9

Time Protocols

Contents

Overview

This chapter describes:

- SNTP Time Protocol Operation
- Timep Time Protocol Operation

Using time synchronization ensures a uniform time among interoperating devices. This helps you to manage and troubleshoot switch operation by attaching meaningful time data to event and error messages.

The switch offers TimeP and SNTP (Simple Network Time Protocol) and a **timesync** command for changing the time protocol selection (or turning off time protocol operation).

Notes

- Although you can create and save configurations for both time protocols without conflicts, the switch allows only one active time protocol at any time.
- In the factory-default configuration, the time synchronization option is set to TimeP, with the TimeP mode itself set to **Disabled**.

TimeP Time Synchronization

You can either manually assign the switch to use a TimeP server or use DHCP to assign the TimeP server. In either case, the switch can get its time synchronization updates from only one, designated Timep server. This option enhances security by specifying which time server to use.

SNTP Time Synchronization

SNTP provides two operating modes:

- **Broadcast Mode:** The switch acquires time updates by accepting the time value from the first SNTP time broadcast detected. (In this case, the SNTP server must be configured to broadcast time updates to the network broadcast address. Refer to the documentation provided with your SNTP server application.) Once the switch detects a particular server, it ignores time broadcasts from other SNTP servers unless the configurable **Poll Interval** expires three consecutive times without an update received from the first-detected server.

Note

To use Broadcast mode, the switch and the SNTP server must be in the same subnet.

- **Unicast Mode:** The switch requests a time update from the configured SNTP server. (You can configure one server using the menu interface, or up to three servers using the CLI **sntp server** command.) This option provides increased security over the Broadcast mode by specifying which time server to use instead of using the first one detected through a broadcast.

Selecting a Time Synchronization Protocol or Turning Off Time Protocol Operation

General Steps for Running a Time Protocol on the Switch:

1. Select the time synchronization protocol: **SNTP** or **TimeP** (the default).
2. Enable the protocol. The choices are:
   - SNTP: **Broadcast** or **Unicast**
   - TimeP: **DHCP** or **Manual**
3. Configure the remaining parameters for the time protocol you selected.

   The switch retains the parameter settings for both time protocols even if you change from one protocol to the other. Thus, if you select a time protocol, the switch uses the parameters you last configured for the selected protocol.

Note that simply selecting a time synchronization protocol does not enable that protocol on the switch unless you also enable the protocol itself (step 2, above). For example, in the factory-default configuration, TimeP is the selected time synchronization method. However, because TimeP is disabled in the factory-default configuration, no time synchronization protocol is running.

Disabling Time Synchronization

You can use either of the following methods to disable time synchronization without changing the Timep or SNTP configuration:

- In the System Information screen of the Menu interface, set the **Time Synch Method** parameter to **None**, then press **[Enter],** then **[S]** (for **Save**).
- In the Global config level of the CLI, execute **no timesync**.

SNTP: Viewing, Selecting, and Configuring

SNTP Feature	Default	Menu	CLI	Web
view the SNTP time synchronization configuration	n/a	page 9-6	page 9-9	—
select SNTP as the time synchronization method	timep	page 9-7	page 9-11 ff.	—
disable time synchronization	timep	page 9-7	page 9-15	—
enable the SNTP mode (Broadcast, Unicast, or Disabled)	disabled			—
broadcast	n/a	page 9-7	page 9-12	—
unicast	n/a	page 9-7	page 9-12	—
none/disabled	n/a	page 9-7	page 9-16	—
configure an SNTP server address (for Unicast mode only)	none	page 9-7	page 9-12 ff.	—
change the SNTP server version (for Unicast mode only)	3	page 9-8	page 9-14	—
change the SNTP poll interval	720 seconds	page 9-8	page 9-15	—
change the server priority	n/a	—	page 9-15	—

Table 9-1. SNTP Parameters

SNTP Parameter	Operation
Time Sync Method	Used to select either SNTP, TIMEP, or None as the time synchronization method.
SNTP Mode	
Disabled	The Default. SNTP does not operate, even if specified by the Menu interface **Time Sync Method** parameter or the CLI **timesync** command.
Unicast	Directs the switch to poll a specific server for SNTP time synchronization. Requires at least one server address.
Broadcast	Directs the switch to acquire its time synchronization from data broadcast by any SNTP server to the network broadcast address. The switch uses the first server detected and ignores any others. However, if the Poll Interval expires three times without the switch detecting a time update from the original server, it the switch accepts a broadcast time update from the next server it detects.
Poll Interval (seconds)	In Unicast Mode: Specifies how often the switch polls the designated SNTP server for a time update. In Broadcast Mode: Specifies how often the switch polls the network broadcast address for a time update. Value between 30-720 seconds.
Server Address	Used only when the **SNTP Mode** is set to **Unicast**. Specifies the IP address of the SNTP server that the switch accesses for time synchronization updates. You can configure up to three servers; one using the menu or CLI, and two more using the CLI. Refer to "SNTP Unicast Time Polling with Multiple SNTP Servers" on page 9-35.
Server Version	Default: 3; range: 1 - 7. Specifies the SNTP software version to use, and is assigned on a per-server basis. The version setting is backwards-compatible. For example, using version 3 means that the switch accepts versions 1 through 3.
Priority	Specifies the order in which the configured servers are polled for getting the time. Value is between 1 and 3.

Menu: Viewing and Configuring SNTP

To View, Enable, and Modify SNTP Time Protocol:

