



78-10186-01 10/22/99

DS3 Subtend Host Module FRU Installation and Replacement Notes

Product Number: 6100-ST-3-DS3=

This document provides information about installing and replacing the Cisco 6100 Series system DS3 subtend host module (STM). The DS3 STM is a field-replaceable unit (FRU).

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.

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2. Subtended Network Configuration Overview

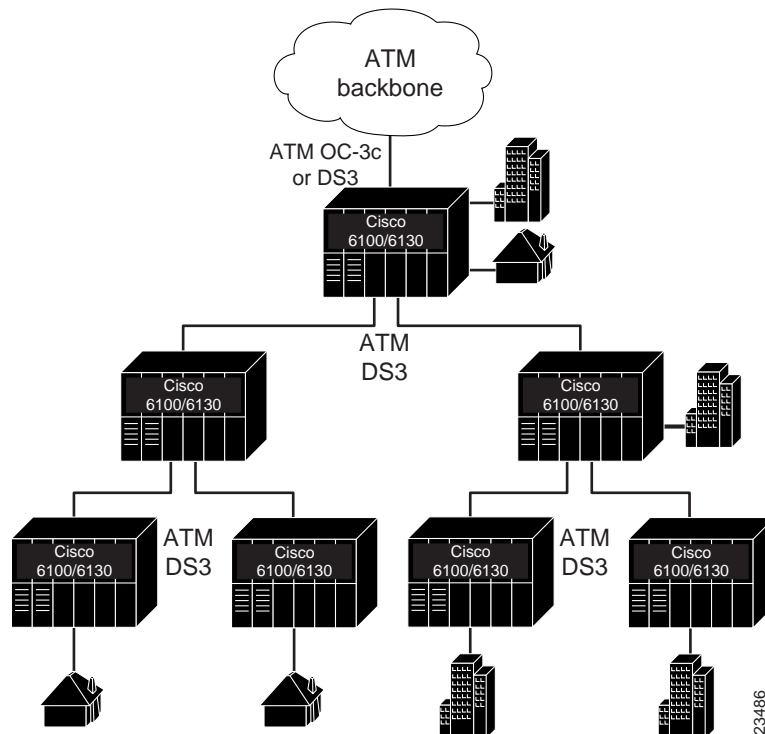
A subtended network configuration

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

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

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

Figure 1 Subtended Cisco 6100 Series System Network



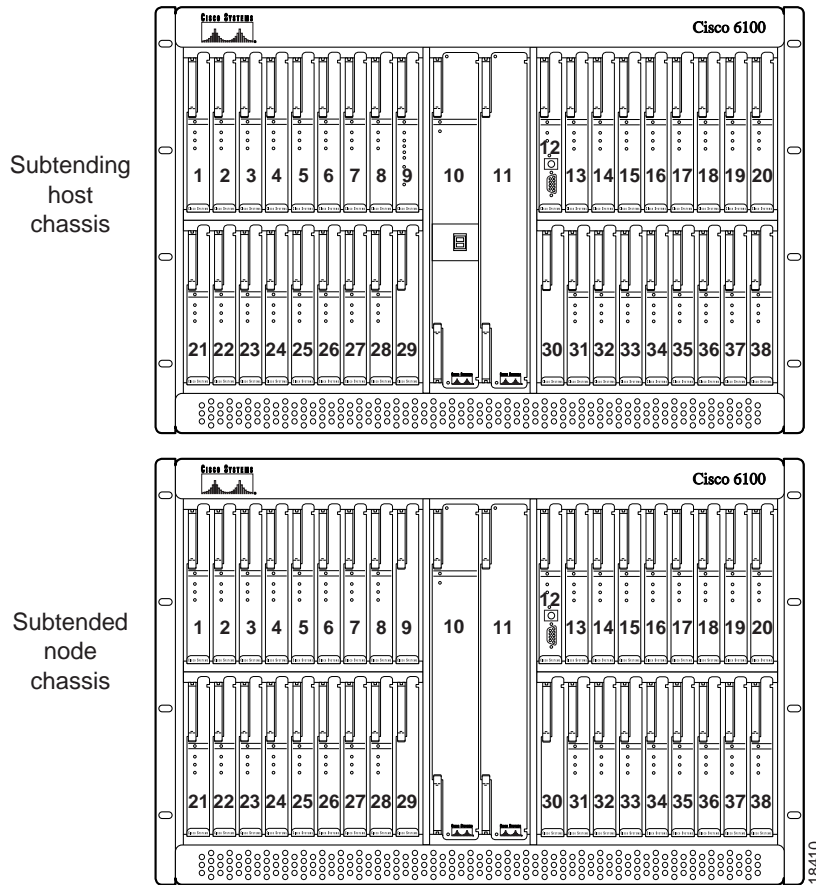
You can subtend an MC to three tiers, with up to six MCs, all connecting through one subtending host MC to the ATM backbone (see Figure 1).

