

# System I/O Card FRU Installation and Replacement Notes

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**Product Number: 6100-SYS-IO-3=**

This document provides information about installing and replacing the Cisco 6100 Series system I/O card. The system I/O card is a field-replaceable unit (FRU) and is installed on a Cisco 6100/6130 chassis backplane in a subtended network configuration.

**Note**

Older versions of the system I/O card, the DS3 subtending I/O card, or the DS3 subtend host module (STM) cannot be mixed with the newer versions. The system I/O card (version 6100-SYS-IO-3=), the DS3 subtending I/O card (version 6100-ST-IO-3-DS3=) and the DS3 STM (version 6100-ST-3-DS3=) are compatible with each other. If you mix older versions with newer versions, the hardware components will not work properly.

If you need to replace all three hardware components at the same time, follow the removal and replacement procedures provided in the *DS3 Retrofit Kit Release Notes* located on the World Wide Web at

[http://www.cisco.com/univercd/cc/td/doc/product/dsl\\_prod/c6100/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/c6100/index.htm).

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## Subtended Network Configuration Overview

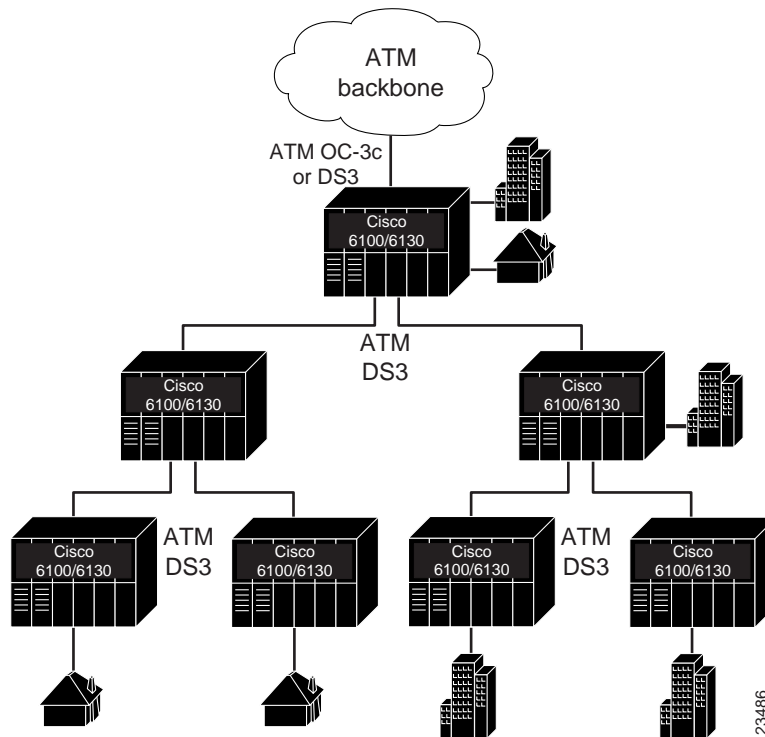
A subtended network configuration

- Services and aggregates the data from one or more remotely located Cisco 6100/6130 chassis into a subtending host chassis to take advantage of the data network interface on the subtending host chassis
- Provides additional benefits by reducing the number of ATM edge-switch ports required to terminate the chassis

The term *subtending* refers to the host chassis, and *subtended* refers to the downstream chassis in a subtended network.

Figure 1 shows a subtending tree. The subtending host chassis at the top of the subtending tree connects directly to the ATM switch. You can have two subtended node chassis connected to the first subtending host chassis located at the top of the subtending tree. One or both of these subtended node chassis can also become a subtending host chassis and therefore have one or two subtended node chassis connected to them.

**Figure 1** Subtended Cisco 6100 Series System Network



You can subtend a Cisco 6100/6130 chassis to three tiers, with up to six chassis, all connecting through one subtending host chassis to the ATM backbone (see Figure 1).

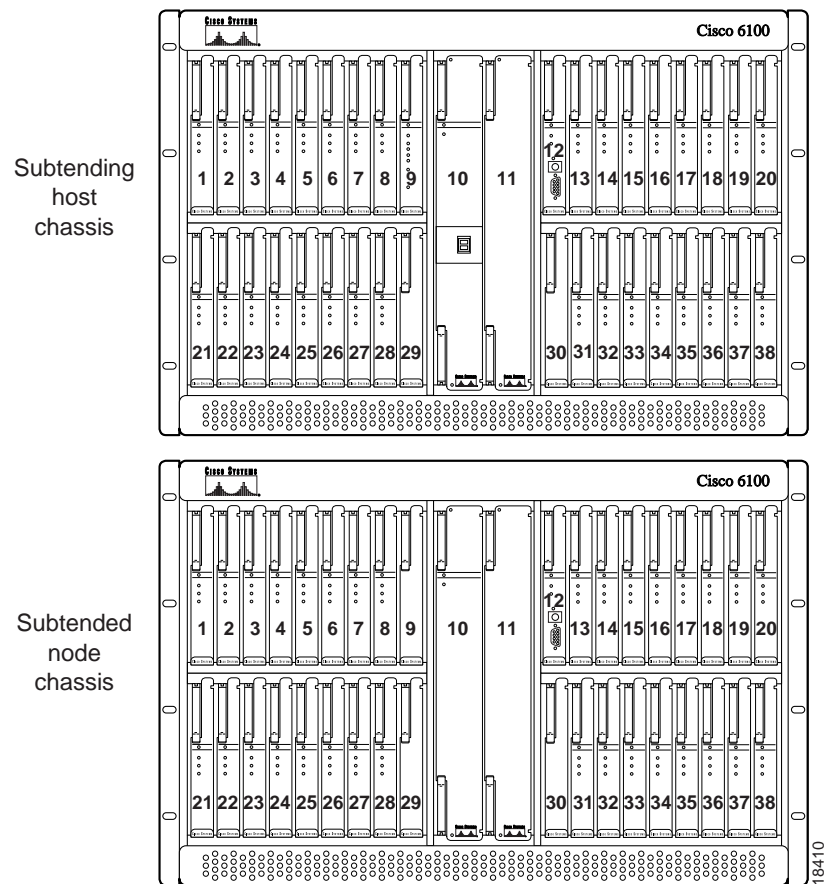
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In Figure 2, the DS3 STM is installed in slot 9 of the subtending host chassis. A network interface module is located in slot 10. If you have

- A DS3 connection from the ATM backbone to the Cisco 6100/6130 chassis, install a DS3 network interface module.
- An OC-3c connection from the ATM backbone to the Cisco 6100/6130 chassis, install an OC-3c network interface module. The DS3 network interface module is installed in slot 10 of each subtended node chassis.

Figure 2 shows a subtending host chassis and a subtended node chassis with corresponding slot number assignments.

**Figure 2** *Subtending Host and Subtended Node Chassis Slot Assignments*



All chassis have a system I/O card installed on the backplane. In addition to the system I/O card, a DS3 subtending I/O card is installed on the subtending host chassis backplane.

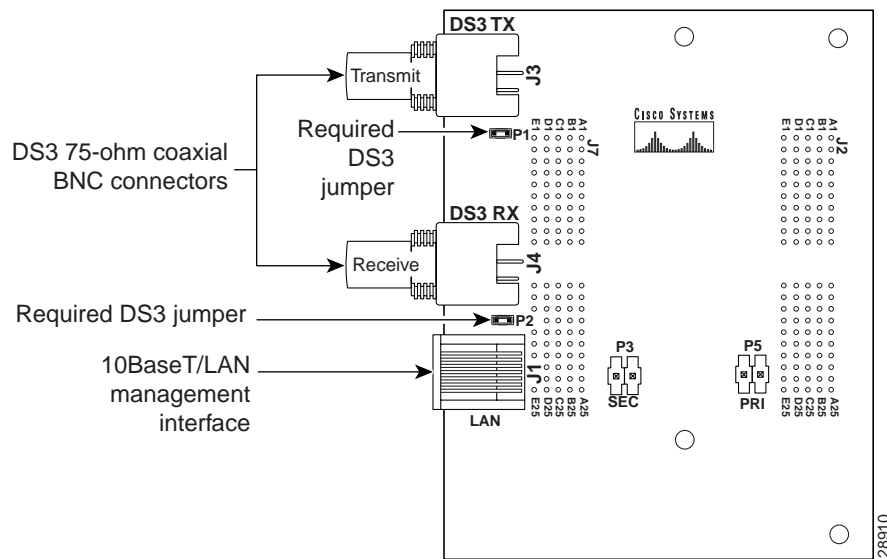
# System I/O Card Overview

The system I/O card provides the following:

- The 10BaseT Ethernet/LAN connector for the system management interface to a PC or UNIX system and external clock wire-wrap pins.
- Coaxial connections for DS3 cabling when a DS3 network interface module is installed. If a DS3 network interface module is not present, the coaxial connections are not used.