1. From the Main Menu, select:

   2. Switch Configuration...

   1. System Information

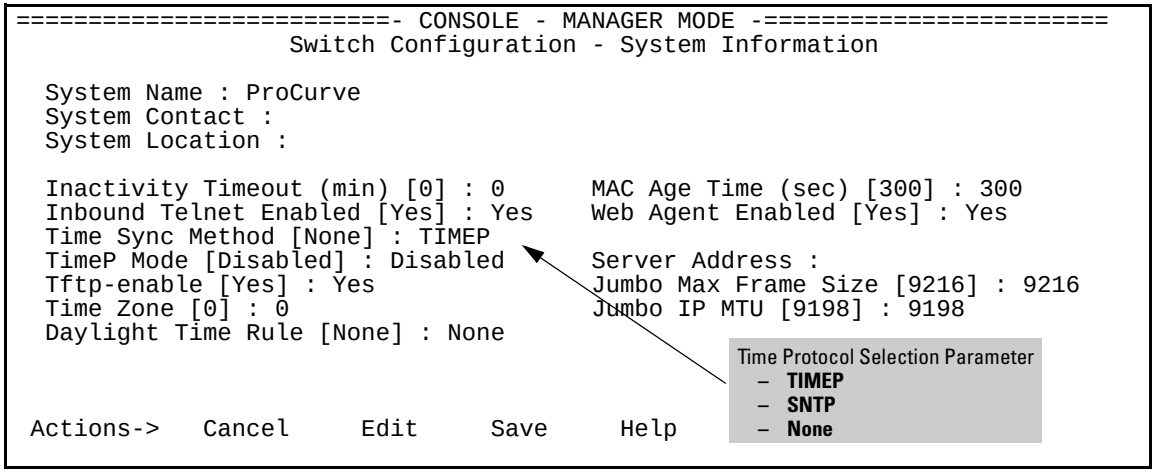

Figure 9-1. The System Information Screen (Default Values)

2. Press **[E]** (for **Edit**). The cursor moves to the **System Name** field.
3. Use ↓ to move the cursor to the **Time Sync Method** field.
4. Use the Space bar to select **SNTP**, then press ↓ once to display and move to the **SNTP Mode** field.
5. Do one of the following:
   - Use the Space bar to select the **Broadcast** mode, then press ↓ to move the cursor to the **Poll Interval** field, and go to step 6. (For Broadcast mode details, refer to "SNTP Operating Modes" on page 9-3.)

```
Time Sync Method [None] : SNTP
SNTP Mode [Disabled] : Broadcast
Poll Interval (sec) [720] : 720
Tftp-enable [Yes] : Yes
Time Zone [0] : 0
Daylight Time Rule [None] : None
```

Figure 9-2. Time Configuration Fields for SNTP with Broadcast Mode

   - Use the Space bar to select the **Unicast** mode, then do the following:
     i. Press → to move the cursor to the **Server Address** field.
     ii. Enter the IP address of the SNTP server you want the switch to use for time synchronization.

Note: This step replaces any previously configured server IP address. If you will be using backup SNTP servers (requires use of the CLI), then refer to "SNTP Unicast Time Polling with Multiple SNTP Servers" on page 9-35.

iii. Press ↓ to move the cursor to the **Server Version** field. Enter the value that matches the SNTP server version running on the device you specified in the preceding step (step ii). If you are unsure which version to use, ProCurve recommends leaving this value at the default setting of **3** and testing SNTP operation to determine whether any change is necessary.

Note: Using the menu to enter the IP address for an SNTP server when the switch already has one or more SNTP servers configured causes the switch to delete the primary SNTP server from the server list and to select a new primary SNTP server from the IP address(es) in the updated list. For more on this topic, refer to "SNTP Unicast Time Polling with Multiple SNTP Servers" on page 9-35.

iv. Press → to move the cursor to the **Poll Interval** field, then go to step 6.

```
Time Sync Method [None] : SNTP
SNTP Mode [Disabled] : Unicast        Server Address : 10.28.227.15
Poll Interval (sec) [720] : 720       Server Version [3] : 3
Tftp-enable [Yes] : Yes
Time Zone [0] : 0
Daylight Time Rule [None] : None
```

Note: The Menu interface lists only the highest priority SNTP server, even if others are configured. To view all SNTP servers configured on the switch, use the CLI **show management** command. Refer to "SNTP Unicast Time Polling with Multiple SNTP Servers" on page 9-35.

Figure 9-3. SNTP Configuration Fields for SNTP Configured with Unicast Mode

6. In the **Poll Interval** field, enter the time in seconds that you want for a Poll Interval. (For Poll Interval operation, see table 9-1, "SNTP Parameters", on page 9-6.)

7. Press **[Enter]** to return to the Actions line, then **[S]** (for **Save**) to enter the new time protocol configuration in both the startup-config and running-config files.

CLI: Viewing and Configuring SNTP

CLI Commands Described in this Section

SNTP Command	Page
show sntp	9-9
[no] timesync	9-11 and ff., 9-15
sntp broadcast	9-12
sntp unicast	9-12
sntp server	9-12 and ff.
Protocol Version	9-14
Priority	9-15
poll-interval	9-15
no sntp	9-16

This section describes how to use the CLI to view, enable, and configure SNTP parameters.

Viewing the Current SNTP Configuration

Syntax: show sntp

*This command lists both the time synchronization method (***TimeP***, ***SNTP***, or* ***None****) and the SNTP configuration, even if SNTP is not the selected time protocol.*

For example, if you configured the switch with SNTP as the time synchronization method, then enabled SNTP in broadcast mode with the default poll interval, show sntp lists the following:

```
ProCurve(config)# show sntp

 SNTP Configuration

  Time Sync Mode: Sntp
  SNTP Mode : Unicast
  Poll Interval (sec) [720] : 719


  Priority SNTP Server Address                          Protocol Version
  -------- ---------------------------------------------- ----------------
  1        2001:db8::215:60ff:fe79:8980                  7
  2        10.255.5.24                                   3
  3        fe80::123%vlan10                              3
```

Figure 9-4. Example of SNTP Configuration When SNTP Is the Selected Time Synchronization Method

In the factory-default configuration (where TimeP is the selected time synchronization method), **show sntp** still lists the SNTP configuration even though it is not currently in use. For example:

```
ProCurve(config)# show sntp

 SNTP Configuration

  Time Sync Mode: Timep
  SNTP Mode : Unicast
  Poll Interval (sec) [720] : 719


  Priority SNTP Server Address                          Protocol Version
  -------- ---------------------------------------------- ----------------
  1        2001:db8::215:60ff:fe79:8980                  7
  2        10.255.5.24                                   3
  3        fe80::123%vlan10                              3
```

Even though, in this example, TimeP is the current time synchronous method, the switch maintains the SNTP configuration.

