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QUICK START GUIDE

Cisco 7301 Router

1 Documentation and Resources

Documentation for the Cisco 7301 router is online and orderable. For detailed hardware installation instructions, refer to the online *Cisco 7301 Installation and Configuration Guide.* Refer to the following online documents for titles and links to related documentation for installation and replacement of parts (including port adapters), regulatory compliance information, and troubleshooting information and tools.

- All Cisco 7301 documentation—See the *Cisco 7301 Internet Router Documentation Roadmap* at http://www.cisco.com/univercd/cc/td/doc/product/core/7301/4878.htm
- Port adapter documentation—See the *Cisco 7301 Router Port Adapter Documentation Roadmap* at http://www.cisco.com/univercd/cc/td/doc/product/core/7301/4879.htm
- Troubleshooting documentation and tools—See the *Cisco 7301 Internet Router Troubleshooting Documentation Roadmap* at http://www.cisco.com/univercd/cc/td/doc/product/core/7301/4951.htm

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Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation,* which also lists all new and revised technical documentation at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html.

Document Revision History

The Document Revision History table below records technical changes to this document begininng beginning with version OL-5341-03.

Document Version	Date	Change Summary
OL-5341-03	August, 2005	This is the third version of this document.

2 Prepare for Installation

This section contains information about tools and parts, warnings, site preparation information, and information for workbench or tabletop installation and rack-mount installation.

Warning **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 1030

Warning **Read the installation instructions before you connect the system to its power source.** Statement 1004

Warning **This unit is intended for installation in restricted access areas. A restricted access area is where access can only be gained by service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.** Statement 37

⚠	
Warning	**The ports labeled "Ethernet," "10BaseT," "Token Ring," "Console," and "AUX" are safety extra-low voltage (SELV) circuits. SELV circuits should only be connected to other SELV circuits. Because the BRI circuits are treated like telephone-network voltage, avoid connecting the SELV circuit to the telephone network voltage (TNV) circuits.** Statement 22

Before beginning this router installation, read the *Cisco 7300 Series Internet Routers Regulatory Compliance and Safety Information*.

Site Preparation and Unpacking

- Lift the router safely out of the packing container.
- Ensure the power service at the site is suitable for the router you are installing.
- Check the packing slip to ensure that all the proper components are present.
- Locate and have accessible the Site Log for recording information about this installation.

Tools and Parts

Use the following list of tools and parts as a checklist for preparing for installing the Cisco 7301 router:

- ESD-preventative wrist strap
- Power cord and AC power cable-retention clip
- Appropriate cables to connect the router to the network and to the console terminal
- One serial port adapter cable for each serial port to connect the port with the remote device or network Ethernet transceiver
- Data service unit (DSU) to connect each serial port to an external network
- Tape measure and level
- Screwdrivers: Number 2 Phillips screwdriver and 3/16-inch flat-blade screwdriver
- Grounding lug and wires:
  - A grounding lug with two number-10 screw holes with a 0.63-inch (16.002-mm) spacing between them
  - A wire receptacle large enough to accept a 6-AWG multistrand, copper wire
  - Two Phillips machine screws with locking washers—M5 (metric), 0.031-inch (.08-mm) pitch, 0.315-inch (8-mm) length
  - A crimping tool to fit the grounding lug wire receptacle
  - One grounding wire—6-AWG, 0.162-inch (4.115-mm) diameter, with approximately 0.108-inch (2.743-mm) insulation, for a total wire diameter of approximately 0.27 inches (6.858 mm). The wire length depends on your router location and site environment.
- The rack-mount and cable-management kit:
  - Two rack-mount brackets and one cable-management bracket
  - Screws: Four 12-24 x 0.5-inch screws, four 8-18 x .37-inch screws for use with a 19-inch rack, four 8 x .375-inch screws for use in a 21–23-inch rack, and one M4 x 20-mm screw
- T1 channel service unit/data service unit (CSU/DSU) that converts the High-Level Data Link Control (HDLC) synchronous serial data stream into a T1 data stream with the correct framing and ones density to connect a serial port to a T1 network. (Some telephone systems require a minimum number of 1 bits per time unit in a data stream, called *ones density*.) Several T1 CSU/DSU devices are available as additional equipment, and most provide a V.35, EIA/TIA-449, or EIA-530 electrical interface.

Prepare for Workbench or Tabletop Installation

For a workbench or tabletop installation, verify the following before installing the router:

- The router is off the floor and has adequate ventilation.
- An adequate chassis ground (earth) connection exists for the router.
- The router has at last 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (sides of router).
- The router has 19 inches (48.3 cm) clearance at the front and rear to allow for CompactFlash Disk, SFP Gigabit Interface Converter (GBIC) module, and port adapter replacement or installation, or to access cables or equipment.
- The port adapter filler panel is installed if a port adapter is not installed. The slot must not be empty.

For cable-management bracket installation instructions, see page 9.

Prepare for Rack-Mount Installation

Before you begin the rack-mounting tasks, decide whether or not you want to front- or rear-mount the chassis, decide whether or not you want to attach the cable-management bracket, and determine the type of rack—four-post or two-post—that you will be using.

3 Install External Options

This section provides installation instructions for the Gigabit Ethernet SFP Gigabit Interface Converter (GBIC) module. It does not ship installed.

Figure 1   Cisco 7301 Front Panel
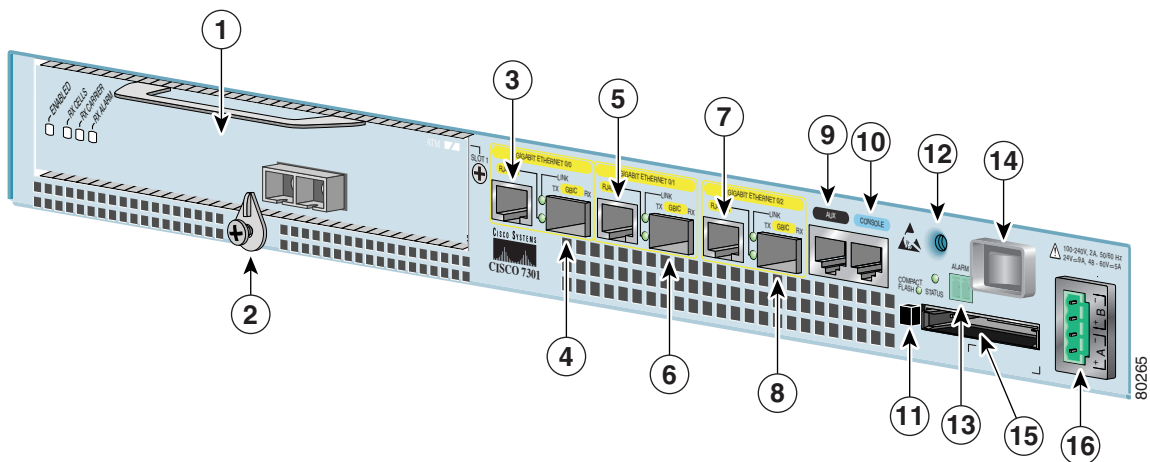
1	Port adapter	9	Auxiliary port
2	Port adapter latch	10	Console port
3	RJ-45 port GE 0/0	11	CompactFlash Disk ejector button
4	Gigabit Ethernet SFP GBIC port 0/0	12	Ground for ESD wrist strap with banana jack
5	RJ-45 port GE 0/1	13	Alarm port
6	Gigabit Ethernet SFP GBIC port 0/1	14	Power switch
7	RJ-45 port GE 0/2	15	CompactFlash Disk slot
8	Gigabit Ethernet SFP GBIC port 0/2	16	Power connector

Install the SFP Gigabit Interface Converter Module

⚠️
Warning   **Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051

⚠️
Warning   **Class 1 laser product.** Statement 10008

⚠️
Warning   **Class 1 LED product.** Statement 1027

⚠️
Warning   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

- Only three of the six Gigabit Ethernet ports may be used at the same time.

- The Gigabit Ethernet small form-factor pluggable (SFP) GBIC module supports online insertion and removal (OIR).

- The native fiber optical Gigabit Ethernet ports and the RJ-45 Gigabit Ethernet ports are reported as GigabitEthernet 0/0, GigabitEthernet 0/1, and GigabitEthernet 0/2 in software. You must use the **media-type** command to select which media type you want to use before you configure these ports. See page 24.

Figure 2   Identifying SFP GBIC Module Latches
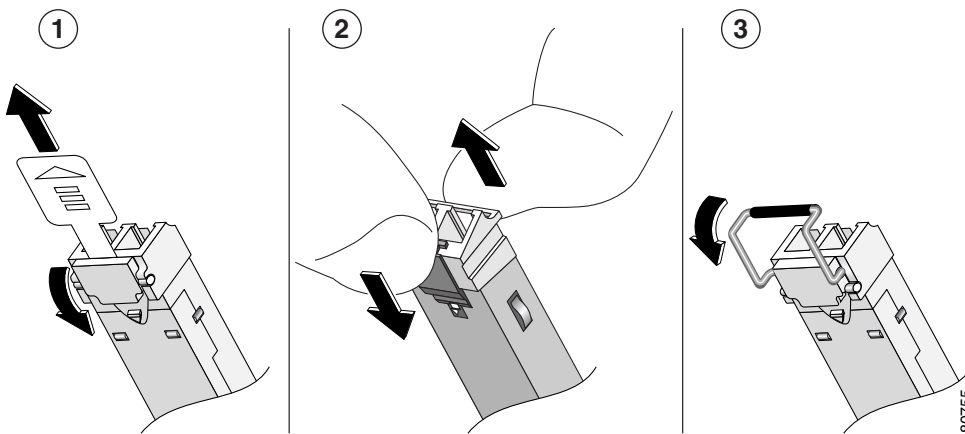
1	Sliding latch	3	Hinged latch
2	Hinged and sliding latch		

Different manufacturers have different types of latching mechanisms for Gigabit Ethernet SFP GBIC modules. There is no correlation of the type of latch to the model (such as SX or LH) or technology type (such as Gigabit Ethernet) of SFP GBIC modules. See the label for the SFP technology type and model. The SFP GBIC modules use LC-type connectors.

