System Overview

Introduction

The Cisco MGX 8230 Edge Concentrator provides a gateway for narrowband services in space and power limited situations. The MGX 8230 acts as a standalone gateway or as a feeder for the Cisco IGX 8400 and Cisco BPX 8600 Series Multiservice Switches. The MGX 8230 offers a full range of narrowband service interfaces and a switching capacity up to 1.2 Gbps.

The MGX 8230 delivers Frame Relay, Circuit Emulation (CE), ATM cell relay service, IP VPNs (VoIP, VoATM) and voice at high volume and with high scalability—from DS0 to OC-12C/STM-4 speeds. The MGX 8230 chassis accommodates narrowband interfaces from DS0 with port density scaling to more than 1000 DS1s of service interfaces.

The MGX 8230 supports both Layer 2 and Layer 3 services.

Services include

- IP VPNs using Cisco IOS software-based MPLS/label switching

- Voice-over-IP and voice-over-ATM

- Frame Relay services

- High-density Point-to-Point Protocol (PPP) for Internet access and aggregation

- Narrowband ATM for managed data, voice, and video services

- Circuit Emulation (CE) for private line replacement

The MGX 8230 platform can also support a wide range of services over narrowband and mid-band user interfaces, mapping all the service traffic to and from ATM, based upon standardized interworking methods.

The MGX 8230 switches support up to 64 channelized or unchannelized T1 and E1 interfaces on a single switch, providing support for Frame Relay UNI and NNI; ATM UNI, NNI, and FUNI, Frame Relay-to-ATM network interworking; and Frame Relay-to-ATM service interworking. Using the Service Resource Module (SRM), multiple T1 interfaces can be supported on physical T3 lines. Frame-based services on T3 and E3 high-speed lines are also supported. The MGX 8230 switches also support the use of Inverse Multiplexing for ATM (IMA) to provide ATM trunking below T3/E3.

The MGX 8230 can be either rack mounted in a 19-inch rack, or fitted with side panels to be a free-standing box. An optional mounting bracket kit is available for mounting in 23-inch racks.

MGX 8230 Example Applications

The MGX 8230 switch is a multiservice, carrier-class platform that aggregates IP, Frame Relay, ATM, voice, and private lines at the edge of the network. This section contains information on the following applications:
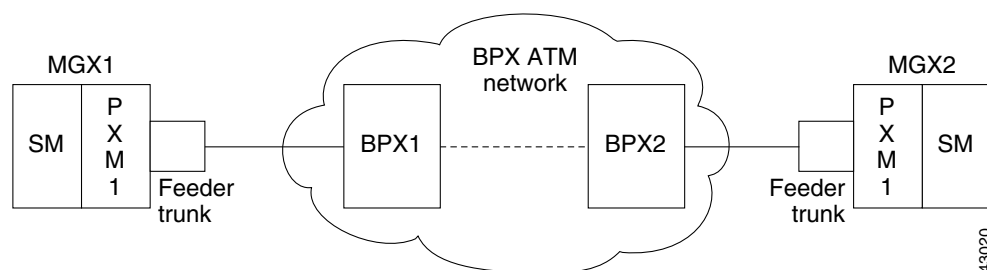
Feeder to BPX Networks

The MGX 8230 supports the networking protocols required to integrate into an existing BPX network, so an MGX 8230 switch can be deployed as a feeder of a BPX 8600 series service node.

By enabling deployment of multiple services on a single platform, this capability allows carriers to customize deployments across diverse point-of-presence (PoP) while maintaining common inventory and operations support.

Configuring as a feeder to BPX networks (see Figure 1-1) has several enhancements:

- In addition to the T3/E3 and OC-3Cc/STM-feeder trunking options, the MGX 8230 also supports an OC-12c/STM-4 feeder trunk to the BPX 8600 for greater aggregate capacity for traffic, which can be fed to the BPX 8600 core switching shelf.

- The MGX 8230 supports local switching between port. This allows MGX 8230 feeders to be situated remotely from the BPX and perform local switching without consuming either bandwidth on the feeder trunk or BPX connection counts.

- The MGX 8230 supports SONET/SDH 1+1 automatic protection switching (APS) on both the OC-3c/STM-1 and OC-12c/STM-4 interfaces. With APS, the feeder trunk is also protected against fiber cuts with 50 ms switchovers. This is particularly important for remote feeder applications.

Figure 1-1   MGX 8230 (PXM1) as a Feeder to the BPX Backbone Networks

Multiservice Standalone Switch

The MGX 8230 can be deployed as a stand-alone switch, providing "cross-connect" connections between UNI and NNI ports. Traditionally, this would be used in a concentration-type mode, allowing standards-based adaptation and concentration of multiservice traffic onto one or more high-speed ATM interfaces. This enables the MGX 8230 to interface to a multivendor ATM network, or to any other ATM attached device (such as a Cisco 7200 or GSR router LS1010, MSR 8450, and so on).