Figure 9-5. Example of SNTP Configuration When SNTP Is Not the Selected Time Synchronization Method

Syntax: **show management**

This command can help you to easily examine and compare the IP addressing on the switch. It lists the IP addresses for all time servers configured on the switch, plus the IP addresses and default gateway for all VLANs configured on the switch.

```
ProCurve(config)# show management

 Status and Counters - Management Address Information

  Time Server Address : fe80::215:60ff:fe7a:adc0%vlan10

  Priority SNTP Server Address                          Protocol Version
  -------- ------------------------------------------- ----------------
  1        2001:db8::215:60ff:fe79:8980                 7
  2        10.255.5.24                                  3
  3        fe80::123%vlan10                             3


  Default Gateway     : 10.0.9.80

  VLAN Name    MAC Address         | IP Address
  ------------ ------------------- + ------------------
  DEFAULT_VLAN 001279-88a100       | Disabled
  VLAN10       001279-88a100       | 10.0.10.17
```

Figure 9-6. Example of Display Showing IP Addressing for All Configured Time Servers and VLANs

Configuring (Enabling or Disabling) the SNTP Mode

Enabling the SNTP mode means to configure it for either broadcast or unicast mode. Remember that to run SNTP as the switch's time synchronization protocol, you must also select SNTP as the time synchronization method by using the CLI **timesync** command (or the Menu interface **Time Sync Method** parameter).

Syntax: timesync sntp

Selects SNTP as the time protocol.

sntp < broadcast | unicast >

Enables the SNTP mode (below and page 9-12).

Syntax: sntp server < ip-addr >

Required only for unicast mode page 9-12).

Syntax: sntp server priority <1 - 3 >

Specifies the order in which the configured servers are polled for getting the time. Value is between 1 and 3.

Syntax: sntp poll-interval < 30 - 720 >

Enabling the SNTP mode also enables the SNTP poll interval (default: 720 seconds; page 9-15).

Enabling SNTP in Broadcast Mode. Because the switch provides an SNTP polling interval (default: 720 seconds), you need only these two commands for minimal SNTP broadcast configuration:

Syntax: timesync sntp
Selects SNTP as the time synchronization method.

Syntax: sntp broadcast
Configures **broadcast** *as the SNTP mode.*

For example, suppose:

- Time synchronization is in the factory-default configuration (TimeP is the currently selected time synchronization method).
- You want to:
  1. View the current time synchronization.
  2. Select SNTP as the time synchronization mode.
  3. Enable SNTP for Broadcast mode.
  4. View the SNTP configuration again to verify the configuration.

The commands and output would appear as follows:

```
ProCurve(config)# show sntp                    (1)
 SNTP Configuration
  Time Sync Mode: Timep
  SNTP Mode : disabled
  Poll Interval (sec) [720] : 720
ProCurve(config)# timesync sntp                (2)
ProCurve(config)# sntp broadcast               (3)
ProCurve(config)# show sntp                    (4)
 SNTP Configuration
  Time Sync Mode: Sntp
  SNTP Mode : Broadcast
  Poll Interval (sec) [720] : 720
```

1 **show sntp** displays the SNTP configuration and also shows that TimeP is the currently active time synchronization mode.

4 **show sntp** again displays the SNTP configuration and shows that SNTP is now the currently active time synchronization mode and is configured for broadcast operation.

Figure 9-7. Example of Enabling SNTP Operation in Broadcast Mode

Enabling SNTP in Unicast Mode. Like broadcast mode, configuring SNTP for unicast mode enables SNTP. However, for Unicast operation, you must also specify the IP address of at least one SNTP server. The switch allows up to three unicast servers. You can use the Menu interface or the CLI to configure one server or to replace an existing Unicast server with another. To add a

second or third server, you must use the CLI. For more on SNTP operation with multiple servers, refer to "SNTP Unicast Time Polling with Multiple SNTP Servers" on page 9-35.

Syntax: timesync sntp

Selects SNTP as the time synchronization method.

sntp unicast

Configures the SNTP mode for Unicast operation.

Syntax: [no] sntp server priority <*1-3*> <*ip-address*> [oobm] [version]

Use the **no** *version of the command to disable SNTP.*

priority *specifies the order in which the configured SNTP servers are polled for the time; allowable values are 1 through 3.*

ip-address *is an IPv4 or IPv6 address of an SNTP server.*

For switches that have a separate out-of-band management port, **oobm** *specifies that SNTP traffic goes through that port. (By default, SNTP traffic goes through the data ports.)*

version *is the protocol version of the SNTP server. Allowable values are 1 through 7; default is 3.*

Syntax: no sntp server < ip-addr >

Deletes the specified SNTP server.

Note

Deleting an SNTP server when only one is configured disables SNTP unicast operation.

For example, to select SNTP and configure it with unicast mode and an SNTP server at 10.28.227.141 with the default server version (3) and default poll interval (720 seconds):

```
ProCurve(config)# timesync sntp
```

Selects SNTP.

```
ProCurve(config)# sntp unicast
```

Activates SNTP in Unicast mode.

```
ProCurve(config)# sntp server 10.28.227.141
```

Specifies the SNTP server and accepts the current SNTP server version (default: 3).

```
ProCurve(config)# show sntp

 SNTP Configuration

  Time Sync Mode: Sntp
  SNTP Mode : Unicast
  Poll Interval (sec) [720] : 720

  Priority SNTP Server Address                          Protocol Version
  -------- ---------------------------------------------- ----------------
  1        2001:db8::215:60ff:fe79:8980                  7
  2        10.255.5.24                                   3
  3        fe80::123%vlan10                              3
```

In this example, the **Poll Interval** and the **Protocol Version** appear at their default settings.

Both IPv4 and IPv6 addresses are displayed.

Note: Protocol Version appears only when there is an IP address configured for an SNTP server.

Figure 9-8. Example of Configuring SNTP for Unicast Operation

If the SNTP server you specify uses SNTP version 4 or later, use the **sntp server** command to specify the correct version number. For example, suppose you learned that SNTP version 4 was in use on the server you specified above (IP address 10.28.227.141). You would use the following commands to delete the server IP address and then re-enter it with the correct version number for that server:

```
ProCurve(config)# no sntp server 10.28.227.141
ProCurve(config)# sntp server 10.28.227.141 4
ProCurve(config)# show sntp
 SNTP Configuration
  Time Sync Mode: Sntp
  SNTP Mode : Broadcast
  Poll Interval (sec) [720] : 600
  IP Address       Protocol Version
  --------------   ----------------
  10.28.227.141    4
```

Deletes unicast SNTP server entry.

Re-enters the unicast server with a non-default protocol version.

show sntp displays the result.

Figure 9-9. Example of Specifying the SNTP Protocol Version Number

Changing the SNTP Poll Interval.

