is used enable the MLD report suppression function. When it is enabled, the switch forwards only the first MLD report message per mulicast group to the Layer 3 device, and the subsequent MLD reports from the same multicast group are discarded. To disable the MLD report suppression function and forward all the MLD reports to the Layer 3 device, please use **no ipv6 mld snooping report-suppression** command. This function is disabled by default.

Syntax

ipv6 mld snooping report-suppression

no ipv6 mld snooping report-suppression

Command Mode

Global Configuration Mode

Example

Enable MLD Report message suppression function:

T1600G-52TS(config)# ipv6 mld snooping report-suppression

28.6 ipv6 mld snooping immediate-leave

Description

The **ipv6 mld snooping immediate-leave** command is used to configure the Fast Leave function for port. To disable the Fast Leave function, please use **no ipv6 mld snooping immediate-leave** command.

Syntax

ipv6 mld snooping immediate-leave

no ipv6 mld snooping immediate-leave

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Enable the Fast Leave function for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# ipv6 mld snooping immediate-leave

28.7 ipv6 mld snooping drop-unknown

Description

The **ipv6 mld snooping drop-unknown** command is used to enable the unknown multicast packets filter function. To disable this function, please use **no ipv6 mld snooping drop-unknown** command. By default, it is disabled.

Syntax

ipv6 mld snooping drop-unknown

no ipv6 mld snooping drop-unknown

Command Mode

Global Configuration Mode

Example

Enable unknown multicast filter function:

T1600G-52TS(config)# ipv6 mld snooping drop-unknown

28.8 ipv6 mld snooping last-listener query-inteval

Description

The **ipv6 mld snooping last-listener query-inteval** command is used to specify the interval to send Specific Query Message. The default value is 1 second. To restore the default interval, please use **no ipv6 mld snooping last-listener query-inteval** command.

Syntax

ipv6 mld snooping last-listener query-inteval *interval*

no ipv6 mld snooping last-listener query-inteval

Parameter

interval —— Specify the interval to send Specific Query Message in seconds, ranging from 1 to 5.

Command Mode

Global Configuration Mode

Example

Specify the interval of Specific Query Message to 3 seconds:

T1600G-52TS(config)# ipv6 mld snooping last-listener query-inteval 3

28.9 ipv6 mld snooping last-listener query-count

Description

The **ipv6 mld snooping last-listener query-count** command is used to specify the numbers of Specific Query Message to be sent. The default value is 2. To

restore the default number, please use **no ipv6 mld snooping last-listener query-count** command.

Syntax

ipv6 mld snooping last-listener query-count *num*

no ipv6 mld snooping last-listener query-count

Parameter

num —— Specify the numbers of Specific Query Message to be sent, ranging from 1 to 5.

Command Mode

Global Configuration Mode

Example

Specify the number of Specific Query Message to 3:

T1600G-52TS(config)# ipv6 mld snooping last-listener query-count 3

28.10   ipv6 mld snooping vlan-config

Description

The **ipv6 mld snooping vlan-config** command is used to enable VLAN MLD Snooping function or to modify MLD Snooping parameters, and to create static multicast IP entry. To disable the VLAN MLD Snooping function, please use **no ipv6 mld snooping vlan-config** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

ipv6 mld snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }

no ipv6 mld snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

no ipv6 mld snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }

Parameter

vlan-id-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 MLD 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 0 and the global router-time will be used.

member-time —— Member Port Time. Within this time, if the switch does not receive MLD 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 0 and the global member-time will be used.

port-list —— The list of Ethernet ports.

lagid —— The ID of the LAGs.

ip —— The static multicast IP address.