The MGX 8230 interfaces to the ATM equipment using a standard ATM UNI or NNI.
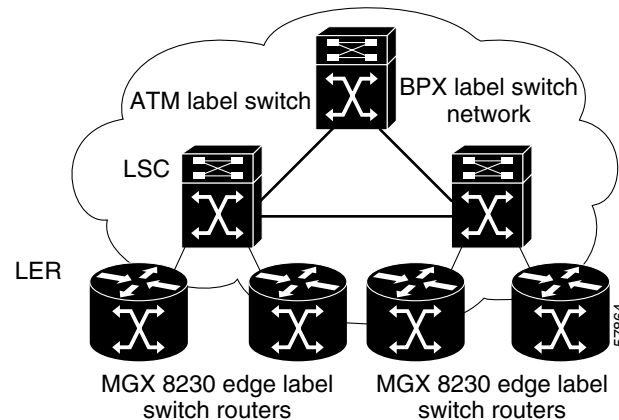
Multiprotocol Label Switching

The MGX 8230 is well suited as an edge device in an Multiprotocol Label Switching (MPLS) network. The MGX 8230 can act as an edge label switch router for support of IP traffic. At the same time, the MGX 8230 can also support Layer 2 services as a BPX feeder or as a multiservice stand-alone switch.

As a component of the BPX 8680-IP universal service node, the MGX 8230 is capable of forwarding traffic into the BPX MPLS network by acting as a multiservice feeder and supporting up to 12 edge label switch routers in a single chassis.
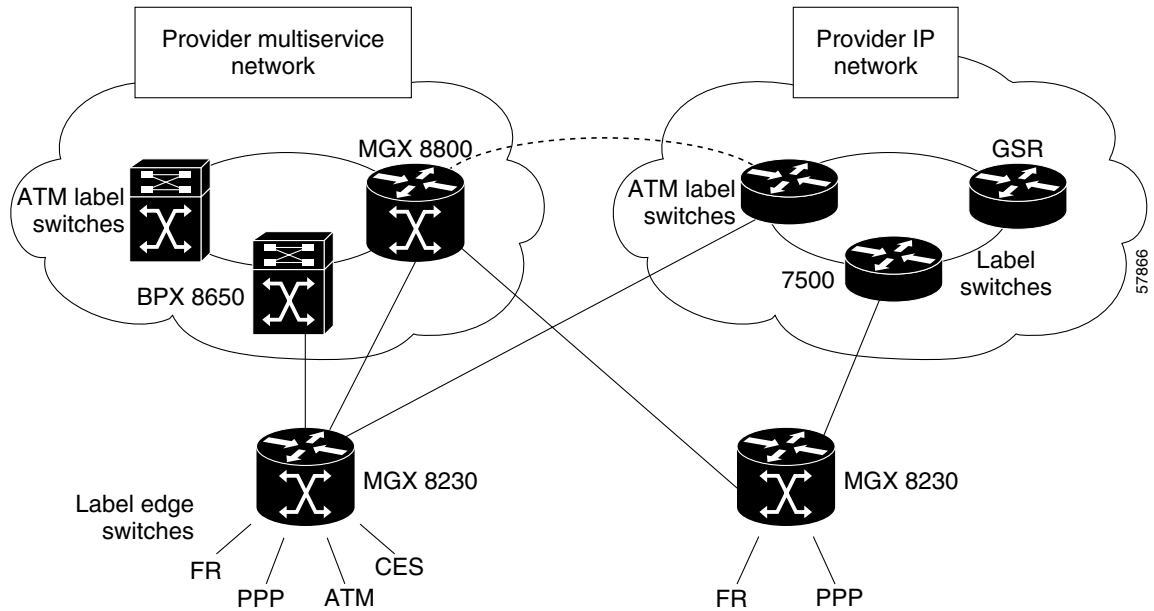
The MGX 8230 can also be used to aggregate and separate the IP traffic onto a pure IP backbone, distinct from the ATM backbone it uses for Layer 2 services.