Syntax: sntp poll-interval < 30..720 >

Specifies how long the switch waits between time polling intervals. The default is 720 seconds and the range is 30 to 720 seconds. (This parameter is separate from the poll interval parameter used for Timep operation.)

For example, to change the poll interval to 300 seconds:

```
ProCurve(config)# sntp poll-interval 300
```

Changing the Priority. You can choose the order in which configured servers are polled for getting the time by setting the server priority.

Syntax: sntp server priority <1 - 3> <ip-address>

Specifies the order in which the configured servers are polled for getting the time. Value is between 1 and 3.

Note: *Both IPv4 and IPv6 addresses can be entered. For more information about IPv6 addresses, see the "IPv6 Configuration Guide" for your switch.*

For example, to set one server to priority 1 and another to priority 2:

```
ProCurve(config)# sntp server priority 1 10.28.22.141

ProCurve(config)# sntp server priority 2
                    2001:db8::215:60ff:fe79:8980
```

Disabling Time Synchronization Without Changing the SNTP Configuration. The recommended method for disabling time synchronization is to use the **timesync** command.

Syntax: no timesync

Halts time synchronization without changing your SNTP configuration.

For example, suppose SNTP is running as the switch's time synchronization protocol, with **Broadcast** as the SNTP mode and the factory-default polling interval. You would halt time synchronization with this command:

```
ProCurve(config)# no timesync
```

If you then viewed the SNTP configuration, you would see the following:

```
ProCurve(config)# show sntp
 SNTP Configuration
  Time Sync Mode: Disabled
  SNTP Mode : Broadcast
  Poll Interval (sec) [720] : 720
```

Figure 9-10. Example of SNTP with Time Synchronization Disabled

Disabling the SNTP Mode. If you want to prevent SNTP from being used even if selected by **timesync** (or the Menu interface's **Time Sync Method** parameter), configure the SNTP mode as disabled.

Syntax: no sntp

Disables SNTP by changing the SNTP mode configuration to **Disabled**.

For example, if the switch is running SNTP in Unicast mode with an SNTP server at 10.28.227.141 and a server version of 3 (the default), **no sntp** changes the SNTP configuration as shown below, and disables time synchronization on the switch.

```
ProCurve(config)# no sntp

ProCurve(config)# show sntp
 SNTP Configuration
  Time Sync Mode: Sntp
  SNTP Mode : disabled
  Poll Interval (sec) [720] : 720
  IP Address       Protocol Version
  --------------   ----------------
  10.28.227.141    3
```

Even though the **Time Sync Mode** is set to **Sntp**, time synchronization is disabled because **no sntp** has disabled the **SNTP Mode** parameter.

Figure 9-11. Example of Disabling Time Synchronization by Disabling the SNTP Mode

SNTP Client Authentication

Enabling SNTP authentication allows network devices such as HP ProCurve switches to validate the SNTP messages received from an NTP or SNTP server before updating the network time. NTP or SNTP servers and clients must be configured with the same set of authentication keys so that the servers can authenticate the messages they send and clients (HP ProCurve switches) can validate the received messages before updating the time.

This feature provides support for SNTP client authentication on HP ProCurve switches, which addresses security considerations when deploying SNTP in a network.

Requirements

The following must be configured to enable SNTP client authentication on the switch.

SNTP Client Authentication Support

- Timesync mode must be SNTP. Use the **timesync sntp** command. (SNTP is disabled by default.)
- SNTP must be in unicast or broadcast mode. See "Configuring Unicast and Broadcast Mode" on page 9-21.
- The MD5 authentication mode must be selected.
- An SNTP authentication key-identifier (**key-id**) must be configured on the switch and a value (**key-value**) must be provided for the authentication key. A maximum of 8 sets of **key-id** and **key-value** can be configured on the switch.
- Among the keys that have been configured, one key or a set of keys must be configured as trusted. Only trusted keys will be used for SNTP authentication.
- If the SNTP server requires authentication, one of the trusted keys has to be associated with the SNTP server.
- SNTP client authentication must be enabled on the ProCurve switch. If client authentication is disabled, packets are processed without authentication. All of the above steps are necessary to enable authentication on the client.

SNTP Server Authentication Support

Note SNTP server is not supported on ProCurve products.

The following must be performed on the SNTP server:

- The same authentication key-identifier, trusted key, authentication mode and key-value that were configured on the SNTP client must also be configured on the SNTP server.
- SNTP server authentication must be enabled on the server.

If any of the parameters on the server are changed, the parameters have to be changed on all the SNTP clients in the network as well. The authentication check will fail on the clients otherwise, and the SNTP packets will be dropped.

Configuring the Key-Identifier, Authentication Mode, and Key-Value

This command configures the **key-id**, **authentication-mode**, and **key-value**, which are required for authentication. It is executed in the global configuration context.

Syntax: sntp authentication key-id <*key-id*> authentication-mode <md5> key-value <*key-string*> [trusted] no sntp authentication key-id <*key-id*>

Configures a key-id, authentication-mode (MD5 only), and key-value, which are required for authentication.

The **no** *version of the command deletes the authentication key.*

Default: No default keys are configured on the switch.

key-id: *A numeric key identifier in the range of 1-4,294,967,295 (2^{32})that identifies the unique key value. It is sent in the SNTP packet.*

key-value <*key-string***>:** *The secret key that is used to generate the message digest. Up to 32 characters are allowed for <key-string>.*

```
ProCurve(config)# sntp authentication key-id 55 authentication-mode md5
 key-value secretkey1
```

Figure 9-12. Example of Setting Parameters for SNTP Authentication

Configuring a Trusted Key

Trusted keys are used in SNTP authentication. In unicast mode, a **trusted** key must be associated with a specific NTP/SNTP server. That key is used for authenticating the SNTP packet.

In unicast mode, a specific server is configured on the switch so that the SNTP client communicates with the specified server to get the date and time.

In broadcast mode, the SNTP client switch checks the size of the received packet to determine if it is authenticated. If the broadcast packet is authenticated, the key-id value is checked to see if the same key-id value is configured on the SNTP client switch. If the switch is configured with the same key-id value and the key-id value is configured as "trusted", the authentication succeeds. Only trusted key-id value information is used for SNTP authentication. See"Configuring Unicast and Broadcast Mode" on page 9-21 for information about configuring these modes.

If the packet contains key-id value information that is not configured on the SNTP client switch or the received packet contains no authentication information, it is discarded. The SNTP client switch expects packets to be authenticated if SNTP authentication is enabled.

