CHAPTER 2

B

background-routes

To enable background route computation, use the **background-routes** ATM router PNNI configuration command. To disable background route computation, use the **no** form of this command.

background-routes
no background-routes

Syntax Description

This command has no keywords or arguments.

Default

Disabled.

Command Mode

ATM router PNNI configuration.

Usage Guidelines

The LightStream 1010 ATM switch supports the following two route selection modes:

On-demand (no background-routes)—a separate route computation is performed for each SETUP or ADD PARTY message received over a UNI or IISP interface. In this mode, the most recent topology information received by this node is always used for each setup request.

Background-routes—Most calls can be routed using precomputed routing trees. In this mode, multiple background trees are precomputed for several service categories and QOS metrics. If no route is found in the background trees that satisfies the QOS requirements of a particular setup request, route selection reverts to on-demand route computation.

The background-routes mode should be enabled in large networks, where it could exhibit less stringent processing requirements and better scalability. Route computation is performed at almost every poll-interval seconds, when a significant change in the topology of the network is reported, or when insignificant-threshold changes has occurred since the last route computation.

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

Example

The following example shows how to enable background routes using the **background-routes** ATM router PNNI configuration command.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# background-routes
```

Related Commands

bg
show atm pnni bg-routes
show atm pnni bg-status

banner exec

To display a message on terminals with an interactive EXEC, use the **banner exec** global configuration command. This command specifies a message to be displayed when an EXEC process is created (line activated or incoming connection to VTY).

banner exec *d message d*

Syntax Description

d Delimiting character of your choice—a pound sign (#), for example. You cannot use the delimiting character in the banner message.

message Message text.

Default

Banners are not displayed.

Command Mode

Global configuration.

Usage Guidelines

Follow the command with one or more blank spaces and a delimiting character of your choice. Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character.

Example

The following example sets an EXEC message. The dollar sign ($) is used as a delimiting character.

```
Switch(config)# banner exec $
Session activated. Enter commands at the prompt.
$
```

Related Command

banner motd

banner incoming

To specify a message used when you have an incoming connection to a line from a host on the network, use the **banner incoming** global configuration command. An incoming connection is one initiated from the network side of the switch. The EXEC banner can be suppressed on certain lines using the **no exec-banner** line configuration command. This line should *not* display the EXEC or MOTD banners when an EXEC is created.

banner incoming *d message d*

Syntax Description

d Delimiting character of your choice—a pound sign (#), for example. You cannot use the delimiting character in the banner message.

message Message text.

Default

No incoming banner is displayed.

Command Mode

Global configuration.

Usage Guidelines

Follow the command with one or more blank spaces and a delimiting character of your choice. Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character.

Example

The following example sets an incoming connection message. The pound sign (#) is used as a delimiting character.

```
Switch(config)# banner incoming #
Welcome to LightStream 1010.
#
```

Related Command

banner motd

banner motd

To specify a message-of-the-day (MOTD) banner, use the **banner motd** global configuration command.

banner motd *d message d*

Syntax Description

d Delimiting character of your choice—a pound sign (#), for example. You cannot use the delimiting character in the banner message.

message Message text.

Default

Disabled.

Command Mode

Global configuration.

Usage Guidelines

Follow the command with one or more blank spaces and a delimiting character of your choice. Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character.

This message-of-the-day banner is displayed to all terminals connected and is useful for sending messages that affect all users (for example, notice of impending system shutdowns).

Without keywords specified, the **banner** command defaults to the **banner motd** command. When a new **banner motd** command is added to the configuration, it overwrites the existing **banner** command (no keyword specified). Similarly, if a **banner** command is added to the configuration, any existing banner **motd** command is overwritten.

Example

The following example sets a message-of-the-day banner. The pound sign (#) is used as a delimiting character.