Figure 3   Inserting a SFP GBIC Module into a SFP GBIC Port
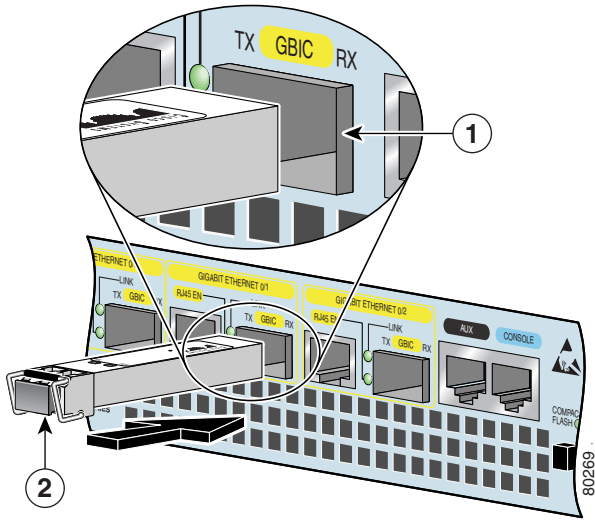
| 1	SFP GBIC port	2	Latch beneath plug

Step 1   Turn the SFP GBIC module so the latch is on the bottom. The SFP GBIC module is keyed to be inserted correctly.

Step 2   Insert the SFP GBIC module into SFP port 0/0, 0/1, or 0/2. Repeat Step 2 if you are inserting a second or third SFP GBIC module.

Step 3   Do not remove the SFP GBIC module plugs until you are ready to install the cables.

4   Rack-Mount the Router

This section provides information for rack-mounting the router.

Attach the Rack-Mount Brackets—Chassis Front-Mounted

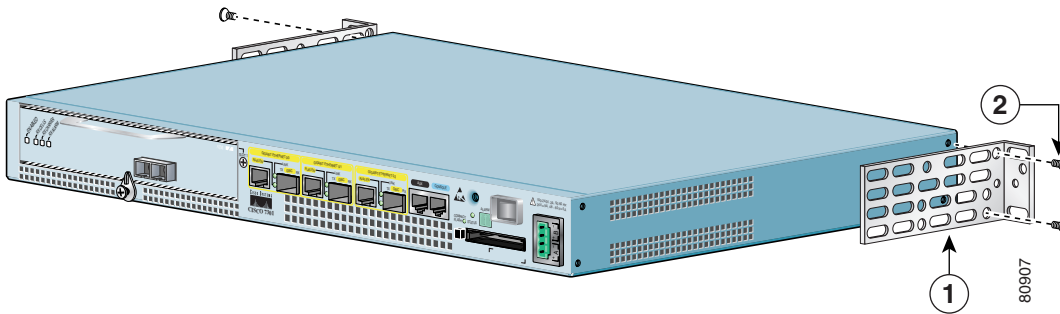*Figure 4   Attaching the Rack-Mount Brackets to the Front of the Chassis*
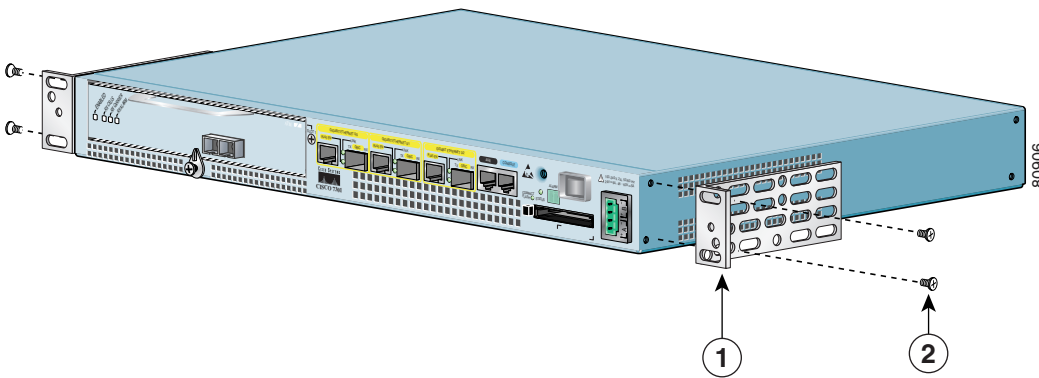
1	Rack-mount bracket	2	4 screws, 8-18 x .37 in., for use with a 19-inch rack
			4 screws, 8 x .375 in., for use in a 21–23-inch rack

Depending on how the rack-mount brackets are attached to the chassis, the chassis either protrudes from the rack or is recessed in the rack.

Step 1 Locate the rack-mount and cable-management brackets and screws and a Number 2 Phillips screwdriver.

Step 2 Align the rack-mount bracket (1) to the side of the router. Depending on which set of rack-mount bracket holes you choose to use to attach the rack-mount bracket to the router, the chassis will either be recessed in the rack or protrude from the rack.

Step 3 Insert and tighten the two screws (2). Repeat Step 1 and Step 2 on the other side of the router.

Step 4 To install the cable-management bracket, see page 9. If you are not installing the cable-management bracket, skip to the "Four-Post Rack Installation" section on page 8 or the "Two-Post Rack Installation" section on page 9 for rack-mount instructions.

Attach the Rack-Mount Brackets—Chassis Rear-Mounted

Figure 5   Attaching the Rack-Mount Brackets to the Rear of the Chassis

1	Rack-mount bracket	2	4 screws, 8-18 x .37 in., for use with a 19-inch rack
			4 screws, 8 x .375 in., for use in a 21–23-inch rack

Depending on how the rack-mount brackets are attached to the chassis, it either protrudes from the rack or is recessed in the rack.

Step 1 Locate the rack-mount brackets and screws and a Number 2 Phillips screwdriver.

Step 2 Align the rack-mount bracket (1) to the side of the router and insert and tighten the screws (2). Depending on which set of holes on the rack-mount bracket that you use, the router will either be recessed in the rack or protrude from the rack.

✎
Note To use the cable-management bracket with the Cisco 7301 router rear-mounted, you must purchase a second rack-mount kit, attach a rack-mount bracket to the left front of the chassis, and attach the cable-management bracket to it. See below for cable-management bracket installation instructions.

Go to the "Four-Post Rack Installation" section on page 8 or the "Two-Post Rack Installation" section on page 9.

Attach the Cable-Management Bracket

Figure 6   Attaching the Cable-Management Bracket
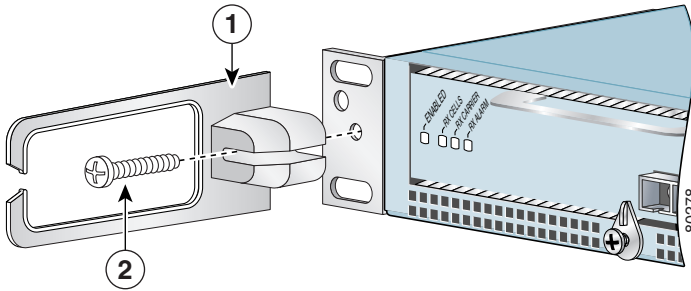
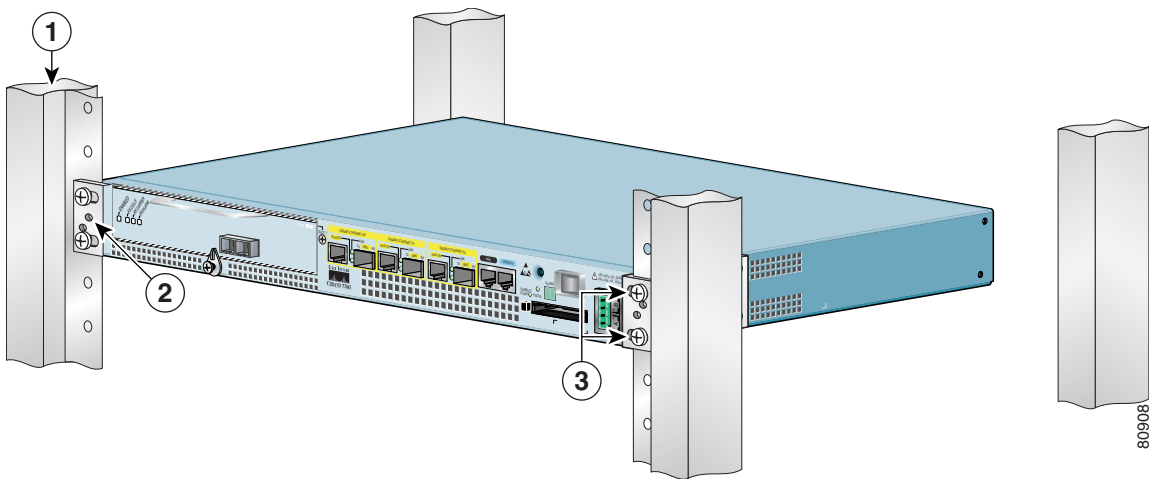| 1	Cable-management bracket	2	M4 x 20-mm screw

Step 1   Align the cable-management bracket (1) to the rack-mount bracket on the left side of the Cisco 7301 router.