When authentication succeeds, the time in the packet is used to update the time on the switch.

Enter the following command to configure a **key-id** as **trusted**.

Syntax: sntp authentication key-id <*key-id*> trusted
no sntp authentication key-id <*key-id*> trusted

Trusted keys are used during the authentication process. The switch can be configured with up to eight sets of key-id/key-value pairs. One specific set must selected for authentication; this is done by configuring the set as **trusted**.

The **key-id** *itself must already be configured on the switch. To enable authentication, at least one* **key-id** *must be configured as* **trusted**.

The **no** *version of the command indicates the key is unreliable (not trusted).*

Default: No key is trusted by default.

Associating a Key with an SNTP Server

After a key is configured, it must be associated with a specific server.

Syntax: [no] sntp server priority <1-3> <ip-address | ipv6-address> <*version-num*> [key-id <1-4,294,967,295>]

Configures a **key-id** *to be associated with a specific server. The key itself must already be configured on the switch.*

The **no** *version of the command disassociates the key from the server. This does not remove the authentication key.*

Default: No key is associated with any server by default.

priority*: Specifies the order in which the configured servers are polled for getting the time. Value is between 1 and 3.*

<version-num>:*Specifies the SNTP software version to use, and is assigned on a per-server basis. The version setting is backwards-compatible. For example, using version 3 means that the switch accepts versions 1 through 3.*

Default: 3; range: 1 - 7.

key-id: *Optional command. The key identifier (range 1-4,294,967,295) sent in the SNTP packet. This* **key-id** *will be associated with the SNTP server specified in the command.*

```
ProCurve(config)# sntp server priority 1 10.10.19.5 2 key-id 55
```

Figure 9-13. Example of Associating a Key-Id with a Specific Server

Enabling SNTP Client Authentication

The **sntp authentication** command enables SNTP client authentication on the switch. If SNTP authentication is not enabled, SNTP packets are not authenticated.

Syntax: [no] sntp authentication

Enables the SNTP client authentication.

The **no** *version of the command disables authentication.*

Default: SNTP client authentication is disabled by default.

Configuring Unicast and Broadcast Mode

To enable authentication, either unicast or broadcast mode must be configured. When authentication is enabled, changing the mode from unicast to broadcast or vice versa is not allowed. You must disable authentication and then change the mode.

To set the SNTP mode or change from one mode to the other, enter the appropriate command.

Syntax: sntp unicast
sntp broadcast

Enables SNTP for either broadcast or unicast mode.

Default: SNTP mode is disabled by default. SNTP does not operate even if specified by the CLI **timesync** *command or by the menu interface* **Time Sync Method** *parameter.*

Unicast: *Directs the switch to poll a specific server periodically for SNTP time synchronization. The default value between each polling request is 720 seconds but can be configured. At least one manually configured server IP address is required.*

Note: *At least one* **key-id** *must be configured as* **trusted** *and it must be associated with one of the SNTP servers. To edit or remove the associated* **key-id** *information or SNTP server information, SNTP authentication must be disabled.*

Broadcast: *Directs the switch to acquire its time synchronization from data broadcast by any SNTP server to the network broadcast address. The switch uses the first server detected and ignores any others. However, if the Poll Interval (configurable up to 720 seconds) expires three times without the switch detecting a time update from the original server, the switch accepts a broadcast time update from the next server it detects.*

Displaying SNTP Configuration Information

The **show sntp** command displays SNTP configuration information, including any SNTP authentication keys that have been configured on the switch.

```
ProCurve(config)# show sntp

 SNTP Configuration

  SNTP Authentication : Enabled
  Time Sync Mode: Sntp
  SNTP Mode : Unicast
  Poll Interval (sec) [720] : 720


  Priority SNTP Server Address                      Protocol Version KeyId
  -------- ---------------------------------------  ---------------- -----
  1        10.10.10.2                               3                55
  2        fe80::200:24ff:fec8:4ca8                 3                55
```

Figure 9-14. Example of SNTP Configuration Information

To display all the SNTP authentication keys that have been configured on the switch, enter the **show sntp authentication** command.

```
ProCurve(config)# show sntp authentication

  SNTP Authentication Information

  SNTP Authentication : Enabled

  Key-ID  Auth Mode  Trusted
  ------- ---------- --------
  55      MD5        Yes
  10      MD5        No
```

Figure 9-15. Example of show sntp authentication Command Output

To display the statistical information for each SNTP server, enter the **sntp statistics** command. The number of SNTP packets that have failed authentication is displayed for each SNTP server address.

```
ProCurve(config)# show sntp statistics
SNTP Statistics

  Received Packets  : 0
  Sent Packets      : 3
  Dropped Packets   : 0

  SNTP Server Address                          Auth Failed Pkts
  -------------------------------------        ----------------
  10.10.10.1                                       0
  fe80::200:24ff:fec8:4ca8                         0
```

Figure 9-16. Example of SNTP Authentication Statistical Information

Saving Configuration Files and the Include-Credentials Command

You can use the **include-credentials** command to store security information in the running-config file. This allows you to upload the file to a TFTP server and then later download the file to the ProCurve switches on which you want to use the same settings. For more information about the **include-credentials** command, see "Configuring Username and Password Security" in the *Access Security Guide* for your switch.

The authentication key values are shown in the output of the **show running-config** and **show config** commands only if the **include-credentials** command was executed.

When SNTP authentication is configured and **include-credentials** has not been executed, the SNTP authentication configuration is not saved.

```
ProCurve(config)# show config

Startup configuration:

.
.
.
timesync sntp
sntp broadcast
sntp 50
sntp authentication
sntp server priority 1 10.10.10.2 3 key-id 55
sntp server priority 2 fe80::200:24ff:fec8:4ca8 4 key-id 55
.
.
.
```

SNTP authentication has been enabled and a key-id of 55 has been created.

Figure 9-17. Example of Configuration File with SNTP Authentication Information

In figure 9-17, the **include-credentials** command has not been executed and is not present in the configuration file. The configuration file is subsequently saved to a TFTP server for later use. The SNTP authentication information is not saved and is not present in the retrieved configuration file, as shown in figure 9-18.

```
ProCurve(config)#copy tftp startup-config 10.2.3.44 config1

.
.
.
Switch reboots...

Startup configuration
.
.
.
timesync sntp
sntp broadcast
sntp 50 sntp server priority 1 10.10.10.2 3
sntp server priority 2 fe80::200:24ff:fec8:4ca8 4
.
.
.
```

The **sntp authentication** line and the **key-id**s are not displayed. You must reconfigure SNTP authentication.

