CHAPTER 12

N

name

To configure a name for a PNNI node, use the **name** node-level subcommand. To return to the default value, use the **no** form of this command.

name *name*
no name

Syntax Description

name Specify the ASCII name for the PNNI node.

Default

The value assigned by the **hostname** command.

Command Mode

PNNI node command.

Usage Guidelines

The LightStream 1010 PNNI node name is distributed to all other nodes via PNNI flooding. This allows all LightStream 1010 PNNI nodes to use this node name to identify this node in the following PNNI show commands:

- **show atm pnni database**
- **show atm pnni identifiers**
- **show atm pnni interface**
- **show atm pnni neighbor**
- **show atm pnni node**
- **show atm pnni topology**

This command only applies to PNNI nodes.

For more information, refer to the *LightStream 1010 ATM Switch Software Configuration Guide*.

Example

The following example configures the node name to be eng_1.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1
Switch(config-pnni-node)# name eng_1
Switch(config-pnni-node)#
```

Related Commands

hostname
show atm pnni node

name-connection

Note This command or some of its parameters might not function as expected in the LightStream 1010 ATM switch environment.

To name an existing network connection, use the **name-connection** EXEC command.

name-connection *name*

Syntax Description

name A name that identifies the internal adapter.

Command Mode

EXEC.

Usage Guidelines

The *name* can be any string of up to 8 characters that does not include blanks.

Example

The following example assigns a name to an internal adapter interface.

```
Switch# name VTAM_B14
```

network-clock-select

Use the **interface atm** command with global configuration commands. Allows the recovered clock to specify a particular port to provide network clocking. Use the **no** form of this command to disable this feature.

network-clock-select *priority* **atm** *card/subcard/port*
no network-clock-select atm *card/subcard/port*

Syntax Description

card/sub/card/port	Card, subcard, and port number for the SONET port.
priority	Specifies the priority between 1 and 4.

Default

No network-clocks.

Command Mode

Global configuration.

Usage Guidelines

This command applies only to SONET interfaces.

Sample Display

The following example shows how to configure ATM 3/0/1 as a network clock source of priority 2 and to configure ATM 0/1/0 to use network-clock mode.

```
Switch# configure terminal
Switch(config)# network 2 atm 3/0/1
Switch(config)# interface atm 0/1/0
Switch(config)# clock network-derived
end
```

Warning Make sure a network clock-source is configured before a port uses it as its clock source, which could cause serious problems on the link.

Related Commands

clock source
show network-clocks

node

To create, delete, enable, or disable nodes running on this switch and to specify or change the level of a node, use the **node** ATM router PNNI configuration command. PNNI node configuration mode is started when this command is entered. To remove a previously set node index, use the **no** form of this command.

node *node_index* **level** *level_indicator* **[lowest] [enable | disable]**
no node *node_index*

Syntax Description

node_index	Specifies the local node index used to identify nodes running on this switch.
level_indicator	Specifies the PNNI level (position in the PNNI hierarchy) at which the node exists.
lowest	Indicates that the node to be created is a lowest-level node (for example, the node runs over physical links and VPCs). If this is not present when a new *node_index* is specified, the new node becomes a logical group node that represents a PNNI peer group. A logical group node only becomes active when its child node is elected peer group leader.

Default

With LightStream 1010 ATM switch's autoconfiguration capabilities, a lowest-level PNNI node, with the node index 1, is automatically created and by default runs on all PNNI interfaces (including interfaces determined by ILMI to be PNNI interfaces and on interfaces configured to run PNNI).

The default level is 56, the proper level for lowest-level nodes using autoconfigured Cisco ATM addresses in a single level hierarchy.

Command Mode

ATM router PNNI configuration.

Usage Guidelines

Currently only a single lowest-level node with node index 1 is supported.

Only a node running at the lowest level can be configured to run on an interface.

The level of a node can only be modified when the node is disabled.

Enable and disable can be used to reinitialize PNNI. For example, the node ID and peer group ID are recalculated based on the switch's first ATM address and the node-level whenever a node is enabled.

For more information, refer to the *LightStream 1010 ATM Switch Software Configuration Guide*.

Example

The following example shows how to enter PNNI node configuration mode.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1
Switch(config-pnni-node)#
```

The following example shows how to create a lowest-level PNNI node with node index 1 at level 96 (assuming no node currently exists on this switch).

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1 level 96 lowest
Switch(config-pnni-node)#
```

Related Commands

atm address
atm router pnni
show atm pnni node

notify

To enable terminal notification about pending output from other connections, use the **notify** line configuration command. The **no** form of this command ends notification.

notify
no notify

Syntax Description

This command has no arguments or keywords.

Default

Disabled.

Command Mode

Line configuration.

Usage Guidelines

The command sets a line to inform a user with multiple, concurrent Telnet connections when output is pending on a connection other than the current one.

Example

The following example sets up notification of pending output from connections on virtual terminal lines 0 to 4.