Step 2   Using a Phillips screwdriver and the M4 x 20-mm screw (2), thread and tighten the screw to the cable-management bracket.

Go to the "Four-Post Rack Installation" section on page 8 or the "Two-Post Rack Installation" section on page 9.

Four-Post Rack Installation

Figure 7   Installing the Cisco 7301 Router in a Four-Post Rack

1	Four-post rack	3	Four 12-24 x 0.5-inch screws
2	Screw hole for cable-management bracket		

Note   Inner clearance (the width between the inner sides of the two posts or rails) must be at least 17.3 inches (43.9 cm) The height of the chassis is 1.73 inches (4.39 cm). Airflow through the chassis is from front to back.

Step 1 Make sure that the port adapter latch is in the locked position and the screw is tightened.

Step 2 Make sure the rack brakes are locked or the rack (1) is stabilized.

Step 3 Position the router so the front is closest to you and lift it carefully into the rack. To prevent injury, avoid any sudden twists or moves.

Step 4 Slide the chassis into the rack, pushing it back until the brackets meet the mounting strips or posts on both sides of the rack.

Step 5 Keeping the brackets flush against the posts or mounting strips, align the holes in the brackets with the holes on the rack or mounting strip.

Step 6 For each bracket, insert and tighten two 12-24 x 0.5-inch screws (3) to the rack.

Two-Post Rack Installation

Figure 8   Installing the Cisco 7301 Router in a Two-Post Rack

1	Two-post rack	3	Four 12-24 x 0.5-inch screws
2	Screw hole for cable-management bracket		

Note Inner clearance (the width between the inner sides of the two posts or rails), must be at least 17.3 inches (43.9 cm) The height of the chassis is 1.73 inches (4.39 cm). Airflow through the chassis is from front to back.

Step 1 Make sure that the port adapter latch is in the locked position and the screw is tightened.

Step 2 Make sure the rack brakes are locked or the rack (1) is stabilized.

Step 3 Position the router so the front is closest to you and lift it carefully into the rack. To prevent injury, avoid any sudden twists or moves.

Step 4 Slide the chassis into the rack, pushing it back until the brackets meet the mounting strips or posts on both sides of the rack.

Step 5 Keeping the brackets flush against the posts or mounting strips, align the holes in the brackets with the holes on the rack or mounting strip.

Step 6 For each bracket, insert and tighten two 12-24 x 0.5-inch screws (3) to the rack.
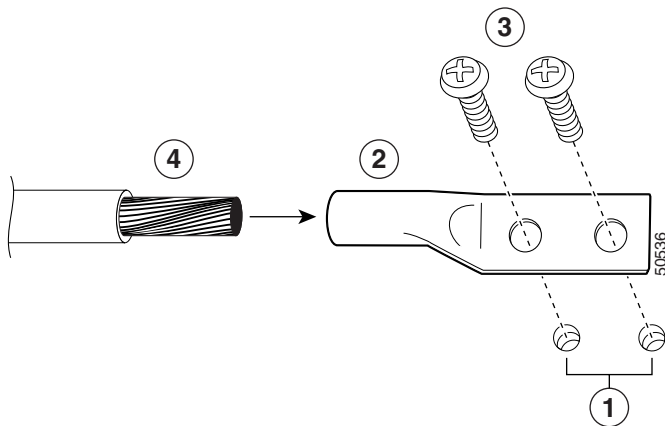
Chassis Ground Connection Installation

Figure 9   *Attaching the Grounding Lug and Wire to the Chassis*

| 1	Chassis ground connector	3	Screws
2	Grounding lug	4	Wire

📝 **Note**   The grounding lug and Phillips screws are not available from Cisco Systems. Get the grounding lug from an electrical-connector vendor and the screws from a hardware vendor. See Page 4 for the parts needed.

Step 1   Use the wire stripper to strip one end of the 6-AWG wire approximately 0.75 inches (19.05 mm).

Step 2   Insert the 6-AWG wire (4) into the wire receptacle on the grounding lug.

Step 3   Use the crimping tool to carefully crimp the wire receptacle around the wire; this step is required to ensure a proper mechanical connection.

Step 4   Locate the chassis ground connector (1) on the rear of your router chassis.

Step 5   Insert the two screws (3) through the holes in the grounding lug (2).

Step 6   Use the Number 2 Phillips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not overtighten the screws.

Step 7   Connect the opposite end of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

5 Connect the Router to the Network

This section provides information about cables and ports and attaching the router to the network.

Figure 10   Attaching the Console and Auxiliary Port Cables
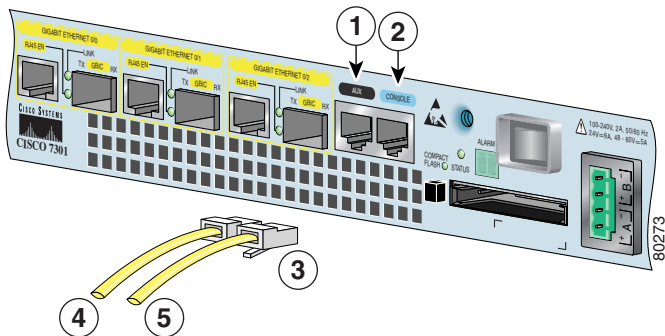
1	Auxiliary port	4	Cable to modem or DCE
2	Console port	5	Cable to console terminal or DTE
3	RJ-45 connector		

Console and Auxiliary Port Cable Connections

Note   Both the console and auxiliary ports are asynchronous serial ports; any devices connected to these ports must be capable of asynchronous transmission. The DCE-mode console port is for connecting a console terminal and the DTE-mode auxiliary port is for connecting a modem or other DCE device (such as a CSU/DSU or other router) to your router.

Step 1   Before connecting a terminal to the console port, configure the terminal to match the router console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bit (9600 8N1).

Step 2   Use an auxiliary and console port cable. Use the console cable to connect the terminal to the console port. After you establish normal router operation, you can disconnect the terminal.

Note   You must supply your own interface cable between the auxiliary port and the equipment you are connecting. For console and auxiliary port pinouts, see the online *Cisco 7301 Installation and Configuration Guide*.
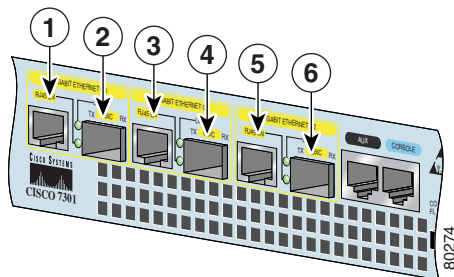
Gigabit Ethernet SFP GBIC and RJ-45 Connections

The Cisco 7301 router has three native Gigabit Ethernet interfaces. Each interface consists of three RJ-45 media ports and three SFP GBIC optical fiber ports. The RJ-45 media ports provide 10/100/1000-Mbps connectivity while the SFP GBIC optical fiber ports provide 1000-Mbps connectivity.

Note   Any three of the six Gigabit Ethernet ports may be used at the same time.

For more information on SFP GBIC cabling specifications, see the online *Cisco 7301 Installation and Configuration Guide and the Gigabit Interface Converter (GBIC) Module and Small Form-Factor Pluggable (SFP) GBIC Module Installation Information and Specifications*.

Figure 11   Gigabit Ethernet SFP GBIC and RJ-45 Port Identification

1	Gigabit Ethernet RJ-45 port 0/0	4	Gigabit Ethernet SFP GBIC port 0/1
2	Gigabit Ethernet SFP GBIC port 0/0	5	Gigabit Ethernet RJ-45 port 0/2
3	Gigabit Ethernet RJ-45 port 0/1	6	Gigabit Ethernet SFP GBIC port 0/2

Intra-Building Lightning Protection

Shielded cables which are grounded at both ends are required to be used on the 10/100/1000 Ethernet port in order to be in compliance with requirement R4-11 in GR-1089-Core for a Central Office environment. This is not a requirement for customer premise installations.

Warning   **To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.** Statement 76

To identify the RJ-45 cable type, hold the two ends of the cable next to each other so you can see the colored wires inside the ends. The straight-through wire type has colored wires in the same sequence at both ends. In the crossover wire type, the first colored wire at the far left is the third colored wire at the other end. The second colored wire at the far left is the sixth colored wire at the other end.

Attach RJ-45 Ethernet cables to the appropriate connector.

Note   Both native Gigabit Ethernet ports, SFP GBIC and RJ-45, are reported as Gigabit Ethernet 0/0, Gigabit Ethernet 0/1, and Gigabit Ethernet 0/2 in software. You must use the **media-type** command to select which media type you want to use before you configure these ports. See the "Configure the Native Gigabit Ethernet Interfaces" section on page 22.