```
Switch(config)# banner motd #
Building power will be off from 7:00 AM until 9:00 AM this coming Tuesday.
#
```

Related Commands

banner incoming
exec-banner

bg

To specify how often the switch polls for a significant change that triggers a new computation of the background routes, use the **bg** ATM router PNNI configuration command. To change back to the default values, use the **no** form of this command.

bg [insignificant-threshold *number* **] [poll-interval** *seconds* **]**
no bg [insignificant-change] [poll-interval]

Syntax Description

insignificant-threshold	Specifies the number of insignificant threshold.
number	Specifies the number of insignificant changes necessary to trigger a new computation of the background routes, from 1 to 100. The default is 32.
poll-interval	Specifies the poll interval time.
seconds	Specifies the poll interval in seconds, from 1 to 60. The default is 10 seconds.

Default

See individual commands.

Command Mode

ATM router PNNI configuration.

Usage Guidelines

This command only applies when background route computation is enabled (see the **background-routes** command). The **poll-interval** is used to throttle background route computation.

Caution Decreasing the **poll-interval** increases the load on the switch processor.

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

Example

The following example shows how to change the **poll-interval** to 15 seconds using the **bg** ATM router PNNI configuration command.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# bg poll-interval 15
```

Related Commands

background-routes
show atm pnni bg-status

boot

To boot the switch manually, use the **boot** ROM monitor command.

boot [*device***:** *filename* **[***ip_address***]]**
boot *filename* [*ip-address*]

Syntax Description

filename When used in conjunction with the *ip-address* argument, the *filename* argument is the name of the system image file to boot from a network server. The filename is case sensitive.

(Optional) The *device***:** argument specifies the Flash memory device from which to obtain the system image. See the *device***:** argument for valid device values. The filename is case sensitive. Without *filename*, the first valid file in Flash memory is loaded.

ip-address (Optional) IP address of the TFTP server on which the system image resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.

*device***:** Device containing the configuration file. The colon (**:**) is required. Valid devices are as follows:

- **bootflash:** This device is the internal Flash memory and is the initial default device.
- **slot0:** This device is the Personal Computer Memory Card International Association (PCMCIA) slot on the route switch processor ASP card.
- **slot1:** This device is the second PCMICA slot on the ASP card.

Default

If you enter the **boot** command and press Return, the switch boots from the first image file in the bootflash.

For other defaults, see the Syntax Description section.

Command Mode

ROM monitor.

Usage Guidelines

Use this command only when your switch cannot find the configuration information needed in NVRAM. To get to the ROM monitor prompt (>), enter the **reload** EXEC command, and then press the Break key during the first 60 seconds of startup, or change the boot bits in the configuration register to zero, for manual booting, and then issue the **reload** command.

Example

In the following example, the switch is manually booted from ROM.

```
rommon> boot bootflash: ls1010-wr mz
rommon> boot tftp remote-image 172.20.40.60
```

Related Commands

show version
tftp serv-config

boot buffersize

To modify the buffer size used to load configuration files, use the **boot buffersize** global configuration command. To return to the default setting, use the **no** form of this command.

boot buffersize *bytes*
no boot buffersize

Syntax Description

bytes Specifies the size of the buffer to be used. There is no minimum or maximum limit on the size that can be specified.

Default

Buffer size of the NVRAM.

Command Mode

Global configuration.

Usage Guidelines

Normally, the switch uses a buffer the size of the system NVRAM to hold configuration commands read from the network. You can increase this size if you have a very complex configuration.

Example

The following example sets the buffer size to 64000.

```
Switch# configure terminal
Switch(config)# boot buffersize 64000
```

Related Commands

dir bootflash
write terminal

boot config

To specify the device and filename of the configuration file from which the switch configures itself during initialization, use the **boot config** global configuration command. Use the **no** form of the command to remove this specification.

boot config *device***:***filename*
no boot config

Syntax Description

*device***:** Device containing the configuration file. The colon (**:**) is required. Valid devices are as follows:

- **bootflash:** This device is the internal Flash memory.
- **slot0:** This device is the PCMCIA slot ASP card.
- **slot1:** This device is the second PCMCIA slot on the ASP card.

filename Name of the configuration file. The configuration file must be an ASCII file. The maximum filename length is 63 characters.

Default

None.

Command Mode

Global configuration.

Usage Guidelines

You set the *config_file* environment variable in the current running memory when you use the **boot config** command. This variable specifies the configuration file used for initialization.

Note When you use this global configuration command, you affect only the running configuration. You must save the environment variable setting to your startup configuration to place the information under ROM monitor control and to have the environment variable function as expected. Use the **copy running** command to save the environment variable from your running configuration to your startup configuration.

