



About This Guide

This preface describes the objectives, audience, organization, and conventions of the *Cisco PNNI Network Planning Guide for MGX and SES Products, Release 5.1*.

Objectives

This guide describes how to plan a PNNI network before for installing and configuring the following products:

- Cisco MGX 8830 Release 3.0 and higher
- Cisco MGX 8850 (PXM1E) Release 3.0 and higher
- Cisco MGX 8850 (PXM45) Release 2.0 and higher
- Cisco MGX 8880 Media Gateway Release 5.0 and higher
- Cisco MGX 8950 Release 2.1.60 and higher
- Cisco BPX 8600 and Cisco Service Expansion Shelf (SES) with SES Release 1.0 or later software

Audience

The *Cisco PNNI Network Planning Guide for MGX and SES Products, Release 5.1* helps network architects and planners identify the information they need to provide to the personnel that will install and configure the PNNI switch products described in this guide.

Organization

The major sections of this document are as follows:

- [Chapter 1, “Introduction to PNNI,”](#) introduces PNNI network concepts, components, and terminology.
- [Chapter 2, “Interoperability and Performance Planning,”](#) lists PNNI network specifications and provides general guidelines for planning PNNI networks.

- Chapter 3, “Address and Closed User Group Planning,” describes how to implement network plans using ATM addresses that help define the network structure.
- Chapter 4, “Planning Intermediate Route Selection,” describes how PNNI network nodes select routes and provides guidelines for influencing route selection.

Conventions

This publication uses the following conventions.

Command descriptions use these conventions:

- Commands and keywords are in **boldface**.
- Arguments for which you supply values are in *italics*.
- Required command arguments are inside angle brackets (< >).
- Optional command arguments are in square brackets ([]).
- Alternative keywords or variables are separated by vertical bars (|).

Examples use these conventions:

- Terminal sessions and information the system displays are in `screen font`.
- Information you enter is in **boldface screen font**.
- Nonprinting characters, such as passwords, are in angle brackets (< >).
- Default responses to system prompts are in square brackets ([]).



Note

Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Tip

Provides additional information that can help you understand the product or complete a task more efficiently.



Warning

This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents. (To see translated versions of this warning, refer to the *Regulatory Compliance and Safety Information* document that accompanied the product.

Documentation

A *Guide to Cisco Multiservice Switch and Media Gateway Documentation* ships with your product. That guide contains general information about how to locate Cisco MGX, BPX, SES, and CWM documentation online.

Documentation Notes for these Product Releases

This release includes new hardware or features for the following releases:

- Cisco MGX Release 5.1 introduces the Cisco MGX 8850/B multiservice switch
- Cisco MGX Release 5.1, for these multiservice switches:
 - Cisco MGX 8850 (PXM1E)
 - Cisco MGX 8850 (PXM45)
 - Cisco MGX 8950
 - Cisco MGX 8830
- Cisco MGX Release 1.3, for these multiservice switches:
 - Cisco MGX 8850 (PXM1)
 - Cisco MGX 8230
 - Cisco MGX 8250
- Cisco MGX Release 5.1, for the Route Processor Modules (RPM-XF and RPM-PR)
- Cisco WAN Manager Release 15.1. CWM Release 15 introduced a helpful new documentation feature: web-based *online help*. To invoke online help, press **F1** on a PC, press the **Help** key on a UNIX workstation, or select **Help** from the main or popup menu. Cisco WAN Manager online help has been updated for Release 15.1.

Other components of multiservice WAN products, such as the Service Expansion Shelf (SES) and WAN switching software have no new features for this release.

Related Documentation

This section describes the technical manuals and release notes that support this release of Cisco Multiservice Switch products.