On the system I/O card, the receive DS3 Bayonet-Neill-Concelman (BNC) connector is designated as J4, and the transmit DS3 BNC connector is designated as J3. Figure 3 shows the system I/O card that is currently in the field.

**Figure 3** System I/O Card



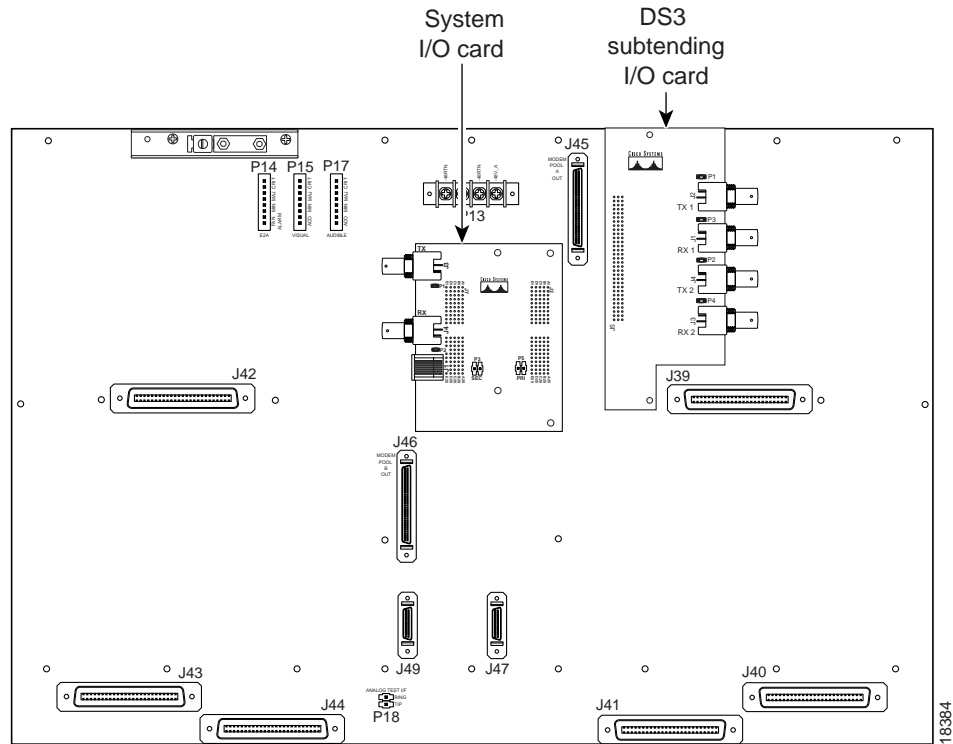
## Note

There are two DS3 jumpers on the system I/O card. The DS3 jumpers connect the BNC shield to the chassis ground. Both the receive DS3 jumper (P2) and the transmit DS3 jumper (P1) are installed on the system I/O card when it ships.

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In a subtended network configuration, the system I/O card is attached to the Cisco 6100/6130 chassis connectors P3 and P9, two 2-mm hard metric (HM) module connectors. Figure 4 shows the location of the system I/O card in relation to the DS3 subtending I/O card on the Cisco 6100/6130 chassis backplane.

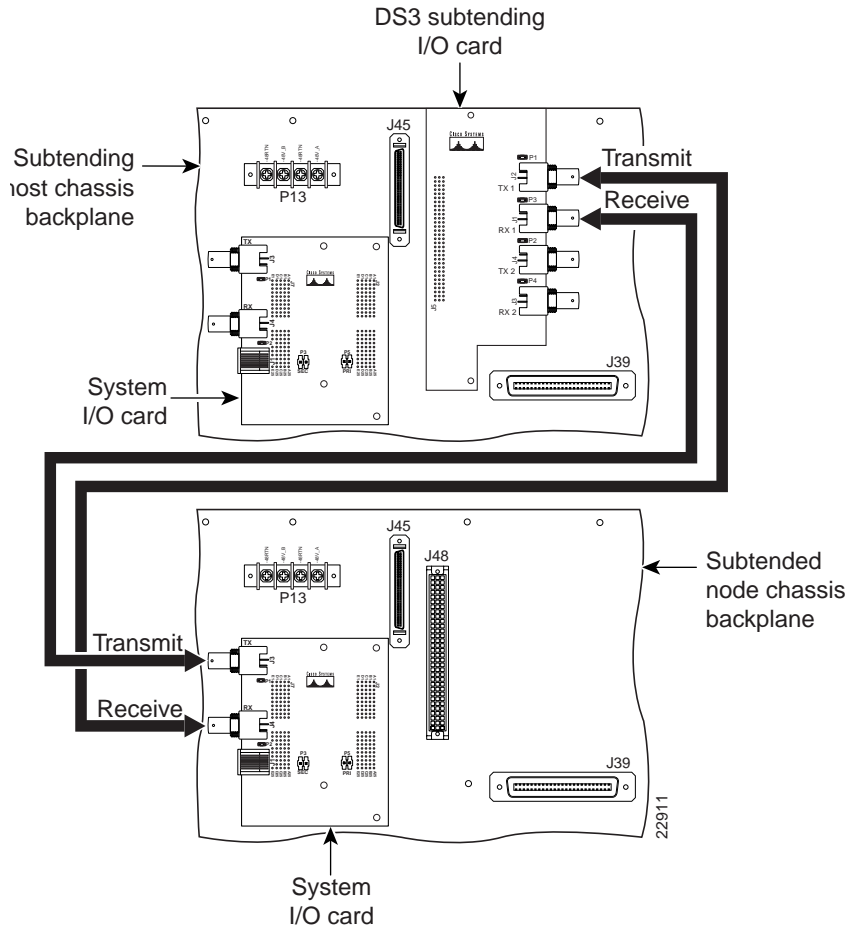
**Figure 4** System I/O Card and DS3 Subtending I/O Card Locations



# System I/O Card Cabling

Coaxial connections for cabling are located on the system I/O card and the DS3 subtending I/O card. The transmit and receive DS3 BNC connectors on the DS3 subtending I/O card are connected to the transmit and receive DS3 BNC connectors on the system I/O card (see Figure 5). Refer to the appropriate installation guide for cabling the system I/O card in a version of the Cisco 6100 Series system that is earlier than Release 2.4.0.

Figure 5 Cabling for Subtended Network Configuration



Note

The system I/O card and DS3 subtending I/O card coaxial cables are not provided by Cisco Systems, Inc.

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# Installation Prerequisites

This section describes hardware requirements and lists the parts and tools used to install the system I/O card.

## Hardware Requirements

The system I/O card is installed on all Cisco 6100/6130 chassis backplanes and it is not a stand-alone product. In order for a system I/O card to work properly on a subtending host chassis, you must install both a DS3 subtending I/O card and DS3 STM.

## Part and Tool Requirements

To install or replace the system I/O card, you need the following parts and tools:

- System I/O card.
- DS3 subtending I/O card (installed). For installation procedures, refer to the *DS3 Subtending I/O Card FRU Installation and Replacement Notes*.
- DS3 STM (installed). For installation procedures, refer to the *DS3 Subtend Host Module FRU Installation and Replacement Notes*.
- A one-quarter inch socket driver or wrench.
- A Phillips-head screwdriver.
- Ferrites that yield an impedance greater than 200 ohms  $\pm$  20 percent at 100 MHz.
- Tie wraps.
- Coaxial cable.
  - Type 734A or equivalent.
  - Type 735A or equivalent.
- Standoff screws—Shipped with the system I/O card.
- Backplane screws—Included on the chassis backplane.
- Plastic ESD shield for system I/O card.
- Necessary equipment for ESD protection—Required whenever you handle Cisco Digital Subscriber Line Access Multiplexer (DSLAM) equipment, which includes the chassis, modules, and cards.

# General Safety Precautions and Maintenance Guidelines

This section covers the following topics:

- General Safety Precautions
- Installation and Replacement Suggestions

## General Safety Precautions

Before working on the equipment, be aware of standard safety practices and the hazards involved in working with electrical circuitry to prevent accidents. Adhere to the following cautions and warnings for safe and hazard-free installation.



Note

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To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information for the Cisco 6100 Series System* document.

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Caution

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Proper ESD protection is required whenever you handle Cisco DSLAM equipment. Installation and maintenance personnel should be properly grounded using ground straps to eliminate the risk of ESD damage to the equipment. Modules are subject to ESD damage whenever they are removed from the chassis.

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Caution

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Be careful when you remove the standoff screws and reinsert the screws into the screw holes on the backplane so that the backplane circuitry does not become damaged.

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Caution

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If the modules are installed when you apply power to the system, you could damage the modules and the chassis.

