PTC1000 PTP Clock Converter

Web Operation Manual

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Preface

This manual mainly introduces the access methods and software features of PTC1000 (PTP Clock Converter), and introduces the clock converter configuration methods through Web interface in detail.

The manual is applicable for software version

PTC1000-V1.1.0.bin

Content Structure

The manual contains the following contents:

Main Content	Explanation
1. Product introduction	➢ Overview ➢ Product Models ➢ Software Features
2. Device access methods	➢ View types ➢ Access switch by Console port ➢ Access switch by Telnet ➢ Access switch by Web
3. Device management	➢ Reboot ➢ Exit from the Web interface
4. Device Status	➢ Basic Information ➢ Device running information
5. Device basic configuration	➢ IP address ➢ Device basic information configuration ➢ Change password ➢ Software update (FTP update) ➢ Software version query ➢ Configuration file uploading and

	downloading
6. Device advanced configuration	➢ PTP configuration ➢ SNMP configuration

Conventions in the manual

1. Text format conventions

Format	Explanation
< >	The content in < > is a button name. For example, click <Apply> button
[ ]	The content in [ ] is a window name or a menu name. For example, click [File] menu item
→	Multi-level menus are separated by "→". For example, Start→All Programs→Accessories. Click [Start] menu, click the sub menu [All programs], then click the submenu [Accessories].
/	Select one option from two or more options that are separated by "/". For example "Addition/Deduction" means addition or deduction.
~	It means a range. For example, "1~255" means a range from 1 to 255

2. Command line format conventions

Format	Explanation
Bold	Key words of command lines. Directly input them in the CLI for configuration. For example: "**show version**" is to show switch software version.
Italic	Command line parameters that are replaced by actual values. For example: "**show vlan** *vlan id*" is to show the vlan information corresponding to the vlan id.

3. Symbol conventions

Symbol	Explanation
Caution	The matters need attention during the operation and configuration, and it is a supplement to the operation description

Note	Necessary explanations to the operation description
Warning	The matters that call for special attention. Incorrect operation might cause data loss or damage to devices

Product Documents

The documents of PTC1000 (PTP Clock converter):

Name of Document	Content Introduction
PTC1000 (PTP Clock converter) Hardware Installation Manual	Introduces PTC1000's hardware structure, hardware specifications, mounting and dismounting methods
PTC1000 (PTP Clock converter) Web Operation Manual	Introduces clock converter's software functions, Web configuration methods and steps of all functional modules

Document Obtainment

Product documents can be obtained by:

- CD shipped with the device
- Kyland website: www.kyland.cn

1. Product Introduction

1.1 Overview

PTC1000 clock converter realizes the conversion from network precision clock (PTP) to IRIG-B clock and the conversion from network precision clock (PTP) to PPS, so that the industrial equipments that are equipped with IRIG-B clock interfaces and PPS interfaces can conveniently access the precision clock network, realizing the normalization of network clocks and the high accuracy in the industrial control system.

1.2 Product Model Introduction

This series of products support two types of models, along with abundant types of ports, meeting different needs of customers, as shown in Table 1.

Table 1: Product models

Product Model	Fast Ethernet		PPS BNC Port	IRIG-B(DC)		IRIG-B(AC)	
	RJ45 Port	SC/ST/FC Connector		BNC Port	4-pin 5.08mm-spacing terminal block	BNC Port	2-pin 5.08mm-spacing terminal block
PTC1000-1T	1	--	1	1	1	1	1
PTC1000-1S/M	--	1	1	1	1	1	1

1.3 Software Features

This series of products have the following software features.

- Synchronization protocol: PTP, ITU-T.G.8261/G.8262
- Device management: FTP software update, FTP file transmission
- Network management: supports CLI, Telnet, Web management methods, Kyvision network management software and SNMP network monitoring

2. Device Access Methods

There are 4 ways to access the device.

- Console port
- Telnet
- Web browser
- Kyvision management software

Kyvision network management software is designed by Kyland Corporation. Please refer to its user manual for more information.

2.1 View Types

When logging into CLI (Command Line Interface) by Console port or Telnet, user can use different commands to enter different views or switch between different views, as shown in Table 2.

Table 2: View Types

View Prompt	View Type	View Function	Command for View Switching
SWITCH>	User View	➢ Show history commands; ➢ Show software version	Input "**enable**" to enter management view
SWITCH #	Management View	➢ Show IP address ➢ Show device configuration information ➢ Upload/Download configuration file ➢ Restore the default configuration	➢ Input "**configure terminal**" to switch from management view to configuration view; ➢ Input "**exit**" to return to user

		➢ Save current configuration ➢ Software update ➢ Reboot device	view
SWITCH(config) #	Configuration View	Configure all device functional modules	Input "**exit**" or "**end**" to return to management view

When using command lines to configure the device, user can use "?" to get command help. In the help information, there are parameter descriptions with different formats, for example, <1-255> is a range of number; <H.H.H.H> is a IP address configuration format; <H:H:H:H:H:H> is a MAC address configuration format; word<1, 31> is a range of character string. In addition, ↑ and ↓ can be used to choose a command among recently used 10 commands.

2.2 Console Port Access

The hyper terminal of Windows system or other software that supports serial port connection, such as HTT3.3 can be used to log into device by Console port. The following example shows how to use Hyper Terminal to access device by Console port.

1. Use a DB9-RJ45 cable to connect PC's serial communication port and device Console port
2. Run the Hyper Terminal in Windows desktop. Click [Start]→[All Programs]→[Accessories]→[Communications]→[Hyper Terminal], as shown in Figure 1.

