Cisco Connection Online

Cisco Connection Online (CCO), formerly Cisco Information Online (CIO), is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional content and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously—a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, Internet e-mail, and fax download options, and is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: `http://www.cisco.com`.
- Telnet: `cco.cisco.com`.
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and baud rates up to 14.4 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact `cco-help@cisco.com`. For additional information, contact `cco-team@cisco.com`.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or `tac@cisco.com`. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or `cs-rep@cisco.com`.

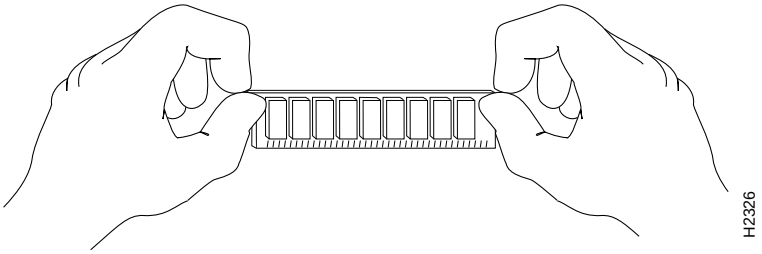
This document is to be used in conjunction with the *LightStream 1010 ATM Switch User Guide and the LightStream 1010 ATM Switch Command Reference* publication.

965R

- Ensure that all SIMMs are installed correctly. If necessary, shut down the system and remove the ASP. Check the SIMMs by looking straight down on them and then at eye level. All SIMMs should be aligned at the same angle and the same height when properly installed. If a SIMM sticks out or rests in the socket at a different angle from the others, remove the SIMM and reinsert it. Then replace the ASP and reboot the system for another installation check.
- Each DRAM SIMM bank must contain SIMMs of the same size and speed or the system does not operate. SIMMs must be 60 ns or faster. The speed is silkscreened along one edge of the SIMM.

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, make note of any error messages, unusual LED states, or any other indications that might help solve the problem.

Figure 7 Handling a SIMM



Caution Handle SIMMs by the card edges only. SIMMs are sensitive components that can be shorted by mishandling.

Follow these steps to install the new SIMMs:

Step 1 Hold the ASP in the same position as in the previous procedure (with the handle facing away and the edge connector toward you), install the first SIMM in the socket farthest from you. Then install the last SIMM in the socket closest to you.

Step 2 Remove a new SIMM from the antistatic bag.

Step 3 Hold the SIMM component side up with the connector edge (the metal fingers) closest to you.

Step 4 Hold the sides of the SIMM between your thumb and middle finger, with your forefinger against the far edge, opposite the connector edge. (See Figure 5.)

Step 5 Tilt the SIMM to approximately the same angle as the socket, and insert the entire connector edge into the socket.

Caution When inserting SIMMs, use firm but not excessive pressure. If you damage a socket, you must return the ASP to the factory for repair.

Step 6 Push the SIMM gently into the socket until the spring clips snap over the ends of the SIMM. If necessary, rock the SIMM gently back and forth to seat it properly.

Step 7 Repeat steps 2 through 6 for the remaining SIMM.

Step 8 Check all four alignment holes, when both SIMMs are installed, (two on each SIMM) and ensure that the spring retainer is visible. If it is not, the SIMM is not seated properly. If any SIMM appears misaligned, carefully remove it and reseat it in the socket. Push the SIMM firmly back into the socket until the retainer springs snap into place.

The SIMM replacement procedure is now complete.

To replace the ASP in the chassis, see the section “Installing and Replacing the ASP, CAMs, and PAMs” in the *LightStream 1010 ATM Switch User Guide*. After the rasp is replaced, restart the system for an installation check.