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Caution

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If fuses are already installed in the fuse and alarm panel, remove them. You can replace the fuses after the system I/O card is installed. Do not power up the system while you install and connect the system I/O card.

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Warning

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The customer 48 volt power system must provide reinforced insulation between the primary AC power and the 48 VDC output.

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Warning

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There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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Warning













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Class 1 laser product.


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-  Warning Use copper conductors only.
-  Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.
-  Warning The DS3 ports are not intended to be connected to cables that run outside the building where it is installed. For any connections outside the building, the DS3 ports must be connected to a network termination unit (NTU). NTU devices should comply with appropriate national safety standards such as UL 1950, CSA 950, EN 60950, IEC 950, and AS 3260.
-  Warning Do not reach into a vacant slot or chassis while you install or remove a module or a fan. Exposed circuitry could constitute an energy hazard.
-  Warning Ethernet cables must be shielded when used in a central office environment.
-  Warning An exposed wire lead from a DC-input power source can conduct harmful levels of electricity. Be sure that no exposed portion of the DC-input power source wire extends from the terminal block plug.
-  Warning Incorrect connection of this or connected equipment to a general purpose outlet could result in a hazardous situation.
-  Warning Read the installation instructions before you connect the system to its power source.
-  Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
-  Warning Do not work on the system or connect or disconnect cables during periods of lightning activity.
-  Warning This unit has more than one power supply connection; all connections must be removed completely to completely remove power from the unit.
-  Warning To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.


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 Warning To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104°F (40°C).


 Warning Secure all power cabling when installing this unit to avoid disturbing field-wiring connections.


 Warning The power supply circuitry for the equipment can constitute an energy hazard. Before you install or replace the equipment, remove all jewelry (including rings, necklaces, and watches). Metal objects can come into contact with exposed power supply wiring or circuitry inside the DSLAM equipment. This could cause the metal objects to heat up and cause serious burns or weld the metal object to the equipment.


 Warning Ultimate disposal of this product should be handled according to all national laws and regulations.

 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

 Warning Connect the unit only to DC power source that complies with the Safety Extra-Low Voltage (SELV) requirements in IEC 60950 based safety standards.

 Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.

 Warning Care must be given to connecting units to the supply circuit so that wiring is not overloaded.

 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.

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## Installation and Replacement Suggestions

The following are examples of recommended installation and replacement practices:

- Do not force the card into the chassis backplane connectors P3 and P9. This action can damage the pins on the connectors if they are not aligned properly with the system I/O card.
- Ensure that the card is straight and perpendicular to the chassis backplane when you install the card onto the connectors. The pins on the connectors can be damaged if the card is not installed correctly.

Any card that is only partially connected to the backplane can disrupt system operation.

## Installing the System I/O Card

Use the procedures in this section to install and cable the system I/O card.

**Caution**

Proper ESD protection is required whenever you handle Cisco DSLAM equipment. Installation and maintenance personnel should be properly grounded using ground straps to eliminate the risk of ESD damage to the equipment. Modules are subject to ESD damage whenever they are removed from the chassis.

**Note**

The Cisco 6100/6130 chassis is shipped with the system I/O card already installed on the backplane. If the system I/O card is missing from your chassis backplane, you need to install it according to the procedures in this section.

Use the following steps to install a system I/O card on an Cisco 6100/6130 chassis backplane (subtending host or subtending node):

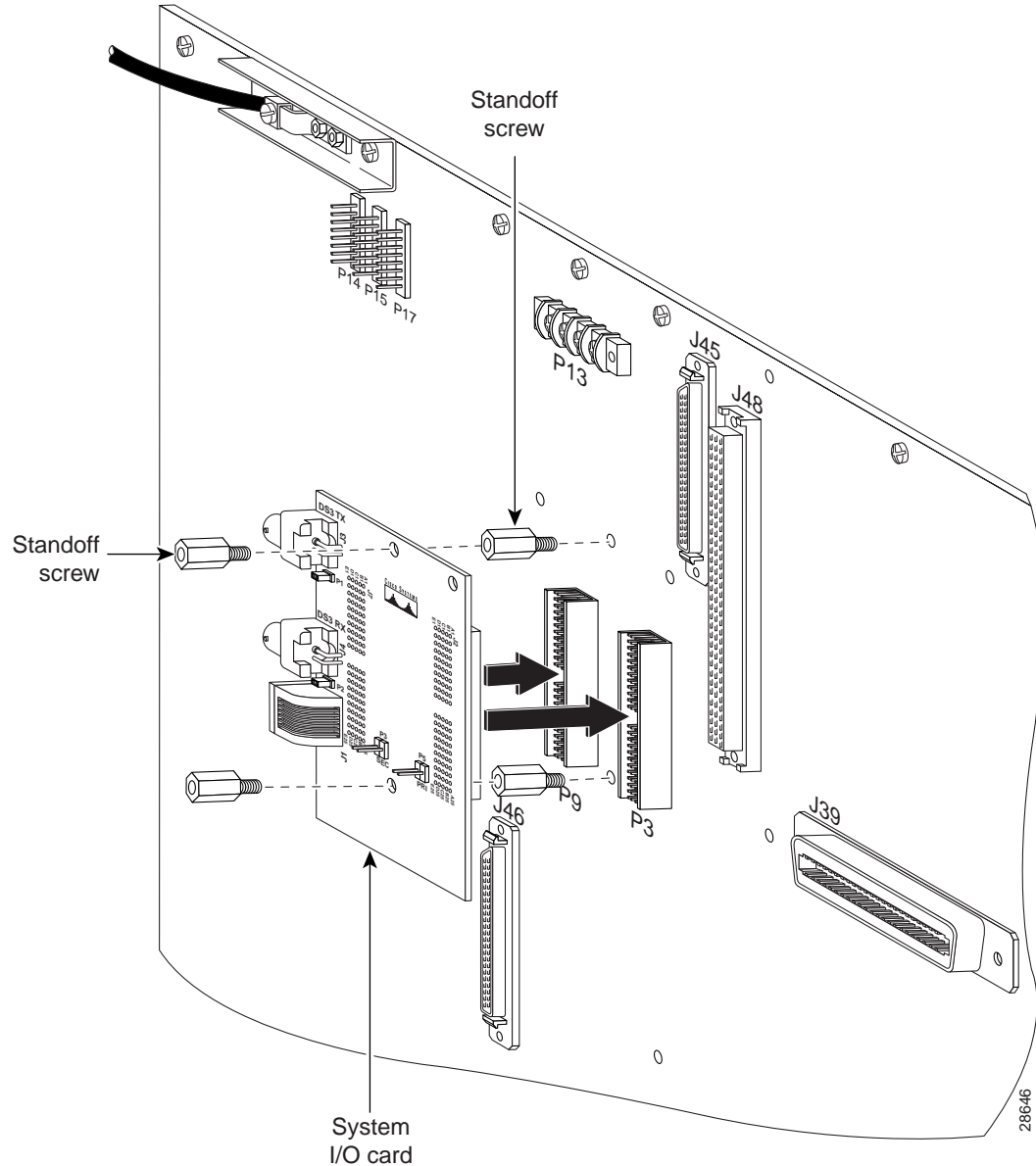
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- Step 1** Remove the optional rear door, if your system has one.
- Step 2** Open the front door of the Cisco 6100/6130 chassis.
- Step 3** Pull all of the modules away from the Cisco 6100/6130 chassis backplane connection.
- Lift up on the ejector tab of each module. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 4** Pull all of the modules away from the Cisco 6110 chassis backplane connection.
- Lift up on the ejector tab of each module. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 5** Pull all of the modules away from the POTS splitter backplane connection:
- Lift up on the ejector tab of each module. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 6** Remove the fuses from the fuse and alarm panel. By removing the fuses, the system is not powered while you install and connect the system I/O card.

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**Step 7** Locate the two backplane screws between connectors P3 and P9 on the chassis backplane. Use a Phillips-head screwdriver to remove the two backplane screws. Keep these backplane screws for use when you install the plastic ESD shield.

Figure 6 shows Step 7 through Step 10.

**Figure 6** System I/O Card Installation



**Step 8** Use a one-quarter inch socket driver or wrench to screw two standoff screws into the locations formerly occupied by the two screws you removed in Step 7. Tighten the standoff screws using the one-quarter inch socket driver or wrench.