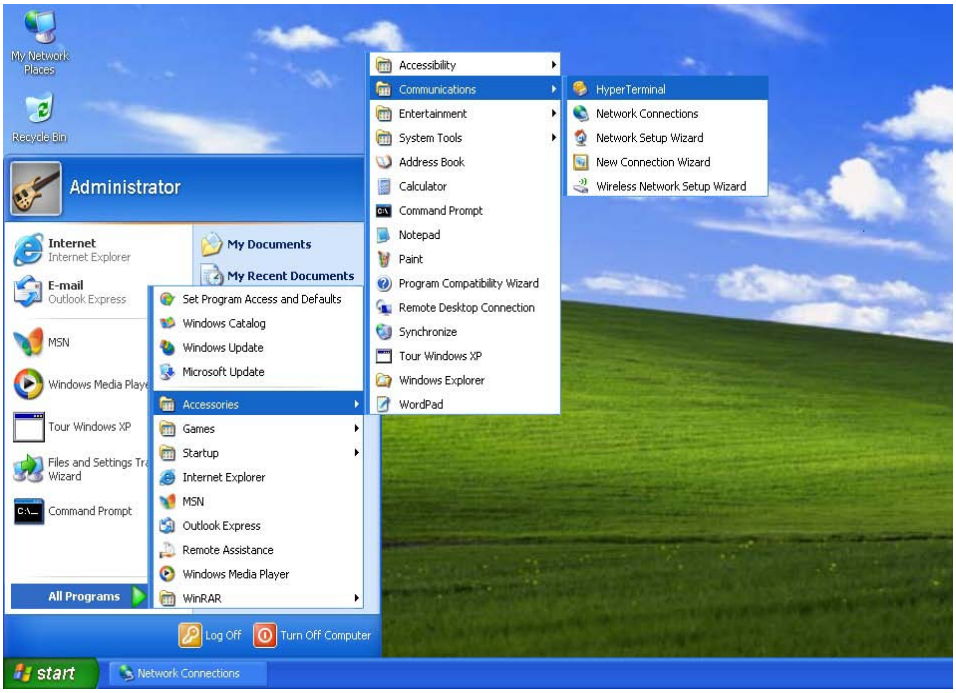

Figure 1: Hyper Terminal

3. Create a new connection “aa”, as shown in Figure 2

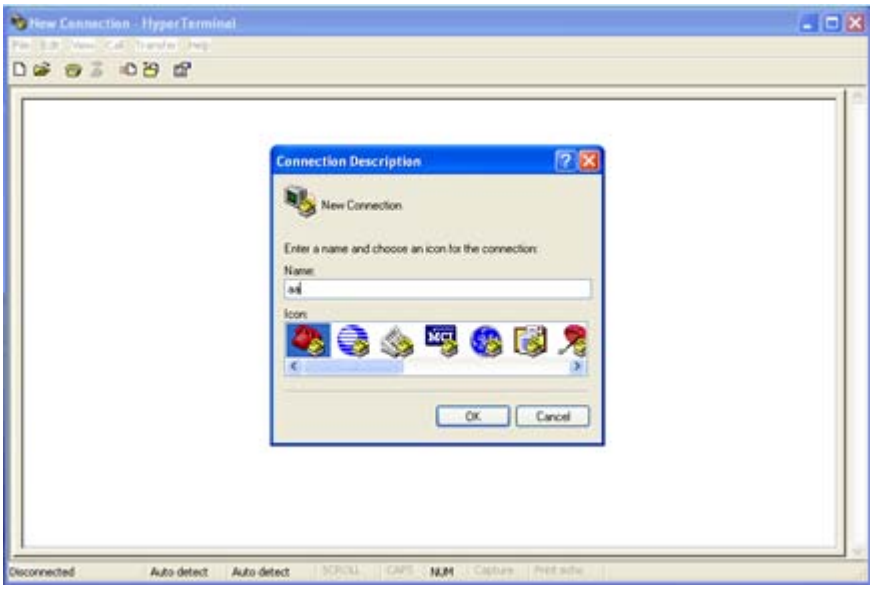

Figure 2: New Connection

4. Connect a correct communication port, as shown in Figure 3

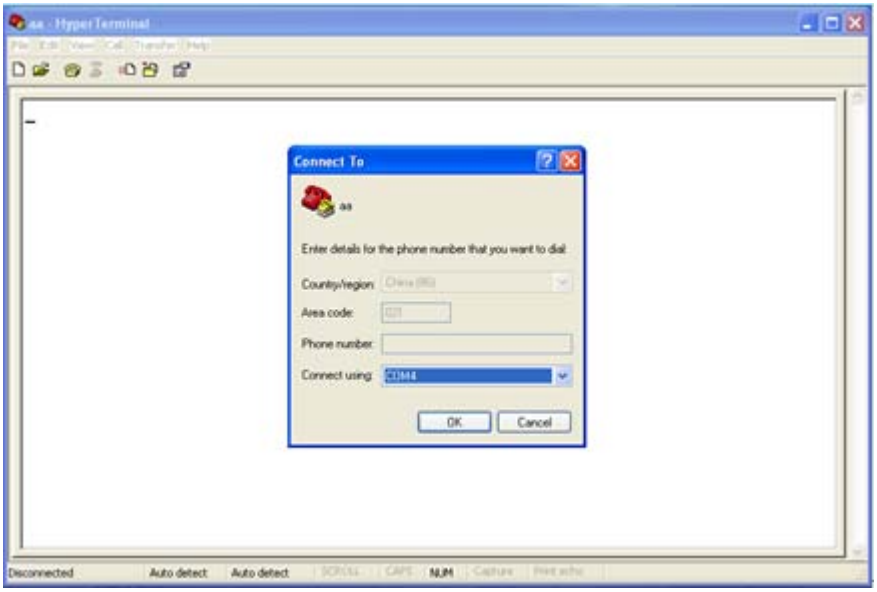

Figure 3: Select serial port

Note:

To confirm communication port, please right click [My Computer]→[Property]→[Hardware]→[Device Manager]→[Port] to check the Console port-used communication port.

5. Serial port setting is shown in Figure 4. Bits per second (Baud rate): 9600; Data bits: 8; Parity: None; Stop bits: 1; Flow control: None

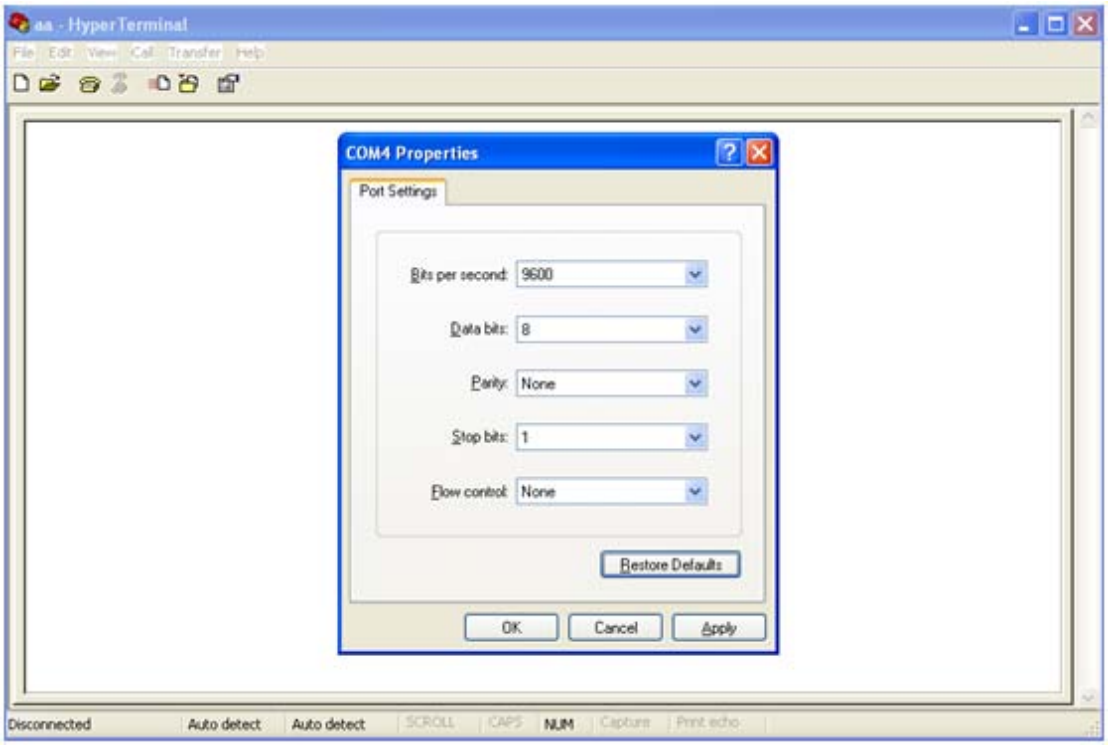

Figure 4: Port Setting

6. Click <OK> button and enter the device CLI. Press <Enter> to enter user view as shown in Figure 5.

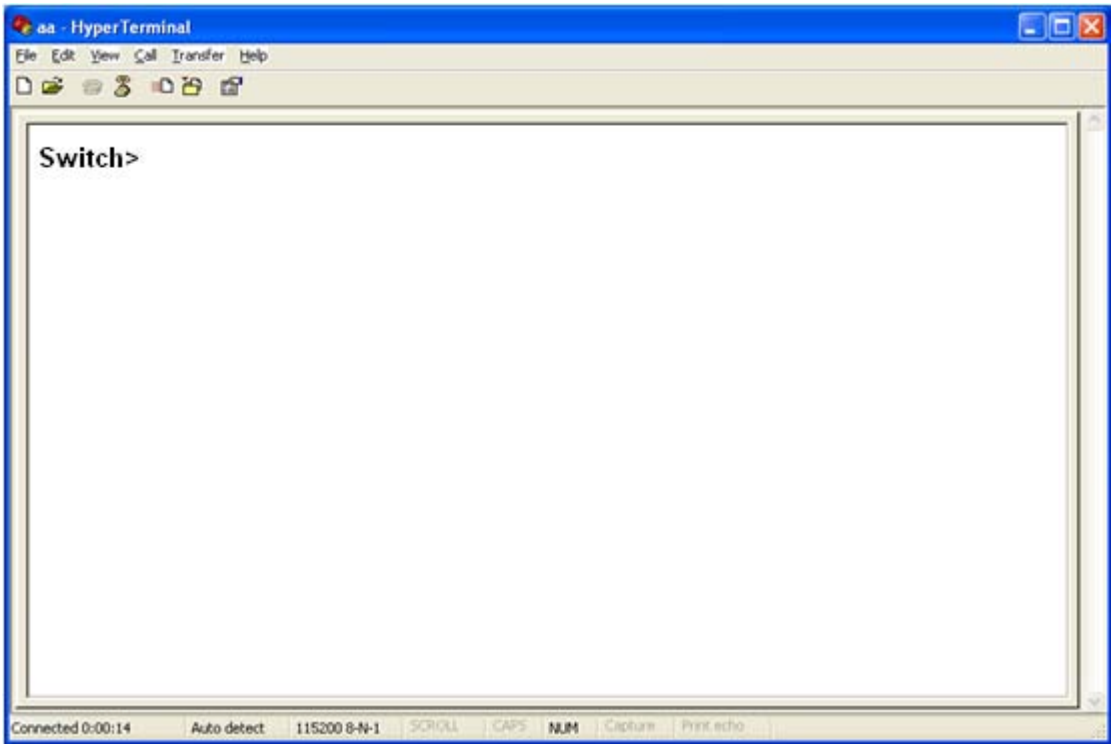

Figure 5: CLI

2.3 Telnet Access

The precondition of Telnet login is the normal communication of PC and device.