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

- A DS3 connection from the ATM backbone to the MC, install a DS3 NI module.
 - An OC-3c connection from the ATM backbone to the MC, install an OC-3c NI module.
- The DS3 NI module is installed in slot 10 of each subtended node MC.

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

Figure 2 Subtending Host and Subtended Node MC Slot Assignments



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

3. DS3 STM Overview

The DS3 STM manages subscribers sent from a subtended MC and installed in slot 9 of a subtending host MC, as shown in Figure 3.

Figure 3 DS3 STM Slot in the MC

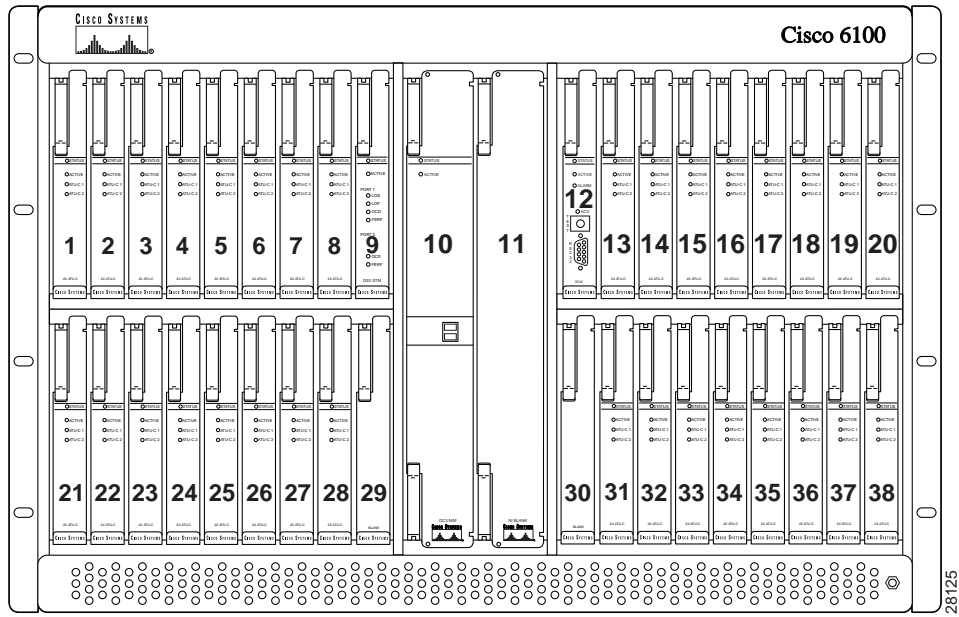


Figure 4 shows a close-up of the DS3 STM faceplate.

Figure 4 DS3 STM Faceplate

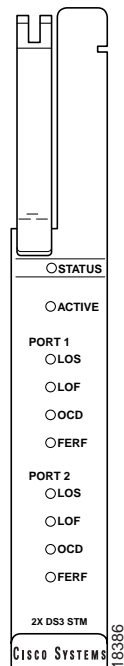


Table 1 describes the DS3 STM LED indicator functions.

Table 1 DS3 STM LED Indicators

LED	State	Function
STATUS	Green blinking	The self-test is in progress.
	Green solid	The status is OK.
	Red	The self-test or module has failed.
ACTIVE	Green solid	The module is active.
	Off	The module is in standby mode.
PORT 1		
LOS	Green solid	Port 1 has a proper DS3 signal to the far end connection.
	Red	Port 1 has detected a loss of signal condition from the subtended MC.
LOF	Green solid	Port 1 has DS3 frame sync to the far end connection.
	Red	Port 1 has detected a loss of frame condition from the subtended MC.
OCD	Green solid	Port 1 has achieved cell delineation from or to the far end connection.
	Red	Port 1 has detected a loss of cell delineation condition from the subtended MC.
FERF	Green solid	The far end connection to port 1 is receiving signals.
	Red	Port 1 has detected a receiver failure in the far end equipment.