If the system fails to boot properly, or if the console terminal displays a checksum or memory error, check the following:

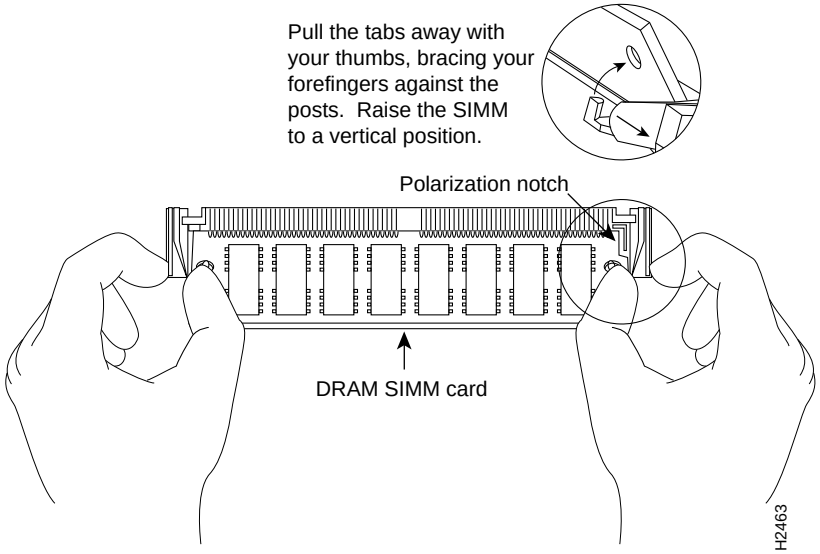
Step 4 Loosen the captive installation screws on the ASP and remove one from slot 2 of the chassis (refer to Figure 6).

Step 5 Place the ASP on an antistatic mat or pad, and ensure that you are wearing an antistatic device, such as a wrist strap. Position the ASP so that the faceplate is away from you, and the edge connector is toward you (opposite of the position shown in Figure 5).

Step 6 Locate SIMMs. The DRAM SIMMs occupy sockets U164 and U178. The Flash SIMM occupies socket U189 (see Figure 5).

Step 7 Release the spring clips from the SIMM that you wish to remove and release the SIMM from the socket (see Figure 6).

Figure 6 Releasing the SIMM Spring Clips



Step 8 Grasp the ends of the SIMM with your thumb and forefinger, When both ends of the SIMM are released from the socket, and pull the SIMM completely out of the socket. Handle the edges of the SIMM only; avoid touching the memory module, pins, metal traces, or fingers, along the socket edge.

Step 9 Place the SIMM in an antistatic bag to protect it from ESD damage.

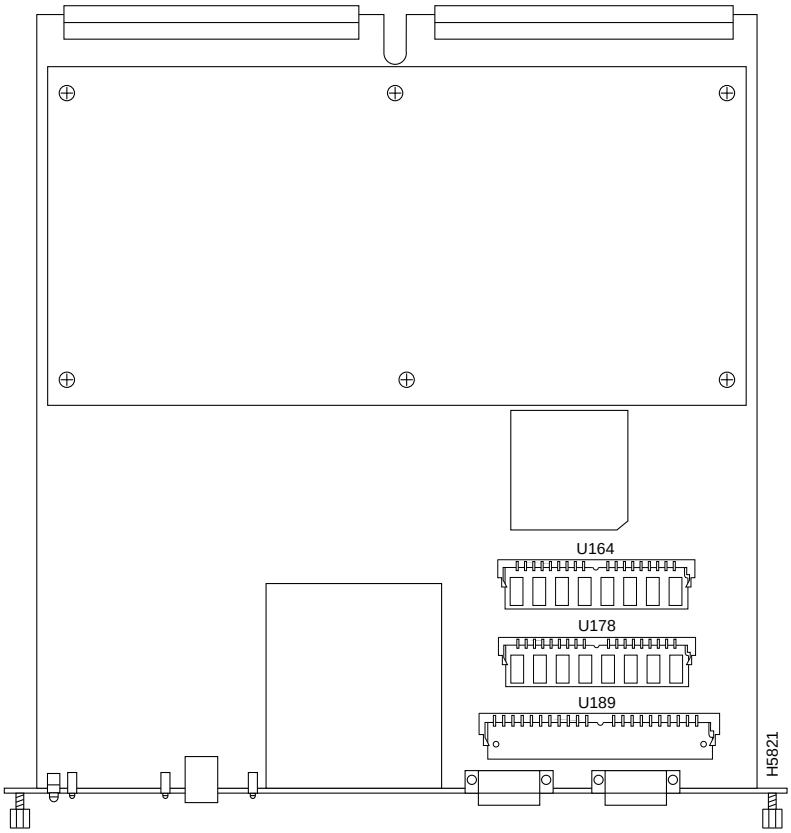
Step 10 Repeat steps 7 through 9 for the remaining SIMMs, as required for your upgrade.