```
Switch# line vty 0 4
Switch(config-line)# notify
```

Related Command

terminal notify

ntp access-group

To control access to the system's Network Time Protocol (NTP) services, use the **ntp access-group** global configuration command. To remove access control to the system's NTP services, use the **no** form of this command.

ntp access-group {**query-only** | **serve-only** | **serve** | **peer**} *access-list-number*
no ntp access-group {**query-only** | **serve-only** | **serve** | **peer**}

Syntax Description

query-only	Allows only NTP control queries. See RFC 1305 (NTP version 3).
serve-only	Allows only time requests.
serve	Allows time requests and NTP control queries, but does not allow the system to synchronize to the remote system.
peer	Allows time requests and NTP control queries and allows the system to synchronize to the remote system.
access-list-number	Number (1 to 99) of a standard IP access list.

Default

No access control (full access granted to all systems).

Command Mode

Global configuration.

Usage Guidelines

The **ntp-access group** command scans the options in the following order from least restrictive to most restrictive:

1. peer
2. serve
3. serve-only
4. query-only

Access is granted for the first match found. If no access groups are specified, complete access is granted to all sources. If any access groups are specified, only the specified access is granted. This facility provides minimal security. If more security is desired, use the NTP authentication facility.

Example

In the following example, the system is configured to allow itself to be synchronized by a peer from access list 99. However, the system restricts access to allow only time requests from access list 42.

```
Switch# ntp access-group peer 99
Switch# ntp access-group serve-only 42
```

Related Command

access-list

ntp authenticate

To enable Network Time Protocol (NTP) authentication, use the **ntp authenticate** global configuration command. Use the **no** form of this command to disable the feature.

ntp authenticate
no ntp authenticate

Syntax Description

This command has no keywords or arguments.

Default

No authentication.

Command Mode

Global configuration.

Usage Guidelines

Use this command if you want authentication. If this command is specified, the system does not synchronize to a system unless it carries one of the authentication keys specified in the **ntp trusted-key** command.

Example

The following example enables NTP authentication.

```
Switch# ntp authenticate
```

Related Commands

ntp authentication-key
ntp trusted-key

ntp authentication-key

To define an authentication key for Network Time Protocol (NTP), use the **ntp authentication-key** global configuration command. Use the **no** form of this command to remove the authentication key for NTP.

ntp authentication-key *number* **md5** *value*
no ntp authentication-key *number*

Syntax Description

number	Key number (1 to 4294967295).
md5	Authentication key. Message authentication support is provided using the Message Digest (MD5) algorithm. The key type **md5** is currently the only key type supported.
value	Key value (an arbitrary string of up to eight characters).

Default

No authentication key is defined for NTP.

Command Mode

Global configuration.

Usage Guidelines

Use this command to define authentication keys for use with other NTP commands to provide a higher degree of security.

Example

The following example sets authentication key 10 to *aNiceKey.*

```
Switch# ntp authentication-key 10 md5 aNiceKey
```

Related Commands

ntp authentication-key
ntp peer
ntp server
ntp trusted-key

ntp broadcast

To specify that a specific interface should send Network Time Protocol (NTP) broadcast packets, use the **ntp broadcast** interface configuration command. Use the **no** form of this command to disable this capability.

ntp broadcast [**version** *number*]
no ntp broadcast

Syntax Description

version *number*	(Optional) Number from 1 to 3 indicating the NTP version.

Default

Disabled.

Command Mode

Interface configuration.

Example

In the following example, Ethernet interface 2/0/0 is configured to send NTP version 2 packets.

```
Switch(config)# interface ethernet 2/0/0
Switch(config-if)# ntp broadcast version 2
```

Related Commands

ntp broadcast client
ntp broadcastdelay

ntp broadcast client

To allow the system to receive NTP broadcast packets on an interface, use the **ntp broadcast client** interface configuration command. Use the **no** form of this command to disable this capability.

ntp broadcast client
no ntp broadcast client

Syntax Description

This command has no arguments or keywords.

Default

Disabled.

Command Mode

Interface configuration.

Usage Guidelines

Use this command to allow the system to listen to broadcast packets on an interface-by-interface basis.

Example

In the following example, the switch synchronizes to NTP packets broadcast on Ethernet interface 2/0/0.