SFP GBIC Cabling and Connection Equipment

The Gigabit Ethernet small form-factor pluggable (SFP) GBIC module port is a 1000-Mbps optical interface in the form of an LC-type duplex port that supports IEEE 802.3z interfaces compliant with the 1000BASEX standard. Gigabit Ethernet SFP GBIC models GLC-SX-MM, GLC-LH-SM, and GLC-ZX-SM are supported in the Cisco 7301 router, as are a variety of Coarse Wavelength-Division Multiplexing (CWDM) SFPs, and the Cisco 1000BASE-T (copper) SFP with an RJ-45 port. For cabling distances, specifications, and other information, see the online *Gigabit Interface Converter (GBIC) Module and Small Form-Factor (SFP) GBIC Module Installation Information and Specifications*. Also see the *Coarse Wavelength- Division Multiplexing SFP Compatibility Matrix* at *http://www.cisco.com/en/US/products/hw/modules/ps4999/ products_quick_reference_guide09186a008019f055.html*, the *Cisco Small Form-Factor Pluggable Gigabit Interface Converter Data Sheet*, and the *Cisco 1000BASE-T SFP Data Sheet*.

Note   All SFP GBIC ports have LC-type connectors.

Warning   **Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051
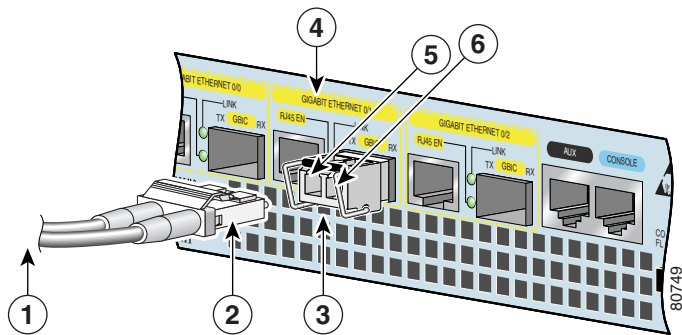
Warning   **Class 1 laser product.** Statement 1008

Warning   **Class 1 LED product.** Statement 1027

Figure 12   Inserting the Gigabit Ethernet SFP GBIC Cables

1	To external 1000BASEX network	4	Gigabit Ethernet SFP GBIC port 0/1
2	1 duplex connector (TX and RX)	5	RX
3	SFP GBIC module	6	TX

Note   There is no support for copper-based SFP GBICs (1000BASET) as these do not conform to the SFP GBIC standard and have not been validated by Cisco.

Step 1   Remove the SFP GBIC plug.

Step 2   Attach the appropriate optical fiber cable directly to SFP GBIC module. You can use either simplex or duplex connectors for most devices.

- Two cables are required for simplex connectors, one cable for transmit (TX) and one for receive (RX).
- One cable that has both TX and RX connectors is required for duplex connectors.

Use a Category 5 unshielded twisted pair cable with RJ-45 connector, if you are using a Cisco 1000BASE-T SFP.

Caution   If you plan to use a GLC-LH-SM at distances greater than 984.25 feet (300 meters) over 50/125-micron or 62.5/125-micron multimode fiber, to prevent data transmission problems you must use the mode-conditioning patch cord.

Attach the Mode-Conditioning Patch Cord

Figure 13   Attaching the Mode-Conditioning Patch Cord
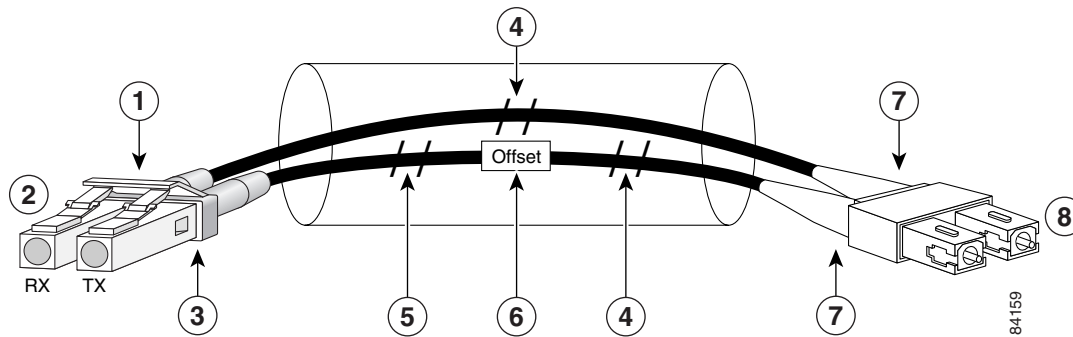
1	Gray color identifier	5	Single-mode bar
2	To GE interface	6	Offset
3	Blue color identifier	7	Beige color identifier
4	Multimode bar	8	To cable plant

Step 1   Attach the patch cord to the LC-type connector on the SFP GBIC modules (2).

Step 2   Attach the network ends of your patch cord to the appropriate 1000BASEX equipment in your building cable plant (9).

✎
Note   Ensure that you connect the TX and RX ports on one end of the patch cord to the RX and TX ports (respectively) on the other end. Connect TX to RX and RX to TX.

A mode-conditioning patch cord can be used with the GLC-SX-MM or GLC-LH-SM to allow reliable laser transmission between the single-mode laser source on the SFP GBIC module and a multimode optical fiber cable.

Port Adapter Cable Connections

The instructions for connecting the cables for each port adapter installed in the Cisco 7301 router are in the respective online notes for each port adapter. The documents are available on the Documentation CD-ROM and on Cisco.com at http://www.cisco.com/univercd/cc/td/doc/product/core/cis7300/ol3531.htm. Also see the release notes for information about a specific port adapter. Release notes are found at http://www.cisco.com/univercd/cc/td/doc/product/software/index.htm.

Alarm Port Connection

Figure 14   Connecting the Alarm Port Cable
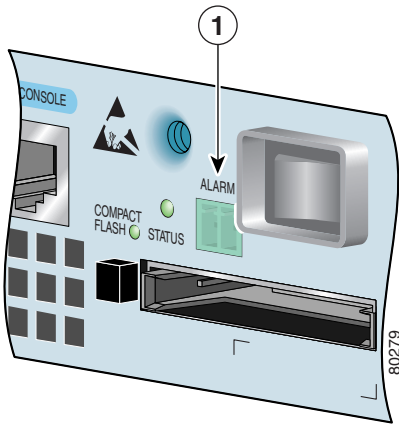

1	Alarm port		

Connect the dry relay alarm port cable connector to the alarm port. It cannot be inserted incorrectly.

The dry relay alarm port operates up to 50V AC/DC maximum and up to 80 mA maximum. Total power dissipation should not exceed 300 milliwatts.   The normally closed position will have from 15 to 30 ohms resistance. The open position will be greater than 1 megohm. The alarm condition is the closed position. This port is a switch so that the cable connector can be inserted in either orientation.

Cable Management

Figure 15   Inserting the Cables Through the Cable-Management Bracket
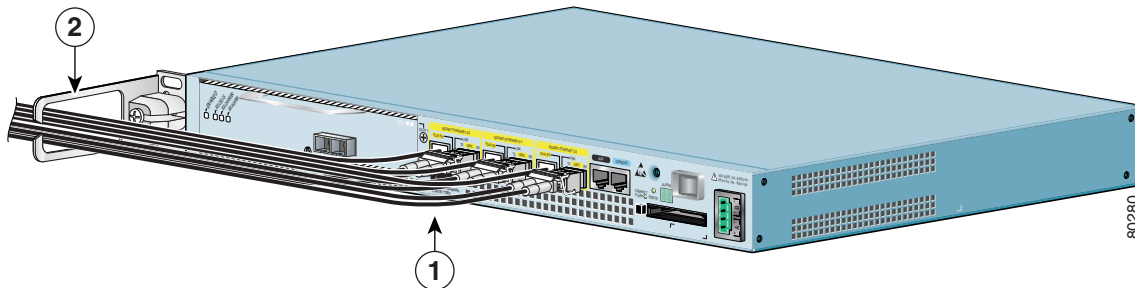
1	Input/output cables	2	Cable-management bracket

If you have not already done so, run the port adapter and input/output cables through the cable-management bracket.

6 Start the System

Connect Power to the Router

This section provides instructions for attaching the power cables to the router and powering on the router.

⚠️

Warning **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.** Statement 1028

⚠️

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors.)** Statement 13

The Cisco 7301 router comes with either an AC or DC power supply. Dual AC and dual DC power supply options are available.

Connect AC-Input Power

Step 1 Check that the power switch is in the OFF (O) position.

Step 2 Plug the single power cable into the AC connector on the router. The cable is keyed so that it cannot be inserted incorrectly.

Figure 16   *Attaching the AC Power Cable*
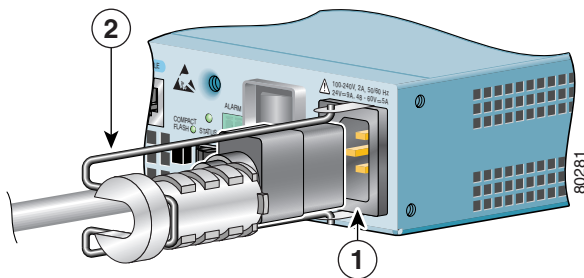
1	AC power receptacle	2	Adjustable AC cable-retention clip

Step 3 If you are using the single AC power cable, insert the cable-retention clip wire into the retention-clip holes. See Figure 16.

Step 4 Slide the plastic part of the cable-retention clip into the wire holder.

Step 5 Place the AC power cable into the adjustable cable-retention clip.

Step 6 Plug a power cable into each end of the dual AC power cord that is attached to the router.