Figure 9-18. Example of a Retrieved Configuration File When Include Credentials is not Configured

If **include-credentials** is configured, the SNTP authentication configuration is saved in the configuration file. When the **show config** command is entered, all of the information that has been configured for SNTP authentication displays, including the key-values.

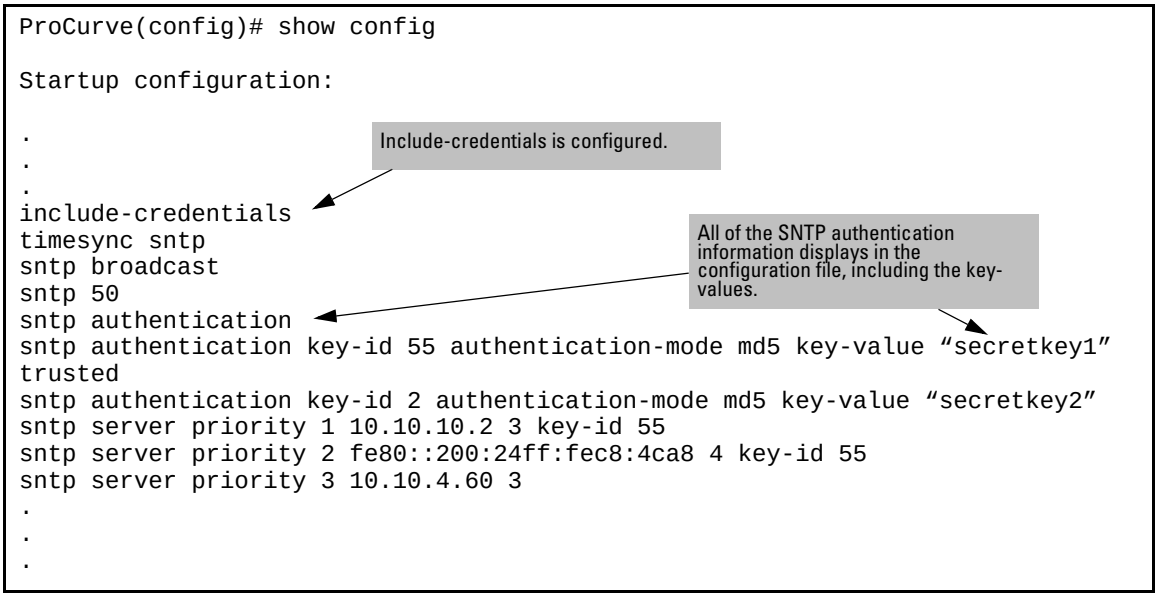

Figure 9-19. Example of Saved SNTP Authentication Information when include-credentials is Configured

TimeP: Viewing, Selecting, and Configuring

TimeP Feature	Default	Menu	CLI	Web
view the Timep time synchronization configuration	n/a	page 9-27	page 9-29	—
select Timep as the time synchronization method	TIMEP	page 9-16	pages 9-31 ff.	—
disable time synchronization	timep	page 9-27	page 9-33	—
enable the Timep mode	Disabled			—
DHCP	—	page 9-27	page 9-31	—
manual	—	page 9-28	page 9-32	—
none/disabled	—	page 9-27	page 9-34	—
change the SNTP poll interval	720 minutes	page 9-28	page 9-33	—

Table 9-2. Timep Parameters

SNTP Parameter	Operation
Time Sync Method	Used to select either TIMEP (the default), SNTP, or None as the time synchronization method.
Timep Mode	
Disabled	The Default. Timep does not operate, even if specified by the Menu interface **Time Sync Method** parameter or the CLI **timesync** command.
DHCP	When Timep is selected as the time synchronization method, the switch attempts to acquire a Timep server IP address via DHCP. If the switch receives a server address, it polls the server for updates according to the Timep poll interval. If the switch does not receive a Timep server IP address, it cannot perform time synchronization updates.
Manual	When Timep is selected as the time synchronization method, the switch attempts to poll the specified server for updates according to the Timep poll interval. If the switch fails to receive updates from the server, time synchronization updates do not occur.
Server Address	Used only when the **TimeP Mode** is set to **Manual**. Specifies the IP address of the TimeP server that the switch accesses for time synchronization updates. You can configure one server.

Menu: Viewing and Configuring TimeP

To View, Enable, and Modify the TimeP Protocol:

1. From the Main Menu, select:

   2. Switch Configuration...

   1. System Information

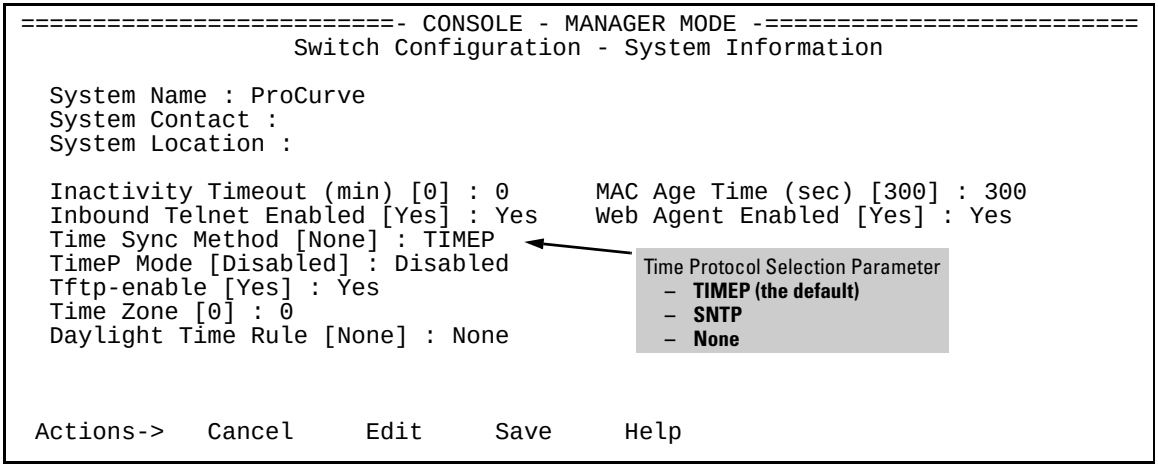

Figure 9-20. The System Information Screen (Default Values)

Press **[E]** (for **Edit**). The cursor moves to the **System Name** field.