```
Switch(config)# interface ethernet 2/0/0
Switch(config-if)# ntp broadcast client
```

Related Commands

ntp broadcast
ntp broadcastdelay

ntp broadcastdelay

To set the estimated round-trip delay between the switch and a Network Time Protocol (NTP) broadcast server, use the **ntp broadcastdelay** global configuration command. Use the **no** form of this command to revert to the default value.

ntp broadcastdelay *microseconds*
no ntp broadcastdelay

Syntax Description

microseconds	Estimated round-trip time (in microseconds) for NTP broadcasts. The range is from 1 to 999999.

Default

3000 microseconds.

Command Mode

Global configuration.

Usage Guidelines

Use this command when the switch is configured as a broadcast client and the round-trip delay on the network is other than 3000 microseconds.

Example

In the following example, the estimated round-trip delay between the switch and the broadcast client is set to 5000 microseconds.

```
Switch# ntp broadcastdelay 5000
```

Related Commands

ntp broadcast
ntp broadcast client

ntp clock-period

Caution Do not use this command; it is documented for informational purposes only. The system automatically generates this command as Network Time Protocol (NTP) determines the clock error and then compensates.

As NTP compensates for the error in the system clock, it keeps track of the correction factor for this error. The system automatically saves this value into the system configuration using the **ntp clock-period** global configuration command. The system uses the **no** form of this command to revert to the default.

ntp clock-period *value*
no ntp clock-period

Syntax Description

value Amount to add to the system clock for each clock hardware tick (in units of 2 to 32 seconds).

Default

17179869 (4 milliseconds).

Command Mode

Global configuration.

Usage Guidelines

If a **copy running-config startup-config** command is entered to save the configuration to memory, this command is automatically added to the configuration. It is a good idea to perform this task after NTP has been running for a week or so; this helps NTP synchronize more quickly if the system is restarted.

ntp disable

To prevent an interface from receiving Network Time Protocol (NTP) packets, use the **ntp disable** interface configuration command. To enable receipt of NTP packets on an interface, use the **no** form of this command.

ntp disable
no ntp disable

Syntax Description

This command has no arguments or keywords.

Default

Disabled.

Command Mode

Interface configuration.

Usage Guidelines

This command provides a simple method of access control.

Example

In the following example, Ethernet interface 2/0/0 is prevented from receiving NTP packets.

```
Switch(config)# interface ethernet 2/0/0
Switch(config-if)# ntp disable
```

ntp master

To configure the switch as a Network Time Protocol (NTP) master clock to which peers synchronize themselves when an external NTP source is not available, use the **ntp maste**r global configuration command. To disable the master clock function, use the **no** form of this command.

ntp master [*stratum*]
no ntp master [*stratum*]

Caution Use this command with *extreme* caution. It is very easy to override valid time sources using this command, especially if a low stratum number is configured. Configuring multiple machines in the same network with the **ntp master** command can cause instability in timekeeping if the machines do not agree on the time.

Syntax Description

stratum (Optional) Number from 1 to 15. Indicates the NTP stratum number that the system claims.

Default

By default, the master clock function is disabled. When enabled, the default stratum is 8.

Command Mode

Global configuration.

Usage Guidelines

Since the Cisco implementation of NTP does not support directly attached radio or atomic clocks, the switch is normally synchronized, directly or indirectly, to an external system that has such a clock. In a network without Internet connectivity, such a time source may not be available. The **ntp master** command is used in such cases.

If the system has **ntp master** configured and it cannot reach any clock with a lower stratum number, the system claims to be synchronized at the configured stratum number, and other systems synchronize to it via NTP.

Note The system clock must have been set from some source, including manually before **ntp master** has any effect. This protects against distributing erroneous time after the system is restarted.

Example

In the following example, the switch is configured as an NTP master clock to which peers may synchronize.

```
Switch# ntp master 10
```

Related Command

clock calendar-valid

ntp peer

To configure the switch's system clock to synchronize a peer or to be synchronized by a peer, use the **ntp peer** global configuration command. To disable this capability, use the **no** form of this command.

ntp peer *ip-address* [**version** *number*] [**key** *keyid*] [**source** *interface*] [**prefer**]
no ntp peer *ip-address*

Syntax Description

ip-address	IP address of the peer providing or being provided the clock synchronization.
version	(Optional) Defines the Network Time Protocol (NTP) version number.
number	(Optional) NTP version number (1 to 3).
key	(Optional) Defines the authentication key.
keyid	(Optional) Authentication key to use when sending packets to this peer.
source	(Optional) Names the interface.
interface	(Optional) Name of the interface from which to pick the IP source address.
prefer	(Optional) Makes this peer the preferred peer that provides synchronization.

Default

No peers are configured by default. If a peer is configured, the default NTP version number is 3, no authentication key is used, and the source IP address is taken from the outgoing interface.

Command Mode

Global configuration.

Usage Guidelines

Use this command if you want to allow this machine to synchronize with the peer or vice versa. Using the **prefer** keyword reduces switching back and forth between peers.

If you are using the default version of 3 and NTP synchronization does not occur, try using NTP version number 2. Many NTP servers on the Internet run version 2.

Example

In the following example, the switch is configured to allow its system clock to be synchronized with the clock of the peer (or vice versa) at IP address 131.108.22.33 using NTP version 2. The source IP address is the address of Ethernet 2/0/0.