Step 7 Plug the single AC power supply cable into a single AC power source.

Step 8 Plug the dual AC power supply cables into two AC power sources.

✎

Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

✎

Note If required, use Sinewave Output UPS (uninterruptable power supply), not Ferro-resonant type UPS.

Connect DC-Input Power

The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Match the lead color coding for the DC-input power supply to the lead color coding used at the DC power source.

⚠ **Warning**   **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a Listed and Certified fuse or circuit breaker no larger than 60 VDC, 15 A is used on all currently-carrying conductors.** Statement 96

⚠ **Warning**   **Before completing any of the following steps, and to prevent short-circuit or shock hazards, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 140

Step 1   Be sure the power switch is in the OFF (O) position.

Step 2   Ensure that no current is flowing through the DC power supply leads. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Step 3   Using a wire stripper, strip approximately 0.55 inch (14 mm) from the –V and +V leads.

Figure 17   Attaching the Wires to the DC Plug and the DC Plug to the DC Connector
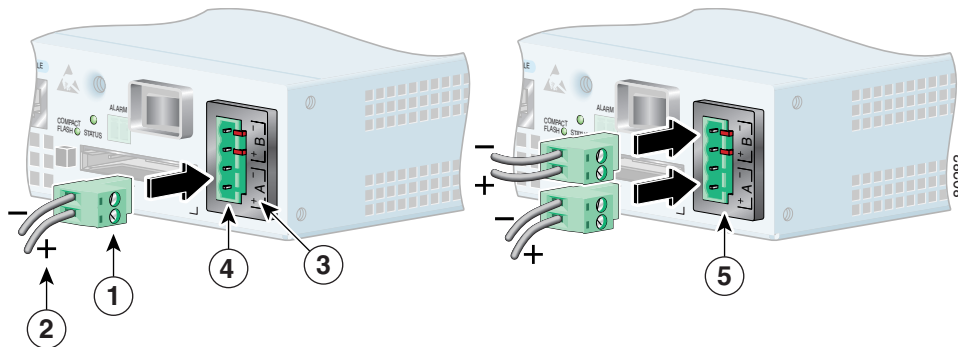
1	DC plug	4	Single DC power supply connector
2	Lead	5	Dual DC power supply connectors
3	+ and – embossed on connector		

Step 4   To determine which lead to connect to which screw in the DC plug, align the DC plug (1) with the DC connector (4, 5) in the chassis as shown in the illustration above. Do not insert the plug in the connector. Notice the symbols, + A –, embossed on the connector (3). Use the symbols and the orientation of the plug to guide you when inserting the leads into the plug.

Step 5   Loosen the screws in the DC plug (1), insert the +V and –V leads, and tighten the screws.

Step 6   Insert the DC plug (1) into the DC connector (4) in the chassis. Repeat Step 5 and Step 6 if you have a dual DC power supply (5).

Step 7 Switch the circuit breaker to the ON position.

Step 8 Press the power switch to turn on the router.

✎

Note After powering off the router, wait a minimum of 30 seconds before powering it on again.

Observe the System Startup and Perform a Basic Configuration

Check conditions prior to system startup:

Step 1 Check that all hardware parts and cables are securely attached to the chassis.

Step 2 Check that port adapter configuration information is available, if needed.

Step 3 Check that a CompactFlash Disk is installed.

Step 4 Check that the console terminal is turned on.

Start the Router

⚠

Caution The DC return connection to this system is to remain isolated from the system frame and chassis (DC-I).

Step 1 Place the power switch in the ON (|) position.

Step 2 Listen for the fans; they should be operating as soon as power is turned on. The following table provides information about the LEDs as the system starts.

Figure 18   Identifying LEDs and LED Status
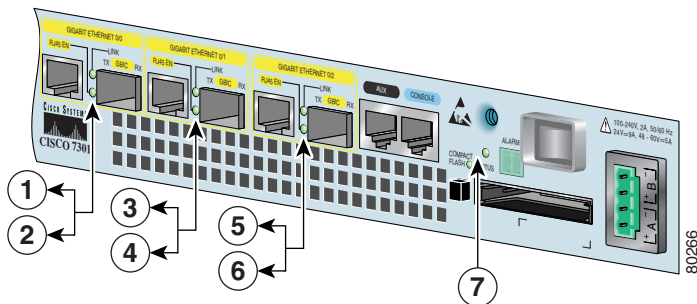
No.	LED Label	LED	Color	Status	LED flashes when there is traffic
1	LINK (0/0)	LINK (0/0)	Green	—	Yes
2	RJ-45 EN (0/0)	RJ-45 enable (0/0)	Green	In the Power Up state, the LED is On	No, remains constantly on
3	LINK (0/1)	LINK (0/1)	Green	—	Yes
4	RJ-45 EN (0/1)	RJ-45 enable (0/1)	Green	In the Power Up state, the LED is On	No, remains constantly on
5	LINK (0/2)	LINK(0/2)	Green	—	Yes

No.	LED Label	LED	Color	Status	LED flashes when there is traffic
6	RJ-45 EN (0/2)	RJ-45 enable (0/2)	Green	In the Power Up state, the LED is On	No, remains constantly on
7	STATUS	System status	Amber while the system boots	—	No, remains constantly on
			Green when the system is operational	In the Power Up state, the LED is On	

Step 3 During the boot process, observe the system LEDs. The STATUS LED comes on immediately as amber, then turns to green when the Cisco IOS is booted. Port adapter LEDs go on and off irregularly.

Step 4 Observe the initialization process. The port adapter ENABLED LEDs go on when initialization is completed and the console screen displays a script and system banner.

7 Configure the Router

Before configuring the router, determine whether or not you want to use a management tool such as Cisco Security Device Manager.

Cisco Security Device Manager (SDM), version 1.1, is an optional Java-based device-management tool that allows you to configure LAN interfaces, routing, Network Address Translation (NAT), firewalls, Virtual Private Networks (VPNs), and other features without knowledge of the Cisco command-line interface (CLI). You can configure features such as Access Control Lists (ACLs), routing protocols, and other options using SDMs advanced mode.

✎

Note You will need to use CLI commands to configure several features that SDM does not support. SDM does not support the following features: WAN configuration, Gigabit Ethernet (GE) interfaces, AA client, EZ VPN server, QoS,SSHv2, DHCP server configuration options, and usability enhancements.

SDM is preinstalled on your routers Flash Disk or CompactFlash Disk when it is ordered as part of a VPN bundle or as part of a 7xxx VPN bundle. If your router did not ship with SDM preinstalled, you can download a free copy from the Software Center at Cisco.com at http://ww.cisco.com/kobayashi/sw-center/index.shtm. Because SDM uses a GUI, it requires that you access it from a PC using a supported web browser. Go to the *Security Device Manager (SDM), Version 1.1 User Note for the 7xxx Routers* for more information.

Performing a Basic Configuration Using the Setup Facility

If you do not plan to use AutoInstall, do not connect the router's serial (WAN) cable to the channel service unit/data service unit (CSU/DSU). If the WAN cable is not connected, the router boots from Flash memory and goes automatically into the setup facility.

You can run the setup facility any time you are at the enable prompt (#) by entering the **setup** command.

If the serial (WAN) cable is connected to the CSU/DSU and the router does not have a configuration stored in NVRAM, the router attempts to run AutoInstall at startup. The router may take several minutes to determine that AutoInstall is not set up to a remote TCP/IP host. Once the router determines that AutoInstall is not configured, it defaults to the setup facility.

Configure Global Parameters

When you first start the setup program, you must configure the global parameters. These parameters are used for controlling system-wide settings. Complete the following steps to enter the global parameters:

Step 1   Connect a console terminal to the console port, and then boot the router.

The system boots from Flash memory. The following information appears after about 30 seconds. When you see this information, you have successfully booted your router:

```
Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706

Cisco Internetwork Operating System Software
IOS (tm) 7301 Software (C7301-JS-M), Experimental Version 12.2(20030103:230909) [biff 100]
Copyright (c) 1986-2003 by cisco Systems, Inc.
Compiled Fri 03-Jan-03 16:03 by biff
Image text-base:0x600088F4, data-base:0x617F6000

cisco 7301 (NPE-G1) processor (revision A) with 245760K/16384K bytes of memory.
Processor board ID 0
SB-1 CPU at 650Mhz, Implementation 1, Rev 0.2, 512KB L2 Cache
1 slot midplane, Version 2.0

Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
3 Gigabit Ethernet/IEEE 802.3 interface(s)
509K bytes of non-volatile configuration memory.

125440K bytes of ATA PCMCIA card at slot 2 (Sector size 512 bytes).
32768K bytes of Flash internal SIMM (Sector size 256K).

Press RETURN to get started!
```

The first two sections of the configuration script (the banner and the installed hardware) appear only at initial system startup. On subsequent uses of the setup facility, the script begins with a System Configuration Dialog as shown in the following example.

```
--- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.
```

Step 2   When asked if you want to enter the initial configuration dialog and see the current interface summary, enter **yes** or press **Return**:

```
Would you like to enter the initial configuration dialog? [yes]:

First, would you like to see the current interface summary? [yes]:
```

In the following example, the summary shows a Cisco 7301 router at first-time startup; that is, nothing is configured.

```
Any interface listed with OK? value "NO" does not have a valid configuration

Interface        IP-Address      OK?    Method    Status     Protocol
ATM1/0           unassigned      NO     unset     down       down
FastEthernet1/0  unassigned      NO     unset     down       down
```

Step 3 Choose which protocols to support on your interfaces. For Internet Protocol (IP)-only installations, you can accept the default values for most of the questions. A typical configuration using IP, IPX, and AppleTalk follows and continues through Step 8:

```
Configuring global parameters:

  Enter host name [Router]:
```

Step 4 Enter enable secret, enable, and virtual terminal passwords:

```
The enable secret password is a one-way cryptographic secret
password used instead of the enable password when it exists.

Enter enable secret: barney

The enable password is used when there is no enable secret
password and when using older software and some boot images.

Enter enable password: betty

Enter virtual terminal password: fred
```

Step 5 The Simple Network Management Protocol (SNMP) is the most widely supported open standard for network management. It provides a means to access and set configuration and run-time parameters of routers and communication servers. SNMP defines a set of functions that can be used to monitor and control network elements.