Technical Manual Order of Use

Use the technical manuals listed here in the following order:

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- Step 1** Refer to the documents that ship with your product. Observe all safety precautions.
- *Regulatory Compliance and Safety Information for Cisco Multiservice Switch and Media Gateway Products (MGX, BPX, and SES)*—This document familiarizes you with safety precautions for your product.
 - *Guide to Cisco Multiservice Switch and Media Gateway Documentation*—This document explains how to find documentation for MGX, BPX, and SES multiservice switches and media gateways as well as CWM network management software. These documents are available only online.

- *Installation Warning Card*—This document provides precautions about installing your cards. It explains such subjects as removing the shipping tab and inserting cards properly into the correct slots.
- Step 2** Refer to the release notes for your product.
- Step 3** If your network uses the CWM network management system, upgrade CWM. (If you are going to install CWM for the first time, do so *after* Step 4.) Upgrade instructions are included in the following documents:
- *Cisco WAN Manager Installation Guide, Release 15.1*
 - *Cisco WAN Manager User's Guide, Release 15.1*
- Step 4** If your network contains MGX and SES products, refer to this manual for planning information:
- *Cisco PNNI Network Planning Guide for MGX and SES Products*
- Step 5** Refer to these manuals for information about installing cards and cables in the MGX chassis:
- *Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Hardware Installation Guide, Releases 2 Through 5* for installing cards and cables in these chassis.
 - *Cisco MGX 8xxx Edge Concentrator Installation and Configuration Guide* for installing cards and cables in the Cisco MGX 8230, Cisco MGX 8250, or Cisco MGX 8850 (PXM1) chassis.
- Step 6** Refer to the manuals that help you configure your MGX switch and processor cards:
- *Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Configuration Guide, Release 5.1* for these chassis.
 - *Cisco MGX 8xxx Edge Concentrator Installation and Configuration Guide* for the Cisco MGX 8230, Cisco MGX 8250, or Cisco MGX 8850 (PXM1) chassis.
- Step 7** Refer to the manual that supports the additional cards you intend to install in your switch. For example:
- The services books can help you establish ATM, Frame Relay, or circuit emulation services on your switch.
 - The VISM book can help you set up your switch as a voice gateway, and the RPM book can help you implement IP on the switch.
- Step 8** Additional books, such as command reference guides and error message books, can help with the daily operation and maintenance of your switch.

**Note**

Manual titles may be different for earlier software releases. The titles shown in [Table 1](#) are for the January 2005 release.

Technical Manual Titles and Descriptions

[Table 1](#) lists the technical manuals and release notes that support the January 2005 multiservice switch product releases. Books and release notes in [Table 1](#) are listed in order of use and include information about which multiservice switch or media gateway the document supports.

The books for Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) switches were not updated for the January 2005 release, therefore, some information about configuring and using the new MPSM-8-T1E1 card in these switches is included in the following books:

- *Cisco ATM Services (AUSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*
- *Cisco Frame Relay Services (FRSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*
- *Cisco Circuit Emulation Services (CESM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*

Information about how to install or upgrade to the MPSM-8-T1E1 card in Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) switches is in the *Release Notes for Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) Switches, Release 1.3.10*.

**Note**

Refer to each product's release notes for the latest information on features, bug fixes, and more.

Terms

Two main types of ATM cards are used in MGX switches: AXSM and AUSM. AXSM stands for ATM Switching Service Module. AUSM stands for ATM UNI (User Network Interface) Service Module.

CWM stands for Cisco WAN Manager, our multiservice switch network management system.

Legacy service module refers to a previously introduced card. For this release, the term is used specifically for the CESM-8-T1E1, FRSM-8-T1E1, and AUSM-8-T1E1 cards, which can now be replaced by the new MPSM-8-T1E1 card.

MPSM stands for Multiprotocol Service Module.

RPM stands for Route Processor Module.

SES stands for Service Expansion Shelf.

VISM stands for Voice Interworking Service Module.

VXSM stands for Voice Switch Service Module.