Table 1 DS3 STM LED Indicators (continued)

LED	State	Function
PORT 2		
LOS	Green solid	Port 2 has a proper DS3 signal to the far end connection.
	Red	Port 2 has detected a lost of signal condition from the subtended MC.
LOF	Green solid	Port 2 has DS3 frame sync to the far end connection.
	Red	Port 2 has detected a loss of frame condition from the subtended MC.
OCD	Green solid	Port 2 has achieved cell delineation from or to the far end connection.
	Red	Port 2 has detected a loss of cell delineation condition from the subtended MC.
FERF	Green solid	The far end connection to port 2 is receiving signals.
	Red	Port 2 has detected a receiver failure in the far end equipment.

4. Installation Prerequisites

This section describes hardware requirements and lists parts and tools used to install the DS3 STM.

4.1 Hardware Requirements

The DS3 STM is not a stand-alone product. In order for a DS3 STM to work properly on a subtending host MC, you must install both a DS3 system I/O card and DS3 subtending card.

Note The DS3 system I/O card is installed on all MC backplanes.

4.2 Part and Tool Requirements

To install or replace the DS3 STM, you need the following parts and tools:

- DS3 STM.
- DS3 subtending card (installed). For installation procedures, refer to the *DS3 Subtending Card FRU Installation and Replacement Notes*.
- DS3 system I/O card (installed). For installation procedures, refer to the *DS3 System I/O Card FRU Installation and Replacement Notes*.
- Necessary equipment for ESD protection—Required whenever you handle Cisco Digital Subscriber Line Access Multiplexer (DSLAM) equipment, which includes the chassis, modules, and cards.

Note The Cisco 6100 Series system has no internal user-serviceable parts. However, you can add or remove a DS3 STM without removing power from the system (hot swapping).

5. General Safety Precautions and Maintenance Guidelines

This section covers the following topics:

- General Safety Precautions
- Hot-Swapping Modules
- Module Installation and Replacement Suggestions

5.1 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 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.



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.



Caution Installing the modules in the chassis with the power leads reversed can damage the modules.



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



Warning Use copper conductors only.



Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.



Warning Never install telephone wiring during an electrical storm.



Warning Do not reach into a vacant slot or chassis while you install or removing a module or a fan. Exposed circuitry could constitute an energy hazard.



Warning Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.



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



Warning The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hardwired connection (other than by a nonremovable, connect-one-time-only plug) must be made only by PTO staff or suitably trained engineers.



Warning The power supply circuitry for the Cisco DSLAM 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 Do not work on the system or connect or disconnect cables during periods of lightning activity.



Warning Use caution when installing or modifying telephone lines.



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



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



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 The safety cover is an integral part of the product. Do not operate the unit without the safety cover installed. Operating the unit without the cover in place will invalidate the safety approvals and pose a risk of fire and electrical hazards.



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 Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.



Warning Do not use a telephone to report a gas leak in the vicinity of the leak.



Warning Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.



Warning Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.



Warning This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.



Warning Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.

5.2 Hot-Swapping Modules

The DS3 STM supports hot swapping. Hot swapping allows you to remove and replace the modules without disconnecting the system power. When the system detects that a module is added or removed, it automatically runs diagnostic and discovery routines, and acknowledges the presence or absence of the module.

If an unprovisioned module is installed for the first time, the system identifies it as present but unprovisioned. Instructions for provisioning the module are found in the following guides:

- *ViewRunner for Windows Provisioning and Operation Guide*, if you are using ViewRunner for Windows as your management software
- *ViewRunner for HP OpenView Provisioning and Operation Guide*, if you are using ViewRunner for HP OpenView as your management software

5.3 Module Installation and Replacement Suggestions

The following are recommended module installation and replacement practices:

- Do not force the module into its slot. This action can damage the pins on the backplane if they are not aligned properly with the module.
- Ensure that the module is straight and not at an angle when you install the module in the slot. Installing the module at an angle can damage the module.
- Fully depress the ejector tabs to ensure that the module connector mates with the backplane correctly. Firmly seat the module in the slot.

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

6. Removing and Installing a DS3 STM

The following sections describe how to remove and replace or install a DS3 STM.