Examples

In the following example, the first line specifies that the switch should use the configuration file *switch-config* located in internal Flash memory to configure itself during initialization. The second line copies the specification to the startup configuration, ensuring that this specification takes effect on the next reload.

```
Switch (config)# boot config bootflash:switch-config
^Z
Switch# copy running-config startup-config
```

The following example instructs the switch to use the configuration file *switch-config* located on the Flash memory card inserted in the second PCMCIA slot of the ASP card during initialization. The second line copies the specification to the startup configuration, ensuring that this specification takes effect on the next reload.

```
Switch(config)# boot config slot1:switch-config
^Z
Switch# copy running-config startup config
```

Related Commands

copy running-config startup-config
show boot
write memory

boot host

To change the default name of the host configuration filename from which you want to load configuration commands, use the **boot host** global configuration command. Use the **no** form of this command to restore the host configuration filename to the default.

boot host [**tftp** | **rcp**] *filename* [*ip-address*]
no boot host [**tftp** | **rcp**] *filename* [*ip-address*]

Syntax Description

filename	Name of the file from which you want to load configuration commands.
tftp	(Optional) Indicates that the switch is configured from a configuration file stored on a TFTP server.
rcp	(Optional) Indicates that the switch is configured from a configuration file stored on a RCP server.
ip-address	(Optional) IP address of the TFTP server on which the file resides. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.

Default

The switch uses its host name to form a host configuration filename. To form this name, the switch converts its name to all lowercase letters, removes all domain information, and appends *-confg*.

Command Mode

Global configuration.

Usage Guidelines

Use the **service config** command to enable the loading of the specified configuration file at reboot time. Without this command, the switch ignores the **boot host** command and uses the configuration information in NVRAM. If the configuration information in NVRAM is invalid or missing, the **service config** command is enabled automatically.

The network server attempts to load two configuration files from remote hosts. The first is the network configuration file containing commands that apply to all network servers on a network. The second is the host configuration file containing commands that apply to one network server in particular.

Example

The following example sets the host filename to *wilma-confg* at address 192.31.7.19.

```
Switch(config)# boot host /usr/local/tftpdir/wilma-confg 192.31.7.19
```

Related Commands

boot network
service config

boot network

To change the default name of the network configuration file from which you want to load configuration commands, use the **boot network** global configuration command. Use the **no** form of this command to restore the network configuration filename to the default.

boot network [**tftp** | **rcp**] *filename* [*ip-address*]
no boot network [**tftp** | **rcp**] *filename* [*ip-address*]

Syntax Description

filename	Name of the file from which you want to load configuration commands. The default filename is *network-config*.
tftp	(Optional) Configures the switch to download the configuration file from a network server using **tftp**. If omitted and **rcp** is not specified, defaults to **tftp**.
rcp	(Optional) Configures the switch to download the configuration file from a network server using **rcp**. If omitted, defaults to **tftp**.
ip-address	(Optional) If **rcp** or **tftp** is specified, the IP address of the network server on which the compressed image file resides. If the IP address is omitted, this value defaults to the IP broadcast address of 255.255.255.255.

Default

The default filename is *network-config*. The default transfer protocol type is **tftp**, if neither **tftp** nor **rcp** is specified.

Command Mode

Global configuration.

Usage Guidelines

When booting from a network server, the switch ignores routing information, static IP routes, and bridging information. As a result, intermediate switches are responsible for handling **rcp** or **tftp** requests correctly. Before booting from a network server, verify that a server is available by using the **ping** command.

Use the **service config** command to enable the loading of the specified configuration file at reboot time. Without this command, the switch ignores the **boot network** command and uses the configuration information in NVRAM. If the configuration information in NVRAM is invalid or missing, the **service config** command is enabled automatically.

The network server attempts to load two configuration files from remote hosts. The first is the network configuration file containing commands that apply to all network servers on a network. Use the **boot network** command to identify the network configuration file.

The **rcp** software requires that a client send the remote username on each **rcp** request to the network server. When the **boot network rcp** command is executed, the switch software sends the switch host name as both the remote and local usernames. If the server has a directory structure, the **rcp** implementation searches for the configuration files to be used (relative to the account directory of the remote username) on the network server.

Note For **rcp**, if you do not explicitly specify a remote username by issuing the **ip rcmd remote-username** command and the switch host name is used, then an account for the switch host name must be defined on the destination server. If the network administrator of the destination server fails to establish an account for the switch host name, this command does not execute successfully.

If you copy the system image to a personal computer used as a file server, the remote host computer must support the remote shell (**rsh**) protocol.