Table 1 *Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases)*

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1.
Overview and Safety Documents									
<i>Guide to Cisco Multiservice Switch and Media Gateway Documentation</i> DOC-7814807=	x	x	x	x	x	x	x	x	x
<i>Installation Warning Card</i> DOC-7812348=	x	x	x	x	x	x	x	x	x

Table 1 Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases) (continued)

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1
<i>Regulatory Compliance and Safety Information for Cisco Multiservice Switch and Media Gateway Products (MGX, BPX, and SES)</i> DOC-7814790=	x	x	x	x	x	x	x	x	x
<i>Release Notes for the Cisco MGX 8880 Media Gateway, Release 5.1.00</i> OL-6493-01	—	—	—	—	—	—	—	—	x
<i>Release Notes for Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, and Cisco MGX 8830 Switches, Release 5.1.00</i> OL-6478-01	—	—	—	—	x	x	x	x	
<i>Release Notes for Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) Switches, Release 1.3.10</i> OL-4539-01	—	x	x	x	—	—	—	—	—
<i>Release Notes for the Cisco Voice Switch Service Module (VXSM), Release 5.1.00</i> OL-4627-01	—	—	—	—	—	—	x	—	x
<i>Release Notes for Cisco WAN Manager, Release 15.1.00</i> OL-6495-01	x	x	x	x	x	x	x	x	x
<i>Release Notes for the Cisco Voice Interworking Service Module (VISM), Release 3.3.00</i> OL-5357-01	—	x	x	x	x	x	x	—	x
<i>Release Notes for Cisco MGX Route Processor Module (RPM-XF) IOS Release 12.3(2)T5 for PXM45-based Switches, Release 5.1.00</i> OL-4536-01	—	—	—	—	x	—	x	x	x

Table 1 Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases) (continued)

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1.
<i>Release Notes for Cisco MGX Route Processor Module (RPM-PR) IOS Release 12.3(7)T3 for MGX Releases 1.3.10 and 5.0.10</i> OL-4535-1	—	x	x	x	x	x	x	x	x
<i>Cisco MGX 8230 Edge Concentrator Overview, Release 1.1.3¹</i> DOC-7812899=	—	x	—	—	—	—	—	—	—
<i>Cisco MGX 8250 Edge Concentrator Overview, Release 1.1.3¹</i> DOC-7811576=	—	—	x	—	—	—	—	—	—
<i>Cisco MGX 8850 Multiservice Switch Overview, Release 1.1.3¹</i> OL-1154-01	—	—	—	x	—	—	—	—	—
Hardware Installation Guides									
<i>Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Hardware Installation Guide, Releases 2 Through 5</i> OL-4545-01	—	—	—	—	x	x	x	x	x
<i>Cisco Service Expansion Shelf Hardware Installation Guide, Release 1¹</i> DOC-786122=	x	—	—	—	—	—	—	—	—
Planning and Configuration Guides									
<i>Cisco PNNI Network Planning Guide for MGX and SES Products</i> OL-3847-01	x	—	—	—	x	x	x	x	x
<i>Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Configuration Guide, Release 5.1</i> OL-6482-01	—	—	—	—	x	x	x	x	x

Table 1 Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases) (continued)

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1
<i>Cisco WAN Manager Installation Guide, Release 15.1</i> OL-6259-01	x	x	x	x	x	x	x	x	x
<i>Cisco WAN Manager User's Guide, Release 15.1</i> OL-6257-01	x	x	x	x	x	x	x	x	x
<i>Cisco MGX 8850 Edge Concentrator Installation and Configuration, Release 1.1.3¹</i> DOC-7811223=	—	—	—	x	—	—	—	—	—
<i>Cisco SES PNNI Controller Software Configuration Guide, Release 3¹</i> DOC-7814258=	x	—	—	—	—	—	—	—	—
<i>Cisco MGX 8230 Edge Concentrator Installation and Configuration, Release 1.1.3¹</i> DOC-7811215=	—	x	—	—	—	—	—	—	—
<i>Cisco MGX 8250 Edge Concentrator Installation and Configuration, Release 1.1.3¹</i> DOC-7811217=	—	—	x	—	—	—	—	—	—
Service Module Configuration and Reference Guides									
<i>Cisco MGX Route Processor Module (RPM-PR) Installation and Configuration Guide, Release 2.1¹</i> 78-12510-02	—	x	x	x	—	—	—	—	—
<i>Cisco Frame Relay Software Configuration Guide and Command Reference for the Cisco MGX 8850 (PXM45) FRSM-12-T3E3 Card, Release 3¹</i> DOC-7810327=	—	—	—	—	—	—	x	—	—
<i>Cisco ATM Services (AUSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1²</i> OL-6479-01	—	2	2	2	x	x	x	—	—