1. Type “telnet *IP address*” in the RUN dialog box, as shown in Figure 6.

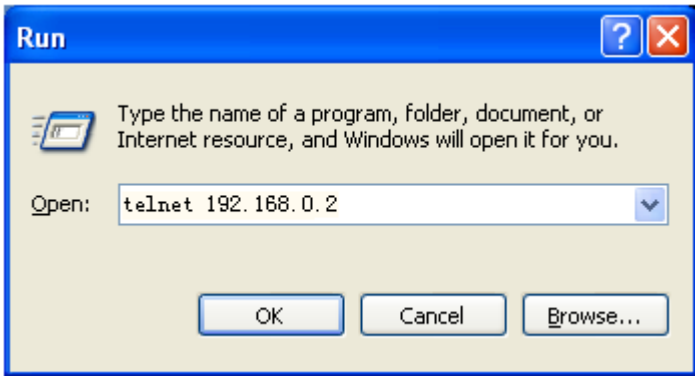

Figure 6: Telnet Access

Note:

To confirm the device IP address, please refer to “5.1 IP Address ” to learn how to obtain IP address.

2. In the Telnet interface, input “admin” in User, and “123” in Password, click <Enter >to enter device CLI, as shown in Figure 7.

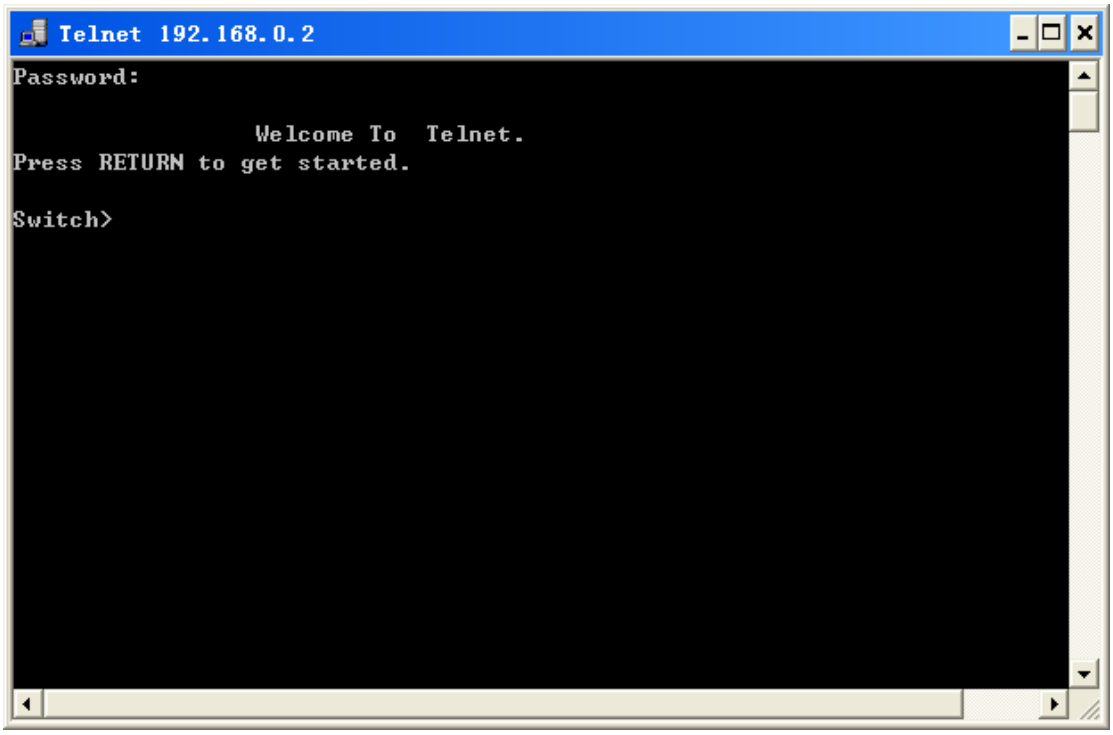

Figure 7: Telnet interface

2.4 Web Access

The precondition of Web login is the normal communication of PC and device.

Note:

IE browser is recommended for the best Web access results.

1. Input "*IP address*" in the browser address bar and the login dialog box appears as shown in Figure 8, input the user name "admin" and the default password "123", then click <OK> .

Figure 8: Web login

Note:

To confirm the device IP address, please refer to "5.1 IP Address" to learn how to obtain IP address.

2. Once successfully logged into the Web configuration interface, there is a configuration navigation tree on the left side, as shown in Figure 9.

Figure 9: Web interface

Click <Close Up>, <Expand> buttons at the top of the navigation tree to close or expand all submenus in the navigation tree.

In the top right corner, Click <中文> button to change language to Chinese; Click <Exit> button to exit from the Web interface.

In the navigation tree, click [Save current running-config] to save the current configuration; click [Reboot with the default configuration] to restore the default configuration.

Caution:

Please reboot the device after restoring the default configuration to activate the operation.

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3. Device Management

Device management includes reboot and logout. If you need to reboot the device (such as, after software update or IP address modification), please click <Reboot> button, as shown in Figure 10; if you would like to log out the Web interface, please click [Logout] in the navigation tree to enter the screen shown in Figure 11, click <Logout> button.

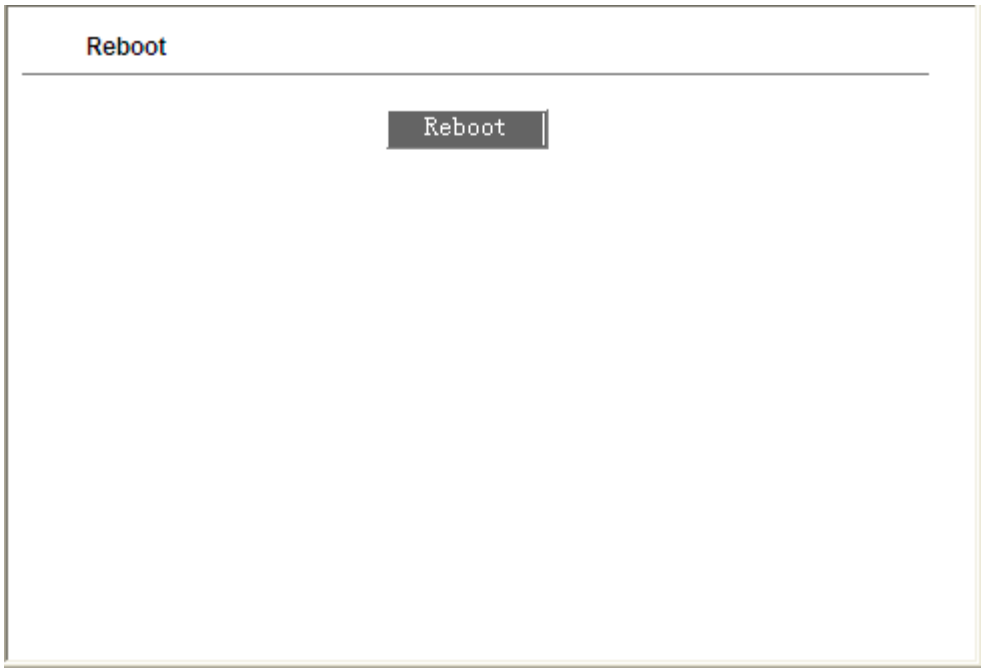

Figure 10: Reboot device

Figure 11: Logout

4. Device Status

4.1 Basic Information

The basic information contains MAC address, serial number, IP address, subnet mask, gateway, device name, device model, software version and firmware version, as shown in Figure 12.

Item	Information
MAC Address	08-00-3E-32-53-22
SN	KY0102300010001
IP Address	192.168.0.2
Subnet Mask	255.255.255.0
GateWay	192.168.0.1
Device Name	Switch
Device Model	
Software Version	ID:1 V1.0.2 (2012-2-1 16:00)
FW Version	v255.255.255 (65535-255-255 65535:65535)

Figure 12: Device Basic Information

4.2 Device Running Information

Device running information shows device operating time and CPU utilization rate, as shown in Figure 13

Device Run Info	
Device Run Time:	0Days,0H:22M:1S
CPU USE:	5%(short-term), 1%(long-term)
Power Info:	POWER1: ON, POWER2: ON

Figure 13: Device running information

5. Device Basic Configuration

5.1 IP Address

1. Check device IP address by Console port

When logging into device CLI by Console port, input "**show interface**" in the management view to check device IP address. As Figure 14 shows, the IP address is circled in red.

