Content

Chapter 1 SNTP Configuration

1.1 Introduction to SNTP

The Network Time Protocol (NTP) is widely used for clock synchronization for global computers connected to the Internet. NTP can assess packet sending/receiving delay in the network, and estimate the computer's clock deviation independently, so as to achieve high accuracy in network computer clocking. In most positions, NTP can provide accuracy from 1 to 50ms according to the characteristics of the synchronization source and network route.

Simple Network Time Protocol (SNTP) is the simplified version of NTP, removing the complex algorithm of NTP. SNTP is used for hosts who do not require full NTP functions; it is a subset of NTP. It is common practice to synchronize the clocks of several hosts in local area network with other NTP hosts through the Internet, and use those hosts to provide time synchronization service for other clients in LAN. The figure below depicts a NTP/SNTP application network topology, where SNTP mainly works between second level servers and various terminals since such scenarios do not require very high time accuracy, and the accuracy of SNTP (1 to 50 ms) is usually sufficient for those services.
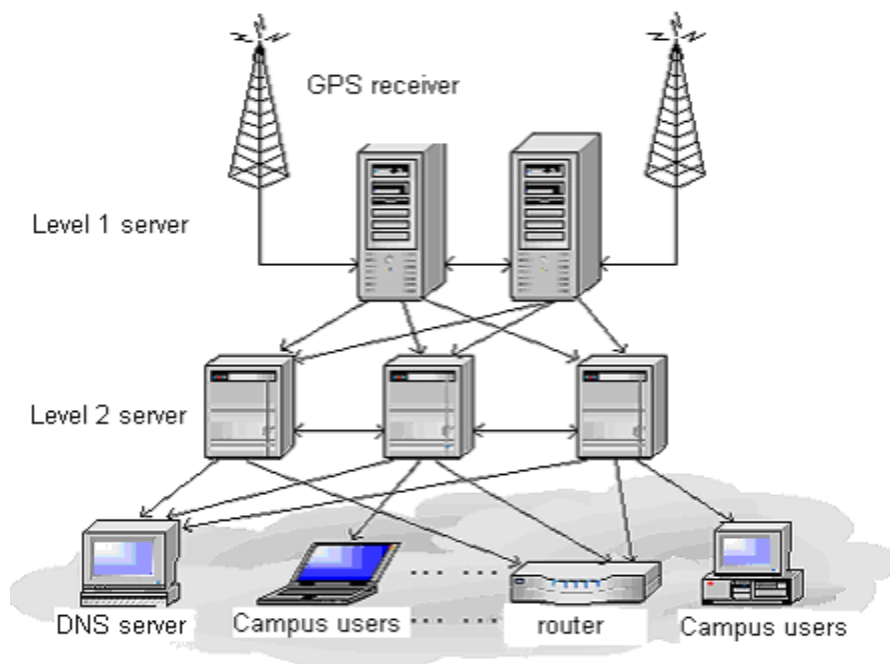

Fig 1-1 Working Scenario

Switch implements SNTPv4 and supports SNTP client unicast as described in RFC2030; SNTP client multicast and unicast are not supported, nor is the SNTP server function.

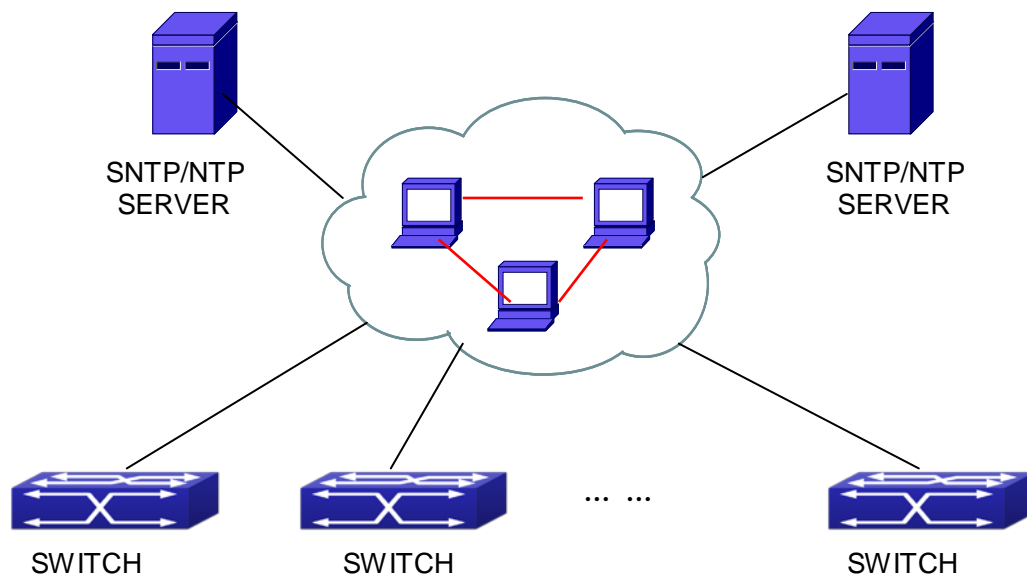# 1.2 Typical Examples of SNTP Configuration