```
Switch# ntp peer 131.108.22.33 version 2 source ethernet 2/0/0
```

Related Commands

ntp authentication-key
ntp server
ntp source

ntp server

To allow the switch's system clock to be synchronized by a time server, use the **ntp server** global configuration command. To disable this capability, use the **no** form of this command.

ntp server *ip-address* [**version** *number*] [**key** *keyid*] [**source** *interface*] [**prefer**]
no ntp server *ip-address*

Syntax Description

ip-address	IP address of the time server providing the clock synchronization.
version	(Optional) Defines the Network Time Protocol (NTP) version number.
number	(Optional) NTP version number (1 to 3).
key	(Optional) Defines the authentication key.
keyid	(Optional) Authentication key to use when sending packets to this peer.
source	(Optional) Identifies the interface from which to pick the IP source address.
interface	(Optional) Name of the interface from which to pick the IP source address.
prefer	(Optional) Makes this server the preferred server that provides synchronization.

Default

No peers are configured by default. If a peer is configured, the default NTP version number is 3, no authentication key is used, and the source IP address is taken from the outgoing interface.

Command Mode

Global configuration.

Usage Guidelines

Use this command if you want to allow this machine to synchronize with the specified server. The server does not synchronize to this machine.

Using the **prefer** keyword reduces switching back and forth between servers.

If you are using the default version of 3 and NTP synchronization does not occur, try using NTP version number 2. Many NTP servers on the Internet run version 2.

Example

In the following example, the switch is configured to allow its system clock to be synchronized with the clock of the peer at IP address 128.108.22.44 using NTP version 2.

```
Switch# ntp server 128.108.22.44 version 2
```

Related Commands

ntp authentication-key
ntp peer
ntp source

ntp source

To use a particular source address in Network Time Protocol (NTP) packets, use the **ntp source** global configuration command. Use the **no** form of this command to remove the specified source address.

ntp source *interface*
no ntp source

Syntax Description

interface	Any valid system interface name.

Default

Source address is determined by the outgoing interface.

Command Mode

Global configuration.

Usage Guidelines

Use this command when you want to use a particular source IP address for all NTP packets. The address is taken from the named interface. This command is useful if the address on an interface cannot be used as the destination for reply packets. If the **source** keyword is present on an **ntp server** or **ntp peer** command, that value overrides the global value.

Example

In the following example, the switch is configured to use the IP address of Ethernet 2/0/0 as the source address of all outgoing NTP packets.

```
Switch# ntp source ethernet 2/0/0
```

Related Commands

ntp peer
ntp server

ntp trusted-key

If you want to authenticate the identity of a system to which Network Time Protocol (NTP) synchronizes, use the **ntp trusted-key** global configuration command. Use the **no** form of this command to disable authentication of the identity of the system.

ntp trusted-key *key-number*
no ntp trusted-key *key-number*

Syntax Description

key-number Key number of authentication key to be trusted.

Default

Disabled.

Command Mode

Global configuration.

Usage Guidelines

If authentication is enabled, use this command to define one or more key numbers (corresponding to the keys defined with the **ntp authentication-key** command) that a peer NTP system must provide in its NTP packets in order for this system to synchronize to it. This provides protection against accidentally synchronizing the system to a system that is not trusted because the other system must know the correct authentication key.

Example

In the following example, the system is configured to synchronize only to systems providing authentication key 42 in its NTP packets.

```
Switch# ntp authenticate
Switch# ntp authentication-key 42 md5 aNiceKey
Switch# ntp trusted-key 42
```

Related Command

ntp authentication-key

ntp update-calendar

To periodically update the calendar from Network Time Protocol (NTP), use the **ntp update-calendar** global configuration command. Use the **no** form of this command to disable this feature.

ntp update-calendar
no ntp update-calendar

Syntax Description

This command has no arguments or keywords.

Default

The calendar is not updated.

Command Mode

Global configuration.

Usage Guidelines

If a switch is synchronized to an outside time source via NTP, you should periodically update the calendar with the time learned from NTP. Otherwise, the calendar tends to gradually lose or gain time. The calendar is updated only if NTP has synchronized to an authoritative time server.

Example

In the following example, the system is configured to periodically update the calendar from the system clock.

```
Switch# ntp update-calendar
```

Related Commands

clock read-calendar
clock update-calendar