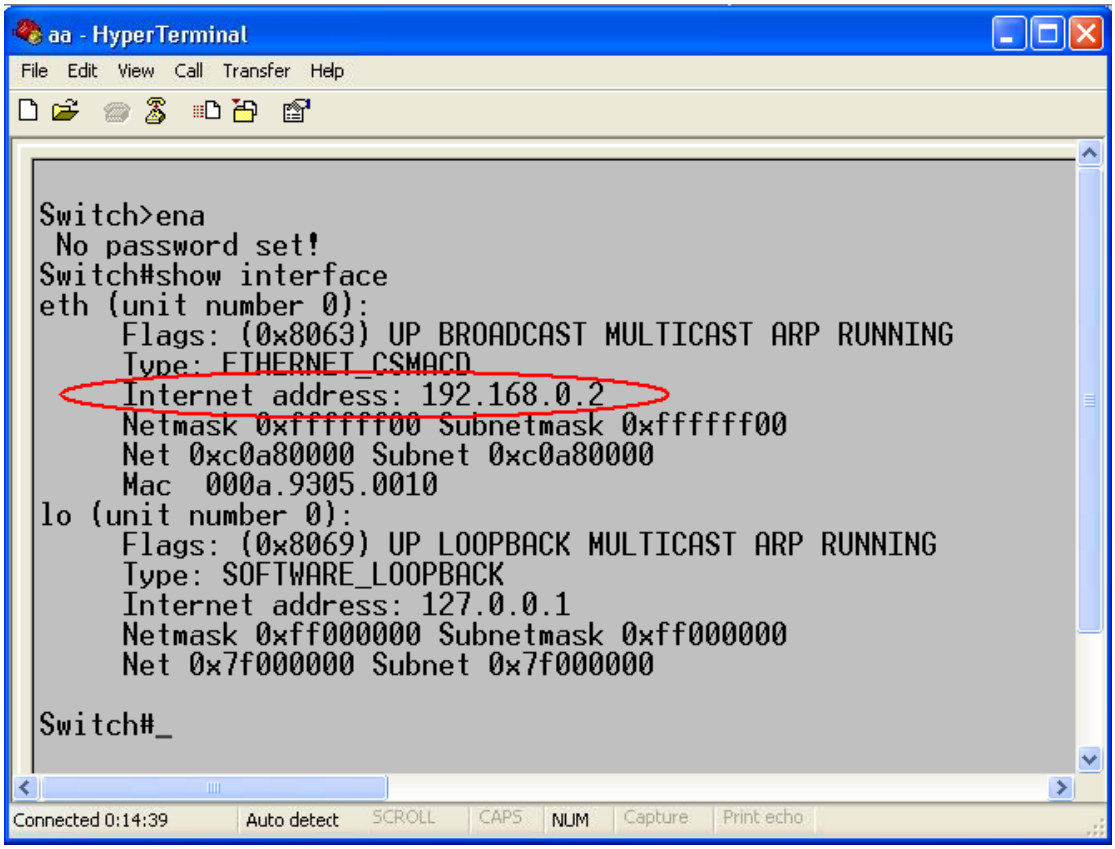

Figure 14: Show IP address

2. IP address configuration

Device IP address and gateway can be manually configured, as shown in Figure 15.

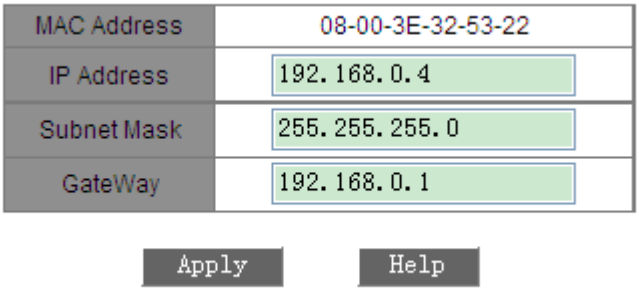

Figure 15: IP address

Caution:

- IP address and gateway must be in a same segment; otherwise, IP address can not be modified.
- The new configured IP address will take effect after reboot.

5.2 Device Information Configuration

Device information configuration can configure project name, device name, address and contact information, as shown in Figure 16.

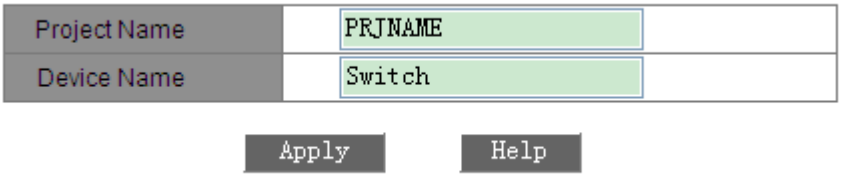

Figure 16: Device information

Project Name

Configuration range: 1-64 characters

Device Name

Configuration range: 1-32 characters

5.3 Change Password

User can change the password corresponding to the username of “admin”, as shown in Figure 17.

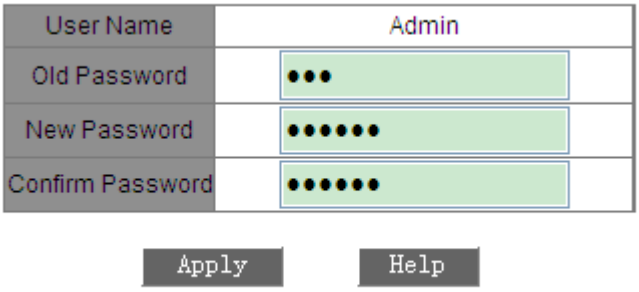

Figure 17: Change Password

5.4 Software Update

The device can obtain more performances by software update. For this series device, software updates contains Bootrom software version update and system software version update. First, update the Bootrom software version, and then update the system software version. If no change in the Bootrom version, users can only update the system software version.

The software version update needs FTP server.

5.4.1 Software Update by FTP

Install an FTP server. We will use WFTPD software as an example to introduce FTP server configuration and software update.

1. Click [Security]→[Users/rights] to open “Users/Rights Security Dialog”; Click <New User> button to create a new FTP user, as shown in Figure 18. Input user name and password, such as user name “admin”, and password “123”, click <OK>.