This completes the SIMM removal procedure. Proceed to the next section to install the new SIMMs.

Installing SIMMs

SIMMs are sensitive components that are susceptible to ESD damage. Handle SIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SIMM). (See Figure 7.)

Figure 5 ATM Switch Processor SIMM Sockets



Before proceeding, you must met the following prerequisites:

- You have the proper tools and ESD-prevention equipment available.
- You have two SIMMs of an approved type and speed that you obtained from an approved vendor.

Caution To upgrade DRAM, you install SIMMs in both DRAM SIMM connectors. To prevent DRAM errors, both DRAM connectors must contain one SIMM of the same type.

Caution The ASP must not be removed while the switch is powered on. The switch must be powered off before removing this module. Removing the ASP while the power is on may damage the processor.

Removing SIMMs

Place removed SIMMs on an antistatic mat and store them in an antistatic bag. You can use the SIMMs that you remove in compatible equipment. To prevent ESD damage, handle SIMMs by the card edges only.

Follow these steps to remove the existing SIMMs:

Step 1 Turn off the system power, but do not disconnect the power cable (to channel ESD voltages to ground).

Step 2 Attach an ESD-preventive wrist strap between you and an unpainted chassis surface.

Step 3 Disconnect the console and auxiliary cables from the ASP.

Table 2 DRAM Required Determined by SVCs

DRAM Required	SVCs Required
16 MBytes DRAM	Less than 4000 active SVCs
32 MBytes DRAM	Between 4000 and 16000 active SVCs
64 MBytes DRAM	Between 16000 and 32000 active SVCs

Note You must use SIMMs that you obtain from an approved vendor; otherwise, Cisco Systems cannot ensure proper operation. Contact your Cisco sales representative.

Although the SIMM specifications are defined in the manufacturers' part numbers, the SIMMs must meet the following requirements:

- DRAM SIMMs must be obtained from an approved vendor.
- Minimum speed is 60 nanoseconds (ns).
- Maximum height is one inch.

Note The following procedures can also be used to replace the onboard Flash SIMM, which is located in SIMM socket U164. (See Figure 5.)

Parts and Tools Required

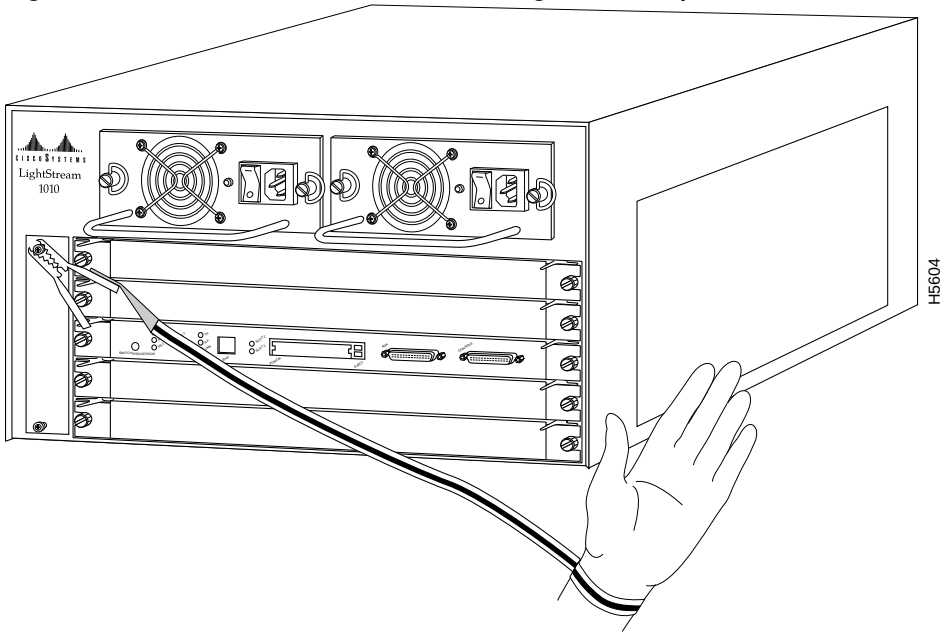
You need the following parts and tools to replace SIMMs. If you need additional equipment, contact a customer service representative for ordering information.