2. Use ↓ to move the cursor to the **Time Sync Method** field.
3. If **TIMEP** is not already selected, use the Space bar to select **TIMEP**, then press ↓ once to display and move to the **TimeP Mode** field.
4. Do one of the following:
   - Use the Space bar to select the **DHCP** mode, then press ↓ to move the cursor to the **Poll Interval** field, and go to step 6.

```
Time Sync Method [None] : TIMEP
TimeP Mode [Disabled] : DHCP
Poll Interval (min) [720] : 720
Time Zone [0] : 0
Daylight Time Rule [None] : None
```

- Use the Space bar to select the **Manual** mode.
  i. Press → to move the cursor to the **Server Address** field.
  ii. Enter the IP address of the TimeP server you want the switch to use for time synchronization.

  Note: This step replaces any previously configured TimeP server IP address.
  iii. Press → to move the cursor to the **Poll Interval** field, then go to step 6.

5. In the **Poll Interval** field, enter the time in minutes that you want for a TimeP Poll Interval.

Press **[Enter]** to return to the Actions line, then **[S]** (for **Save**) to enter the new time protocol configuration in both the startup-config and running-config files.

CLI: Viewing and Configuring TimeP

CLI Commands Described in this Section

Command	Page
show timep	9-29
[no] timesync	9-30 ff., 9-33
ip timep	
dhcp	9-31
manual	9-32
server <*ip-addr*>	9-32
interval	9-33
no ip timep	9-34

Viewing the Current TimeP Configuration

Using different **show** commands, you can display either the full TimeP configuration or a combined listing of all TimeP, SNTP, and VLAN IP addresses configured on the switch.

Syntax: show timep

This command lists both the time synchronization method (TimeP, SNTP, or None) and the TimeP configuration, even if SNTP is not the selected time protocol. (If the TimeP Mode is set to **Disabled** *or* **DHCP**, *then the* **Server** *field does not appear.)*

For example, if you configure the switch with TimeP as the time synchronization method, then enable TimeP in DHCP mode with the default poll interval, **show timep** lists the following:

```
ProCurve(config)# show timep
 Timep Configuration
  Time Sync Mode: Timep
  TimeP Mode [Disabled] : DHCP       Server Address  :  10.10.28.100
  Poll Interval (min) [720] : 720
```

Figure 9-21. Example of TimeP Configuration When TimeP Is the Selected Time Synchronization Method

If SNTP is the selected time synchronization method, **show timep** still lists the TimeP configuration even though it is not currently in use:

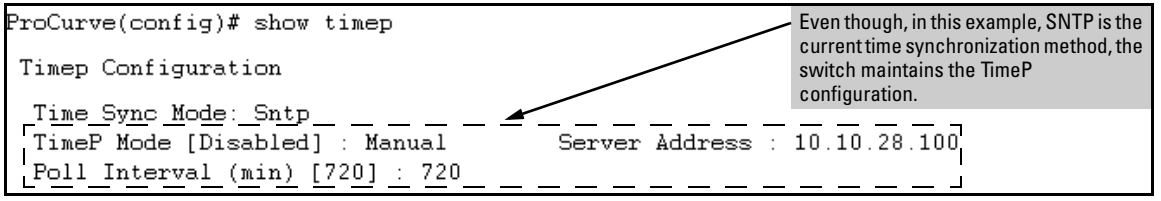

Figure 9-22. Example of TimeP Configuration When TimeP Is Not the Selected Time Synchronization Method

Syntax: show management

This command can help you to easily examine and compare the IP addressing on the switch. It lists the IP addresses for all time servers configured on the switch, plus the IP addresses and default gateway for all VLANs configured on the switch.

```
ProCurve(config)# show management

 Status and Counters - Management Address Information

  Time Server Address : 10.10.28.100

  Priority SNTP Server Address                              Protocol Version
  -------- ------------------------------------------------ ----------------
  1        10.10..28.101                                    3
  2        10.255.5.24                                      3
  3        fe80::123%vlan10                                 3


  Default Gateway     : 10.0.9.80

  VLAN Name    MAC Address         | IP Address
  ------------ ------------------- + ------------------
  DEFAULT_VLAN 001279-88a100       | 10.30.248.184
  VLAN10       001279-88a100       | 10.0.10.17
```

Figure 9-23. Example of Display Showing IP Addressing for All Configured Time Servers and VLANs

Configuring (Enabling or Disabling) the TimeP Mode

Enabling the TimeP mode means to configure it for either broadcast or unicast mode. Remember that to run TimeP as the switch's time synchronization protocol, you must also select TimeP as the time synchronization method by using the CLI timesync command (or the Menu interface **Time Sync Method** parameter).

Syntax: timesync timep
Selects TimeP as the time protocol.

Syntax: ip timep < dhcp | manual >
Enables the selected TimeP mode.

Syntax: no ip timep
Disables the TimeP mode.

Syntax: no timesync
Disables the time protocol.

Enabling TimeP in DHCP Mode. Because the switch provides a TimeP polling interval (default: 720 minutes), you need only these two commands for a minimal TimeP DHCP configuration:

Syntax: timesync timep

Selects TimeP as the time synchronization method.

Syntax: ip timep dhcp

Configures DHCP as the TimeP mode.

For example, suppose:

- Time synchronization is configured for SNTP.
- You want to:
  1. View the current time synchronization.
  2. Select TimeP as the time synchronization mode.
  3. Enable TimeP for DHCP mode.
  4. View the TimeP configuration.

The commands and output would appear as follows:

```
ProCurve(config)# show timep                    (1)
 Timep Configuration
  Time Sync Mode: Sntp
  TimeP Mode : Disabled

ProCurve(config)# timesync timep                (2)

ProCurve(config)# ip timep dhcp                 (3)

ProCurve(config)# show timep                    (4)
 Timep Configuration
  Time Sync Mode: Timep
  TimeP Mode : DHCP    Poll Interval (min) : 720
```

(1) **show timep** displays the TimeP configuration and also shows that SNTP is the currently active time synchronization mode.

(4) **show timep** again displays the TimeP configuration and shows that TimeP is now the currently active time synchronization mode.