Table 1 Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases) (continued)

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1
<i>Cisco Frame Relay Services (FRSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1²</i> OL-6480-01	—	2	2	2	x	x	x	—	—
<i>Cisco Circuit Emulation Services (CESM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1²</i> OL-6481-01	—	2	2	2	x	x	x	—	—
<i>Cisco MGX Route Processor Module (RPM-XF) Installation and Configuration Guide, Release 4¹</i> OL-5087-01	—	—	—	—	—	—	x	x	x
<i>Cisco ATM Services (AXSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6484-01	—	—	—	—	—	—	x	x	x
<i>Cisco ATM and Frame Relay Services (MPSM-T3E3-155) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6487-01	—	—	—	—	x	—	x	—	—
<i>Cisco Voice Switch Services (VXSM) Configuration Guide and Command Reference for MGX Switches and Media Gateways, Release 5.1</i> OL-4625-01	—	—	—	—	—	—	x	—	x
<i>Cisco Voice Interworking Services (VISM) Configuration Guide and Command Reference, Release 3.3</i> OL-5358-01	—	x	x	x	x	x	x	—	x
Reference Guides									
<i>Cisco MGX 8230 Multiservice Gateway Error Messages, Release 1.1.3¹</i> DOC-78112113=	—	x	—	—	—	—	—	—	—

Table 1 Technical Manuals and Release Notes for Cisco MGX and BPX Switches and Media Gateways (January 2005 Product Releases) (continued)

Document Title and Part Number	BPX with SES Rel. 4	MGX 8230 Rel. 1.3	MGX 8250 Rel. 1.3	MGX 8850 (PXM1) Rel. 1.3	MGX 8830 Rel. 5.1	MGX 8850 (PXM1E) Rel. 5.1	MGX 8850 (PXM45) Rel. 5.1	MGX 8950 Rel. 5.1	MGX 8880 Rel. 5.1
<i>Cisco MGX 8230 Multiservice Gateway Command Reference, Release 1.1.3¹</i> DOC-7811211=	—	x	—	—	—	—	—	—	—
<i>Cisco MGX 8250 Multiservice Gateway Command Reference, Release 1.1.3¹</i> DOC-7811212=	—	—	x	—	—	—	—	—	—
<i>Cisco MGX 8250 Multiservice Gateway Error Messages, Release 1.1.3¹</i> DOC-7811216=	—	—	x	—	—	—	—	—	—
<i>Cisco MGX 8800 Series Switch Command Reference, Release 1.1.3¹</i> DOC-7811210=	—	x	x	x	—	—	—	—	—
<i>Cisco MGX 8800 Series Switch System Error Messages, Release 1.1.3¹</i> DOC-7811240=	—	x	x	x	—	—	—	—	—
<i>Cisco SES PNNI Controller Command Reference, Release 3¹</i> DOC-7814260=	x	—	—	—	—	—	—	—	—
<i>Cisco MGX 8850 (PXM45/PXM1E), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Command Reference, Release 5.1</i> OL-6483-01	—	—	—	—	x	x	x	x	x
<i>Cisco WAN Manager SNMP Service Agent, Release 15.1</i> OL-6260-01	x	x	x	x	x	x	x	x	x
<i>Cisco WAN Manager Database Interface Guide, Release 15.1</i> OL-6261-01	x	x	x	x	x	x	x	x	x
<i>Cisco MGX and Service Expansion Shelf Error Messages, Release 5.1</i> OL-6485-01	x	—	—	—	x	x	x	x	x