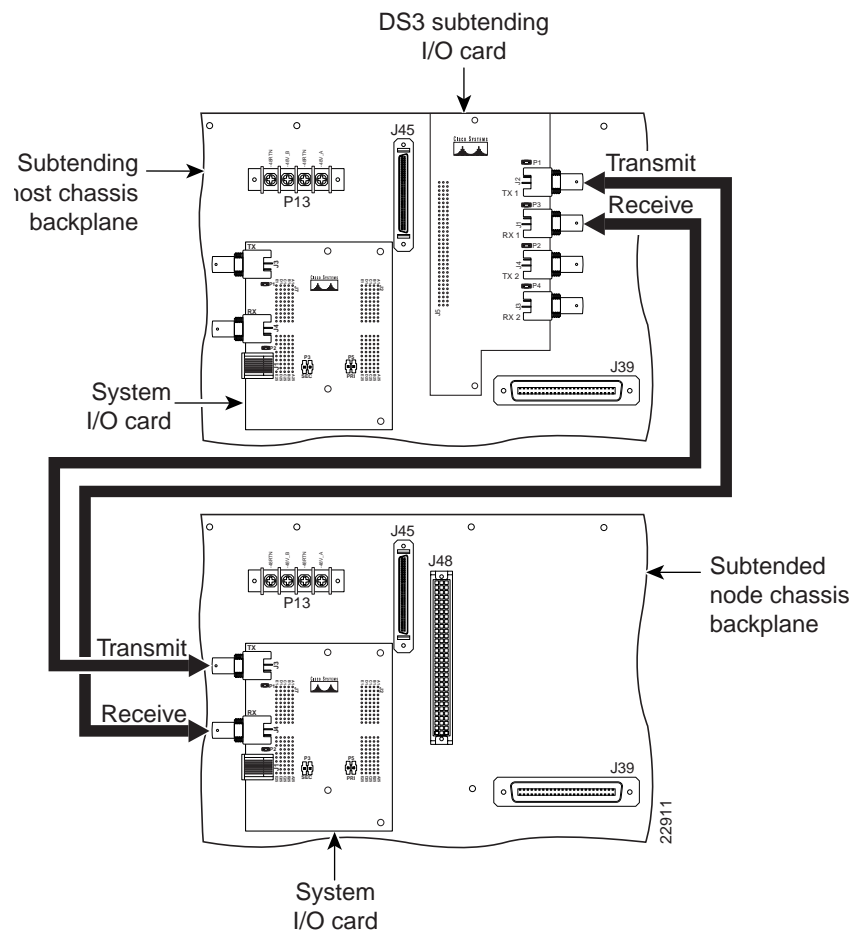
**Caution**

Be careful when you remove the standoff screws and reinsert the screws into the screw holes on the backplane so that the backplane circuitry does not become damaged.

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- Step 9** Position and align the holes on the system I/O card over the two standoff screws and gently press the system I/O card onto the Cisco 6100/6130 connectors P3 and P9 on the chassis backplane.
- Step 10** Use a one-quarter inch socket driver or wrench to screw two additional standoff screws into the screw holes in the system I/O card and into the original standoff screws added in Step 8. Tighten the standoff screws using the one-quarter inch socket driver or wrench.
- Step 11** Attach one end of a coaxial cable (type 734A, type 735A, or equivalent) to the transmit DS3 BNC connector (TX1) for the DS3 subtending I/O card on the subtending host chassis backplane. Figure 7 shows cabling for a subtended network configuration.

**Figure 7** Cabling for Subtended Network Configuration



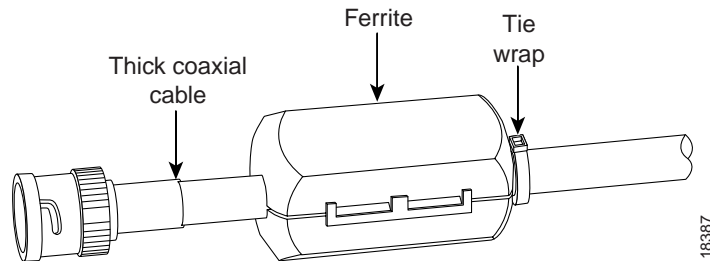
- Step 12** Add ferrites to the coaxial cables that you use to cable the DS3 subtending I/O card to the system I/O card to reduce the radiation/EMI susceptibility to high frequency noise between 30 and 200 MHz. Use either the ferrites shipped with the DS3 network interface module or ferrites that yield an impedance greater than 200 ohms  $\pm$  20 percent at 100 MHz.

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If you are using

- Thick type 734A coaxial cable or equivalent, run the cable through a ferrite and clamp the ferrite shut, as shown in Figure 8. Attach the ferrite as close as possible to the transmit DS3 BNC connector (TX1) on the DS3 subtending I/O card. Tie wrap the cable directly behind the ferrite.

**Figure 8** *Thick Coaxial Cable Through Ferrite*



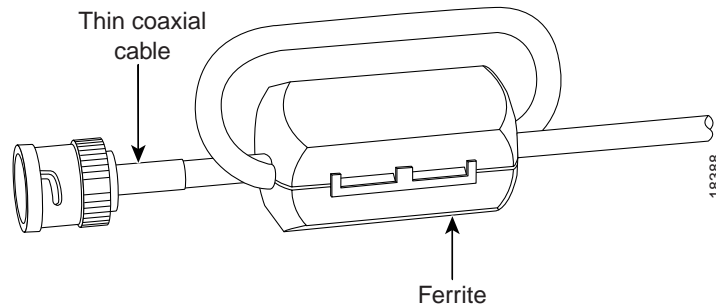
- Thin type 735A coaxial cable or equivalent, run the cable through the ferrite one time, loop the cable back through the ferrite, and clamp the ferrite shut, as shown in Figure 9. Attach the ferrite as close as possible to the transmit DS3 BNC connector (TX1) on the DS3 subtending I/O card.



**Note** The minimum bend radius for thin type 735A coaxial cable or equivalent is one-quarter of an inch. If the minimum bend radius exceeds one-quarter of an inch, the cable might not work properly..

Looping the wire secures the ferrite.

**Figure 9** *Thin Coaxial Cable Through Ferrite*

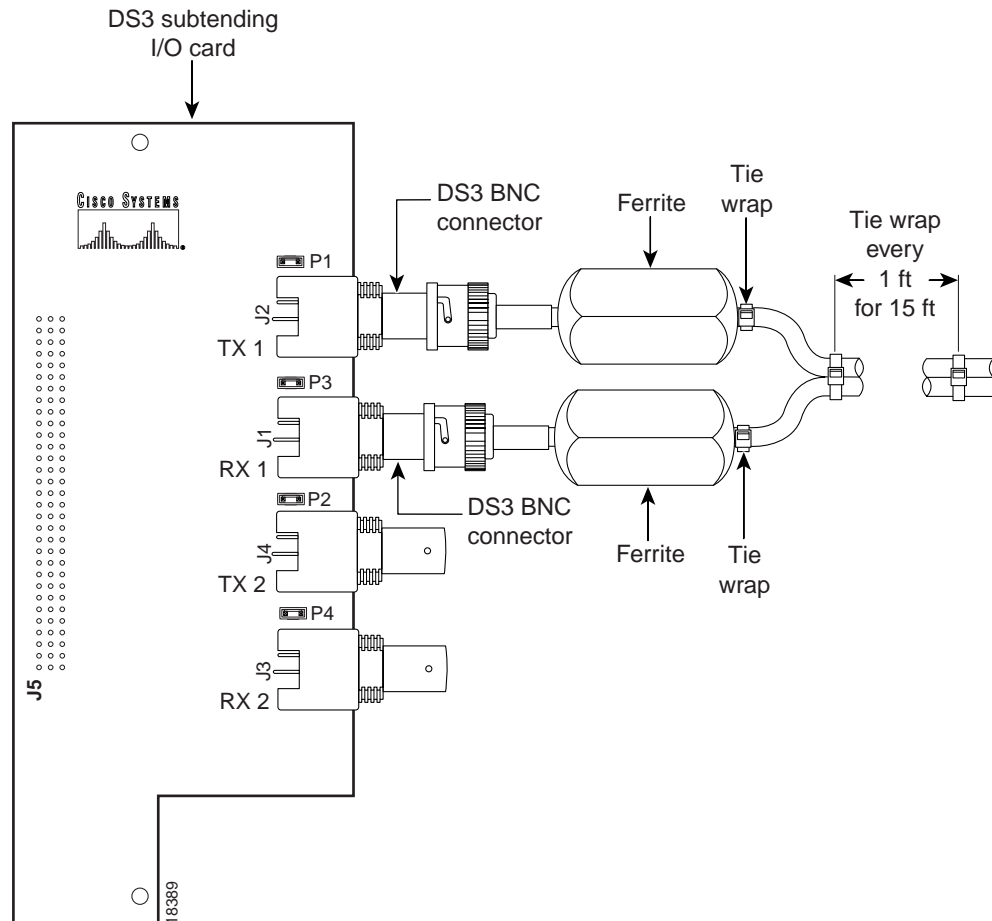


- Step 13** Attach a ferrite as close as possible to the remaining end of the cable (see Figure 8 or Figure 9 for ferrite installation). Tie wrap the cable directly behind the ferrite as necessary.
- Step 14** Attach the end of the cable used in Step 13 to the receive DS3 BNC connector (RX) for the system I/O card on the subtended node chassis backplane.
- Step 15** Attach one end of a coaxial cable to the receive DS3 BNC connector (RX1) for the DS3 subtending I/O card on the subtending host chassis backplane.
- Step 16** Attach the ferrite as close as possible to the receive DS3 BNC connector (RX1) on the DS3 subtending I/O card (see Figure 8 or Figure 9 for ferrite installation). Tie wrap the cable directly behind the ferrite as necessary.

