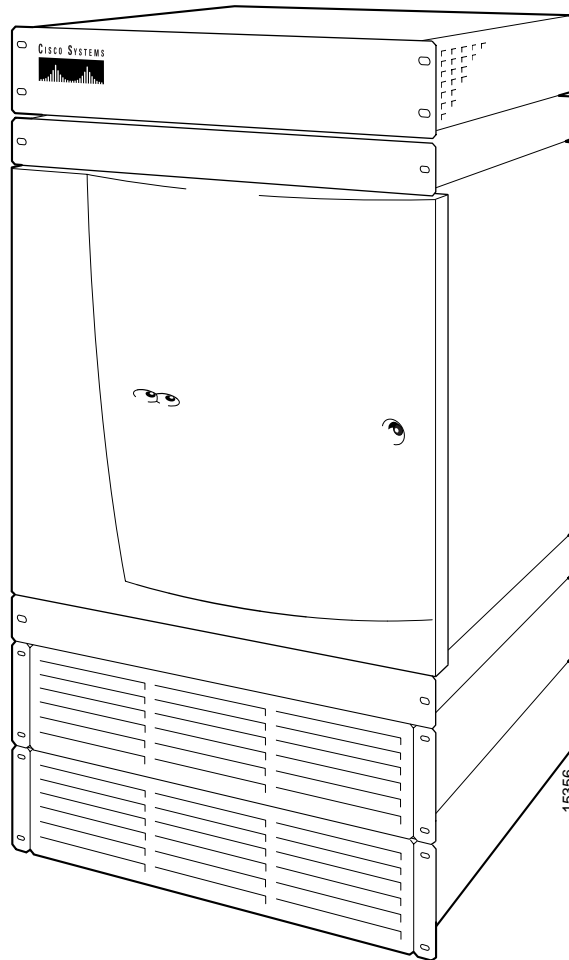




Introducing the MGX 8850 Switch

This chapter contains a brief outline of the features of the Cisco MGX 8850 switch. An illustration of the AC-powered version of the switch appears in .

Figure 2-1 MGX 8850 Switch



MGX 8850 System Overview

The Cisco MGX 8850 wide-area edge switch supports:

- Integrated IP+ATM services
- Frame Relay
- IP-based virtual private network
- Video
- Circuit emulation services for private line replacement

The Applications of the MGX 8850 Switch

The MGX 8850 switch operates in two operational *applications*:

- As a *feeder*, the MGX 8850 switch concentrates narrow-band and medium-band ATM, Frame Relay, and into a single, wide-band ATM feeder trunk to an BPX 8600-series switch.
- As a *stand-alone node*, the MGX 8850 switch concentrates narrow-band and medium-band ATM, Frame Relay, and voice into a single ATM line to a third-party switch. The MGX 8850 interface in this application is a UNI or an NNI.

For a description of how to configure the switches for a particular application, see Chapter 5, “Configuring the MGX 8850 (PXM1-based) Switch.”

The switch is also capable of supporting Cisco Multi-Protocol Label Switching (MPLS).

Universal Edge Architecture

The MGX 8850 switch can support a wide range of services over narrowband and mid-band user interfaces. It maps all the service traffic to and from ATM by using standardized interworking methods. When the MGX 8850 switch operates as a feeder, it uses a single port to communicate the aggregated traffic over an ATM interface with an MGX 8850 or BPX 8600-series switch.

The supported interfaces for user-traffic are:

- Frame Relay UNI on T3, E3, HSSI, T1, and E1 lines
- ATM UNI and FUNI and optional inverse multiplexing for ATM (IMA)
- Frame Relay to ATM network interworking and service interworking
- Circuit emulation services

The optional Service Resource Module-3T3 (MGX-SRM-3T3/B) can support up to 80 T1 interfaces over its 3 T3 lines and provide 1:N redundancy for the T1 and E1 cards.

The modular, software-based system architecture enables the switch to support new features through downloadable software upgrades or new hardware modules.

The MGX 8850 backplane supports a minimum of 1.2 Gbps of non-blocking switching up to 45 Gbps. Individual line rates range from DS0 through OC-12.