1. This document was not updated for the January 2005 release.
2. Some configuration and command information is included in this book for using the multiprotocol service module (MPSM-8-T1E1/MPSM-16-T1E1) in a Cisco MGX 8230, MGX 8250, or MGX 8850 (PXM1) switch.

**Note**

For the January 2005 product release, there are no new features for the Service Expansion Shelf (SES) of the BPX switch and BPX WAN switching software. Therefore, documentation for these items was not updated. [Table 1](#) lists the most recent technical manuals and release notes for these products.

[Table 1](#) also lists the latest documentation available for the Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) switches. These switches use the PXM1 processor card. Although there are new features in MGX Release 1.3 for these switches, only the release notes were updated. And the following books contain some information about configuring the MPSM-8-T1E1 and MPSM-16-T1E1 cards for use in these switches:

- *Cisco Circuit Emulation Services (CESM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*
- *Cisco Frame Relay Services (FRSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*
- *Cisco ATM Services (AUSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1*

[Table 2](#) lists the documents that ship with product.

[Table 3](#) contains alphabetized titles and descriptions of all the manuals and release notes listed in [Table 1](#).

Table 2 Documents that Ship with Multiservice Switch Products

Document Title	Description
<i>Guide to Cisco Multiservice Switch and Media Gateway Documentation</i> DOC-7814807=	Describes how to find the manuals and release notes that support multiservice switches and network management products. These documents are available only online. This guide ships with product.
<i>Installation Warning Card</i> DOC-7812348=	Contains precautions that you should take before you insert a card into a slot. This Warning Card ships with product.
<i>Regulatory Compliance and Safety Information for Cisco Multiservice Switch and Media Gateway Products (MGX, BPX, and SES)</i> DOC-7814790=	Provides regulatory compliance information, product warnings, and safety recommendations for all the Cisco MGX multiservice switches: MGX 8230, MGX 8250, MGX 8850 (PXM1), MGX 8850 (PXM45), MGX 8850 (PXM1E), MGX 8830 and MGX 8950. Also provides such information for the MGX 8880 Media Gateway. This book ships with product.

Table 3 Descriptions of Technical Manuals and Release Notes for Cisco Multiservice Switch Products

Document Title	Description
<i>Cisco ATM and Frame Relay Services (MPSM-T3E3-155) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6487-01	Provides software configuration procedures for provisioning ATM and Frame Relay connections on the new MPSM-T3E3-155 multiprotocol service module. Also describes all MPSM-T3E3-155 commands.
<i>Cisco ATM Services (AUSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6479-01	Provides software configuration procedures for provisioning connections and managing the AUSM cards supported in this release. Also describes all AUSM commands. Includes software configuration procedures for provisioning connections and managing the MPSM-8-T1E1 card as an AUSM card replacement.
<i>Cisco ATM Services (AXSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-4548-01	Explains how to configure the AXSM cards and provides a command reference that describes the AXSM commands in detail. The AXSM cards covered in this manual are the AXSM-XG, AXSM/A, AXSM/B, AXSM-E, and AXSM-32-T1E1-E.
<i>Cisco Circuit Emulation Services (CESM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6481-01	Provides software configuration procedures for provisioning connections and managing the Circuit Emulation Service Module (CESM) cards supported in this release. Also describes all CESM commands. Includes software configuration procedures for provisioning connections and managing the MPSM-8-T1E1 card as a CESM card replacement.
<i>Cisco Frame Relay Services (FRSM/MPSM) Configuration Guide and Command Reference for MGX Switches, Release 5.1</i> OL-6480-01	Provides software configuration procedures for provisioning connections and managing the Frame Relay Service Module (FRSM) cards supported in this release. Also describes all FRSM commands. Includes software configuration procedures for provisioning connections and managing the MPSM-8-T1E1 card as an FRSM card replacement.
<i>Cisco MGX 8230 Edge Concentrator Installation and Configuration, Release 1.1.3</i> DOC-7811215=	Provides installation instructions for the Cisco MGX 8230 edge concentrator.
<i>Cisco MGX 8230 Edge Concentrator Overview, Release 1.1.3</i> DOC-7812899=	Describes the system components and function of the Cisco MGX 8250 edge concentrator.
<i>Cisco MGX 8230 Multiservice Gateway Command Reference, Release 1.1.3</i> DOC-7811211=	Provides detailed information on the general command line interface commands.
<i>Cisco MGX 8230 Multiservice Gateway Error Messages, Release 1.1.3</i> DOC-78112113=	Provides error message descriptions and recovery procedures.
<i>Cisco MGX 8250 Edge Concentrator Installation and Configuration, Release 1.1.3</i> DOC-7811217=	Provides installation instructions for the Cisco MGX 8250 edge concentrator.