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- Step 17** Attach a ferrite as close as possible to the remaining end of the cable (see Figure 8 or Figure 9 for ferrite installation). Tie wrap the cable directly behind the ferrite as necessary.
- Step 18** Attach the end of the cable used in Step 17 to the transmit DS3 BNC connector (TX) for the system I/O card on the subtended node chassis backplane.
- Step 19** Tie wrap the transmit and receive cables coming from the DS3 subtending I/O card where the cables meet after coming from the ferrites and every 1 foot thereafter for a total of 15 feet, as shown in Figure 10.

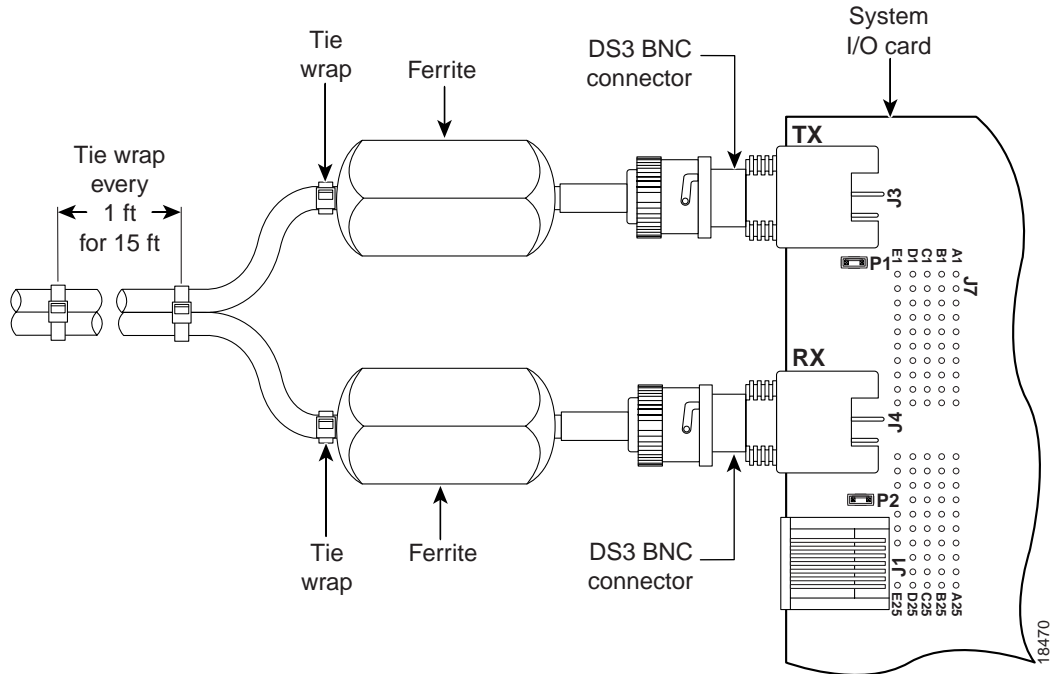
**Figure 10** Ferrite Close to DS3 BNC Connectors on DS3 Subtending I/O Card



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**Step 20** Tie wrap the transmit and receive cables coming from the system I/O card where the cables meet after coming from the ferrites and every 1 foot thereafter for a total of 15 feet, as shown in Figure 11.

*Figure 11 Ferrites Close to DS3 BNC Connectors on System I/O Card*



**Note** If you have one subtending host chassis with two subtended node chassis, the second subtended node chassis connects to the TX2 and RX2 DS3 BNC connectors on the DS3 subtending I/O card.

**Step 21** Complete the following steps to connect the system I/O card to the network if a DS3 network interface module is installed in slot 10 of the subtending host chassis at the top of the subtending tree:

- a. Attach one end of a coaxial cable (type 734A, type 735A, or equivalent) to the transmit DS3 BNC connector (J3) for the system I/O card on the chassis backplane.
- b. Add ferrites to the coaxial cables that you use to cable the system I/O card to the ATM switch. If you are using
  - Thick type 734A coaxial cable or equivalent, run the cable through a ferrite and clamp the ferrite shut, as shown in Figure 8. Attach the ferrite as close as possible to the transmit DS3 BNC connector (J3) on the system I/O card. Tie wrap the cable directly behind the ferrite.
  - Thin type 735A coaxial cable or equivalent, run the cable through one time, loop the cable back through a ferrite, and clamp the ferrite shut, as shown in Figure 9. Attach the ferrite as close as possible to the transmit DS3 BNC connector (J3) on the DS3 system I/O card.



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**Note** The minimum bend radius for thin type 735A coaxial cable or equivalent is one-quarter of an inch. If the minimum bend radius exceeds one-quarter of an inch, the cable might not work properly..

Looping the wire secures the ferrite.

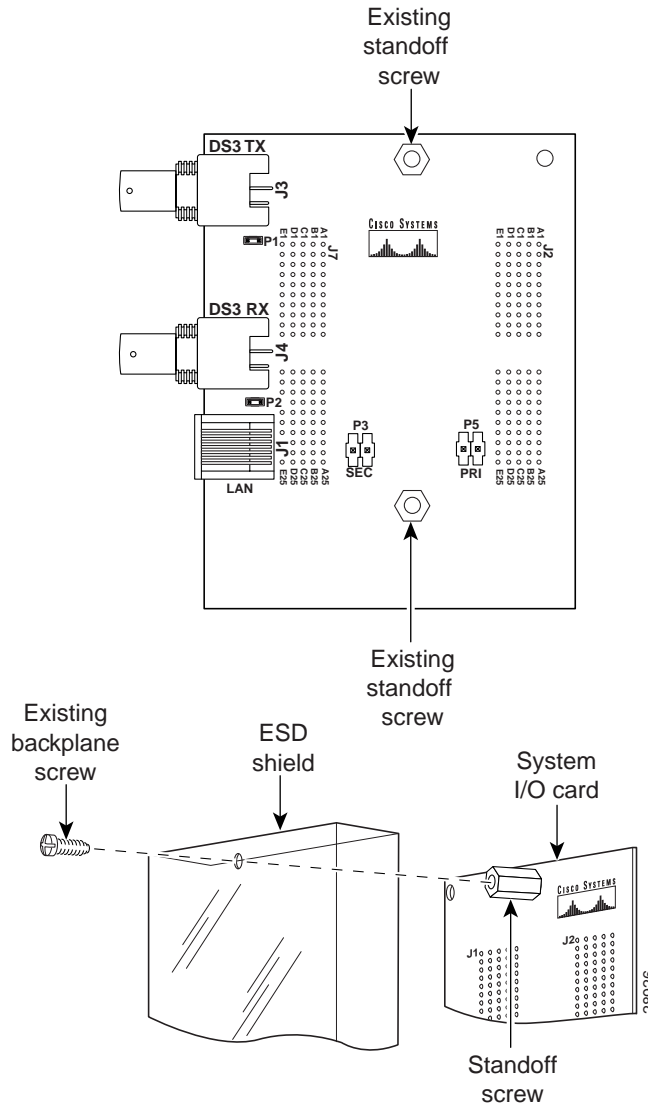
- c. Attach the end of the cable used in Step 21a, which originates at the transmit DS3 BNC connector, to the ATM switch.
- d. Attach one end of a coaxial cable (type 734A, type 735A, or equivalent) to the receive DS3 BNC connector (J4) for the system I/O card on the Cisco 6100/6130 backplane.
- e. Attach the ferrite as close as possible to the receive DS3 BNC connector on the system I/O card (see Figure 8 or Figure 9 for ferrite installation). Tie wrap the cable directly behind the ferrite as necessary.
- f. Attach the end of the cable used in Step 21d, which originates at the receive DS3 BNC connector, to the ATM switch.
- g. Tie wrap the transmit and receive cables coming from the system I/O card where the cables meet after coming from the ferrites and every 1 foot thereafter for a total of 15 feet, as shown in Figure 11.

**Step 22** Install the plastic ESD shield over the system I/O card using the following steps:

- a. Position the holes in the plastic ESD shield over the existing standoff screws installed on the system I/O card.
- b. Use a Phillips-head screwdriver and the backplane screws you removed in Step 7 to attach the plastic ESD shield to the system I/O card (see Figure 12).