Standards-Based Conversion to ATM

The MGX 8850 switch converts all user-information into 53-byte ATM cells by using the appropriate ATM Adaptation Layer (AAL) for transport over the ATM backbone network. The individual service modules segment and reassemble (SAR) cells to eliminate system bottlenecks. The following list shows the applicable AAL for each service:

- Circuit emulation services uses AAL1.
- Frame Relay-to-ATM network interworking uses AAL5 and Frame Relay Service Specific Convergence Sub-layer (FR-SSCS).
- Frame Relay-to-ATM service interworking uses both transparent and translation modes to map Frame Relay to native ATM AAL5.
- Frame Forwarding uses AAL5.

MGX 8850 Enclosure and Power

The MGX 8850 enclosure contains up to 24 service modules (I/O cards) and 4 optional Service Redundancy Modules (SRMs) provide redundancy. It resides in either in a 19-inch or a 23-inch rack. The closed, 19-inch Cisco-built rack also has an optional seismic anchor. The system can accept power from either a DC or an AC source.

Table 2-1 Power supply options

Model	Description
MGX-DC	MGX 8850 DC PEM and MBX-CAB-AC/DC
MGX-AC1-1	NR AC system for MGX 8850: AC shelf, 1 feed, 1 PS, MGX-CAB-AC/DC
MGX-AC2-2	Red AC pwr, red AC feed, AC shel, 2 PS, 2 MGX-CAB-AC/DC
PS-1200-AC	1200 Watt power supply for AC systems

MGX 8850 Cards

The MGX 8850 switch supports two types of *card sets*: the *core cards* (or core modules) and *service modules*. The Processor Switching Module (PXM) and optional Service Resource Module (SRM) are *core cards*. The *service modules* provide the interface to the transport technologies of the CPE—Frame Relay, ATM, and so on. A card set consists of a front card with its attached daughter card and a back card (or line module). The front card contains the processing intelligence and, on the daughter card, the firmware that distinguishes the interface (OC-3, T3, E3, and so on). The back card is a simple card that provides the electrical interface for one or more lines of a particular type. The MGX 8850 front and back cards are the:

- Processor Switching Module (PXM1)
This front card controls the switch and supports external interfaces for user-access and trunking or UNI ports. The back cards consist of a user interface card (PXM1-UI) and a broadband network module (see subsequent list items).
- Processor Switch Module User Interface (PXM1-UI)
The PXM1-UI is the *user interface* card that has various types of ports to let you access and control the switch.