Command Mode

Global Configuration Mode

Example

Enable the MLD Snooping function and modify Router Port Time as 300 seconds, Member Port Time as 200 seconds for VLAN 1-3, and set the router port as 1/0/1 for VLAN 1-2:

T1600G-52TS(config)# ipv6 mld snooping vlan-config 1-3 **rtime** 300

T1600G-52TS(config)# ipv6 mld snooping vlan-config 1-3 **mtime** 200

T1600G-52TS(config)# ipv6 mld snooping vlan-config 1-2 **rport interface gigabitEthernet** 1/0/1

Add static multicast IP address ff01::1234:01, which corresponds to VLAN 2, and configure the forward ports as ports 1/0/1-3:

T1600G-52TS(config)# ipv6 mld snooping vlan-config 2 **static** ff01::1234:01 **interface gigabitEthernet** 1/0/1-3

28.11   ipv6 mld snooping multi-vlan-config

Description

The **ipv6 mld snooping multi-vlan-config** command is used to create Multicast VLAN. To delete the corresponding Multicast VLAN, please use **no ipv6 mld snooping multi-vlan-config** command. To restore the default values, please use **no ipv6 mld snooping multi-vlan-config** with specified parameters.

Syntax

ipv6 mld snooping multi-vlan-config [*vlan-id*] [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

no ipv6 mld snooping multi-vlan-config [**rtime** *router-time* | **mtime** *member-time* | **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *lagid* }]

Parameter

vlan-id —— The ID of the multicast VLAN desired to create or modify, ranging from 2 to 4094. If not specified, the default multicast VLAN will be selected.

router-time —— Router Port Time. Within this time, if the switch does not receive MLD 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 0 and the global router-time will be used.

member-time —— Member Port Time. Within this time, if the switch does not receive MLD 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 0 and the global member-time will be used.

port-list —— The list of Ethernet ports.

lagid —— The ID of the LAGs.

Command Mode

Global Configuration Mode

Example

Enable Multicast VLAN 3, and configure Router Port Time as 100 seconds, Member Port Time 100 seconds, and Static Router Port port 1/0/3:

T1600G-52TS(config)# ipv6 mld snooping multi-vlan-config 3 **rtime** 100

T1600G-52TS(config)# ipv6 mld snooping multi-vlan-config 3 **mtime** 100

T1600G-52TS(config)# ipv6 mld snooping multi-vlan-config 3 **rport**

interface gigabitEthernet 1/0/3

28.12   ipv6 mld snooping querier vlan

Description

The **ipv6 mld snooping querier vlan** command is used to enable the MLD Querier function. To disable this function, please use **no ipv6 mld snooping querier vlan** command.

Syntax

ipv6 mld snooping querier vlan *vlan-id*

no ipv6 mld snooping querier vlan *vlan-id*

Parameter

vlan-id —— The VLAN that enables the MLD querier function, ranging from 1 to 4094.

Command Mode

Global Configuration Mode

Example

Enable MLD Querier function on VLAN 2:

T1600G-52TS(config)# ipv6 mld snooping querier vlan 2

28.13　ipv6　mld　snooping　querier　vlan　(general query)

Description

The **ipv6 mld snooping querier vlan** command is used to configure the parameters for MLD Snooping Querier to send a general query frame. To return to the default configuration, please use **no ipv6 mld snooping querier vlan** command.

Syntax

ipv6 mld snooping querier vlan *vlan-id* { **query-interval** *interval* | **max-response-time** *response-time* | **general-query source-ip** *ip-addr* }

no ipv6 mld 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 MLD 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 MLD Snooping Querier. It should not be a multicast IP or a broadcast IP. By default, it is fe80::02ff:ffff:fe00:0001.

Command Mode

Global Configuration Mode

Example

For VLAN 2, specify its query-interval as 200 seconds, and the response-time as 20 seconds:

T1600G-52TS(config)#ipv6 mld snooping querier vlan 2 **query-interval** 200

T1600G-52TS(config)#ipv6 mld snooping querier vlan 2

max-response-time 20

28.14   ipv6 mld snooping max-groups

Description

The **ipv6 mld snooping max-groups** command is used to configure the maximum number of groups that a port can join in. The **ipv6 mld snooping max-groups action** is used to configure the action that the port takes when it receives an MLD 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 ipv6 mld snooping max-groups** command. To return to the default action of dropping the report, please use the **no ipv6 mld snooping max-groups action** command. These commands only apply to the dynamic multicast groups.

Syntax

ipv6 mld snooping max-groups [*maxgroup*]

ipv6 mld snooping max-groups action { drop | replace }

no ipv6 mld snooping max-groups

no ipv6 mld snooping max-groups action

Parameter

maxgroup   —— Specify the maximum numbers of groups that the port can join. It ranges from 0 to 1000 and the default value is 1000.