Examples

The following example changes the network configuration filename to *bridge_9.1* and uses the default broadcast address.

```
Switch(config)# boot network bridge_9.1
Switch(config)# service config
```

The following example changes the network configuration filename to *bridge_9.1*, specifies that **rcp** is to be used as the transport mechanism, and gives 131.108.1.111 as the IP address of the server on which the network configuration file resides.

```
Switch(config)# boot network rcp bridge_9.1 131.108.1.111
Switch(config)# service config
```

Related Commands

boot host
service config

boot system

To specify the system image that the switch loads at startup, use one of the following **boot system** global configuration commands. Use the **no** form of this command to remove the startup system image specification.

boot system [*device***:**] [*filename*] [*ip-address*]
no boot system [*device***:**] [*filename*] [*ip-address*]

boot system [**rcp | tftp**] *filename* [*ip-address*]
no boot system [**rcp | tftp**] *filename* [*ip-address*]

no boot system

Syntax Description

flash	This keyword boots the switch from internal Flash memory. If you omit all arguments that follow this keyword, the system searches internal Flash for the first bootable image. This keyword boots the switch from a Flash device, as specified by the device: argument. When you omit all arguments that follow this keyword, this system searches the PCMCIA slot 0 for the first bootable image.
device	(Optional) Device containing the system image to load at startup. The colon (**:**) is required. Valid devices are as follows: • **bootflash:** This device is the internal **flash** memory. • **slot0:** This device is the first PCMCIA slot on the ASP card. • **slot1:** This device is the second PCMCIA slot on the ASP card.
rcp	(Optional) Boots the switch from a system image stored on a network server using **rcp**. If you omit this keyword, the transport mechanism defaults to **tftp**.
filename	(Optional) Name of the system image to load at startup. The filename is case sensitive. If you do not specify a *filename*, the switch loads the first valid file in the specified Flash device, the specified partition of Flash memory, or the default Flash device (if you omit the *device***:** argument).
tftp	(Optional) Boots the switch from a system image stored on a TFTP server. This is the default when you do not specify any keyword (**flash**, **tftp**, or **rcp**).
ip-address	(Optional) IP address of the TFTP server containing the system image file. If omitted, this value defaults to the IP broadcast address of 255.255.255.255.

Default

If you do not specify a system image file with the **boot system** command, the switch uses the configuration register settings to determine the default system image filename for booting from a network server. The switch forms the default boot filename by starting with the word *cisco* and then appending the octal equivalent of the boot field number in the configuration register, followed by a hyphen (-) and the processor type name (cisco*nn-cpu*). See the appropriate hardware installation guide for details on the configuration register and default filename. See also the command **config-register**. See also the “Syntax Description” section preceding this section.

If you omit a keyword (**flash**, **rcp**, or **tftp**) from the **boot system** command, the system defaults to booting from a system image stored on a TFTP server.

Command Mode

Global configuration.

Usage Guidelines

For this command to work, the **config-register** command must be set properly.

Enter several **boot system** commands to provide a fail-safe method for booting your switch. The switch stores and executes the **boot system** commands in the order in which you enter them in the configuration file. If you enter multiple boot commands of the same type—for example, if you enter two commands that instruct the switch to boot from different network servers—then the switch tries them in the order in which they appear in the configuration file.

Each time you write a new software image to Flash memory, you must delete the existing filename in the configuration file with the **no boot system** *filename* command. Then add a new line in the configuration file with the **boot system** *filename* command.

Note The **no boot system** global configuration command disables all **boot system** configuration commands regardless of argument. Specifying the **flash** device name or the *filename* argument with the **no boot system** command disables only the command specified by these arguments.

You can boot the switch from a compressed image on a network server. When a network server boots software, both the image being booted and the running image must fit into memory. Use compressed images to ensure that enough memory is available to boot the switch. You can compress a software image on any UNIX platform using the **compress** command. Refer to your UNIX platform's documentation for the exact usage of the **compress** command. (You can also decompress data with the UNIX **uncompress** command.)

The **rcp** protocol requires that a client send the remote username in an **rcp** request to a server. When the switch executes the **boot system rcp** command, by default the switch software sends the switch host name as the both the remote and local usernames. The **rcp** software searches for the system image to boot from the remote server relative to the directory of the remote username (if the server has a directory structure as UNIX systems do, for example).

The **boot system** command modifies the BOOT environment variable in the running configuration. The BOOT environment variable specifies a list of bootable images on various devices.