Figure 1-2   MGX 8230 Label Edge Routing

As a label switch or alabel edge router, the MGX 8230 can interface to a multiservice IP+ATM network consisting of BPX and/or MGX 8230 label switches. The MGX 8230 can also interface to a pure IP backbone such as the one depicted in Figure 1-3.
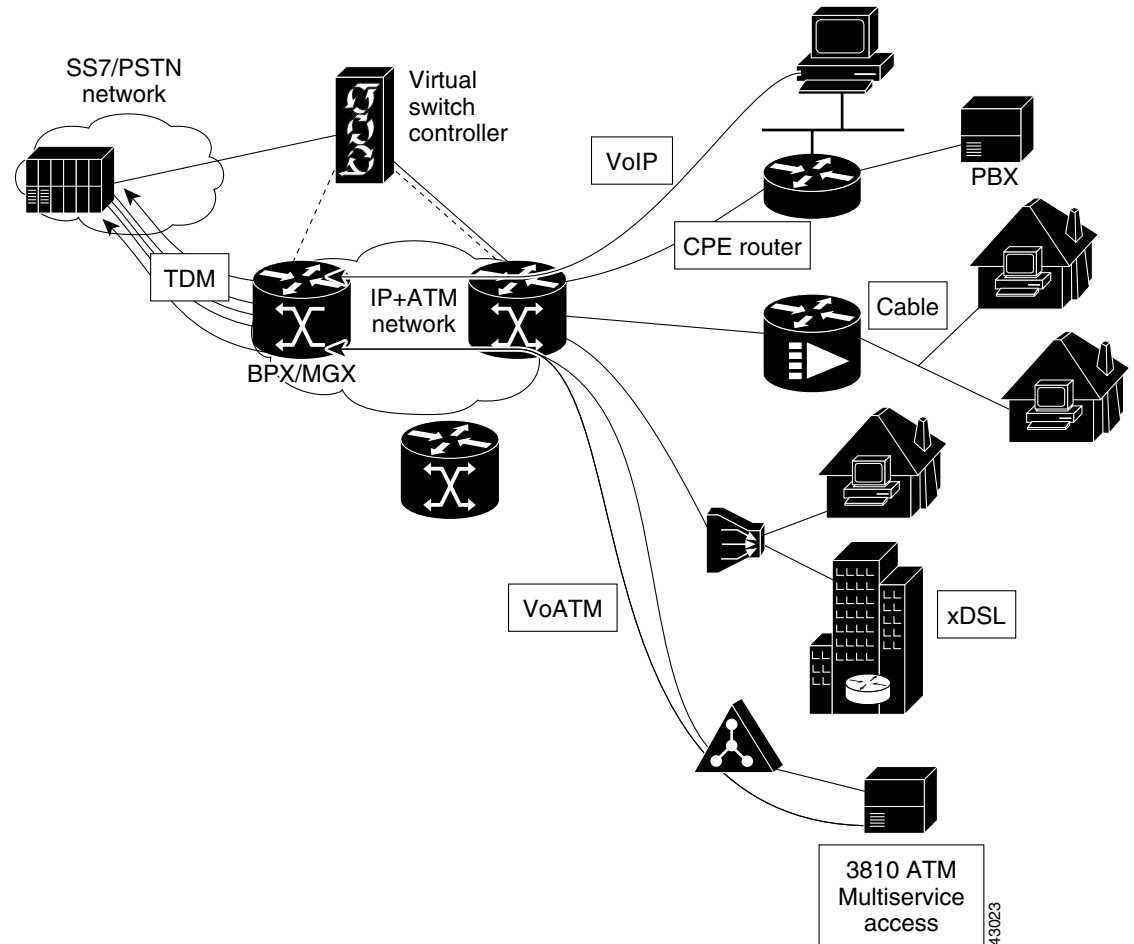
Figure 1-3   MGX 8230 Edge Switch Multiservice Label Feeder Evolution

Consolidation of Cisco CPE Traffic

At the edge of the network, the MGX 8230 can interwork with and consolidate a wide variety of CPE equipment (see Figure 1-4) – ATM, FR, and voice (both Cisco and multivendor).
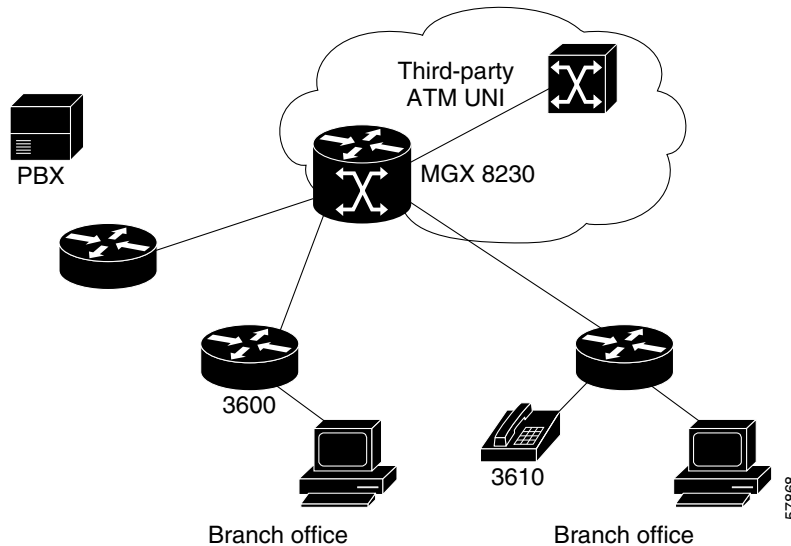
Figure 1-4   Consolidation of CPE Services

Multiservice Stand-alone Concentrator

The MGX 8230 can be deployed as a stand-alone concentrator, interfacing to a multivendor ATM (non-BPX) network, as shown Figure 1-5. The MGX 8230 interfaces to ATM equipment using a standard ATM UNI or NNI.

Figure 1-5   MGX 8230 Edge Switch as a Stand-alone Concentrator

The MGX 8230 supports ATM UNI and NNI service for PVCs. The switch can be deployed in scenarios where other ATM equipment has already been deployed and where an MGX 8230 switch can provide a front end as a multiservice concentration device.

The ATM UNI port can be supported at the PXM uplink to eliminate the need to use a separate card for ATM trunking. In addition, the MGX 8230 supports local switching between service modules and PXM ports.