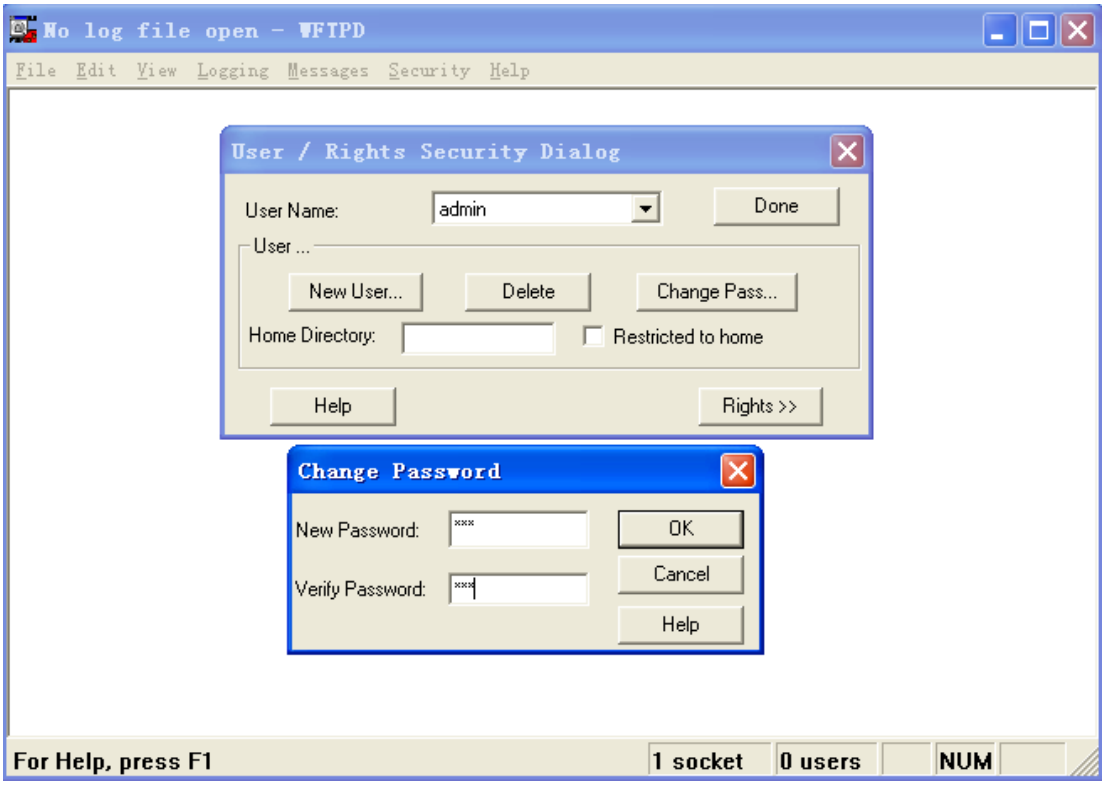

Figure 18: Create a new FTP user

2. Input the storage path of the update file in the space of “Home Directory”, as shown in Figure 19, click <Done>

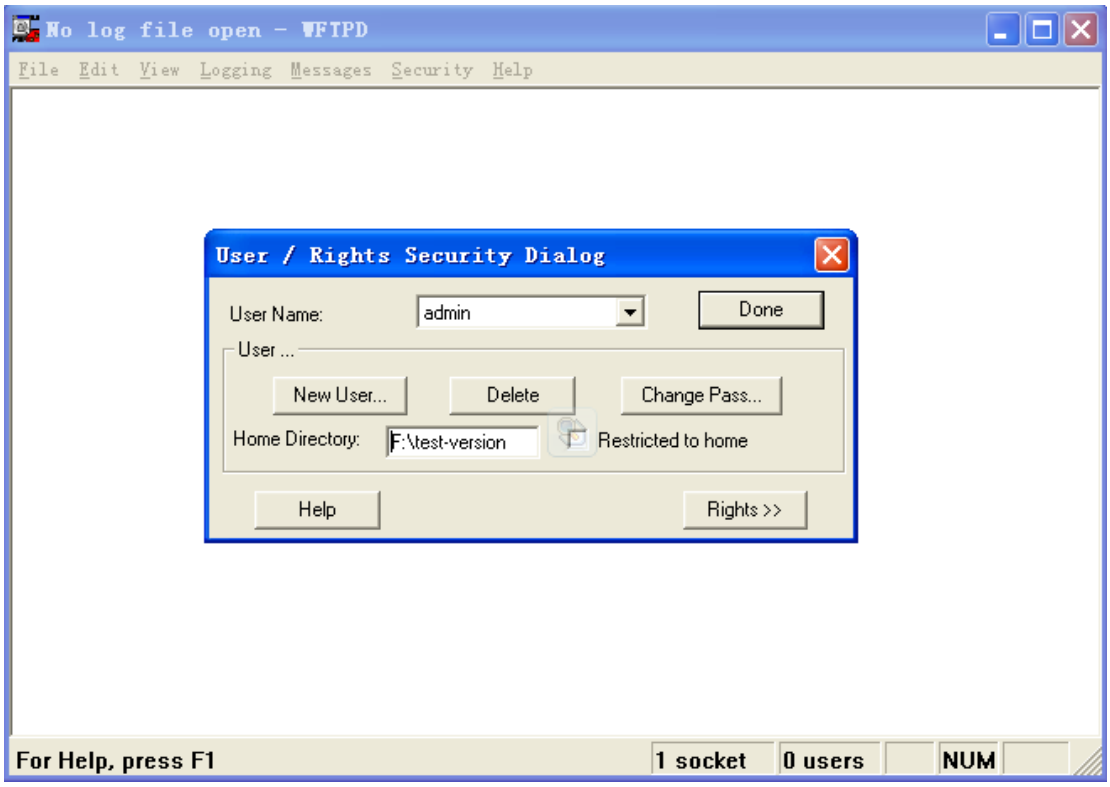

Figure 19: File storage path

3. For Bootrom software update, please input the following command in the management view:

Switch#**update bootrom** *Software_name server_ip_address user_name password*

The parameter explanations are shown in Table 3.

Table 3: Parameter explanations for Bootrom update

Parameter	**Explanation**
Software_name	The name of Bootrom software version
server_ip_address	The IP address of FTP server
user_name	The created FTP username
password	The created FTP user's password

4. The system software update is shown in Figure 20. Input the IP address of FTP server, file name on server, the created FTP username and password, click <Apply> button.

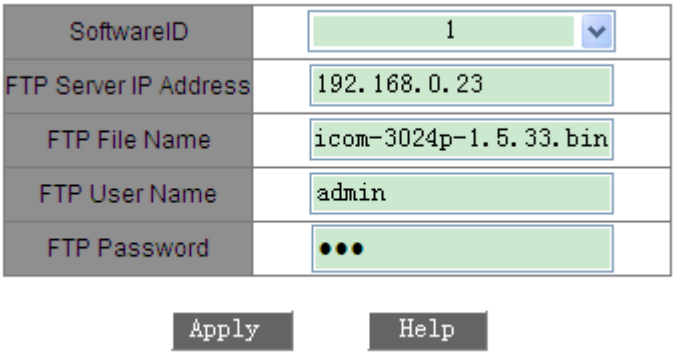

Figure 20: Software update by FTP

Warning:

- The file name must have a suffix, otherwise it might cause update failure.

5. Make sure the normal communication between FTP server and device, as shown in Figure 21.

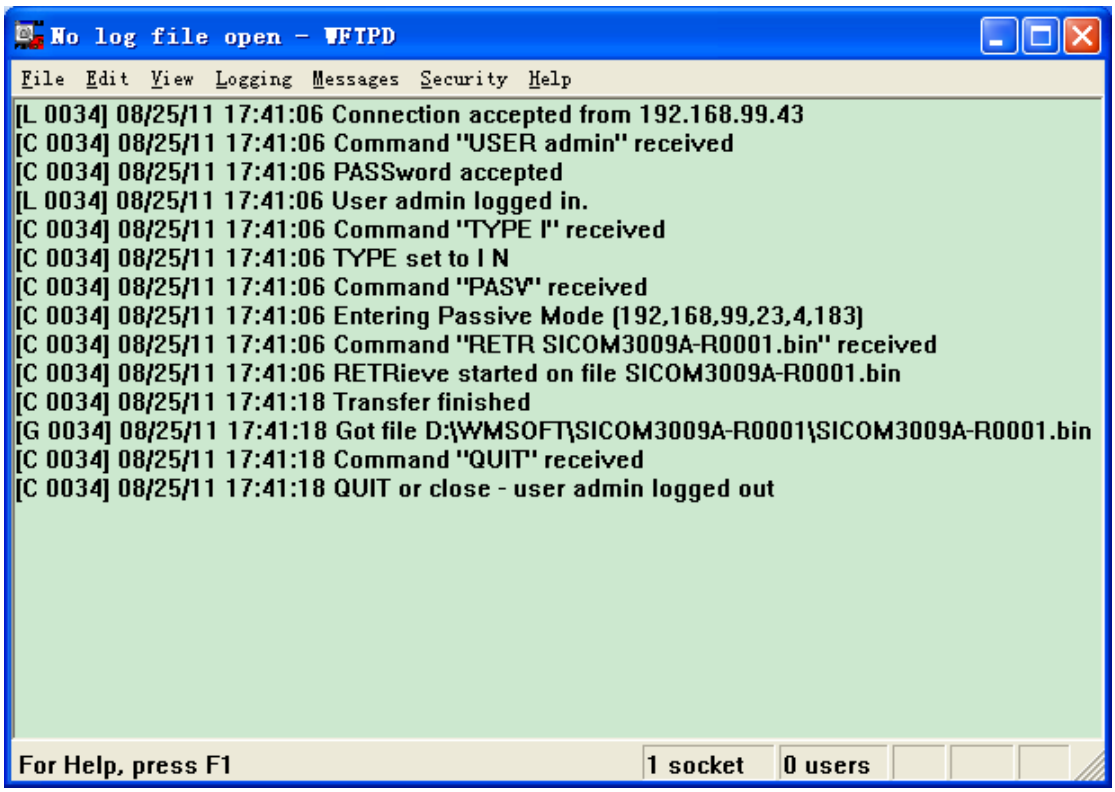

Figure 21: Normal communication of FTP server and device

6. Wait for the update to complete, as shown in Figure 22.

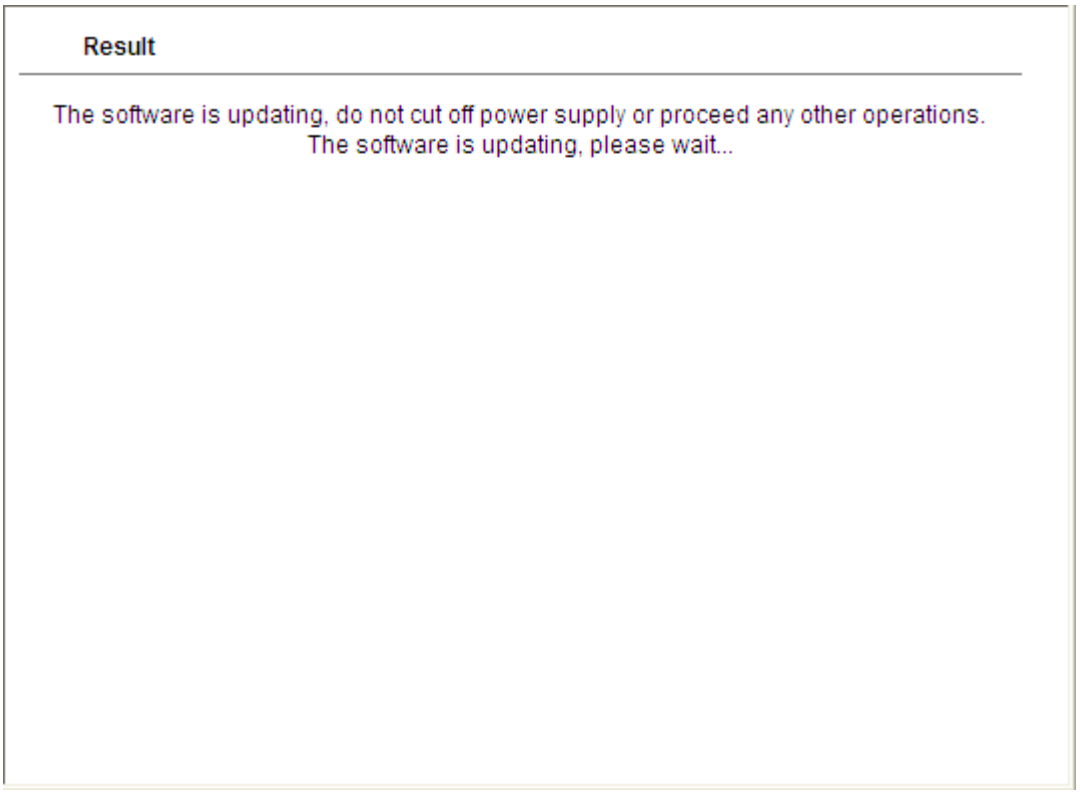

Figure 22: Wait for update to complete

7. When update completes as shown in Figure 23, please reboot the device and

open the Basic Information to check if update succeeded and the new version is active.