- Medium flat-blade and number 1 Phillips screwdriver to loosen the captive installation screws on the chassis cover and ASP
- 60-ns SIMMs from an approved vendor
- Electrostatic discharge (ESD)-preventive wrist strap and antistatic mat or pad for the removed ASP

The system DRAM resides in two SIMMs on the ASP. The DRAM SIMM sockets are U164 and U178. The default DRAM configuration is 16 MB (two 8-MB SIMMs). (See Figure 5.)

Note The total number of memory devices per SIMM is different for each manufacturer. The SIMMs in the following illustrations are generic representations of the actual DRAM SIMMs for your ASP. To ensure that you are using the correct SIMMs, refer to the specific part or product numbers indicated in the approved vendor list (AVL) on Cisco Connection Online (CCO) and by your DRAM upgrade requirements.

Figure 4 Placement of Electrostatic Discharge Wrist Strap



- Handle carriers by the faceplates and carrier edges only; avoid touching the card or any connector pins.
- When removing a module, place the removed module component-side up on an antistatic surface or in a static shielding bag. If the module is to be returned to the factory, immediately place it in a static shielding bag.
- Avoid contact between the modules and clothing. The wrist strap protects only the card from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohms).

Replacing SIMMs (Upgrading DRAM)

The system DRAM resides on a Single In-Line Memory Module (SIMM) on the ASP. The default DRAM configuration is 16 MB. This section provides the steps for increasing the amount of DRAM from 16 MB to 32 or 64 MB by adding two 16- or 32-MB SIMMs.

Note For information on removing, reinstalling, and configuring the ASP card, refer to the *LightStream 1010 ATM Switch User Guide*.

The amount of DRAM required on the ASP module is determined by the number of active physical and logical ports (virtual path tunnels) and the expected number of active switched virtual channels (SVCs) through the switch. Table 2 is an approximate guide that should be used when determining the amount of DRAM required for a switch with 32 physical ports.

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before installing or removing a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

In addition, use the following guidelines when working with any equipment that is disconnected from a power source but still connected to telephone wiring or other network cabling.

Warning Do not work on the system or connect or disconnect cables during periods of lightning activity.

- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which occurs when electronic cards or components are improperly handled, can result in complete or intermittent failures. The ASP and PAMs each consist of a printed circuit card that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding, connectors, and a handle are integral components of the carrier. Although the metal carrier helps to protect the cards from ESD, use a preventive antistatic strap whenever you handle the ASP or PAMs. Handle the carriers by the handles and the carrier edges only; never touch the cards or connector pins.

Caution Always tighten the captive installation screws on the ASP and PAMs when you are installing them. These screws prevent accidental removal of the ASP, CAMs, and PAMs, provide proper grounding for the system, and help to ensure that the bus connectors are properly seated in the backplane.

Following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact.
- When removing any module, connect the equipment end of the strap to one of the captive installation screws on an installed PAM or power supply. (See Figure 4.)

- Up to 16 DS-3 coaxial ports
- Up to 16 E3 coaxial ports
- Up to 8 622-Mbps OC-12 single-mode ports
- Up to 8 622-Mbps OC-12 multimode ports

You can install any combination of PAMs in any of the eight available PAM slots. There are no restrictions on either the number of modules that can be installed or their proximity to the ASP.