6.1 Removing a DS3 STM



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 remove a module from the MC:

- Step 1** Open the front door on the MC.
- Step 2** Lift up the ejector tab.
- Step 3** Carefully slide the module out of the MC.

Either replace the module that you remove, or insert a filler faceplate in the empty slot. See the “Installing a DS3 STM” section on page 10 for DS3 STM installation instructions. For filler faceplate installation instructions, refer to the *Cisco 6100 Series Direct Connect Installation Guide*.

Note Although filler faceplates are not required for system operation, you must install them in all open slots of each chassis to achieve NEBS and thermal compliance. For more information on NEBS requirements, refer to the *Regulatory Compliance and Safety Information for the Cisco 6100 Series System* document.

6.2 Installing a DS3 STM



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.

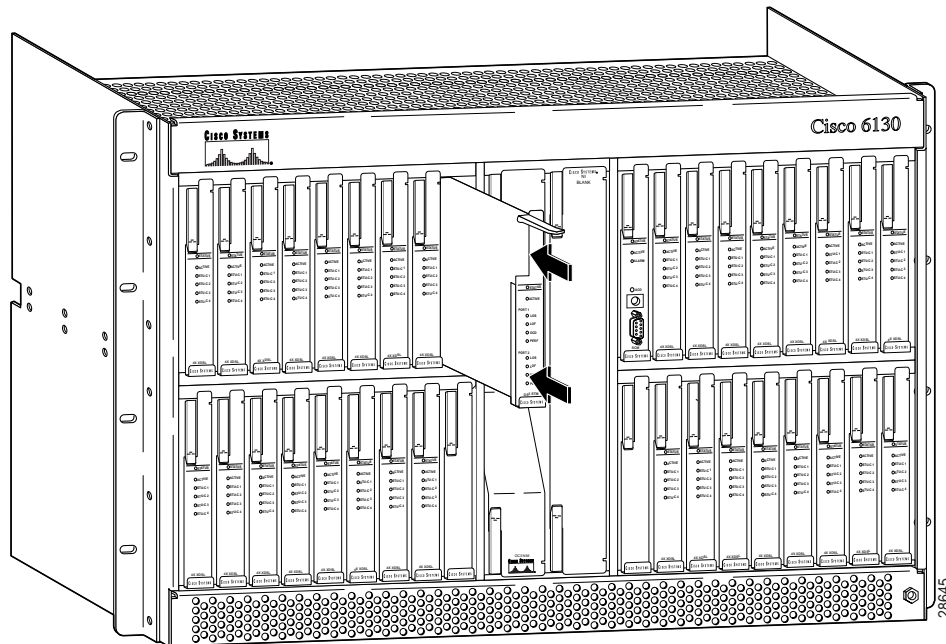
Use the following steps to install a DS3 STM in the MC. It is important that you accomplish each step completely before moving on to the next step.

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.

- Step 1** Open the MC front door.
- Step 2** Vertically align the module edge with the module guides at the top and bottom of slot 9 of the MC.

- Step 3** Lift up on the ejector tab and gently apply pressure to the bottom of the faceplate while pushing the module into the slot (see Figure 5).

Figure 5 DS3 STM Installation



- Step 4** Push on the faceplate of each module to fully seat the module.
- Step 5** Press down on the ejector tab to secure the module.
- Step 6** Verify that the Status LED is solid green after the brief self-test. If the Status LED is not green after the self-test, refer to the *Cisco 6100 Series User Guide* for troubleshooting procedures.
- Step 7** Repeat Steps 2 through 6 for each subtending host MC.
- Step 8** Verify that the MC front door is attached to the MC and closed to achieve NEBS compliance. For more information on NEBS requirements, refer to the *Regulatory Compliance and Safety Information for the Cisco 6100 Series System* document.

Note If you are installing the module for the first time, provision it using the ViewRunner management software. For provisioning procedures, refer to the *ViewRunner for Windows Provisioning and Operation Guide* or *ViewRunner for HP OpenView Provisioning and Operation Guide*.

7. Standards and Certifications

Table 2 lists DS3 STM standards and certifications.

Table 2 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

8. Related Documentation

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

8.1 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.

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 Word Wide Web.

- ViewRunner for Windows
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

8.2 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.

9. Cisco Connection Online

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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
- 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. For additional information, contact cco-team@cisco.com.

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10. Documentation CD-ROM

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