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Figure 12 Plastic ESD Shield Installation



- Step 23 Reinsert the fuses in the fuse and alarm panel. When you reinsert the fuses, the system powers on.
- Step 24 Reseat all of the modules in the Cisco 6100/6130, Cisco 6110, and POTS splitter. It is important that you accomplish each step completely before moving on to the next step.



**Note** All modules must be fully seated in the chassis. A push on the faceplate of each module is required for the module to be fully seated.

- a. Reseat the xTU-C modules in the Cisco 6100/6130.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.

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- Press down on the ejector tab to secure the module.
  - Reseat the remaining xTU-C modules using the same procedure. Repeat Step 24a for each module.
- b. Reseat the network interface module in the Cisco 6100/6130.
- Lift up on the ejector tabs and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tabs to secure the module.
- c. Reseat the POTS modules in the POTS splitter.
- Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
  - Reseat the remaining POTS modules using the same procedure. Repeat Step 24c for each module.
- d. Reseat the DS3 STM in the subtending host chassis.
- Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
- e. Reseat the line interface modules (LIMs) in the Cisco 6110.
- Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
  - Reseat the remaining LIMs using the same procedure. Repeat Step 24e for each module.
- f. Reseat the LIM controller module in the Cisco 6110.
- Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
- g. Reseat the system controller module in the Cisco 6100/6130.
- Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module. This causes each module in the Cisco 6100/6130 to reset.
- h. Verify that the STATUS LEDs on all modules are solid green (where applicable).
- This self-test procedure takes several minutes. Verify that there are no alarms on the system controller module (ALARM LED off). If the STATUS LEDs are not green after the self-test, refer to the appropriate installation guide for troubleshooting procedures.

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- i. Perform a software update using the ViewRunner software if the STATUS LEDs on the xTU-C modules or the network interface module are flashing.  
Refer to the appropriate ViewRunner provisioning and operation guide for software upgrade procedures.

**Step 25** Verify that the Cisco 6100/6130 chassis front door is attached to the chassis and closed.

**Step 26** Use the following steps to connect the ViewRunner system to the Cisco 6100/6130:

- a. Connect one end of the Ethernet cable to the RJ-45 (10BaseT/LAN) connector on the system I/O card.
- b. Connect the other end of the Ethernet cable to one of the following:
  - A PC running ViewRunner for Windows software.
  - A UNIX system running ViewRunner for OpenView software.
  - Your Ethernet LAN.




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**Note** If you are connecting the Ethernet cable to a PC, you need a crossover cable.

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**Step 27** Close the optional rear door using the following steps:

- a. The rear door closes left to right (seen from the rear of the chassis). There are two latches on the rear door. Lift the two latches on the rear door as you close it. After the rear door is in place, release the latches. The rear door closes left to right (seen from the rear of the chassis).
  - b. Align the two thumbscrews located on the rear door with two thumbscrew fasteners on the bracket. Tighten the thumbscrews to secure the rear door.
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## Removing and Replacing the System I/O Card

The following sections describe how to remove and replace a system I/O card.

### Removing a System I/O Card



**Caution**

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Proper ESD protection is required whenever you handle Cisco DSLAM equipment. Installation and maintenance personnel should be properly grounded using ground straps to eliminate the risk of ESD damage to the equipment. Modules are subject to ESD damage whenever they are removed from the chassis.

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Use the following steps to remove a system I/O card from the Cisco 6100/6130 chassis backplane:



**Note**

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There are two versions of the system I/O card currently in the field. With the earlier version (prior to Release 2.4.0), the DS3 BNC connectors are located at the bottom left corner of the card and the 10BaseT management interface is located across the bottom of the card. The removal procedures are the same for each version of the system I/O card.

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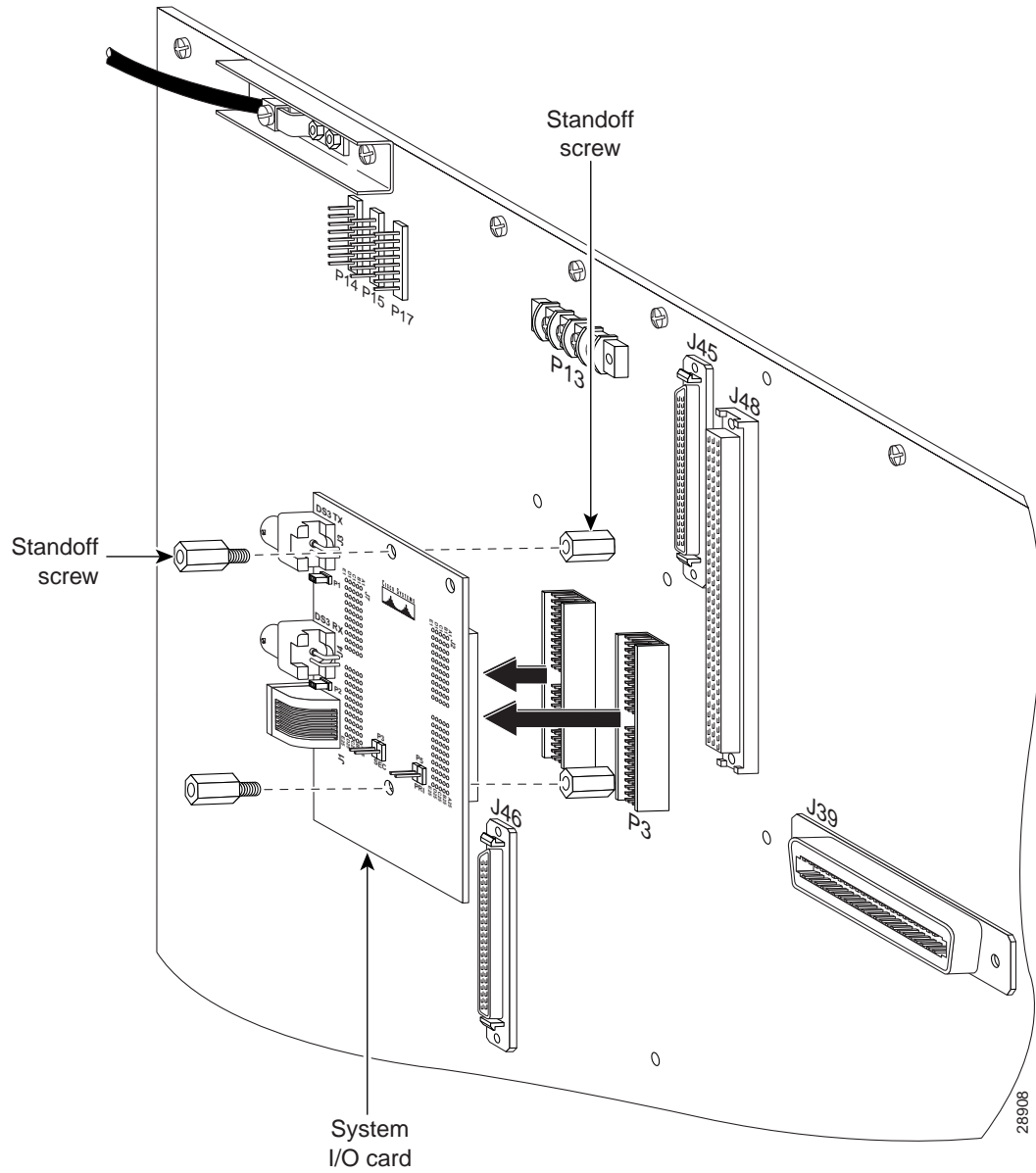
- 
- Step 1** Remove the optional rear door, if your system has one.
- Step 2** Disconnect the ViewRunner system from the Cisco 6100/6130 chassis by removing the Ethernet cable.
- Step 3** Open the front door of the Cisco 6100/6130 chassis.
- Step 4** Disconnect the DS3 network interface module from the network if you have a DS3 network interface module installed in slot 10 of the Cisco 6100/6130 chassis.
- Disconnect the end of the cable that attaches to the receive (J4) DS3 BNC connector on the system I/O card on the chassis backplane.
  - Disconnect the end of the cable that attaches to the transmit (J3) DS3 BNC connector on the system I/O card on the chassis backplane.
  - Pull the DS3 network interface module away from the backplane connection.
    - Lift up on the ejector tabs. This action disconnects the module from the backplane.
    - Carefully slide the module forward and away from the backplane connection.
- Step 5** Pull all of the modules away from the Cisco 6100/6130 chassis backplane connection.
- Lift up on the ejector tab. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 6** Pull all of the modules away from the Cisco 6110 chassis backplane connection (as necessary).
- Lift up on the ejector tab. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 7** Pull all of the modules away from the POTS splitter backplane connection (as necessary).
- Lift up on the ejector tab. This action disconnects the module from the backplane.
  - Carefully slide the module forward and away from the backplane connection.
- Step 8** Remove the fuses from the fuse and alarm panel. By removing the fuses, the system is not powered while you install and connect the system I/O card.
- Step 9** Remove the coaxial cables from the two DS3 BNC connectors (TX and RX) for the system I/O card on a subtended node chassis backplane.
- Step 10** Use a Phillips-head screwdriver to remove the two backplane screws that hold the plastic ESD shield over the system I/O card. Keep these backplane screws and the plastic ESD shield for use when you replace the system I/O card.
- Step 11** Use a one-quarter inch socket driver or wrench to remove the two additional standoff screws that are attached to the system I/O card.