Table 3 Descriptions of Technical Manuals and Release Notes for Cisco Multiservice Switch Products (continued)

Document Title	Description
<i>Cisco MGX 8250 Edge Concentrator Overview, Release 1.1.3</i> DOC-7811576=	Describes the system components and function of the Cisco MGX 8250 edge concentrator.
<i>Cisco MGX 8250 Multiservice Gateway Command Reference, Release 1.1.3</i> DOC-7811212=	Provides detailed information on the general command line interface commands.
<i>Cisco MGX 8250 Multiservice Gateway Error Messages, Release 1.1.3</i> DOC-7811216=	Provides error message descriptions and recovery procedures.
<i>Cisco MGX 8800 Series Switch Command Reference, Release 1.1.3</i> DOC-7811210=	Provides detailed information on the general command line for the Cisco MGX 8850 (PXM1), Cisco MGX 8250, and Cisco MGX 8230 edge concentrators.
<i>Cisco MGX 8800 Series Switch System Error Messages, Release 1.1.3</i> DOC-7811240=	Provides error message descriptions and recovery procedures for Cisco MGX 8850 (PXM1), Cisco MGX 8250, and Cisco MGX 8230 edge concentrators.
<i>Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Hardware Installation Guide, Releases 2 Through 5</i> OL-4545-01	Describes how to install the Cisco MGX 8950, the Cisco MGX 8850 (PXM1E/PXM45), the Cisco MGX 8850/B (PXM1E/PXM45), and the Cisco MGX 8830 switches. Also describes how to install the MGX 8880 Media Gateway. This document explains what each switch does and covers site preparation, grounding, safety, card installation, and cabling. The Cisco MGX 8850 switch uses either a PXM45 or a PXM1E controller card and provides support for both serial bus-based and cell bus-based service modules. The Cisco MGX 8830 switch uses a PXM1E controller card and supports cell bus-based service modules. The Cisco MGX 8950 supports only serial bus-based service modules. The Cisco MGX 8880 uses a PXM45/C controller card, and supports only serial bus-based service modules. <i>This hardware installation guide replaces all previous hardware guides for these switches.</i>
<i>Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Configuration Guide, Release 5.1</i> OL-6482-01	Describes how to configure the Cisco MGX 8880 Media Gateway. Also describes how to configure Cisco MGX 8850 (PXM1E), Cisco MGX 8850 (PXM45), the Cisco MGX 8850/B (PXM1E/PXM45), and Cisco MGX 8830 switches to operate as ATM edge switches and the Cisco MGX 8950 switch to operate as a core switch. This guide also provides some operation and maintenance procedures.
<i>Cisco MGX 8850 (PXM45/PXM1E), Cisco MGX 8950, Cisco MGX 8830, and Cisco MGX 8880 Command Reference, Release 5.1</i> OL-6483-01	Describes the PXM commands that are available in the CLI of the Cisco MGX 8850 (PXM45), Cisco MGX 8850 (PXM1E), Cisco MGX 8950, and Cisco MGX 8830 switches. Also describes the PXM commands that are available in the CLI of the Cisco MGX 8880 Media Gateway.