Fig 1-2 Typical SNTP Configuration

All switches in the autonomous zone are required to perform time synchronization, which is done through two redundant SNTP/NTP servers. For time to be synchronized, the network must be properly configured. There should be reachable route between any switch and the two SNTP/NTP servers.

Example: Assume the IP addresses of the SNTP/NTP servers are 10.1.1.1 and 20.1.1.1, respectively, and SNTP/NTP server function (such as NTP master) is enabled, then configurations for any switch should like the following:

Switch#config

Switch(config)#sntp server 10.1.1.1

Chapter 2 NTP Function Configuration

2.1 Introduction to NTP Function

The NTP (Network Time Protocol) synchronizes timekeeping spans WAN and LAN among distributed time servers and clients, it can get millisecond precision. The introduction of event, state, transmit function and action are defined in RFC-1305.

The purpose of using NTP is to keep consistent timekeeping among all clock-dependent devices within the network so that the devices can provide diverse applications based on the consistent time.

For a local system running NTP, its time can be synchronized by other reference sources and can be used as a reference source to synchronize other clocks, also can synchronize each other by transmit NTP packets.

2.2 NTP Function Configuration Task List

1. To enable NTP function
2. To configure NTP server function
3. To configure the max number of broadcast or multicast servers supported by the NTP client
4. To configure time zone
5. To configure NTP access control list
6. To configure NTP authentication
7. To specified some interface as NTP broadcast/multicast client interface
8. To configure some interface can't receive NTP packets
9. Display information
10. Debug

1. To enable NTP function

Command	Explication
Global Mode	
ntp enable **ntp disable**	To enable or disable NTP function.

2. To configure NTP server function

Command	Explication

Global Mode	
ntp server {<*ip-address*> / <*ipv6-address*>} [version <*version_no*>] [key <*key-id*>] no ntp server {<*ip-address*> / <*ipv6-address*>}	To enable the specified time server of time source.

3. To configure the max number of broadcast or multicast servers supported by the NTP client

Command	Explication
Global Mode	
ntp broadcast server count <number> no ntp broadcast server count	Set the max number of broadcast or multicast servers supported by the NTP client. The no operation will cancel the configuration and restore the default value.

4. To configure time zone

Command	Explication
Global Mode	
**clock timezone WORD {add	subtract} <0-23> [<0-59>] no clock timezone WORD**	This command configures timezone in global mode, the no command deletes the configured timezone.

5. To configure NTP access control list

Command	Explication
Global Mode	
ntp access-group server <*acl*> no ntp access-group server <*acl*>	To configure NTP server access control list.

6. To configure NTP authentication

Command	Explication
Global Mode	
ntp authenticate no ntp authenticate	To enable NTP authentication function.
ntp authentication-key <*key-id*> md5 <*value*> no ntp authentication-key <*key-id*>	To configure authentication key for NTP authentication.

ntp trusted-key *<key-id>*	To configure trusted key.
no ntp trusted-key *<key-id>*	

7. To specified some interface as NTP multicast client interface

Command	Explication
vlan Configuration Mode	
ntp multicast client	To configure specified interface to receive NTP multicast packets.
no ntp multicast client	
ntp ipv6 multicast client	To configure specified interface to receive IPv6 NTP multicast packets.
no ntp ipv6 multicast client	

8. To configure some interface can't receive NTP packets

Command	Explication
vlan Configuration Mode	
ntp disable	To disable the NTP function.
no ntp disable	

9. Display information

Command	Explication
Admin Mode	
show ntp status	To display the state of time synchronize.
show ntp session [*<ip-address>* | *<ipv6-address>*]	To display the information of NTP session.

10. Debug

Command	Explication
Admin Mode	
debug ntp authentication	To enable debug switch of NTP authentication.
no debug ntp authentication	
debug ntp packets [send | receive]	To enable debug switch of NTP packet information.
no debug ntp packets [send | receive]	
debug ntp adjust	To enable debug switch of time update information.
no debug ntp adjust	

debug ntp sync no debug ntp sync	To enable debug switch of time synchronize information.
debug ntp events no debug ntp events	To enable debug switch of NTP event information.