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**Step 12** Lift and disconnect the system I/O card from connectors P3 and P9, two 2-mm HM module connectors on the Cisco 6100/6130 backplane.

Figure 13 shows the system I/O card removal.

**Figure 13** System I/O Card Removal



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## Replacing a System I/O Card

**Caution**

Proper ESD protection is required whenever you handle Cisco DSLAM equipment. Installation and maintenance personnel should be properly grounded using ground straps to eliminate the risk of ESD damage to the equipment. Modules are subject to ESD damage whenever they are removed from the chassis.

Use the following steps to replace a system I/O card on the Cisco 6100/6130 chassis backplane:

**Note**

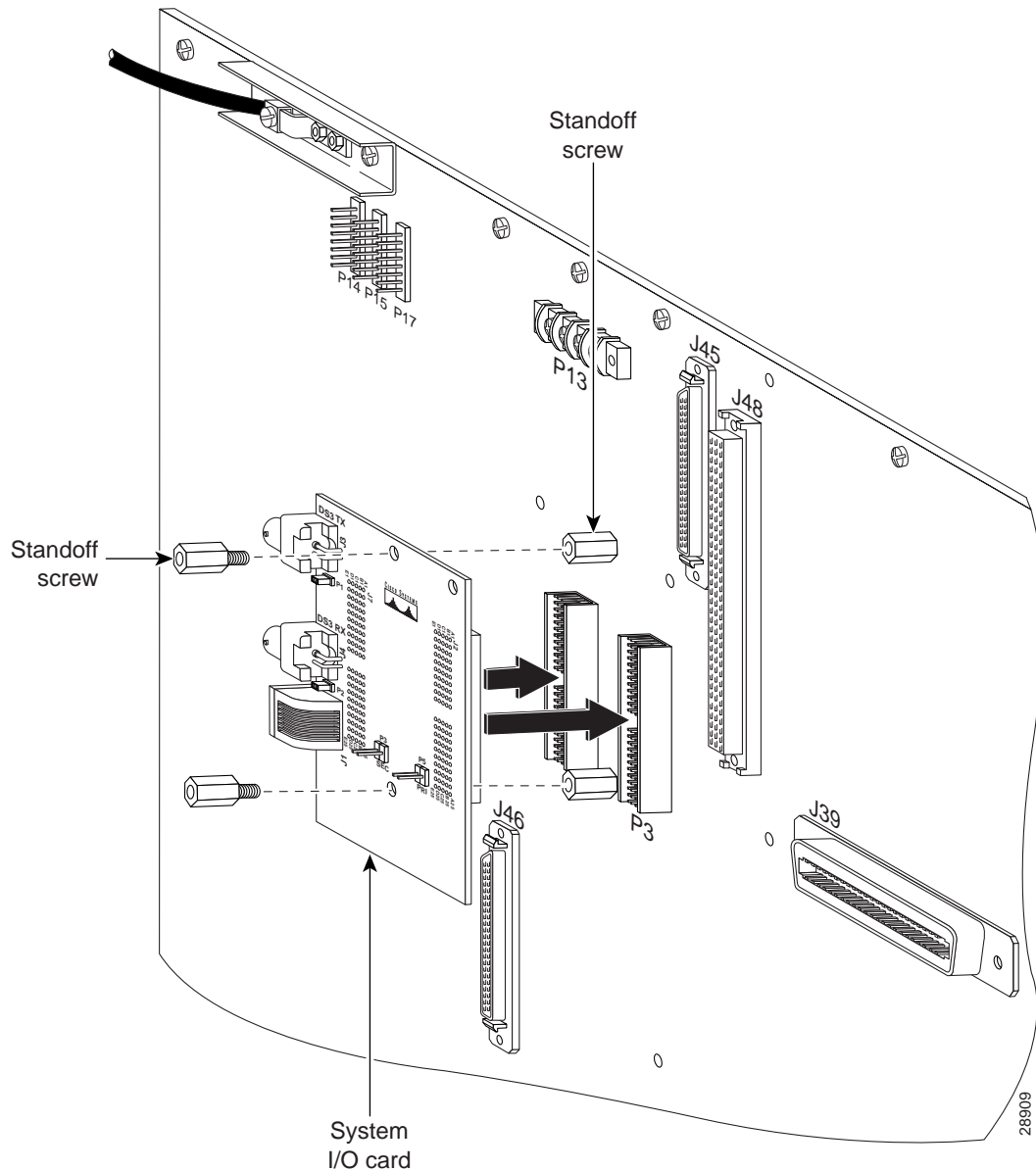
Before you replace a system I/O card, please complete all of the steps in the “Removing a System I/O Card” section on page 20.

- 
- Step 1** Locate the two standoff screws that are between connectors P3 and P9. Tighten the standoff screws using a one-quarter inch socket driver or wrench.
- Step 2** Position and align the holes on the system I/O card over the two standoff screws and gently press the system I/O card onto the Cisco 6100/6130 connectors P3 and P9 on the backplane.

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Figure 14 shows the system I/O card replacement procedures.

Figure 14 System I/O Card Replacement



- Step 3** Use a one-quarter inch socket driver or wrench to screw two additional standoff screws into the screw holes in the system I/O card and into the original standoff screws on the chassis backplane. Tighten the standoff screws using the one-quarter inch socket driver or wrench.
- Step 4** Complete the following steps to connect the system I/O card to the network if a DS3 network interface module is installed in slot 10 of a subtending host chassis at the top of the subtending tree:
- Attach the end of the cable that is connected to the ATM switch to the receive (J4) DS3 BNC connector on the system I/O card.
  - Attach the end of the cable that is connected to the ATM switch to the transmit (J3) DS3 BNC connector on the system I/O card.



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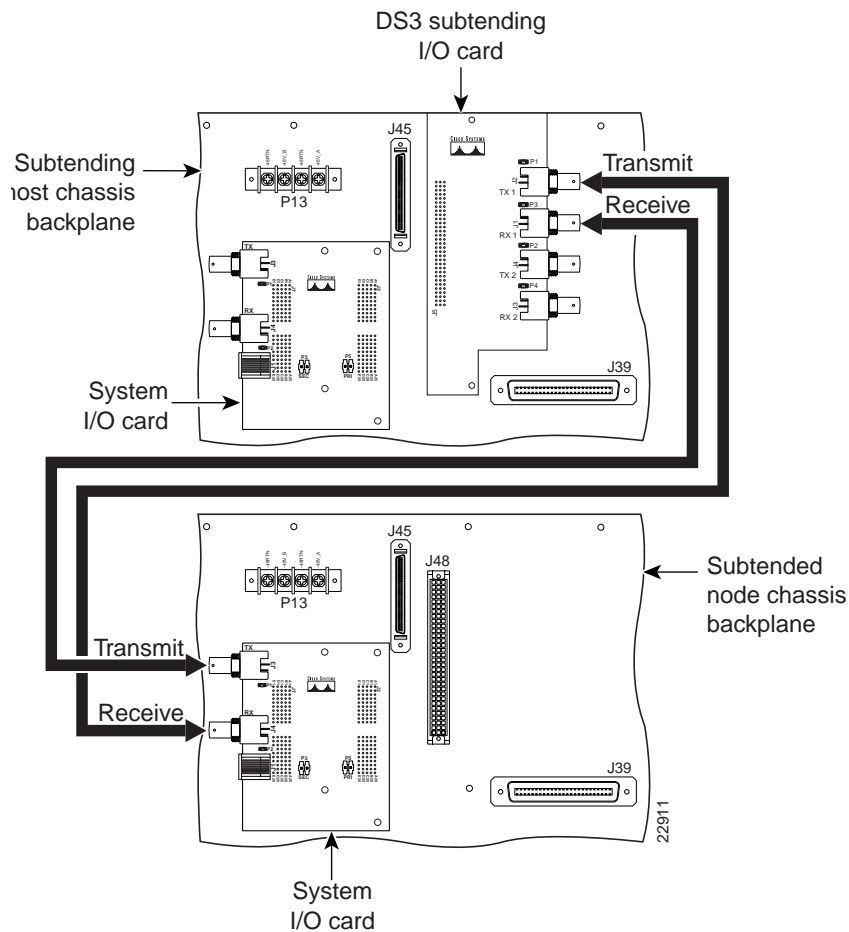
- Step 5** Locate the cable coming from the receive DS3 BNC connector (RX1) for the DS3 subtending I/O card on the subtending host chassis.
- Step 6** Attach the cable from Step 5 to the transmit DS3 BNC connector (TX) for the system I/O card on the subtended node chassis.
- Step 7** Locate the cable coming from the transmit DS3 BNC connector (TX1) for the DS3 subtending I/O card on the subtending host chassis.
- Step 8** Attach the cable from Step 7 to the receive DS3 BNC connector (RX) for the system I/O card on the subtended node chassis.