Table 3 Descriptions of Technical Manuals and Release Notes for Cisco Multiservice Switch Products (continued)

Document Title	Description
<i>Cisco MGX 8850 Edge Concentrator Installation and Configuration, Release 1.1.3</i> DOC-7811223=	Provides installation instructions for the Cisco MGX 8850 (PXM1) edge concentrator.
<i>Cisco MGX 8850 Multiservice Switch Overview, Release 1.1.3</i> OL-1154-01	Describes the system components and function of the Cisco MGX 8850 (PXM1) edge concentrator.
<i>Cisco MGX and Service Expansion Shelf Error Messages, Release 5.1</i> OL-6485-01	Provides error message descriptions and recovery procedures.
<i>Cisco MGX Route Processor Module (RPM-XF) Installation and Configuration Guide, Release 4</i> OL-6954-01	Describes how to install and configure the Cisco MGX Route Processor Module (RPM-XF) in the Cisco MGX 8850 (PXM45), Cisco MGX 8880 (PXM45), and Cisco MGX 8950 switch. Also provides site preparation procedures, troubleshooting procedures, maintenance procedures, cable and connector specifications, and basic Cisco IOS configuration information.
<i>Cisco MGX Route Processor Module (RPM-PR) Installation and Configuration Guide, Release 2.1</i> 78-12510-02	Describes how to install and configure the Cisco MGX Route Processor Module (RPM/B or RPM-PR) in the Cisco MGX 8850 (PXM1), the Cisco MGX 8250, and the Cisco MGX 8230 edge concentrators. Also provides site preparation procedures, troubleshooting procedures, maintenance procedures, cable and connector specifications, and basic Cisco IOS configuration information.
<i>Cisco PNNI Network Planning Guide for MGX and SES Products</i> OL-3847-01	Provides guidelines for planning a PNNI network that uses Cisco MGX 8830, Cisco MGX 8850 (PXM45 and PXM1E), Cisco MGX 8950, or Cisco BPX 8600 switches or the MGX 8880 Media Gateway. When connected to a PNNI network, each Cisco BPX 8600 Series switch requires an SES for PNNI route processing.
<i>Cisco Service Expansion Shelf Hardware Installation Guide, Release 1</i> DOC-786122=	Provides instructions for installing and maintaining an SES controller.
<i>Cisco SES PNNI Controller Command Reference, Release 3</i> DOC-7814260=	Describes the commands used to configure and operate the SES PNNI controller.
<i>Cisco SES PNNI Controller Software Configuration Guide, Release 3</i> DOC-7814258=	Describes how to configure, operate, and maintain the SES PNNI controller.
<i>Cisco Voice Interworking Services (VISM) Configuration Guide and Command Reference, Release 3.3</i> OL-5358-01	Describes how to install and configure the Voice Interworking Service Module (VISM) in the Cisco MGX 8830, Cisco MGX 8850 (PXM45), and Cisco MGX 8850 (PXM1E) multiservice switches. Provides site preparation procedures, troubleshooting procedures, maintenance procedures, cable and connector specifications, and Cisco CLI configuration information.