Enter **yes** or press **Return** to accept SNMP management; enter **no** to refuse it:

```
Configure SNMP Network Management? [yes]:
    Community string [public]:
```

Step 6 For the following queries, do not enable VINES, LAT, DECnet, CLNS, bridging, XNS, or Apollo:

```
Configure Vines? [no]:
Configure LAT? [no]:
Configure DECnet? [no]:
Configure CLNS? [no]:
Configure bridging? [no]:
Configure XNS? [no]:
Configure Apollo? [no]:
```

Step 7 For the following queries, enable routing on AppleTalk and IPX:

```
Configure AppleTalk? [no]: yes
    Multizone networks? [no]: yes

Configure IPX? [no]: yes
```

Step 8 In most cases you use IP routing. If you are using IP routing, you must also select an interior routing protocol. You can specify only one of two interior routing protocols to operate on your system using the setup facility: Interior Gateway Routing Protocol (IGRP) or Routing Information Protocol (RIP). To configure IP routing, enter **yes** (the default) or press **Return**, and then select an interior routing protocol:

```
Configure IP? [yes]:
    Configure IGRP routing? [yes]:
      Your IGRP autonomous system number [1]: 15
```

The following sample display includes a continuous listing of all configuration parameters selected in Step 3 through Step 8. Only IP, IPX, and AppleTalk are the selected protocols for this example.

```
Configuring global parameters:

  Enter host name [Router]: router

The enable secret is a one-way cryptographic secret password used
instead of the enable password when it exists.

  Enter enable secret: barney

The enable password is used when there is no enable secret password
and when using older software and some boot images.
  Enter enable password: betty
  Enter virtual terminal password: fred
  Configure SNMP Network Management? [yes]:
    Community string [public]:
  Configure Vines? [no]:
  Configure LAT? [no]:
  Configure AppleTalk? [no]: yes
    Multizone networks? [no]: yes
  Configure DECnet? [no]:
  Configure IP? [yes]:
    Configure IGRP routing? [yes]:
      Your IGRP autonomous system number [1]: 15
    Configure RIP routing? [no]:
  Configure CLNS? [no]: n
  Configure bridging? [no]:
  Configure IPX? [no]: yes
  Configure XNS? [no]:
  Configure Apollo? [no]:
```

Step 9   Save your settings to NVRAM. See the "Save the Running Configuration to NVRAM" section on page 28. If you do not save the configuration settings that you created in the router using configuration mode and the setup facility, your configuration will be lost the next time you reload the router.

Configure an Auxiliary Port to Receive Console Port Messages

If you choose to have console port messages routed to the auxiliary port, use the IOS command **terminal monitor** on the auxiliary port on which you desire to receive console messages.

```
Router# terminal monitor
```

Configure the Native Gigabit Ethernet Interfaces

The Cisco 7301 reports both the RJ-45 and Gigabit Ethernet SFP GBIC interface ports as Gigabit Ethernet 0/0, Gigabit Ethernet 0/1, and Gigabit Ethernet 0/2. Before configuring any of the three interfaces, you must first use the **media-type** interface command to select the media type, either the SFP GBIC (**gbic**) or RJ-45 (**rj45**) port.

Note   The Gigabit Ethernet interfaces on the Cisco 7301 do not support the Inter-Switch Link (ISL) VLAN encapsulation protocol. We recommend that customers use the IEEE 802.1Q VLAN encapsulation protocol as an alternative. Where an application requires the use of ISL, this can be provided by the Fast Ethernet or Gigabit Ethernet port adapters.

Note   The RJ-45 port is the default media.

Change the Media Type of the Native Gigabit Ethernet SFP GBIC or RJ-45 Ports

To be able to use a particular media port, use Cisco IOS to select the media type. This is done by using the **media-type** interface command:

media-type { gbic | rj45 }

Example:

```
interface GigabitEthernet 0/1
    media-type rj45
end
```

Configure the Interface Transmission and Speed Modes

Step 1 After changing the media type, configure the speed and transmission modes to appropriately match the new interface characteristics. Changing the speed and duplex of a Cisco 7301 router Gigabit Ethernet interface is done using the **speed** and **duplex** interface commands.

> ✎
> **Note** These commands are only applicable when using the RJ-45 media.

speed { 10 | 100 | 1000 | auto }

duplex { full | half | auto }

The following speed/duplex settings are supported:

```
Media Type          Speed                    Duplex
-----------------------------------------------------
RJ45            10, 100, 1000, auto      full, half, auto
GBIC(1)         1000, auto(2)            full, half, auto
-----------------------------------------------------
```

   a. If you are using the **no negotiation auto** command, the speed and duplex should be set to a value other than **auto** for correct operation.

   b. The only available speed in this mode is 1000 Mbps; there is no difference whether **1000** or **auto** is selected.

When using the SFP GBIC media, there is also the additional **negotiation auto** command that is used to enable the IEEE 802.1z Gigabit Ethernet (1000 Mbps) autonegotiation protocol.

Step 2 To turn the **negotiation auto** feature off (it is on by default), issue the interface command **no negotiation auto**. This is useful for connecting to other Gigabit Ethernet equipment that does not support 802.1z autonegotiation.

> ✎
> **Note** The **negotiation auto** feature is not supported when using the media type **rj-45** and will be ignored if implementation is attempted.

The media-type gbic mode will always default to 1000 Mbps. Both full-duplex and half-duplex operation are supported in this mode.

Debug

Cisco IOS provides two commands to provide information on your interfaces: **show interface GigabitEthernet 0/X** (where X is 0, 1, or 2) and **show controllers GigabitEthernet 0/X** (where X is 0, 1, or 2).

The output of the **show interface** command is useful for determining the current operating mode of the interface (speed/duplex/media-type) and the current interface statistics.

The output of the **show controller** command displays more information specific to the Cisco 7301 router Gigabit Ethernet interface. For example, it shows the detected link status, speed, and duplex, and also determines the current status of autonegotiation and the link partners' abilities (if it is an autonegotiation-capable interface).

The **show controller** command also displays the current operating state of the driver and the Ethernet controller hardware. The **show controller** command is a very powerful debugging aid, especially for Cisco engineers should you need help in debugging a problem. If you have any problems with your Gigabit Ethernet interfaces, you will need to provide this information to Cisco for analysis.

Reset the Interface

Should you have a problem with your interface and you wish to try and reset it, use the command:

clear interface GigabitEthernet 0/X   (where X is 0, 1, or 2)

Clear Counters

Interface counters may be cleared (reset) by using the command:

clear counters GigabitEthernet 0/X   (where X is 0, 1, or 2)

✎
Note   Using this command will not reset the interface.

Configure Port Adapter Interfaces

Following are the steps for configuring interfaces to allow communication over a LAN or WAN. To configure the interface parameters, you need your interface network addresses and subnet mask information. Consult with your network administrator for this information.

✎
Note   Only one port adapter can be installed in the Cisco 7301 at one time. Following are three examples of three different interfaces that might be used.

Configure ATM Interfaces

In the following example, an ATM interface in slot 1 is configured for an ATM LAN using IP. Follow these steps to configure an ATM interface:

Step 1   Using your own addresses and mask at the setup prompts, respond to the prompts as follows:

```
Configuring interface parameters:

Configuring interface ATM1/0:
  Is this interface in use? [yes]:
  Configure IP on this interface? [yes]:
    IP address for this interface: 1.1.1.10
    Number of bits in subnet field [0]:
    Class C network is 1.1.1.0, 0 subnet bits; mask is /24
```

Step 2   Determine if you are going to enable IPX on this interface; if you are, enter the unique IPX network number:

```
Configure IPX on this interface? [no]: yes
    IPX network number [2]:
```

Step 3   If you are using AppleTalk on the interface, enter **yes**. Enter **yes** to configure for extended AppleTalk networks, and then enter the cable range number. Enter the zone name and any other additional zones that are associated with your local zone:

```
Configure AppleTalk on this interface? [no]: yes
  Extended AppleTalk network? [no]: yes
  AppleTalk starting cable range [0]:
```

Step 4   Save your settings to NVRAM. See the "Save the Running Configuration to NVRAM" section on page 28. If you do not save the configuration settings that you created in the router using configuration mode and the setup facility, your configuration will be lost the next time you reload the router.

> **✎**
>
> **Note**   If additional ATM interfaces are available in your system, you are prompted for their configurations as well.