Preparing Network Connections

When preparing your site for network connections to the switch, you need to consider a number of factors related to each type of interface:

- Type of cabling required for each type (fiber, twisted-pair, or coaxial cabling).
- Distance limitations for each signal type.
- Specific cables you need to connect each interface.
- Any additional interface equipment you need, such as transceivers, modems, channel service units (CSUs), or data service units (DSUs). Before installing the switch, have all additional external equipment and cables on hand. If you intend to build your own cables, refer to the cable pinouts in the section "Installing the LightStream 1010 Switch" in the *LightStream 1010 ATM Switch User Guide* publication. For ordering information, contact a customer service representative.

Safety Recommendations

The following guidelines help ensure your safety and protect the equipment. This list is not inclusive of all potentially hazardous situations that you may be exposed to as you install the module, so *be alert.*

- Never try to lift the chassis by yourself; *two people are required* to lift the switch.
- Always turn off all power supplies and unplug all power cords before removing the chassis front panel.
- Always unplug all power cords before installing or removing a chassis.
- Keep the chassis area clear and dust free during and after installation.
- Keep tools and chassis components away from walk areas.
- Do not wear loose clothing, jewelry (including rings and chains), or other items that could get caught in the chassis. Fasten your tie or scarf and sleeves.

Warning Metal objects heat up when connected to power and ground, and can cause serious burns.

Safety with Electricity

The supervisor engine, modules, and redundant (second) power supplies are designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system. Before removing a redundant power supply, make sure the first supply is powered on.

You must shut down the system before removing or replacing any of the replaceable components inside the front panel, for example, the backplane. Never install equipment that appears damaged.

Specifications

Table 1 lists the LightStream 1010 ATM switch specifications:

Table 1 LightStream 1010 ATM Switch Specifications

Description	Specifications
Switch and processor capacity	5 Gbps[1] shared memory, nonblocking switch fabric 65,536 cells of ATM cell buffers
Software images	Default image with IISP protocol Optional PNNI image with plug-and-play capacity
Dimensions (H x W x D)	ASP: 1.2 x 14.4 x 16” (3.0 x 36.6 x 40.6 cm)
Microprocessor	100-MHz MIPs R4600
Memory	8 MB of Flash memory (upgradeable to 16 MB) 16 MB of packet-buffer DRAM[2] standard (upgradeable to 64 MB) 256 KB of boot EPROM 128 KB of SRAM[3]
Interface timing	Loop timing, Stratum 4 accuracy clock for self-timing, master clock distribution port
ATM switch processor (ASP)	ASP module, 16 MB DRAM, 8-MB Flash memory, no Flash card installed (WATM-ASP1)
Management access	Standard Ethernet and dual EIA/TIA 232 serial ports on ASP module
ASP Interface ports	RJ-45 IEEE 802.3 Ethernet 10BaseT port 25-pin EIA/TIA-232[4] AUX port and a DB-25 console port for an administration workstation
Mean Time Between Failures	2.6 years for system configuration
Maximum station-to-station cabling distance	10BaseT Ethernet—Category 3-5 UTP[5]: 328 ft.(100 m) ATM multimode—50/125-micron and 62.5/125-micron multimode fiber: 1.24 miles (2 km) ATM single-mode—8/125-micron single-mode fiber: 18.6 miles (30 km)
Agency approvals	Safety: UL[6] 1950, CSA[7]-C22.2 No. 950-93, and EN60950 EMI[8]: FCC Class A CE Mark, and VCCI Class II with shielded cables

1. Gbps = gigabits per second
2. DRAM = dynamic random-access memory
3. SRAM = static random-access memory
4. MII = media independent interface
5. UTP = unshielded twisted-pair
6. UL = Underwriters Laboratory
7. CSA = Canadian Standards Association
8. EMI = electromagnetic interference

Maximum Configuration

The eight available CAMs support any combination of network interfaces to provide the following maximum port densities:

- Up to 32 155 multimode fiber-optic ports
- Up to 32 155 single-mode fiber-optic ports
- Up to 32 155 UTP ports