If an entry in the BOOT environment variable list does not specify a device, the switch assumes the device is **tftp**. When **tftp** is the device, the switch first loads the **rxboot** image to boot the system image file from a network server. If an entry in the BOOT environment variable list specifies an invalid device, the switch skips that entry. To view the contents of the BOOT environment variable, use the **show boot** command.

To eliminate all entries in the bootable image list, use the **no boot system** command. Issuing this command sets the BOOT environment variable to a null string, wiping out all entries. At this point, you can redefine the list of bootable images using the previous **boot system** commands. Be sure to save your changes to your startup configuration by issuing the **copy running-config startup-config** command.

Note If you want to rearrange the order of the entries in the BOOT environment variable, you must first issue the **no boot system** command and then redefine the list.

Examples

The following example illustrates a list specifying two possible internetwork locations for a system image, with the ROM software being used as a backup.

```
Switch(config)# boot system cs3-rx.90-1 192.31.7.24
Switch(config)# boot system cs3-rx.83-2 192.31.7.19
```

The following example instructs the switch to boot from an image located on the Flash memory card inserted in slot 0.

```
Switch(config)# boot system flash slot0:new-image
```

Related Commands

config-register
copy flash
copy rcp
copy running-config
copy tftp
ip rcmd remote-username
show boot
show version
write memory
write terminal

buffers

Use the **buffers** global configuration command to make adjustments to initial buffer pool settings and to the limits at which temporary buffers are created and destroyed. To return the buffers to their default size, use the **no** form of this command.

buffers {**small** | **middle** | **big** | **verybig** | **large** | **huge** | *type number*} {**permanent** | **max-free** | **min-free** | **initial**} *number*
no buffers {**small** | **middle** | **big** | **verybig** | **large** | **huge** | *type number*} {**permanent** | **max-free** | **min-free** | **initial**} *number*

Syntax Description

small	Buffer size of this public buffer pool is 104 bytes.
middle	Buffer size of this public buffer pool is 600 bytes.
big	Buffer size of this public buffer pool is 1,524 bytes.
verybig	Buffer size of this public buffer pool is 4,520 bytes.
large	Buffer size of this public buffer pool is 5,024 bytes.
huge	Default buffer size of this public buffer pool is 18,024 bytes. This value can be configured with the **buffers huge size** command.
type	Interface type of the interface buffer pool.
number	Interface number of the interface buffer pool.
permanent	Number of permanent buffers that the system tries to create and keep. Permanent buffers are normally not trimmed by the system.
max-free	Maximum number of free or unallocated buffers in a buffer pool.
min-free	Minimum number of free or unallocated buffers in a buffer pool.
initial	Number of additional temporary buffers that are to be allocated when the system is reloaded. This keyword can be used to ensure that the system has necessary buffers immediately after reloading in a high-traffic environment.
number	Number of buffers to be allocated.

Default

The default number of buffers in a pool is determined by the hardware configuration and can be displayed with the EXEC **show buffers** command.

Command Mode

Global configuration.

Usage Guidelines

Normally you need not adjust these parameters; do so only after consulting with technical support personnel. Improper settings can adversely impact system performance.

Examples of Public Buffer Pool Tuning

In the following example, the system tries to keep at least 50 small buffers free.

```
Switch(config)# buffers small min-free 50
```

In the following example, the permanent buffer pool allocation for big buffers is increased to 200.

```
Switch(config)# buffers big permanent 200
```

Example of Interface Buffer Pool Tuning

A general guideline is to display buffers with the **show buffers** command, observe which buffer pool is depleted, and increase that one.

In the following example, the permanent Ethernet 2/0/0 interface buffer pool is increased to 96 because the Ethernet 2/0/0 buffer pool is depleted.

```
Switch(config)# buffers ethernet 2/0/0 permanent 96
```

Related Commands

buffers huge size
show buffers

buffers huge size

Use the **buffers huge size** global configuration command to dynamically resize all huge buffers to the value you specify. To restore the default buffer values, use the **no** form of this command.

buffers huge size *number*
no buffers huge size *number*

Syntax Description

number Number of buffers to be allocated.

Default

18,024 bytes.

Command Mode

Global configuration.

Usage Guidelines

Use only after consulting with technical support personnel. The buffer size cannot be lowered below the default.

Example

In the following example, the system resizes huge buffers to 20,000 bytes.

```
Switch(config)# buffers huge size 20000
```

Related Commands

buffers
cdp enable
show buffers