SNTP Configuration

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Chapter 1 Configuring SNTP

1.1 Brief introduction of SNTP

The Simple Network Time Protocol Version 4 (SNTPv4), which is a subset of the Network Time Protocol (NTP) used to synchronize computer clocks in the Internet. In common, there is at least one server in the network, it provides reference time for clienets, finally, all clients in the network synchronized local clocks.

1.1.1 SNTP Operation Mechanism

SNTPv4 can be worked in four modes: unicast, multicast, broadcast and anycast. In unicast mode, client actively sends a request to server, and server sends reply packet to client according to the local time structure after receiving requirement.

In broadcast and multicast modes, server sends broadcast and multicast packets to client periodically, and client receives packet from server passively.

In anycast mode, client actively sends request to local broadcast or multicast address, and all servers in the network will reply to the client. Client will choose the server whose reply packet is first received to be the server, and drops packets from others. After choosing the server, working mode is the same as that of the unicast.

In all modes, after receiving the reply packet, client resolves this packet to obtain current standard time, and calculates network transmit delay and local time complementary, and then adjusts current time according them.

1.2 Configuring SNTP Client

1.2.1 List of SNTP Client Configuration

Table 1- 1 List of SNTP client configuration

Configuration Task		Remark	Detailed configuration
SNTP Basic configuration	Enable SNTP client	Required	1.2.2
SNTP advanced configuration	Modify SNTP client mode	optional	1.2.3
	Configure SNTP sever IP address	optional	1.2.4
	Modify broadcast transfer delay	optional	1.2.5
	Configure interval polling	optional	1.2.6
	Configure overtime retransmit	optional	1.2.7
	Configure valid sever list	optional	1.2.8

	Configure MD5 authentication	optional	1.2.9
Display and maintain SNTP client		optional	1.2.10

1.2.2 Enabling SNTP Client

The switch should only be configured SNTP client.

Table 1-2 startup SNTP client

Operation	Command	Remark
Enter system mode	**Configure terminal**	-
Startup SNTP client	**sntp client**	required

1.2.3 Modifying SNTP Client Operating Mode

Administrators can modify SNTP operating mode according to the network------ unicast, multicast, broadcast or anycast.

Table 1-3 modifying SNTP client operating mode

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
modifying SNTP client Operation mode	**sntp client mode {broadcast| unicast| multicast |anycast [key** *key***]}**	optional by default, SNTP client works in broadcast mode

1.2.4 Configuring SNTP Sever Address

SNTP client must configure appointed SNTP sever in the unicast way. You can also use below Commands to configure key when connecting to SNTP server by authentication.

Table 1-4 configure SNTP sever address

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
configure SNTP sever address	**sntp server** *IP* **[key** *key***]**	required

1.2.5 Modifying Broadcast Transfer Delay

When SNTP client works in the broadcast or multicast way, it needs to use broadcast transfer delay. In the broadcast way, the local time of SNTP client equals the time receiving from sever adds transferring time. Administrators modify the transferring time according to the actual bandwidth in the network.

Table 1-5 configure broadcast transfer delay

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
configure broadcast transfer delay	**sntp client broadcastdelay** *time*	optional By default, transfer delay time is 3ms

1.2.6 Configuring Interval Polling

Configuring interval polling is necessary when SNTP client works in the uticast or any cast way. SNTP client adjusts the local system time by each interval polling requesting to sever.

Table 1-7 Configure interval polling

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
Configure interval polling	**sntp client poll-interval** *time*	optional By default, interval polling is 1000s

1.2.7 Configuring Overtime Retransmist

This Command is effective in unicast and any cast operating mode. SNTP request packet is UDP packet, overtime retransmission system is adopted because the requirement packet cannot be guaranteed to send to the destination. Use above Commands to configure retransmit times and the interval.

Table 1-8 Configure overtime retransmit

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
configure overtime retransmit	**Sntp client retransmit-interval** *time*	optional By default, retransmit-interval seconds is 5s
configure overtime retransmit times	**sntp client retransmit** *times*	optional By default 0, means do not retransmit

1.2.8 Configuring Valid Servers

In broadcast and multicast mode, SNTP client receives protocol packets from all servers without distinction. When there is malice attacking server (it will not provide

correct time), local time cannot be the standard time. To solve this problem, a series of valid servers can be listed to filtrate source address of the packet.

Table 1-9 Configure valid server

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
configure valid servers	**sntp client valid-server** *IP mask*	optional

1.2.9 Configuring MD5 Authentication

To enhance the safety, MD5 authentication can be setup between SNTP sever and SNTP client which only receives the authenticated message. MD5 authentication configures as below:

Table 1-10 Configure MD5 authentication

Operation	Command	Remark
Enter globally configuration mode	**configure terminal**	-
Startup MD5 authentication	**sntp client authenticate**	optional
Configure authentication keys	**sntp client authentication-key** *key-number* **md5** *value*	optional

1.2.10 Displaying and Maintain SNTP Client

After finishing above configuration, you can use below Commands to show SNTP client configuration.

Table 1-11 Displaying and maintain SNTP client

Operation	Command	Remark
Display and maintain SNTP client	**show sntp client**	Perform either of the Commands