Table 3 Descriptions of Technical Manuals and Release Notes for Cisco Multiservice Switch Products (continued)

Document Title	Description
<i>Cisco Voice Switch Services (VXSM) Configuration and Command Reference Guide for MGX Switches, Release 5.1</i> OL-4625-01	Describes the features and functions of the new Voice Switch Service Module (VXSM) in the Cisco MGX 8880 Media Gateway and in the Cisco MGX8850 (PXM45 and PXM1E) multiservice switches. Also provides configuration procedures, troubleshooting procedures, and Cisco CLI configuration information.
<i>Cisco WAN Manager Database Interface Guide, Release 15.1</i> OL-6261-01	Provides information about accessing the CWM Informix database that is used to store information about the network elements.
<i>Cisco WAN Manager Installation Guide, Release 15.1</i> OL-6259-01	Provides procedures for installing Release 15.1 of the CWM network management system.
<i>Cisco WAN Manager SNMP Service Agent, Release 15.1</i> OL-6260-01	Provides information about the CWM Simple Network Management Protocol service agent, an optional adjunct to CWM that is used for managing Cisco WAN switches through SNMP.
<i>Cisco WAN Manager User's Guide, Release 15.1</i> OL-6257-01	Describes how to use the CWM Release 15.1 software, which consists of user applications and tools for network management, connection management, network configuration, statistics collection, and security management. Note The CWM interface now has built-in documentation support in the form of online Help. On a PC, press F1 to access Help; on a UNIX workstation, press the Help key. Alternatively, on either system you can select Help from the main or popup menu.
<i>Cisco Frame Relay Software Configuration Guide and Command Reference for the Cisco MGX 8850 (PXM45) FRSM-12-T3E3 Card, Release 3</i> DOC-7810327=	Describes how to use the high-speed Frame Relay (FRSM-12-T3E3) commands that are available in the CLI of the Cisco MGX 8850 (PXM45) switch.
<i>Release Notes for Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 (PXM1) Switches, Release 1.3.10</i> OL-4539-01	Provides new feature, upgrade, and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for Cisco MGX 8850 (PXM1E/PXM45), Cisco MGX 8950, and Cisco MGX 8830 Switches, Release 5.1.00</i> OL-6478-01	Provides new feature, upgrade, and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for the Cisco MGX 8880 Media Gateway, Release 5.1.00</i> OL-6493-01	Provides new feature and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for Cisco MGX Route Processor Module (RPM-PR) IOS Release 12.3(7)T3 for MGX Releases 1.3.10 and 5.0.10</i> OL-7058-01	Provides upgrade and compatibility information, as well as information about known and resolved anomalies.

Table 3 Descriptions of Technical Manuals and Release Notes for Cisco Multiservice Switch Products (continued)

Document Title	Description
<i>Release Notes for Cisco MGX Route Processor Module (RPM-XF) IOS Release 12.3(2)T5 for PXM45-based Switches, Release 5.1.00</i> OL-7059-01	Provides upgrade and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for the Cisco Voice Interworking Service Module (VISM), Release 3.3.00</i> OL-5357-01	Provides new feature, upgrade, and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for the Cisco Voice Switch Service Module (VXSM), Release 5.1.00</i> OL-6224-01	Provides new feature, upgrade, and compatibility information, as well as information about known and resolved anomalies.
<i>Release Notes for Cisco WAN Manager, Release 15.1.00</i> OL-6495-01	Provides new feature, upgrade, and compatibility information, as well as information about known and resolved anomalies.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation DVD

Cisco documentation and additional literature are available in a Documentation DVD package, which may have shipped with your product. The Documentation DVD is updated regularly and may be more current than printed documentation. The Documentation DVD package is available as a single unit.

Registered Cisco.com users (Cisco direct customers) can order a Cisco Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

Cisco Marketplace:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:
<http://www.cisco.com/en/US/partner/ordering/>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can send comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com
- Nonemergencies—psirt@cisco.com



Tip

We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list:

<http://pgp.mit.edu:11371/pks/lookup?search=psirt%40cisco.com&op=index&exact=on>

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

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>



Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID

or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

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 provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is 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.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

<http://www.cisco.com/ipj>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>