Figure 9-24. Example of Enabling TimeP Operation in DHCP Mode

Enabling Timep in Manual Mode. Like DHCP mode, configuring TimeP for **Manual** mode enables TimeP. However, for manual operation, you must also specify the IP address of the TimeP server. (The switch allows only one TimeP server.) To enable the TimeP protocol:

Syntax: timesync timep

Selects Timep.

Syntax: ip timep manual < ip-addr > [oobm]

Activates TimeP in Manual mode with a specified TimeP server.

For switches that have a separate out-of-band management port, **oobm** *specifies that SNTP traffic goes through that port. (By default, SNTP traffic goes through the data ports.)*

Syntax: no ip timep

Disables TimeP.

Note

To change from one TimeP server to another, you must (1) use the **no ip timep** command to disable TimeP mode, and then reconfigure TimeP in Manual mode with the new server IP address.

For example, to select TimeP and configure it for manual operation using a TimeP server address of 10.28.227.141 and the default poll interval (720 minutes, assuming the TimeP poll interval is already set to the default):

```
ProCurve(config)# timesync timep
```

Selects TimeP.

```
ProCurve(config)# ip timep manual 10.28.227.141
```

Activates TimeP in Manual mode.

```
ProCurve(config)# timesync timep
ProCurve(config)# ip timep manual 10.28.227.141

ProCurve(config)# Show timep
 Timep Configuration
  Time Sync Mode: Timep
  TimeP Mode : Manual          Server Address : 10.28.227.141
  Poll Interval (min) : 720
```

Figure 9-25. Example of Configuring Timep for Manual Operation

Changing the TimeP Poll Interval. This command lets you specify how long the switch waits between time polling intervals. The default is 720 minutes and the range is 1 to 9999 minutes. (This parameter is separate from the poll interval parameter used for SNTP operation.)

Syntax: ip timep < dhcp | manual > interval < 1 - 9999 >

For example, to change the poll interval to 60 minutes:

```
ProCurve(config)# ip timep interval 60
```

Disabling Time Synchronization Without Changing the TimeP Configuration. The recommended method for disabling time synchronization is to use the **timesync** command. This halts time synchronization without changing your TimeP configuration.

Syntax: no timesync

Disables time synchronization by changing the **Time Sync Mode** *configuration to* **Disabled**.

For example, suppose TimeP is running as the switch's time synchronization protocol, with **DHCP** as the TimeP mode, and the factory-default polling interval. You would halt time synchronization with this command:

```
HPswitch(config)# no timesync
```

If you then viewed the TimeP configuration, you would see the following:

```
ProCurve(config)# show timep
 Timep Configuration
  Time Sync Mode: Disabled
  TimeP Mode : DHCP    Poll Interval (min) : 720
```

Figure 9-26. Example of TimeP with Time Synchronization Disabled

Disabling the TimeP Mode. Disabling the TimeP mode means to configure it as disabled. (Disabling TimeP prevents the switch from using it as the time synchronization protocol, even if it is the selected **Time Sync Method** option.)

Syntax: no ip timep

Disables TimeP by changing the TimeP mode configuration to **Disabled**.

For example, if the switch is running TimeP in DHCP mode, **no ip timep** changes the TimeP configuration as shown below, and disables time synchronization.

```
ProCurve(config)# no ip timep

ProCurve(config)# show timep
 Timep Configuration
  Time Sync Mode: Timep
  TimeP Mode : Disabled
```

Even though the Time Sync Mode is set to Timep, time synchronization is disabled because no ip timep has disabled the TimeP Mode parameter.

Figure 9-27. Example of Disabling Time Synchronization by Disabling the TimeP Mode Parameter

SNTP Unicast Time Polling with Multiple SNTP Servers

When running SNTP unicast time polling as the time synchronization method, the switch requests a time update from the server you configured with either the Server Address parameter in the menu interface, or the primary server in a list of up to three SNTP servers configured using the CLI. If the switch does not receive a response from the primary server after three consecutive polling intervals, the switch tries the next server (if any) in the list. If the switch tries all servers in the list without success, it sends an error message to the Event Log and reschedules to try the address list again after the configured **Poll Interval** time has expired.

Displaying All SNTP Server Addresses Configured on the Switch

The System Information screen in the menu interface displays only one SNTP server address, even if the switch is configured for two or three servers. The CLI **show management** command displays all configured SNTP servers on the switch.

```
ProCurve(config)# show management

 Status and Counters - Management Address Information

  Time Server Address : fe80::215:60ff:fe7a:adc0%vlan10

  Priority SNTP Server Address                          Protocol Version
  -------- ------------------------------------------- ----------------
  1        2001:db8::215:60ff:fe79:8980                 7
  2        10.255.5.24                                  3
  3        fe80::123%vlan10                             3


  Default Gateway     : 10.0.9.80

  VLAN Name    MAC Address         | IP Address
  ------------ ------------------- + ------------------
  DEFAULT_VLAN 001279-88a100       | Disabled
  VLAN10       001279-88a100       | 10.0.10.17
```

Figure 9-28. Example of How To List All SNTP Servers Configured on the Switch

Adding and Deleting SNTP Server Addresses

Adding Addresses. As mentioned earlier, you can configure one SNTP server address using either the Menu interface or the CLI. To configure a second and third address, you must use the CLI. To configure the remaining two addresses, you would do the following:

```
ProCurve(config)# sntp server 2001:db8::215:60ff:fe79:8980
ProCurve(config)# sntp server 10.255.5.24
```

Figure 9-29. Example of Creating Additional SNTP Server Addresses with the CLI

Note

If there are already three SNTP server addresses configured on the switch, and you want to use the CLI to replace one of the existing addresses with a new one, you must delete the unwanted address before you configure the new one.

Deleting Addresses. To delete an address, you must use the CLI. If there are multiple addresses and you delete one of them, the switch re-orders the address priority.

Syntax: **no sntp server < ip-addr >**

For example, to delete the primary address in the above example (and automatically convert the secondary address to primary):

```
ProCurve(config)# no sntp server 10.28.227.141
```

Menu: Operation with Multiple SNTP Server Addresses Configured

When you use the Menu interface to configure an SNTP server IP address, the new address writes over the current primary address, if one is configured.

SNTP Messages in the Event Log

If an SNTP time change of more than three seconds occurs, the switch's event log records the change. SNTP time changes of less than three seconds do not appear in the Event Log.