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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

T1600G-52TS(config)#interface range gigabitEthernet 1/0/2-5

T1600G-52TS(config-if-range)#ipv6 mld snooping max-groups 10

T1600G-52TS(config-if-range)#ipv6 mld snooping max-groups action

replace

28.15 ipv6 mld profile

Description

The **ipv6 mld profile** command is used to create the configuration profile. To delete the corresponding profile, please use **no ipv6 mld profile** command.

Syntax

ipv6 mld profile *id*

no ipv6 mld 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:

T1600G-52TS(config)# ipv6 mld profile 1

28.16 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:

T1600G-52TS(config)# ipv6 mld profile 1
T1600G-52TS(config-mld-profile)#deny

28.17 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:

T1600G-52TS(config)# ipv6 mld profile 1
T1600G-52TS(config-mld-profile)#permit

28.18 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. A profile contains 16 filtering IP-range entries at most.

Syntax

range *start-ip end-ip*
no range *start-ip end-ip*

Parameter

start-ip —— Start IPv6 multicast address of the filter entry..

end-ip —— End IPv6 multicast address of the filter entry.

Command Mode

Profile Configuration Mode

Example

Configure one of the filter multicast address entry as range ff80::1234 to ff80::1235 in profile 1:

T1600G-52TS(config)# ipv6 mld profile 1

T1600G-52TS(config-mld-profile)#range ff80::1234 ff80::1235

28.19   ipv6 mld filter

Description

The **ipv6 mld filter** command is used to bind the specified profile to the interface. To delete the binding, please use **no ipv6 mld filter** command.

Syntax

ipv6 mld filter *profile-id*

no ipv6 mld filter

Parameter

profile-id —— Specify the profile ID, ranging from 1 to 999.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Bind profile 1 to interface gigabitEthernet 1/0/2:

T1600G-52TS(config)# interface gigabitEthernet 1/0/2

T1600G-52TS(config-if)# ipv6 mld filter 1

28.20   clear ipv6 mld snooping statistics

Description

The **clear ipv6 mld snooping statistics** command is used to clear the statistics of the MLD packets.

Syntax

clear ipv6 mld snooping statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Clear the statistics of the MLD packets:

T1600G-52TS(config)# clear ipv6 mld snooping statistics

28.21　show ipv6 mld snooping

Description

The **show ipv6 mld snooping** command is used to display the global configuration of MLD Snooping.

Syntax

show ipv6 mld snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the global configuration of MLD Snooping:

T1600G-52TS(config)# show ipv6 mld snooping

28.22　show ipv6 mld snooping interface

Description

The **show ipv6 mld snooping interface** command is used to display the port configuration of MLD snooping.

Syntax

show ipv6 mld snooping interface [**gigabitEthernet** [*port* | *port-list*]] { basic-config | max-groups | packet-stat }

show ipv6 mld snooping interface [**port-channel** [*lagid*]] { basic-config | max-groups }

Parameter

port —— The Ethernet port number.

port-list —— The list of Ethernet ports.

basic-config | max-groups | packet-stat —— The related configuration information selected to display.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the MLD baisic configuration configuration of all ports and LAGs:

T1600G-52TS# show ipv6 mld snooping interface basic-config

Display the MLD basic configuration of port 1/0/2:

T1600G-52TS# show ipv6 mld snooping interface gigabitEthernet 1/0/2

basic-config

Display the MLD packet statistics of ports 1/0/1-4:

T1600G-52TS# show ipv6 mld snooping interface gigabitEthernet 1/0/1-4

packet-stat

28.23   show ipv6 mld snooping vlan

Description

The **show ipv6 mld snooping vlan** command is used to display VLAN information of MLD Snooping.

Syntax

show ipv6 mld snooping vlan [*vlan-id*]

Parameter

vlan-id —— The VLAN ID selected to display, ranging from 1 to 4094.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display all of the VLAN information:

T1600G-52TS(config)# show ipv6 mld snooping vlan

28.24   show ipv6 mld snooping multi-vlan

Description

The **show ipv6 mld snooping multi-vlan** command is used to display the Multicast VLAN configuration.