Figure 15 shows cabling from a DS3 subtending I/O card to a system I/O card.



**Note** If you have one subtending host chassis with two subtended node chassis, the second subtended node chassis system I/O card connects to the TX2 and RX2 DS3 BNC connectors on the DS3 subtending I/O card.

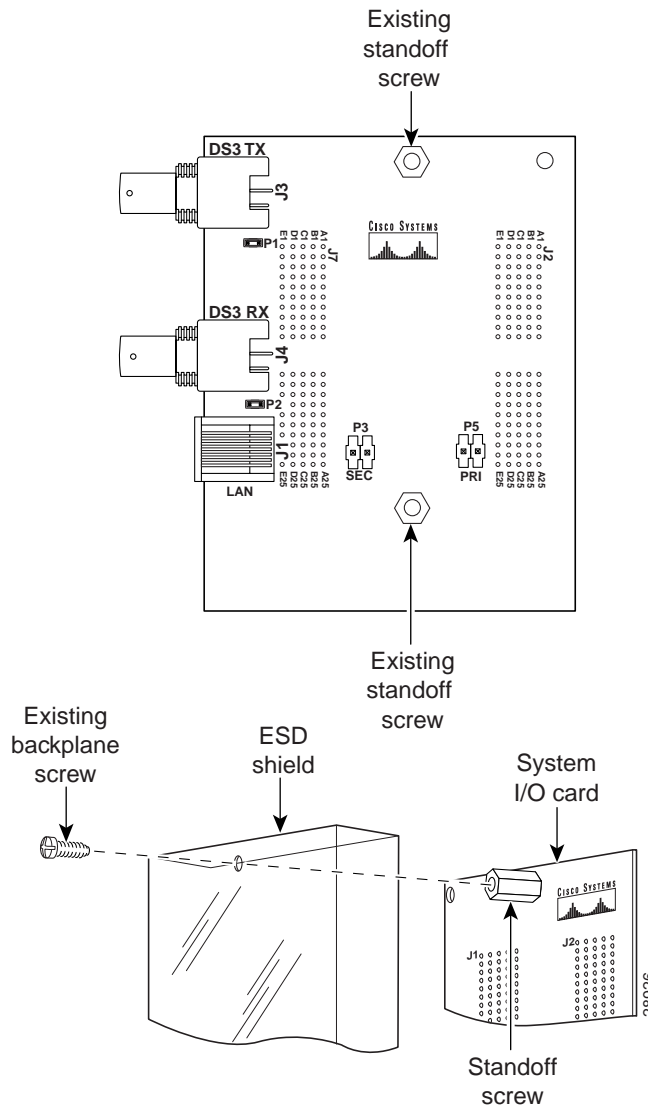
*Figure 15 Cabling for a DS3 Subtending I/O Card and a System I/O Card*



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- Step 9** Install the plastic ESD shield over the system I/O card using the following steps:
- a. Position the holes in the plastic ESD shield over the existing standoff screws installed on the system I/O card.
  - b. Use a Phillips-head screwdriver and the backplane screws you removed in Step 10 of the “Removing a System I/O Card” section on page 20 to attach the plastic ESD shield to the system I/O card (see Figure 16).

Figure 16 Plastic ESD Shield Installation



**Caution**

If the modules are installed when you apply power to the system, you could damage the modules and the chassis.

- Step 10** Reinsert the fuses in the fuse and alarm panel. When you reinsert the fuses, the system powers on.

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**Step 11** Reseat all of the modules in the Cisco 6100/6130, Cisco 6110, and POTS splitter. It is important that you accomplish each step completely before moving on to the next step



**Note** All modules must be fully seated in the chassis. A push on the faceplate of each module is required for the module to be fully seated.

- a. Reseat the xTU-C modules in the Cisco 6100/6130.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
  - Reseat the remaining xTU-C modules using the same procedure. Repeat Step 11a for each module.
- b. Reseat the network interface module in the Cisco 6100/6130.
  - Lift up on the ejector tabs and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tabs to secure the module.
- c. Reseat the POTS modules in the POTS splitter.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
  - Reseat the remaining POTS modules using the same procedure. Repeat Step 11c for each module.
- d. Reseat the DS3 STM in the subtending host chassis.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
- e. Reseat the line interface modules (LIMs) in the Cisco 6110.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.
  - Reseat the remaining LIMs using the same procedure. Repeat Step 11e for each module.
- f. Reseat the LIM controller module in the Cisco 6110.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module.

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- g. Reseat the system controller module in the Cisco 6100/6130.
  - Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot.
  - Push on the faceplate of each module to fully seat the module.
  - Press down on the ejector tab to secure the module. This causes each module in the Cisco 6100/6130 to reset.
- h. Verify that the STATUS LEDs on all modules are solid green (where applicable).  
This self-test procedure takes several minutes. Verify that there are no alarms on the system controller module (ALARM LED off). If the STATUS LEDs are not green after the self-test, refer to the appropriate installation guide for troubleshooting procedures.
- i. Perform a software update using the ViewRunner software if the STATUS LEDs on the xTU-C modules or the network interface module are flashing.  
Refer to the appropriate ViewRunner provisioning and operation guide for software upgrade procedures.

**Step 12** Verify that the Cisco 6100/6130 chassis front door is attached to the chassis and closed.

**Step 13** Connect the ViewRunner system to the Cisco 6100/6130 by attaching the Ethernet cable to the RJ-45 (10BaseT/LAN) connector on the system I/O card.

**Step 14** Close the optional rear door using the following steps:

- a. The rear door closes left to right (seen from the rear of the chassis). There are two latches on the rear door. Lift the two latches on the rear door as you close it. After the rear door is in place, release the latches. The rear door closes left to right (seen from the rear of the chassis).
- b. Align the two thumbscrews located on the rear door with two thumbscrew fasteners on the bracket. Tighten the thumbscrews to secure the rear door.

## Standards and Certifications

Table 1 lists the DS3 subtending I/O card standards and certifications.

*Table 1 Standards and Certifications*

Category	Description
NEBS Level 3	Bellcore GR-63-CORE, GR-1089-CORE
EMI	FCC Part 15, Class A
Safety	UL 1950, 3rd Edition

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## Related Documentation

The following sections list the CO and customer premises equipment (CPE) publications that relate to the Cisco DSL product family.

### CO Publications

A complete list of all released Cisco 6100 Series system with NI-1 related documentation is available on the World Wide Web at

[http://www.cisco.com/univercd/cc/td/doc/product/dsl\\_prod/c6100/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/c6100/index.htm).

The following ViewRunner management software is used to provision and manage the Cisco 6100 Series system with NI-1. A complete list of all released ViewRunner documentation is available on the World Wide Web.

- ViewRunner for Windows  
[http://lbj.cisco.com/push\\_targets1/ucdit/cc/td/doc/product/dsl\\_prod/vrmgtsw/vr4w/index.htm](http://lbj.cisco.com/push_targets1/ucdit/cc/td/doc/product/dsl_prod/vrmgtsw/vr4w/index.htm)
- ViewRunner for HP OpenView  
[http://lbj.cisco.com/push\\_targets1/ucdit/cc/td/doc/product/dsl\\_prod/vrmgtsw/vr4ov/index.htm](http://lbj.cisco.com/push_targets1/ucdit/cc/td/doc/product/dsl_prod/vrmgtsw/vr4ov/index.htm)

### CPE Publications

The Cisco CPE, also known as the Cisco 600 Series, is part of the Cisco end-to-end DSL product family. CPE comprises modems and routers at the customer site primarily used by home office and corporate LAN personnel. Most CPE uses the Cisco Broadband Operating System (CBOS) as its operating system. CBOS provides a comprehensive command set and web interface that allow you to configure your Cisco CPE modem or router.

A complete list of all released Cisco 600 Series documentation is available on the World Wide Web at [http://www.cisco.com/univercd/cc/td/doc/product/dsl\\_prod/c600s/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/c600s/index.htm).

## Cisco Connection Online

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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, and Internet e-mail, and it 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.

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You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: [cco.cisco.com](http://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 connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact [cco-help@cisco.com](mailto:cco-help@cisco.com). For additional information, contact [cco-team@cisco.com](mailto: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](mailto: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](mailto:cs-rep@cisco.com).

## Documentation CD-ROM

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