Figure 23: Successful software update by FTP

Warning:

- In the software update process, keep the FTP server software open
- When update completes, reboot the device to activate the new version
- If update fails, do not reboot the device to avoid the loss of software file and the device cannot be started normally.

5.5 Software Version

Software version shows the software version, release date and active state, as shown in Figure 24.

ID	Version	Date	Status
1	v1.0.2	2012-2-1 16:00	Active

Figure 24: Software version

5.6 Upload & Download Configuration

Configuration backup function can save device's current configuration files to the server. When the device configuration is changed, users can download the original configuration files from the server to device by FTP protocol.

File uploading is to upload the device configuration files to the server and save them to *.doc and *.txt files. File downloading is to download the saved configuration files from the server to device, as shown in Figure 25 and Figure 26.

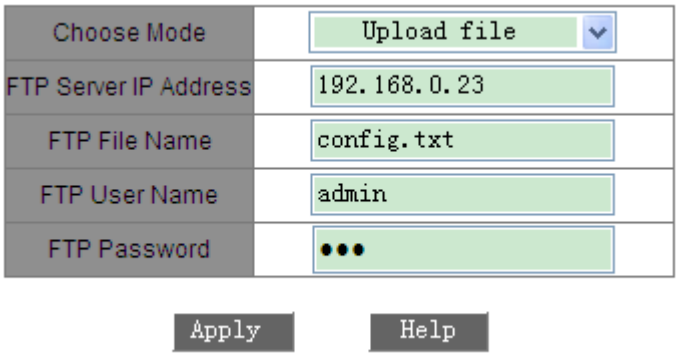

Figure 25: Configuration file upload in FTP mode

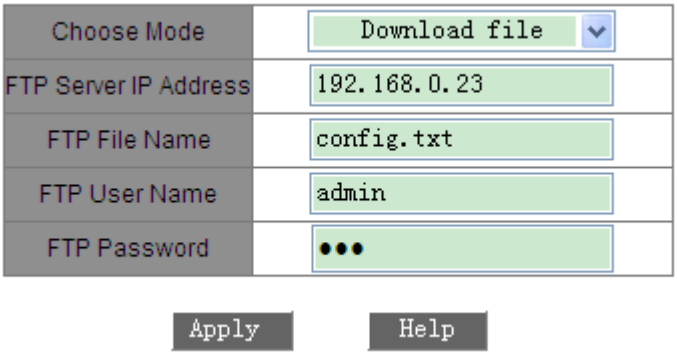

Figure 26: Configuration file download in FTP mode

6. Device Advanced Configuration

6.1 PTP Configuration

6.1.1 Introduction

PTP (Precision Time Protocol) is a protocol to accurately synchronize clocks running independently in isolated nodes that are scattered in a measurement and control system. This synchronization protocol contains phase synchronization and frequency synchronization with the synchronization accuracy of ±100ns.

Synchronous Ethernet (SyncE) applies device's PHY characteristics to synchronize the frequency of the local device with that of the uplink device. Once the SyncE is enabled, the synchronization accuracy of PTP protocol is up to ±10ns. As Figure 27 shows, Switch B uses SyncE to synchronize its data transmission frequency with that of Switch A, and Switch C also uses SyncE to synchronize its data transmission frequency with that of Switch B, finally, all devices in the network realizes the frequency synchronization.

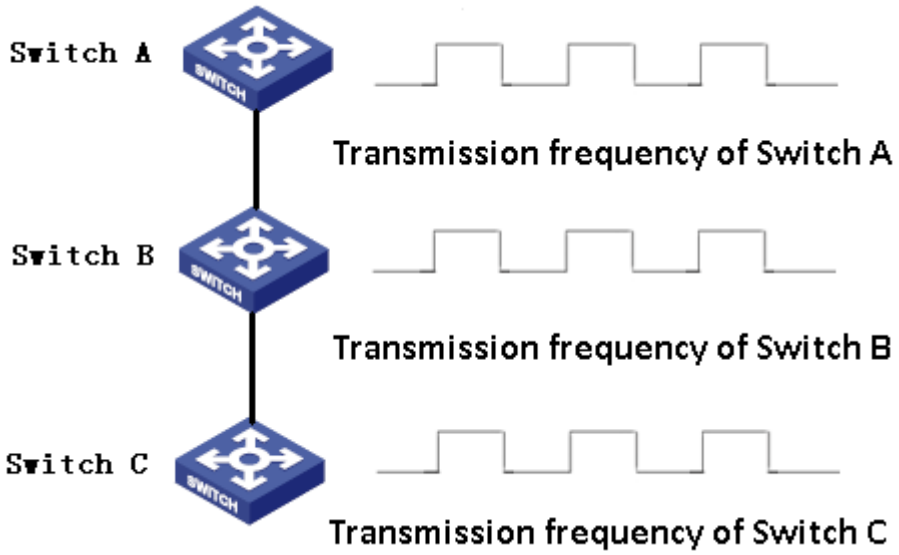

Figure 27: Synchronous Ethernet

Caution:

- The SyncE-enabled device must connect to the uplink device or the master clock whose frequency has synchronized with the device.
- Because SyncE only supports frequency synchronization, so it must be used together with PTP protocol.

6.1.2 Concepts

1. PTP domain

   The network that applies PTP protocol is a PTP domain. There is one and only one Grandmaster clock in a PTP domain; other devices in the domain should synchronize time with the Grandmaster clock.

2. PTP port

   The PTP-enabled port is a PTP port

3. Clock node

   The nodes in a PTP domain are clock nodes. PTP protocol defines several types of clock nodes:

- BC (Boundary Clock):

  This kind of clock node has one or multiple PTP ports in PTP domain to participate in clock synchronization. When there is only one PTP port to attend clock synchronization, this port is used to synchronization time with the upstream clock node or release time to the downstream clock node; when there are multiple PTP ports to participate in clock synchronization, use one of the PTP ports to synchronize time with the upstream clock node, and the rest PTP ports release time to the downstream clock nodes; when a boundary clock works as clock source, multiple PTP ports can release time to the downstream clock nodes.

- TC (Transparent Clock):

This kind of clock node does not need to keep time synchronization with other clock nodes. There are multiple PTP ports on a TC, but these ports only forward PTP protocol messages and corrects message forwarding delay rather than synchronizing time through any one of ports. Transparent clock has two types:

E2ETC (End-to-End Transparent Clock): it directly forward non-P2P protocol messages in the network and participate in the calculation of end-to-end delay.

P2PTC (Peer-to-Peer Transparent Clock): it directly forwards Sync message, Fllow-Up message and Announce message, but cannot forward other PTP protocol messages, and participate in the calculation of peer-to peer delay

4. For a pair of synchronization clock nodes, there is the master and slave relationships as follows:
   - The node that releases synchronization clock is the master node, and the one that receives synchronization clock is the slave node.
   - The clock in the master node is the master clock, and the clock in the slave node is the slave clock
   - The port that releases synchronization clock is the master port and the port that receives synchronization clock is the slave port

6.1.3 Synchronization Principle

1. Choose the grandmaster clock

All clock nodes elect a clock node to the grandmaster clock in the PTP domain by exchanging clock class, MAC address and other information in Announce message. At this moment, the master and slave relationships between all nodes and the master and slave ports in each node are also been determined. Through this process, the PTP domain creates a loop-free spanning tree in which the grandmaster clock is the root. Later, the master clock will periodically transmit Announce messages to slave clock. If slave clock has not received Announce message from the master clock for a period of time, it is assumed that the master clock is invalid and re-elect the grandmaster clock.

2. Synchronization principle

The master and slave clocks exchange synchronization messages and record the time of transmitting and receiving messages. By calculating the interval between sending and receiving a message, the total delay between the master clock and the slave clock is obtained. If the network is a symmetric network, the one way delay time is half of the total delay. The slave clock adjusts the local time according to the deviation between master and slave clock and the one way delay, so as to realize the synchronization with the master clock.