Syntax

show ipv6 mld snooping multi-vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the Multicast VLAN configuration:

T1600G-52TS# show ipv6 mld snooping multi-vlan

28.25   show ipv6 mld snooping groups

Description

The **show ipv6 mld snooping groups** command is used to display multicast groups.

Syntax

show ipv6 mld snooping groups [**vlan** { *vlan-id* }] [*ipv6_multicast_addr* | count | dynamic | dynamic count | static | static count]

Parameter

vlan-id ——The VLAN ID selected to display the information of all multicast items.

ipv6_multicast_addr —— IPv6 address of the multicast group.

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 all of the multicast groups:

T1600G-52TS(config)# show ipv6 mld snooping groups

28.26   show ipv6 mld snooping querier

Description

The **show ipv6 mld snooping querier** command is used to display the Querier configuration of VLAN.

Syntax

show ipv6 mld snooping querier [**vlan** *vlan-id*]

Parameter

vlan-id ——The VLAN ID selected to display, ranging from 1 to 4094.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display all Querier information:

28.27   show ipv6 mld profile

Description

The **show ipv6 mld profile** command is used to display the configuration information of all the profiles or a specific profile.

Syntax

show ipv6 mld profile [*id*]

Parameter

id —— Specify the ID of the profile, ranging from 1 to 999.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration information of all profiles:

T1600G-52TS(config)# show ipv6 mld profile

Chapter 29   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.

29.1 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:

T1600G-52TS(config)# snmp-server

29.2 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 includes 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:

T1600G-52TS(config)# snmp-server view view1 1.3.6.1.6.3.20 include

29.3 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 Mode and SNMP v2c Mode.

read-view —— Select the View to be the Read View. The management access is restricted to read-only, and changes cannot be made to the assigned SNMP View.

write-view —— Select the View to be the Write 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-view —— Select the View to be the Notify View. The management station can receive notification messages of the assigned SNMP view generated by the switch's SNMP agent.

Command Mode

Global Configuration mode

Example

Add a group, and configure the name as group1, the Security Model as SNMP v3, the security level as authNoPriv, the management access to the assigned View viewDefault as read-write, besides the notification messages sent by View viewDefault can be received by Management station:

T1600G-52TS(config)# snmp-server group group1 **smode** v3 **slev**

authNoPriv **read** viewDefault **write** viewDefault **notify** viewDefault

Delete group1:

T1600G-52TS(config)# no snmp-server group group1 **smode** v3 **slev**

authNoPriv

29.4 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 means 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:

29.5 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.

Command Mode

Global Configuration Mode

Example

Add community public, and the community has read-write management right to View viewDefault:

T1600G-52TS(config)# snmp-server community public read-write

viewDefault

29.6 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.

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. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

udp-port —— UDP port, which is used to send notifications. The UDP port functions with the IP address for the notification sending. It ranges from 1 to 65535.

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:

T1600G-52TS(config)# snmp-server host 192.168.0.146 162 admin **smode** v2c **type** inform **retries** 100 **timeout** 1000

Add a Notification entry, and configure the IP Address of the management Host as fe80::1234, 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:

T1600G-52TS(config)# snmp-server host fe80::1234 162 admin **smode** v2c **type** inform **retries** 100 **timeout** 1000

29.7 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-engineID —— 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-engineID —— 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. The **snmp-server engineID** will be disabled if the **local** and **remote** are both not configured.

Command Mode

Global Configuration Mode

Example

Specify the local engineID as 1234567890, and the remote engineID as abcdef123456:

T1600G-52TS(config)# snmp-server engineID local 1234567890 **remote** abcdef123456

29.8 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 | auth-failure]

no snmp-server traps snmp [linkup | linkdown | warmstart | coldstart | auth-failure]

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.

auth-failure —— Enable the auth-failure trap. It is sent when a received SNMP request fails the authentication. By default, it is enabled.

Command Mode

Global Configuration Mode

Example

Enable SNMP standard linkup trap for the switch:

T1600G-52TS(config)# snmp-server traps snmp linkup

29.9 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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable SNMP link status trap for port 1/0/3:

T1600G-52TS(config)# interface gigabitEthernet 1/0/3

T1600G-52TS(config-if)# snmp-server traps link-status

29.10 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 | loopback-detection | storm-control | spanning-tree | memory }

no snmp-server traps { bandwidth-control | cpu | flash | 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.