Configure Fast Ethernet Interfaces

In the following example, a Fast Ethernet interface in slot 1 is configured for a Fast Ethernet LAN using IP. Follow these steps to configure Fast Ethernet interfaces:

Step 1   Using your own addresses and mask at the setup prompts, respond to the prompts as follows:

```
Configuring interface parameters:

Configuring interface FastEthernet1/0:
  Is this interface in use? [yes]:
  Use the 100 Base-TX (RJ-45) connector? [yes]:
  Operate in full-duplex mode? [no]:
  Configure IP on this interface? [yes]:
    IP address for this interface: 1.1.1.20
    Number of bits in subnet field [0]:
    Class C network is 1.1.1.0, 0 subnet bits; mask is /24
```

Step 2   Determine if you are going to enable IPX on this interface; if you are, enter the unique IPX network number:

```
Configure IPX on this interface? [no]: yes
    IPX network number [2]:
```

Step 3   If you are using AppleTalk on the interface, enter **yes**. Enter **yes** to configure for extended AppleTalk networks, and then enter the cable range number. Enter the zone name and any other additional zones that are associated with your local zone:

```
Configure AppleTalk on this interface? [no]: yes
  Extended AppleTalk network? [no]: yes
  AppleTalk starting cable range [0]:
```

Step 4   Save your settings to NVRAM. See the "Save the Running Configuration to NVRAM" section on page 28. If you do not save the configuration settings that you created in the router using configuration mode and the setup facility, your configuration will be lost the next time you reload the router.

> **✎**
>
> **Note**   If additional Ethernet/Fast Ethernet/Gigabit Ethernet interfaces are available in your system, you are prompted for their configurations as well.

Configure Synchronous Serial Interfaces

Synchronous serial interfaces are configured to allow connection to WANs through a CSU/DSU. In the following example, a synchronous serial interface in slot 1 is configured for a WAN connection using IP. Follow these steps to configure synchronous serial interfaces:

Step 1 Using your own addresses and mask at the setup prompts, respond to the prompts as follows:

```
Configuring interface parameters:

Configuring interface serial 1/0:
  Is this interface in use? [yes]:
  Configure IP on this interface? [yes]:
    IP address for this interface: 1.1.1.30
    Number of bits in subnet field [0]:
    Class A network is 1.1.1.0, 0 subnet bits; mask is /24
```

Step 2 Determine if you are going to enable IPX on this interface; if you are, enter the unique IPX network number:

```
Configure IPX on this interface? [no]: yes
    IPX network number [2]:
```

Step 3 If you are using AppleTalk on the interface, enter **yes**. Enter **yes** to configure for extended AppleTalk networks, and then enter the cable range number. Enter the zone name and any other additional zones that are associated with your local zone:

```
Configure AppleTalk on this interface? [no]: yes
  Extended AppleTalk network? [no]: yes
  AppleTalk starting cable range [0]:
```

Step 4 Save your settings to NVRAM. See the "Save the Running Configuration to NVRAM" section on page 28. If you do not save the configuration settings that you created in the router using configuration mode and the setup facility, your configuration will be lost the next time you reload the router.

> ✎
> **Note**   If additional synchronous serial interfaces are available in your system, you are prompted for their configurations as well.

The following sample display lists the ATM configuration parameters:

```
Configuring interface ATM1/0:
  Is this interface in use? [yes]:
  Configure IP on this interface? [yes]:
    IP address for this interface: 1.1.1.10
    Number of bits in subnet field [0]: 0
    Class C network is 1.1.1.0, 0 subnet bits; mask is /24
  Configure IPX on this interface? [yes]:
    IPX network number [2]:
  Configure AppleTalk on this interface? [no]: yes
    Extended AppleTalk network? [no]: yes
    AppleTalk starting cable range [0]:
```

The following configuration command script was created:

```
hostname Router
enable secret 5 $1$u8z3$PMYY8em./8sszhzk78p/Y0
enable password betty
line vty 0 4
password fred
snmp-server community public
!
ip routing
no vines routing
ipx routing
appletalk routing
no apollo routing
no decnet routing
no xns routing
no clns routing
no bridge 1
! Turn off IPX to prevent network conflicts.

interface ATM1/0
ip address 1.1.1.10 255.0.0.1
appletalk cable-range 0-0 0.0
appletalk discovery
!
router igrp 15
network 1.0.0.0
!
end

Use this configuration? [yes/no]: yes
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started!
```

Your router is now minimally configured and ready to use. You can use the **setup** command if you want to modify the parameters after the initial configuration. To perform more complex configurations, use the **configure** command.

For information on additional interface configuration and specific system configurations, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

Enabling the Second Processor

The BC1250 system includes two processors. Processor 0 is turned on by default. Processor 1 requires special software that must be purchased. Processor 1 allows for performance improvement of a specific set of broadband L2TP Access Concentrators (LAC) features.

The software associated with enabling the second processor first appears in Cisco IOS Release 12.3(7)XI.

Also see the *Multi-Processor Forwarding—MPF* document at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123newft/123t/mpf123t7.htm

Note Before enabling the second processor, you must have IP routing turned on.

Processor 1 is enabled by default after you install the enabling software. To have all packets forwarded by processor 0, use the **no ip mpf** command. To enable processor 1, use the **ip mpf** command.

```
hostname: (config)# [no] ip mpf
```

Save the running configuration to NVRAM. See the "Save the Running Configuration to NVRAM" section on page 28. If you do not save the configuration settings that you created in the router using configuration mode and the setup facility, your configuration will be lost the next time you reload the router.

Save the Running Configuration to NVRAM

To store the configuration or changes to your startup configuration in NVRAM, enter the **copy running-config startup-config** command at the `Router#` prompt:

```
Router# copy running-config startup-config
```

Using this command saves the configuration settings that you created in the router using configuration mode and the setup facility. If you fail to do this, your configuration will be lost the next time you reload the router.

Check the Running Configuration Settings

To check the value of the settings you have entered, enter the **show running-config** command at the `Router#` prompt:

```
Router# show running-config
```

To review changes you make to the configuration, use the EXEC mode **show startup-config** command to display the information stored in NVRAM.

View Your System Configuration

You can use the **show version** (or **show hardware**) and the **show diag** commands to display the system hardware, the software version, the names and sources of configuration files, and the boot images. Use the **show diag** command to determine what type of port adapter is installed.

For specific information on the **show version**, **show diag,** and other commands, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

Perform Complex Configurations

After you have installed your Cisco 7301 router hardware and minimally configured the system, you might need to perform more complex configurations, which are beyond the scope of this publication.

For specific information on system and interface configuration, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware. These publications contain additional information on using the **configure** command.

Replace or Recover a Lost Password

See the *Cisco 7301 Installation and Configuration Guide,* Chapter 3, "Starting and Configuring the Router" for instructions. It is possible to recover the enable or console login password. The enable secret password is encrypted and must be replaced with a new enable secret password.

Troubleshooting Information

For system start-up troubleshooting information, see the online *Cisco 7301 Router Troubleshooting Module* and *Cisco 7301 Router Troubleshooting and Configuration Notes*.

8 After Installation

Follow the instructions in this section to replace options after installation. Use the installation and removal information in this section to power off the router, remove the cover, replace the option, replace the cover, and power on the router.

⚠

Warning   **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

⚠

Warning   **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

⚠

Warning   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

Power Off the Cisco 7301 Router

Step 1   Power off the router by placing the power switch in the OFF (l) position.

Step 2   Remove any cables from the Cisco 7301 router, including the power cables. For AC power supplies, unplug the AC power cord from the power outlet. For DC power supplies, to ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

✎

Note   After powering off the router, wait a minimum of 30 seconds before powering it on again.

Replace the CompactFlash Disk

Figure 19   Inserting and Removing the CompactFlash Disk
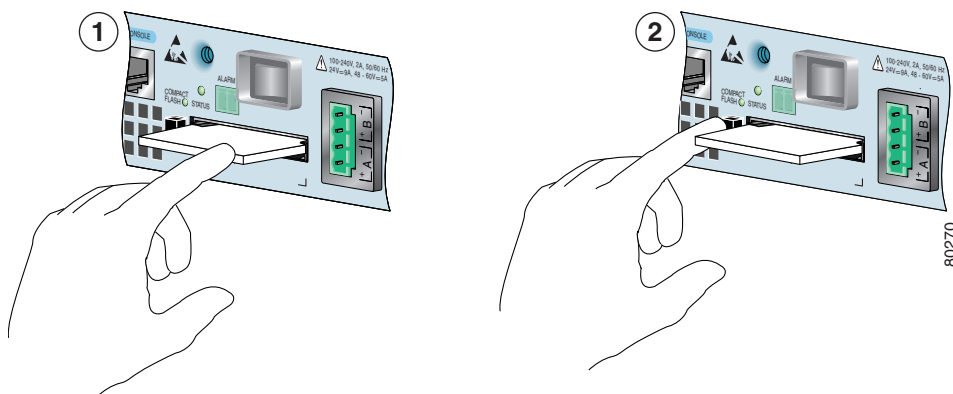
1	Insert the CompactFlash Disk	2	Press the ejector button and remove the CompactFlash Disk

To remove the CompactFlash Disk, press the ejector button, grasp the CompactFlash Disk and pull it from the slot (2).

Insert the CompactFlash Disk into the CompactFlash Disk slot with the label with the vendor name and memory size facing up. The CompactFlash Disk protrudes when completely inserted.

✎ **Note**   Only the CompactFlash Disk is supported in a Cisco 7301 router. Other types of Flash Disks are not supported.