PTP supports two types of delay measurement mechanism:

- Request-Response mechanism: it is used for the end to end delay measurement
- Peer-to-peer mechanism: it is used for peer-to peer delay measurement. Compared with the Request-Response mechanism, the peer-to-peer mechanism measure the delay in each section of the entire link

6.1.4 Web Configuration

1. PTP configuration, as shown in Figure 28.

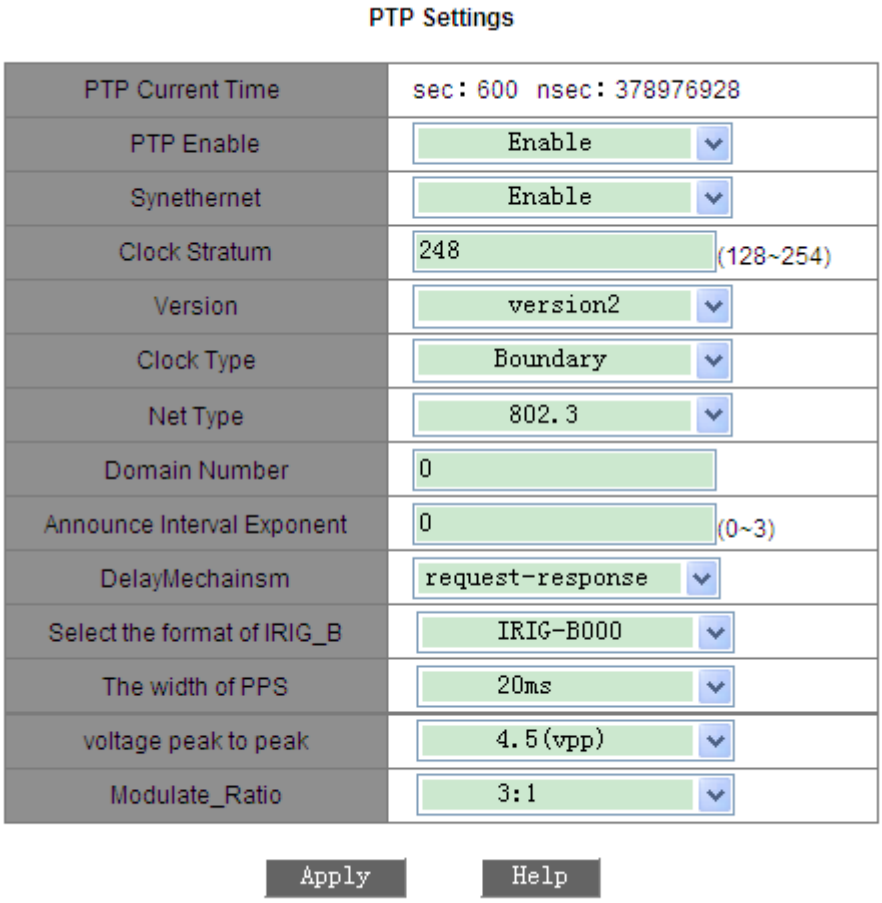

Figure 28: PTP setting

PTP Current Time

Function: Show device's PTP clock information

PTP Enable

Configuration options: Enable/Disable

Default: Disable

Function: whether enable PTP protocol on the device to synchronize clock with the uplink device

Synethernet

Configuration options: Enable/Disable

Default: Disable

Function: whether enable SyncE protocol on the device to synchronize frequency with the uplink device

Clock Stratum

Configuration range: 128~254

Default: 248

Function: Configure clock class

Description: clock class is used to choose the grandmaster clock. The clock with the lowest clock class is elected to the grandmaster clock.

Version

Configuration options: version2

Default: version2

Function: choose the version of PTP protocol

Clock Type

Configuration options: Boundary/E2E/P2P

Default: Boundary

Function: Choose the type of PTP Clock

Net Type

Configuration options: IEEE802.3/IPv4 UDP

Default: IEEE802.3

Function: choose the type of message to transmit PTP information

Domain Number

Configuration range: 0~255

Default: 0

Function: configure the domain ID of PTP

Note:

It is not recommended to modify the domain ID of PTP.

Announce Interval Exponent

Configuration options: 0-3

Default: 0

Function: Configure Announce interval exponent

Description: the interval of each clock node sending Announce message is 2^n s (n is

the interval exponent)

Delay Mechanism

Configuration options: E2E (request-response mechanism)/P2P (peer-to-peer mechanism)

Default: E2E

Function: set PTP's delay measurement mechanism

Caution:

- The delay mechanism of BC clock node can be set to E2E or P2P mode
- If the TC clock node is the type of E2ETC, the delay measurement mechanism is fixed to E2E mode (request-response mechanism)
- If the TC clock node is the type of P2PTC, the delay measurement mechanism is fixed to P2P mode (peer-to-peer mechanism)
- The delay measurement mechanism of all devices in a same PTP domain must be the same, so all TC clock types in a PTP domain must be the same

---

Select the format of IRIG-B

Configuration options: IRIG-B000/ IRIG-B002/ IRIG-B003

Default: IRIG-B000

Function: select the IRIG-B output format

The width of PPS

Configuration options: 20ms-200ms with the step length of 20ms

Default: 20ms

Function: configure the width of PPS

voltage peak to peak

Configuration options: 3/4/4.5/5/6/7/8/9/10 (vpp)

Default: 4.5 (vpp)

Function: configure the peak of IRIG-B after modulation.

Module-Ratio

Configuration options: 3:1⁄4:1⁄5:1⁄6:1

Default: 3:1

Function: configure AM modulation ratio of IRIG-B

6.1.5 Typical Configuration Example

As Figure 29 shows, port 1 of Switch A connects with port 2 of Switch B, and port 3 of Switch B connects with port 4 of PTC1000. Switch A is the master clock and is set to a BC clock. Switch B choose P2PTC clock type. PTC1000 is a slave clock and is set to a BC clock, and it uses SyncE and PTP protocols to synchronize time with Switch A. The delay measurement mechanism is the peer-to-peer mechanism.

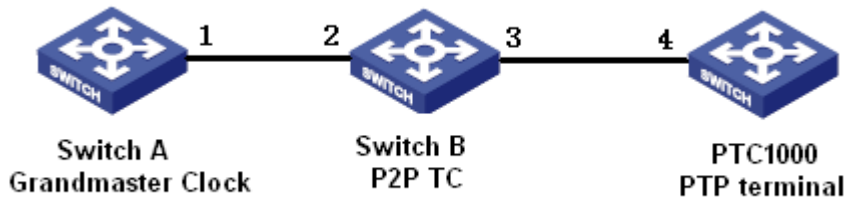

Figure 29: PTP+ SyncE configuration example

Switch A configuration:

1. Enable PTP function in the port 1 of Switch A.
2. Configure the clock type to Boundary. Because Switch A is a master clock, so it should have the optimum clock class. Here it is set to 200; the delay measurement mechanism is set to P2P.

Switch B configuration:

1. Enable SyncE function in Switch B
3. Enable PTP function in Switch B's port 2 and port 3 with the clock class of 210; the delay measurement mechanism is set to P2P.

Switch C configuration:

1. Enable SyncE and PTP function in Switch C, as shown in Figure 28.
2. Configure the clock type to Boundary and the clock class to 220; the delay measurement mechanism is set to P2P, as shown in Figure 28

3. Other parameters all adopts default values.

6.2 SNMP Configuration

6.2.1 Introduction

SNMP (Simple Network Management Protocol) is a framework to manage devices in the network by using TCP/IP protocol suite. Network administrator can use SNMP function to check device information, modify device parameters, monitor device status and locate network faults, and so on.

6.2.2 Implementation

SNMP protocol adopts manager/agent mode, so SNMP network contains NMS and Agent.

- NMS (Network Management Station) is a workstation running of the SNMP-supported network management software client program, playing a core role in SNMP network management.
- Agent is a process in the managed device. It is responsible for receiving, processing the request messages from NMS. When alarm is triggered, Agent will automatically inform the NMS.

NMS manages SNMP network while Agent is managed by SNMP network. The management information exchange between NMS and Agent is through SNMP protocol. SNMP provides 5 basic operations:

- Get-Request
- Get-Response
- Get-Next-Request
- Set-Request
- Trap

NMS sends query and configuration requests to Agent by Get-Request, Get-Next-Request and Set-Request messages. When Agent receives request, it will

send out Get-Response message as respond. When alarm is triggered, Agent will automatically send Trap message to NMS to inform the occurrence of abnormal events.

6.2.3 Explanation

SNMP Agent of this series device supports SNMP v2 version which is compatible with SNMP v1.

SNMP v1 adopts Community Name Authentication. Community name plays a role of password and is used to restrict SNMP NMS accessing SNMP Agent. If a SNMP message carries a community name that cannot pass device authentication, this message will be dropped.

SNMP v2 also adopts community name authentication. It not only is compatible with SNMP v1, but also expands the functions of SNMP v1.