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:

T1600G-52TS(config)# snmp-server traps bandwidth-control

29.11   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:

T1600G-52TS(config)# snmp-server traps mac

Enable new MAC address trap only for the switch:

T1600G-52TS(config)# snmp-server traps mac new

29.12 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：

T1600G-52TS(config)# snmp-server traps vlan

Enable VLAN-created trap only for the switch:

T1600G-52TS(config)# snmp-server traps vlan create

29.13　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 gigabitEthernet** *port* [**interval** *seconds*] [**owner** *owner-name*]　[**buckets** *number*]

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 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".

number —— The maximum number of buckets desired for the RMON history group of statistics, ranging from 1 to 130. The default is 50 buckets.

Command Mode

Global Configuration Mode

Example

Configure the sample port as Gi1/0/2 and the sample interval as 100 seconds for the entry 1-3:

T1600G-52TS(config)# rmon history 1-3 **interface gigabitEthernet** 1/0/2 **interval** 100 **owner** owner1

29.14 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:

T1600G-52TS(config)# rmon event 1-4 **user** user1 **description** description1

type log **owner** owner1

29.15   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:

T1600G-52TS(config)#rmon alarm 1-3 **stats-index** 2 **owner** owner1 **interval** 100

29.16   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 gigabitEtherne**t *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:

T1600G-52TS(config)#rmon statistics 1-3 **interface gigabitEthernet** 1/0/1 **owner** owner1 **status** valid

29.17   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:

T1600G-52TS# show snmp-server

29.18   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:

T1600G-52TS# show snmp-server view

29.19 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:

T1600G-52TS# show snmp-server group

29.20 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:

T1600G-52TS# show snmp-server user

29.21 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:

> **T1600G-52TS# show snmp-server community**

29.22   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:

> **T1600G-52TS# show snmp-server host**

29.23   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:

> **T1600G-52TS# show snmp-server engineID**

29.24   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:

T1600G-52TS# show rmon history

29.25   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:

T1600G-52TS# show rmon event 1-4

29.26　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:

T1600G-52TS# show rmon alarm 1-2

29.27　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:

T1600G-52TS#show rmon statistics 1

Chapter 30 LLDP Commands

Note: Only T1600G-28PS and T1600G-52PS support LLDP function.

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) such as SNMP.

30.1 lldp

Description

The **lldp** command is used to enable LLDP function. To disable the LLDP function, please use **no lldp** command.

Syntax

lldp

no lldp

Command Mode

Global Configuration Mode

Example

Enable LLDP function globally:

T1600G-52PS(config)# lldp

30.2 lldp hold-multiplier

Description

The **lldp 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 = Hold Multiplier * Transmit Interval. To return to the default configuration, please use **no lldp hold-multiplier** command.

Syntax

lldp hold-multiplier *multiplier*

no lldp 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:

    T1600G-52PS(config)# lldp hold-multiplier 5

30.3 lldp 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 2.

    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 LLDPDUs 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:

T1600G-52PS(config)# lldp timer tx-interval 45

T1600G-52PS(config)# lldp timer notify-interval 120

30.4 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:

T1600G-52PS(config)# lldp med-fast-count 5

30.5 lldp 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 gigabitEthernet / interface range gigabitEthernet)

Example

> Enable port 1 to receive LLDPDU:
>
> **T1600G-52PS(config)# interface gigabitEthernet** 1/0/1
>
> **T1600G-52PS(config-if)# lldp receive**

30.6 lldp 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 gigabitEthernet / interface range gigabitEthernet)

Example

> Enable port 1 to transmit LLDPDU:
>
> **T1600G-52PS(config)# interface gigabitEthernet** 1/0/1
>
> **T1600G-52PS(config-if)# lldp transmit**

30.7 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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable the SNMP notification for port 1:

T1600G-52PS(config)# interface gigabitEthernet 1/0/1

T1600G-52PS(config-if)# lldp snmp-trap

30.8 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 gigabitEthernet / interface range gigabitEthernet)