- **Broadband Network Module (MGX-SMFIR-1-622 and MGX-SMFLR-1-622)**
The SMFIR-1-622 is a *broadband network* module for the PXM and provides a SONET OC12/STM4 ATM interface at 622 Mbps.
- **Broadband Network Module (MGX-MMF-4-155)**
The MMF-4-155 is a *broadband network* module for the PXM and provides 4 SONET OC3/STM1 ATM interfaces at 155 Mbps.
- **Broadband Network Module (MGX-BNC-2T3)**
The MGX-BNC-2T3 is a *broadband network* module for the PXM and provides 2 T3 ATM interfaces.
- **Broadband Network Module (MGX-BNC-2E3)**
The MGX-BNC-2E3 is a *broadband network* module for the PXM and provides 2 E3 ATM interfaces. A version for Australia, New Zealand, and elsewhere is available (MGX-BNC-2E3A).
- **Frame Service Module for T3 and E3 (MGX-FRSM-2E3T3)**
The MGX-FRSM-2E3/T3 provides interfaces for up to two T3 or E3 frame relay lines, each of which can support either 2 T3 lines (each at 44.736 Mbps) or 2 E3 lines (each at 34.368Mbps) FR-UNI, ATM-FUNI, or Frame Forwarding port.
- **Frame Service Module for channelized T3 (MGX-FRSM-2CT3)**
The MGX-FRSM-2CT3 supports interfaces for up to two T3 channelized frame relay lines, each of which supports 56 Kbps, 64 Kbps, Nx56 Kbps, Nx64 Kbps, T1 ports for a total of 256 ports that can be freely distributed across the two T3 lines.
- **Frame Service Module for unchannelized HSSI (MGX-HS2/B)**
The MGX-HS2/B supports interfaces for 2 unchannelized HSSI lines, each of which supports approximately 51 Mbps. With both lines operating, maximum throughput is 70 Mbps.
- **Frame Service Module for T1 (AX-FRSM-8T1)**
The AX-FRSM-8T1 provides interfaces for up to eight T1 lines, each of which can support one 56 Kbps or one Nx64 Kbps FR-UNI, ATM-FUNI, or a Frame Forwarding port.
- **Frame Service Module for T1, channelized (AX-FRSM-8T1c)**
The AX-FRSM-8T1c provides interfaces for up to eight T1 lines, each of which can support up to 24 56 Kbps or $N \times 64$ Kbps FR-UNI, ATM-FUNI, or Frame Forwarding port.
- **Frame Service Module for E1 (AX-FRSM-8E1)**
The AX-FRSM-8E1 provides interfaces for up to eight E1 lines, each of which can support one 56 Kbps or one $N \times 64$ Kbps FR-UNI, ATM-FUNI, or frame forwarding port.
- **Frame Service Module for E1, channelized (AX-FRSM-8E1c)**
The AX-FRSM-8E1c provides interfaces for up to 8 E1 channelized frame relay lines Each line can support $N \times 64$ -Kbps or (up to 31) 56-Kbps FR-UNI, ATM-FUNI, or frame forwarding ports.
- **ATM UNI Service Module for T1 (MGX-AUSM/B-8T1)**
The MGX-AUSM/B-8T1 provides interfaces for up to eight T1 lines. You can group $N \times$ T1 lines to form a single, logical interface (IMA).
- **ATM UNI Service Module for E1 (MGX-AUSM/B-8E1)**
The MGX-AUSM/B-8E1 provides interfaces for up to eight E1 lines. You can group $N \times$ E1 lines to form a single, logical interface (IMA).
- **Circuit Emulation Service Module for T1 (AX-CESM-8T1)**
The AX-CESM-8T1 provides interfaces for up to eight T1 lines, each of which is a 1.544 Mbps structured or unstructured synchronous data stream.
- **Circuit Emulation Service Module for E1 (AX-CESM-8E1)**
The AX-CESM-8E1 provides interfaces for up to eight E1 lines, each of which is a 2.048-Mbps structured or unstructured synchronous data stream.

- **Route Processor Module (RPM)**
The RPM is a Cisco 7200-series router redesigned as a double-height card. Each RPM uses two single-height back cards. The back-card types are: single-port Fast Ethernet, four-port Ethernet, and single-port (FDDI).
- **Service Resource Module (MGX-SRM-3T3/B)**
The optional MGX-SRM-3T3/B provides bit error rate testing (BERT), 1:N redundancy for T1 and E1 service modules, and a de-multiplexing function for T1 service called *bulk mode*.
- **Smart Serial Interface FRSM-HS1/B 12IN1**
A multi-personality back card that supports either X.25 or V.35 interface.

MGX 8850 Management

To give you access for control purposes, the MGX 8850 switch supports high and low-level user interfaces. You can use the Cisco WAN Manager application (formerly StrataView Plus) for connection management, the CiscoView application for hardware configuration, and a command line interface for low-level control of hardware functionality and connection control. An assortment of ports and protocols supports these user-interfaces. For communicating with the MGX 8850 switch, the control port (SLIP protocol only), the LAN (Ethernet) port, and the in-band ATM connection (feeder application only) all support access by the command line interface (CLI) via Telnet, TFTP, and SNMP protocols.

The downloadable firmware on each card determines the functionality, and you can upgrade functionality by downloading new firmware through a TFTP application on a workstation or a PC.

The current status and configuration parameters of the MGX 8850 modules reside in a Management Information Base (MIB). The firmware on each card updates the MIB as changes in status and configuration occur.

New Modules Specific for Release 1.0

The new service modules for Release 1.0 of the MGX 8850 switch are:

- **Unchannelized Frame Service Modules MGX-FRSM-2T3E3** support two T3 or E3 lines.
- **A channelized Frame Service Module (MGX-FRSM-2CT3)** supports two channelized T3 lines.
- **The Frame Service Module High Speed Serial Interface 2 (MGX-FRSM-HS2)** supports two HSSI lines. Each line can operate at a maximum rate of 52 Mbps. With both lines active, the maximum throughput is 70 Mbps.