2.3 Typical Examples of NTP Function

A client switch wanted to synchronize time with time server in network, there is two time server in network, the one is used as host, the other is used as standby, the connection and configuration as follows (Switch A and Switch B are the switch or route which support NTP server):
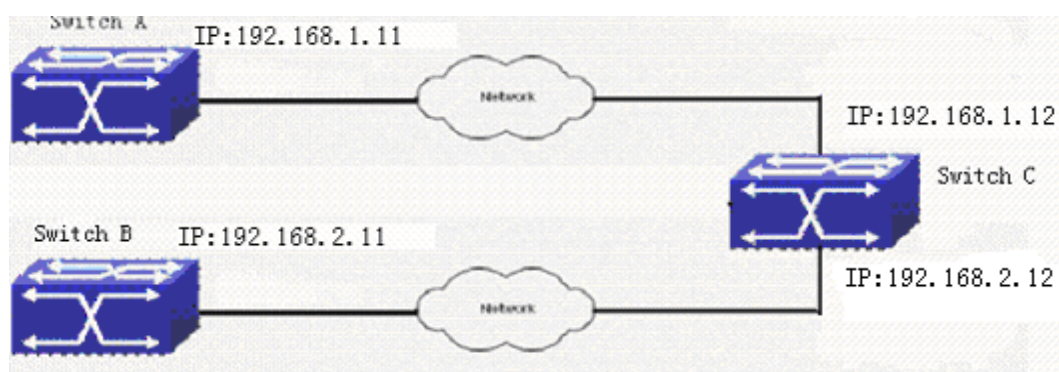
The configuration of Switch C is as follows: (Switch A and Switch B may have the different command because of different companies, we not explain there, our switches are not support NTP server at present)

Switch C:

Switch(config)#ntp enable

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip address 192.168.1.12 255.255.255.0

Switch(config)#interface vlan 2

Switch(Config-if-Vlan1)#ip address 192.168.2.12 255.255.255.0

Switch(config)#ntp server 192.168.1.11

Switch(config)#ntp server 192.168.2.11

2.4 NTP Function Troubleshooting

In configuration procedures, if there is error occurred, the system can give out the

debug information.

The NTP function disables by default, the show command can be used to display current configuration. If the configuration is right please use debug every relative debugging command and display specific information in procedure, and the function is configured right or not, you can also use show command to display the NTP running information, any questions please send the recorded message to the technical service center.

Chapter 3 Summer Time Configuration

3.1 Introduction to Summer Time

Summer time is also called daylight saving time, it is a time system for saving energy sources. In summer the time is advanced 1 hour to keep early hours, reduce the lighting, so as to save electrolighting. The rule that adopt summer time is different in each country. At present, almost 110 countries implement summer time.

Compare with the standard time, usually set summer time 1 hour late, for example, when summer time is implementing, 10:00 am of the standard time is considered 11:00 am of summer time.

3.2 Summer Time Configuration Task Sequence

1. Configure absolute or recurrent time range of summer time

Command	Explanation
Global Mode	
clock summer-time *<word>* absolute *<HH:MM>* *<YYYY.MM.DD>* *<HH:MM>* *<YYYY.MM.DD>* [*<offset>*] **no clock summer-time**	Set absolute time range of summer time, start and end summer time is configured with specified year.
clock summer-time *<word>* recurring *<HH:MM> <MM.DD> <HH:MM> <MM.DD>* [*<offset>*] **no clock summer-time**	Set recurrent time range of summer time, every year the summer time begins from the start time and end at the end time.
clock summer-time *<word>* recurring *<HH:MM>* *<week>* *<day>* *<month>* *<HH:MM>* *<week>* *<day>* *<month>* [*<offset>*] **no clock summer-time**	Set recurrent time range of summer time, every year the summer time begins from the start time and end at the end time.

3.3 Examples of Summer Time

Example1:

The configuration requirement in the following: The summer time from 23:00 on April 1th, 2012 to 00:00 on October 1th, 2012, clock offset as 1 hour, and summer time is named as 2012.

Configuration procedure is as follows:

Switch(config)# clock summer-time 2012 absolute 23:00 2012.4.1 00:00 2012.10.1

Example2:

The configuration requirement in the following: The summer time from 23:00 on the first Saturday of April to 00:00 on the last Sunday of October year after year, clock offset as 2 hours, and summer time is named as time_travel.

Configuration procedure is as follows:

Switch(config)#clock summer-time time_travel recurring 23:00 first sat apr 00:00 last sun oct 120

3.4 Summer Time Troubleshooting

If there is any problem happens when using summer time, please check whether the problem is caused by the following reasons:

☞ Check whether command mode in global mode
☞ Check whether system clock is correct