Example

Exclude "management-address" and "port-vlan-id" TLVs in LLDPDU outgoing from port 1:

T1600G-52PS(config)# interface gigabitEthernet 1/0/1

T1600G-52PS(config-if)# no lldp tlv-select management-address port-vlan

30.9 lldp 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 gigabitEthernet / interface range gigabitEthernet)

Example

Configure the civic address in the Location Identification TLV's content in outgoing LLDPDU of port 2. Configure the language as English and city as London:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# lldp med-location civic-address language English city London

30.10 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 gigabitEthernet / interface range gigabitEthernet)

Example

Enable the LLDP-MED feature for port 2:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# lldp med-status

30.11 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 gigabitEthernet / interface range gigabitEthernet)

Example

Exclude "network policy" and "inventory" TLVs in LLDPDU outgoing from port 2:

T1600G-52PS(config)# interface gigabitEthernet 1/0/2

T1600G-52PS(config-if)# no lldp med-tlv-select network-policy

inventory-management

30.12 show lldp

Description

The **show lldp** command is used to display the global configuration of LLDP and LLDP-MED fast start repeat count number.

Syntax

show lldp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the global configuration of LLDP and LLDP-MED fast start repeat count number:

T1600G-52PS# show lldp

30.13 show lldp interface

Description

The **show lldp interface** command is used to display LLDP and LLDP-MED configuration of the corresponding port. By default, the configuration of all the ports will be displayed.

Syntax

show lldp interface [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the LLDP and LLDP-MED configuration of port 1:

T1600G-52PS# show lldp interface gigabitEthernet 1/0/1

30.14　show lldp local-information interface

Description

The **show lldp local-information interface** command is used to display the LLDP and LLDP-MED local information of the corresponding port. By default, the information of all the ports will be displayed.

Syntax

show lldp local-information interface [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the LLDP and LLDP-MED local information of port 1:

T1600G-52PS# show lldp local-information interface gigabitEthernet 1/0/1

30.15　show lldp neighbor-information interface

Description

The **show lldp neighbor-information interface** command is used to display the LLDP and LLDP-MED neighbor information of the corresponding port. By default, the neighbor information of all the ports will be displayed.

Syntax

show lldp neighbor-information interface [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the LLDP and LLDP-MED neighbor information of port 1:

T1600G-52PS# show lldp neighbor-information interface gigabitEthernet 1/0/1

30.16   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 [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the LLDP statistic information of port 1:

T1600G-52PS# show lldp traffic interface gigabitEthernet 1/0/1

Chapter 31 ARP Commands

Address Resolution Protocol (ARP) is used to resolve an IP address into an Ethernet MAC address. The swich maintains an ARP mapping table to record the IP-to-MAC mapping relations, which is used for forwarding packets. An ARP mapping table contains two types of ARP entries: dynamic and static. An ARP dynamic entry is automatically created and maintained by ARP. A static ARP entry is manually configured and maintained.

31.1 arp

Description

This **arp** command is used to add a static ARP entry. To delete the specified ARP entry, please use the **no arp** command.

Syntax

arp *ip mac type*

no arp *ip type*

Parameter

ip —— The IP address of the static ARP entry.

mac —— The MAC address of the static ARP entry.

type —— The ARP type. Configure it as "arpa".

Command Mode

Global Configuration Mode

Example

Create a static ARP entry with the IP as 192.168.0.1 and the MAC as 00:11:22:33:44:55:

T1600G-52TS(config)# arp 192.168.0.1 00:11:22:33:44:55 arpa

31.2 clear arp-cache

Description

This **clear arp-cache** command is used to clear all the dynamic ARP entries.

Syntax

clear arp-cache

Command Mode

Privileged EXEC Mode

Example

Clear all the dynamic ARP entries:

T1600G-52TS(config)# clear arp-cache

31.3 arp timeout

Description

This **arp timeout** command is used to configure the ARP aging time of the interface.

Syntax

arp timeout *timeout*

no arp timeout

Parameter

timeout —— Specify the aging time, ranging from 1 to 3000 seconds. The default value is 600 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the ARP aging time as 60 seconds on interface 1/0/1:

T1600G-52TS(config)# interface gigabitEthernet 1/0/1
T1600G-52TS(config-if)# arp timeout 60

31.4 show arp

Description

This **show arp** command is used to display the active ARP entries. If no parameter is speicified, all the active ARPA entries will be displayed.