- The larger the CompactFlash Disk size, the longer the system boot time.
- The CompactFlash Disk supports online insertion and removal (OIR).
- Use the CompactFlash Disk to store your configuration files and Cisco IOS software image. The Cisco 7301 router has no onboard Flash memory.

For more information on CompactFlash Disk, see Appendix B, "Using the CompactFlash Disk," in the *Cisco 7301 Installation and Configuration Guide*.

Replace the Port Adapter or Service Adapter

The port adapter or service adapter ships installed. These instructions are provided for future use. Cabling information is included with the specific port adapter documentation.

Figure 20   Removing and Installing the Port Adapter
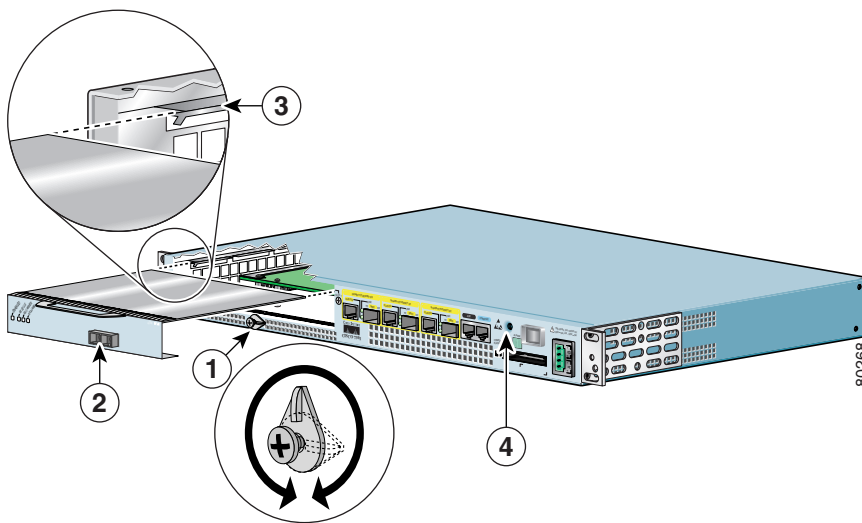
1	Port adapter latch	3	Port adapter slot guide
2	Port adapter partially removed	4	Ground for ESD wrist strap banana jack

⚠ **Warning**   **During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94.

✎ **Note**   Before removing any port adapter, gracefully shut down the interface so that there is no traffic running through the port adapter when it is removed. Removing a port adapter while traffic is flowing through the ports can cause system disruption.

Step 1   Attach an ESD wrist strap between you and an unpainted chassis surface. For wrist straps with a banana jack, insert the banana jack in its grounding hole located on the front of the chassis, near the STATUS LED and power switch.

Step 2 Remove the port adapter from the chassis slot. Use a Phillips screwdriver to turn the screw holding the port adapter latch. The screw should be loose enough to allow the latch to rotate to an unlocked position (1). The latch can rotate 360º.

Step 3 Grasp the handle and pull the port adapter (2) or blank port adapter from the router.

Step 4 Disconnect all cables from the port adapter.

Step 5 Locate the port adapter slot guides inside the Cisco 7301 router. They are near the top, and are recessed about one-half inch.

⚠️
Caution The port adapter must slide into the slot guides under the chassis lid. Do not allow the port adapter components to come in contact with the system board or the port adapter could be damaged.

Step 6 Carefully slide the port adapter into the port adapter slot and seat it. When installed, the port adapter input/output panel should be flush with the face of the router.

Step 7 Rotate the port adapter latch to the upright locked position and use a Phillips screwdriver to tighten the latch screw. Loosen the latch screw, if needed, to be able to rotate the latch over the port adapter. Then tighten the latch screw.

Step 8 Reconnect any cables, including the port adapter and power cables, and place the cables through any cable-management bracket or power cable-retention clip.

Step 9 Power on the router by turning the power switch to the ON position.

For specific port adapter information, see the appropriate port adapter documentation.

Replace the SODIMMs

You can replace the SDRAM SODIMMs in the Cisco 7301 router.

⚠️
Warning **Only trained and qualified personnel should install, replace, or service this equipment.** Statement 1030

Power Off the Router and Remove the Cover

Step 1 If you have not done so, see the "Power Off the Cisco 7301 Router" section on page 29 and follow the instructions to power off the router.

Step 2 Remove the cables from the front of the router, and then remove the grounding cable.

Step 3 Remove the Cisco 7301 router from the rack if it is rack-mounted.

Figure 21 *Removing the Cover*
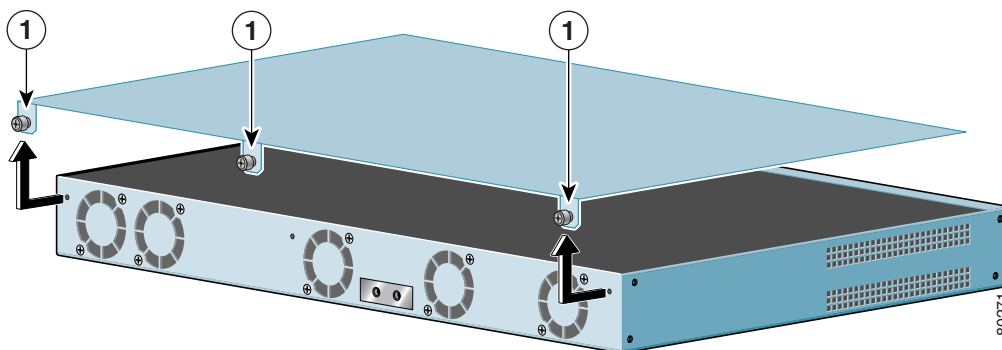
1	Captive installation screws		

Step 4 Turn the Cisco 7301 so that the back is facing you.

Step 5 Using a Phillips screwdriver, loosen the three captive installation screws holding the cover to the chassis.

Step 6 Pull the cover away from the front of the router and lift off the cover.

Remove and Install the SODIMMs

Follow these steps to remove and install the SDRAM SODIMM.

Figure 22   Removing and Replacing the SODIMM
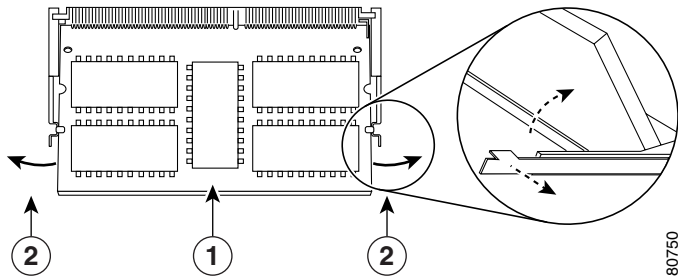
1	SODIMM	2	SODIMM spring latches

✎
Note Both SODIMMs must be of the same size and type.

✎
Note Use only memory purchased from Cisco Systems.

Step 1 If you have not done so, see the "Power Off the Router and Remove the Cover" section on page 31 and follow the instructions to power off the router and remove the cover.

Step 2 Attach an ESD-preventative wrist strap between you and an unpainted router surface.

Step 3 Locate the SODIMMs.

Step 4 Press both spring latches outward to release the SODIMM. See Figure 22.

Step 5 Gently pull the SODIMM free from the SODIMM socket, taking care not to touch the pins that insert into the socket. Place the SODIMM in an anti-static bag.

⚠
Caution Forcing the SODIMM into the socket can damage the SODIMM. Use the notches on the SODIMM to align the SODIMM in the SODIMM socket before inserting it.

Step 6 Locate the notches and align the SODIMM with the socket before inserting it.

Step 7 Gently insert the new SODIMM, taking care not to damage the pins on the edge of the SODIMM.

Step 8 Press the spring latches to lock the SODIMM in place.

Step 9 Repeat Step 1 through Step 7 if you are also replacing the second SODIMM.

Step 10 Go to the "Replace the Cover and Power On the Router" section on page 33.

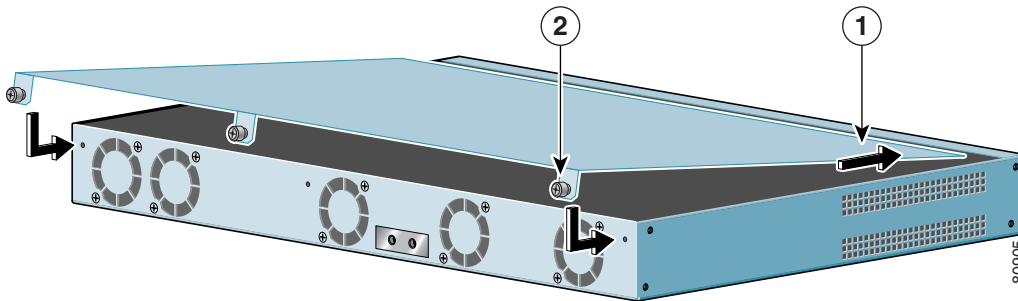For memory specifications and configurations, see the online *Cisco 7301 Installation and Configuration Guide.*

Replace the Cover and Power On the Router

⚠️
Caution   The DC return connection to this system is to remain isolated from the system frame and chassis (DC-I).

Figure 23   Replacing the Cover

1	Insert cover under router lip	2	Captive installation screws

Step 1   Slide the cover under the lip on the top of the router and insert the tabs into their slots.

Step 2   Use a Phillips screwdriver to tighten the captive installation screws.

Step 3   Insert the power cables into the power receptacles on the router.

Step 4   Turn the power switch to the ON position to power on the router.

9   Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.