

Cisco Service Expansion Shelf (SES) for the Cisco BPX 8600 Series Switch

The Cisco Service Expansion Shelf (SES) is used as the Private Network-Network Interface (PNNI) controller for the Cisco BPX[®] 8600 Series Switches to provide integrated PNNI routing, Soft Permanent Virtual Circuit (SPVC) connection support, Switched Virtual Circuit (SVC) signaling, and call setup.

The SES consists of a small chassis and SES-Processor Switch Module (PXM) card (see figure 1).

Figure 1 Cisco SES Chassis and SES-PXM card.



Key Features

- PNNI controller:
 - Redundant PXM processor cards in a single chassis.
 - Connection to Cisco BPX 8600 via OC-3 or DS3 port, with optional APS or Y-cable for redundant units
 - Full support of PNNI and SVC standards
 - Provisioning of SPVC and SPVP connections
 - Can be easily added to existing Cisco BPX 8600 systems and networks
 - Fully managed by Cisco WAN Manager (CWM) Release 10.5.00 or later

Architecture

The Cisco SES-PXM Processor Module

The Cisco SES-PXM is based on the Cisco MGX[™] PXM-1 design and has the same processing capability as the PXM-1. Two double-height slots are reserved for redundant Cisco SES-PXM processor modules. The switch fabric on the Cisco PXM-1 is not used in the SES-PXM. The Cisco SES-PXM connects to the BXM module on the Cisco



BPX 8600 using the integrated trunks. Uplinks available for the Cisco SES-PXM are DS3 and OC-3. Redundant links are supported via Y-cables (for single-mode fiber cards or DS3) and automatic protection switching (APS). One Cisco SES is required per Cisco BPX 8600 switch to be controlled.

Processor Switch Module

The Cisco MGX PXM-1 Processor Switch Module is an ATM switching fabric, data processing, and ATM interface card used on the Cisco MGX 8230, 8250, and 8850 multiservice switches. The Cisco MGX PXM-1 Module combines a 1.2-Gbps shared-memory switching fabric with integrated trunking at speeds up to OC-12. The switching fabric provides 1.2 Gbps of nonblocking switching capacity, while the processor provides the control plane that delivers advanced IP+ATM networking software, diagnostics, and performance monitoring.

Compatibility

The Cisco SES chassis is not compatible with the Cisco MGX 8230 chassis. Cisco SES-PXM cards may only be used in the SES chassis.

Controller Options

The controller options consist of various models of the Cisco SES-PXM controller. Each option consists of a bundle containing the SES-PXM controller card, user interface module, and appropriate ATM interface back card (see table 1 below for interface options).

Table 1 SES-PXM card bundles

Module	Description
SES-PXM-CNTL-MMF	Nonredundant controller with OC-3 MMF interface
SES-PXM-CNTL-MMF-R	Redundant controllers with OC-3 MMF interface
SES-PXM-CNTL-SMF	Nonredundant controller with OC-3 SMF interface
SES-PXM-CNTL-SMF-R	Redundant controllers with OC-3 SMF interface
SES-PXM-CNTL-T3	Nonredundant controller with T3 interface
SES-PXM-CNTL-T3-R	Redundant controllers with T3 interface
SES-PXM-CNTL-E3	Nonredundant controller with E3 interface
SES-PXM-CNTL-E3-R	Redundant controllers with E3 interface

In addition to the above models, a spare version of each controller type may be ordered.

The selection of the interface type will generally be made based on the availability of ports in the Cisco BPX 8600, which can be used to attach the SES. The selection of interface type makes no difference to the capabilities of PNNI controller or the scale or performance of the PNNI networking layer.

Cisco SES PNNI Controller

The Cisco SES PNNI Controller is a standards-based virtual switch interface (VSI) controller that provides the switch being controlled with a full PNNI, SVC, and SPVC feature set. The Cisco SES PNNI Controller has the following features:

- Redundant PXM processor cards in a single chassis
- ATM UNI 3.0/3.1/4.0 SVCs and SVPs (CBR, VBR, UBR)
- ATM SPVC and SPVP (CBR, VBR, UBR, ABR)
- ATM UNI 4.0 SVC and SVPs (CBR, VBR, UBR, ABR) *



- SPVCs on feeder ports on Cisco MGX 8220, 8230, 8250, 8850 feeders
- PNNI 1.0 multiple peer group
- ILMI 3.0/3.1/4.0
- Standard Interim Interswitch Signaling Protocol (IISP) with PNNI interworking
- Enhanced IISP for SPVC support
- AINI Support *
- E.164 and AESA (DCC, ICD, E.164) addressing
- Address filtering (source and destination)
- Support for PNNI/UNI signaling on any BXM port
- Standard based path and connection trace capabilities
- Call processor redundancy. Calls are maintained during switchover (hot standby)
- 100k managed SPVC support
- * Cisco WAN Manager is not supported for these features

Technical Specifications

See table 2 for the physical/electrical specifications for the SES PNNI Controller.

Table 2 Physical/Electrical Specifications for the SES PNNI Controller

Characteristics	Physical/Electrical Specifications
Card slot capacity	Two double-height slots reserved for processor modules Up to 10 single-height or 5 double-height slots for service modules (not used in controller application)
Dimensions	12.25 (excluding optional AC power tray) x 17.72 (excluding rack mounting brackets) x 23.5 (excluding cable management) in (31.12 x 45.01 x 59.69 cm) (H x W x D) 14.00 (including optional AC power tray) x 17.72 (excluding rack mounting brackets) x 23.5 (excluding cable management) in (35.56 x 45.01 x 59.69 cm) (H x W x D)
Weight	Empty: 40 lb Fully loaded (AC): 71.1 lb Fully loaded (DC): 53.5 lb
AC power	Input voltage range: 90 to 264 VAC Maximum input current: 2.8A at 100 VAC, 1.4A at 200 VAC Maximum power: 250W Frequency: 50 to 60 Hz
DC power	Input voltage range: 42 to 56 VDC Maximum input current: 5 A Maximum power: 200W

Table 3 Operating Environment for the SES PNNI Controller

Temperature	Operating: 41° to 131°F (5° to 55°C) Nonoperating: -13° to 158°F (-25° to 70°C)
Humidity	Operating: 5% to 95%, noncondensing Nonoperating: 0% to 95%, noncondensing

Temperature	Operating: 41° to 131°F (5° to 55°C) Nonoperating: -13° to 158°F (-25° to 70°C)
Altitude	Operating: 9,843 ft at 104°F (40°C) Nonoperating: 15,000 ft at 77°F (25°C)

Table 4 Regulatory Compliance for the SES PNNI Controller

Electromagnetic Compatibility (EMC)	<ul style="list-style-type: none"> • EN55022: 1998 (EU) • 47 CFR 15 (FCC) • AS/NZS 3548: 1995 (Australia) • EN300 386-2: 1997 • ETS 300 386-1: 1994 • EN61000-4-2: 1995 • EN61000-4-3: 1995 • EN61000-4-4: 1995 • EN61000-4-5: 1995 • EN300 386-2
Safety	<ul style="list-style-type: none"> • UL 1950 • CSA C22.2 No. 950 • EN60950 • AS/NZS 3260 • IEC 60950 • IEC 60825-1 • EN60825-1
Telecom	<ul style="list-style-type: none"> • FCC 47 CFR Part 68 • NEBS Level 1 and Level 3 • Industry Canada CS-03 • ITU-T G.703 • ANSI T1.102 • ANSI T1.107 • ANSI T1.105.06 • ITU-T G.957



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