The matched SNMP version is the precondition of successful information exchange between NMS and Agent. Agent can be configured with multiple versions at the same time, and uses different version to communicate with different NMS.

6.2.4 MIB Introduction

Any managed resource can be viewed as an object and it is called a managed object.

MIB (Management Information Base) is a collection of managed objects. It defines the hierarchical relationships between managed objects and defines a series of attributes of objects, such as object's name, access rights, data types, and so on. Each Agent has its own MIB. NMS can read or write objects in the MIB according to its rights. The relationship of NMS, Agent and MIB is shown in Figure 30.

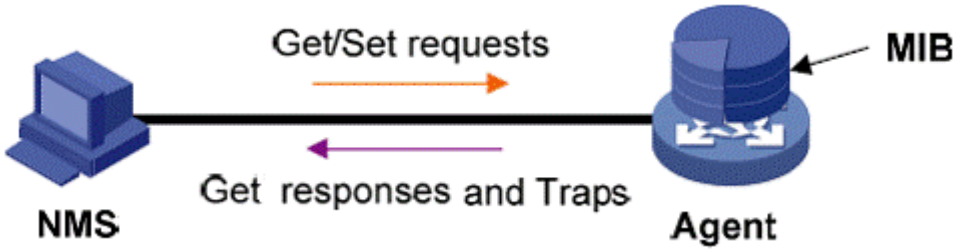

Figure 30: NMS, Agent and MIB relationship

MIB defines a tree structure and each tree node indicates a managed object. Each node contains a sole OID (Object Identifier). OID indicates node's position in the MIB tree structure, as shown in Figure 31. The OID of the managed object A is 1.2.1.1.

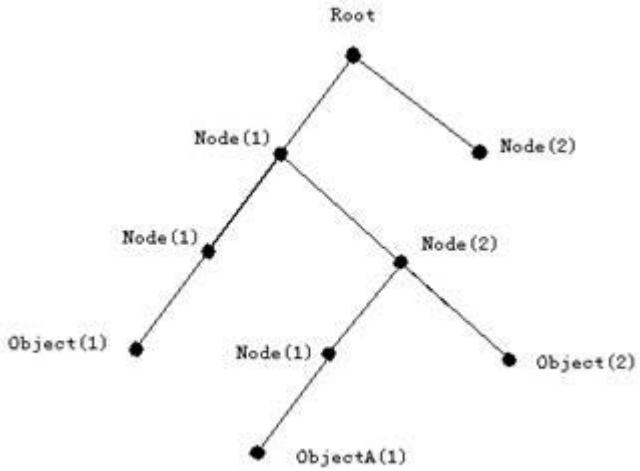

Figure 31: MIB tree structure

6.2.5 Web configuration

1. Enable SNMP Protocol, as shown in Figure 32.

Figure 32: Enable SNMP

SNMP State

Configuration options: Enable/Disable

Default: Enable

Function: Enable/Disable SNMP protocol

2. Configure access rights, as shown in Figure 33.

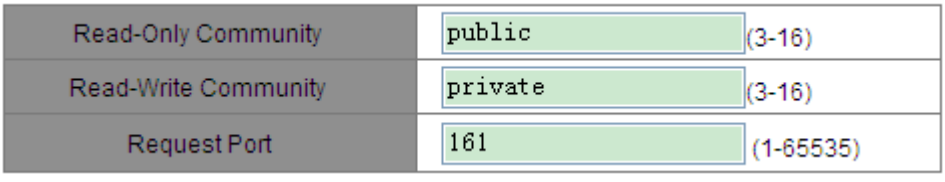

Figure 33: Access rights configuration

Read-Only Community

Configuration range: 3~16 characters

Default: public

Function: configure the Read-only community name

Description: Only when the community name carried in the SNMP message is same as this community string can the user read the information in the device MIB.

Read-Write Community

Configuration range: 3~16 characters

Default: private

Function: Configure the Read-Write community name

Description: Only when the community name carried in the SNMP message is same as this community string can the user read and write the information in the device MIB.

Request Port

Configuration range: 1-65535

Default: 161

Function: configure the number of the port to receive SNMP requests

3. Trap configuration, as shown in Figure 34.

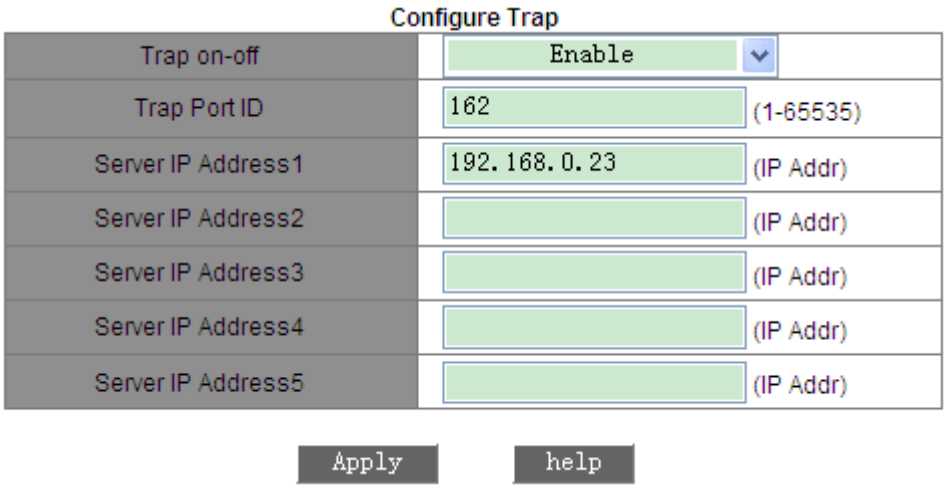

Figure 34: Trap configuration

Trap on-off

Configuration options: Enable/Disable

Default: Enable

Function: allow the device to send Trap message or not

Trap Port ID

Configuration options: 1-65535

Default: 162

Function: configure the number of port to send Trap message

Server IP Address

Configuration format: A.B.C.D

Function: configure the IP address of the server that receives Trap messages. Max 5 server IP addresses are supported to receive Trap messages

4. Check management server IP address, as shown in Figure 35.

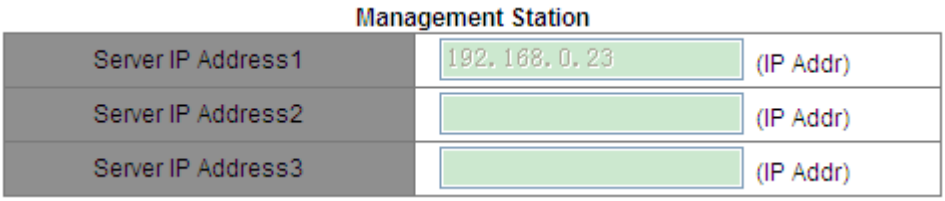

Figure 35: Management server IP address

It is not necessary to manually configure the server IP address. Only need to run the network management software on server and read and write the MIB information of the device, the server IP address will be automatically displayed.

6.2.6 Typical Configuration Example

SNMP NMS connects with device through Ethernet. The IP address of NMS is 192.168.1.23 and the device IP address is 192.168.1.2. NMS monitors and manages Agent by using SNMPv2 and it can read and write MIB information of Agent, and the Agent automatically sends Trap messages to NMS when failover occurs in Agent, as shown in Figure 36.

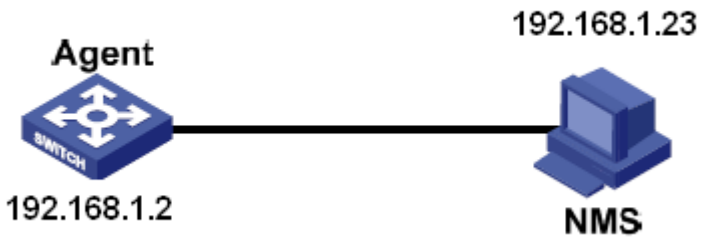

Figure 36: SNMPv2 Configuration example

Agent configuration:

1. Enable SNMP protocol, see Figure 32.
2. Configure access rights with the Read-Only community name “public” and Read-Write community name “private”, and the request port is 161, as shown in Figure 33.
3. Enable Trap, set the Trap Port ID to 162 and server IP address to 192.168.1.23, as shown in Figure 34.

If user would like to monitor and manage Agent devices, it is needed to run the corresponding management software in NMS, such as Kyvision network management software of Kyland.

About the specific operation of Kyvision software in NMS, please refer to “Kyvision Network Management Software Operation Manual” for more details.

Appendix: Acronyms

CLI	Command Line Interface
FTP	File Transfer Protocol
MIB	Management Information Base
NMS	Network Management Station
OID	Object Identifier
P2PTC	Peer-to-Peer Transparent Clock
PTP	Precision Time Protocol
SNMP	Simple Network Management Protocol
TC	Transparent Clock
TCP	Transmission Control Protocol
UDP	User Datagram Protocol