Figure 2 LightStream 1010 Workgroup Configuration Example

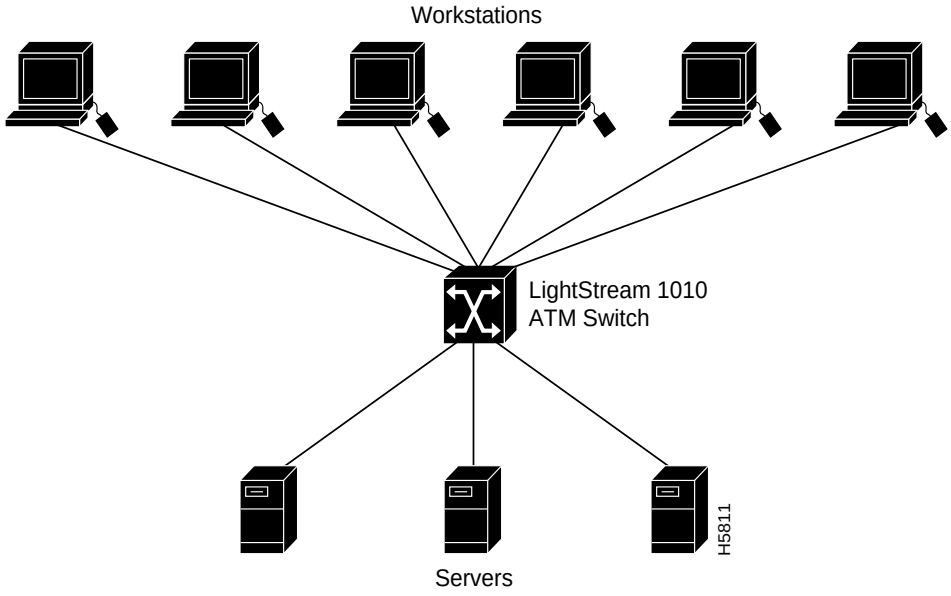
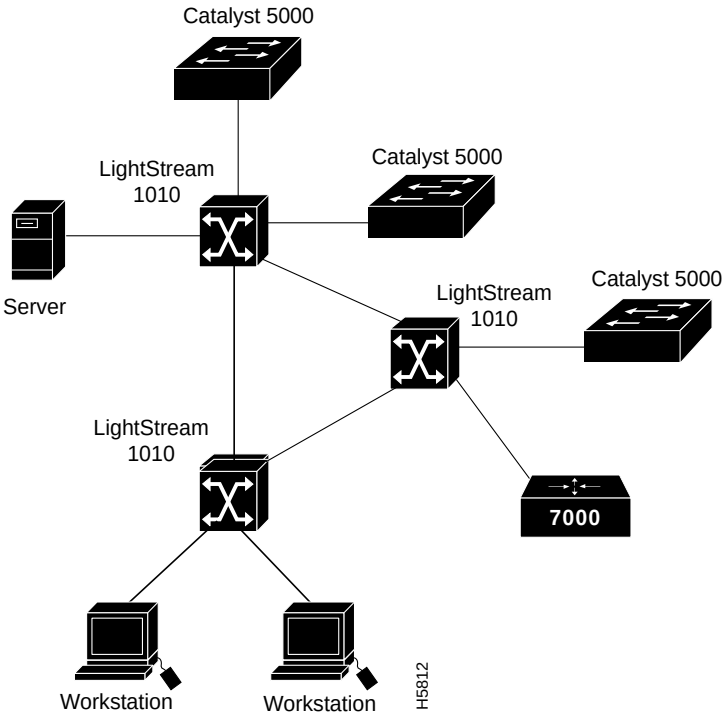