Syntax

show arp [*ip*] [*mac*]

show ip arp [*ip*] [*mac*]

Parameter

    ip —— Specify the IP address of your desired ARP entry.

    mac —— Specify the MAC address of your desired ARP entry.

Command Mode

    Privileged EXEC Mode and Any Configuration Mode

Example

    Display the ARP entry with the IP as 192.168.0.2:

    T1600G-52TS(config)# show ip arp 192.168.0.2

31.5 show ip arp (interface)

Description

    This **show arp** command is used to display the active ARP entries associated with a specified Layer 3 interface.

Syntax

    show ip arp { **gigabitEthernet** *port* | **port-channel** *lagid* | **vlan** *id* }

Parameter

    port —— Specify the number of the routed port.

    lagid —— Specify the ID of the LAG.

    id   —— Specify the VLAN interface ID.

Command Mode

    Privileged EXEC Mode and Any Configuration Mode

Example

    Display the ARP entry associated with VLAN interface 2 :

    T1600G-52TS(config)# show ip arp vlan 2

31.6 show ip arp summary

Description

    This **show ip arp summary** command is used to display the number of the active ARP entries.

Syntax

show ip arp summary

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the number of the ARP entries:

T1600G-52TS(config)# show ip arp summary

Chapter 32 Static Routes Commands

32.1 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:

T1600G-52TS(config)# interface vlan 2

32.2 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 64.

Command Mode

Global Configuration Mode

Example

Create the loopback interface 1:

T1600G-52TS(config)# interface loopback 1

32.3 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 gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Switch the gigabitEthernet port 1/0/9 into the routed port:

T1600G-52TS(config)# interface gigabitEthernet 1/0/9
T1600G-52TS(config-if)# no switchport

32.4 shutdown

Description

This **shutdown** command is used to shut down the specified interface. The interface type include: routed port, port-channel interface, 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 :

T1600G-52TS(config)# interface gigabitEthernet 1/0/9
T1600G-52TS(config-if)# no switchport
T1600G-52TS(config-if)# shutdown

32.5 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*]

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, ranging from 1 to 255. 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:

T1600G-52TS(config)# ip route 192.168.2.0 255.255.255.0 192.168.0.2

32.6 description

Description

This **description** command is used to add a description to the Layer 3 interface, including routed port, port-channel interface, 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 :
>
> **T1600G-52TS(config)# interface gigabitEthernet** 1/0/9
>
> **T1600G-52TS(config-if)# no switchport**
>
> **T1600G-52TS(config-if)# description** system-if

32.7 show interface vlan

Description

> The **show interface vlan** command is used to display the information of the 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:
>
> **T1600G-52TS(config)#show interface vlan** 2

32.8 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 [**gigabitEthernet** *port* | **port-channel** *lagid* | **loopback** *id* | **vlan** *vlan-id*]

Parameter

port —— The port number.

lagid —— The ID of the LAG. Member ports in this LAG should all be routed ports.

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:

T1600G-52TS(config)# show ip interface vlan 2

32.9　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:

T1600G-52TS(config)# show ip interface brief

32.10　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]

Parameter

static | connected —— Specify the route type. If not specified, all types of route entries will be displayed.

static: The static routes.

connected: The connected routes.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the static routes:

T1600G-52TS(config)# show ip route static

32.11   show ip route specify

Description

This **show ip route specify** command is used to display the valid routing information to the specified IP address or network segments.

Syntax

show ip route specify { *ip* } [*mask*] [**longer-prefixes**]

Parameter

ip —— Specify the destination IP address.

mask —— Specify the destination IP address together with the parameter *ip*.

longer-prefixes —— 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:

T1600G-52TS(config)# show ip route specify 192.168.0.100

Look up the route entry with the destination as 192.168.0.0/24:

T1600G-52TS(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:

T1600G-52TS(config)# show ip route specify 192.168.0.0 255.255.0.0 **longer-prefixes**

32.12   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:

T1600G-52TS(config)# show ip route summary