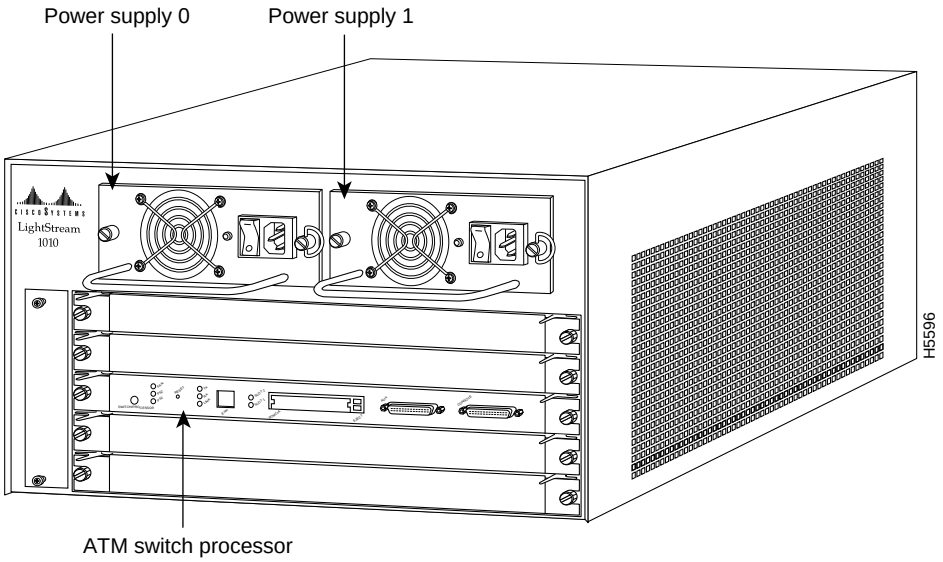
Figure 3 shows an example of a network configuration using the LightStream 1010 ATM switch for a campus backbone.

Figure 3 LightStream 1010 Backbone Configuration Example



device. The remaining slots support up to four hot-swappable Carrier Modules (CAMs). Each CAM supports up to two hot-swappable Port Adapter Modules (PAMs) for a maximum of eight PAMs per switch, supporting a wide variety of desktop, backbone, and wide-area interfaces.

Figure 1 Front View of the LightStream 1010 ATM Switch



The LightStream 1010 ATM switch provides switched ATM connections to individual workstations, servers, LAN segments, or other ATM switches and routers using fiber-optic, unshielded twisted-pair (UTP), and coaxial cable.

The LightStream 1010 ATM switch can accommodate up to 32 OC-3, 8 OC-12, and 16 DS3 and E3 switched ATM ports in a standard 19-inch (48-centimeter) rack.

Figure 2 shows an example of a network configuration using the LightStream 1010 ATM switch in a high-performance workgroup.

Doc. No. 78-2987-01 Rev. A0

LightStream 1010 ATM Switch Flash Memory Configuration Note

Product Numbers: MEM-ASP-16M=, MEM-ASP-32M=, MEM-ASP-64M=

This document contains instructions for installing and configuring the flash memory. For a complete description of commands used to configure and maintain the LightStream 1010 switch, refer to the *LightStream 1010 ATM Switch Software Configuration Guide* and the *LightStream 1010 ATM Switch Command Reference* publications. For complete hardware configuration and maintenance procedures, refer to the *LightStream 1010 ATM Switch User Guide* publication.

Cisco documentation and additional literature are available on a CD called Cisco Connection Documentation, Enterprise Series. The CD is updated and shipped monthly, so it might be more up-to-date than the printed documentation. To order the Cisco Connection Documentation, Enterprise Series CD, contact your local sales representative or call Customer Service. The CD is available both as a single CD and as an annual subscription. You can access Cisco technical documentation on the World Wide Web Universal Resources Locator (URL) `http://www.cisco.com`.

Sections in this document include the following:

- What is the LightStream 1010 ATM Switch?
- Preparing Network Connections
- Safety Recommendations
- Replacing SIMMs (Upgrading DRAM)

Warning Only trained and qualified personnel should install or replace the LightStream 1010 ATM switch, chassis, power supplies, fan assembly, or modules.

What is the LightStream 1010 ATM Switch?

The LightStream 1010 uses a five-slot, modular chassis featuring the option of dual, fault-tolerant, load-sharing power supplies. (See Figure 1.) The central slot in the LightStream 1010 is dedicated to a single, field-replaceable ATM switch processor (ASP) module that supports both the 5-Gbps shared memory and the fully nonblocking switch fabric. The ASP also supports the feature card and high performance reduced instruction set (RISC) processor that provides the central intelligence for the