

Ethernet IP Transport with Multiservice System Control

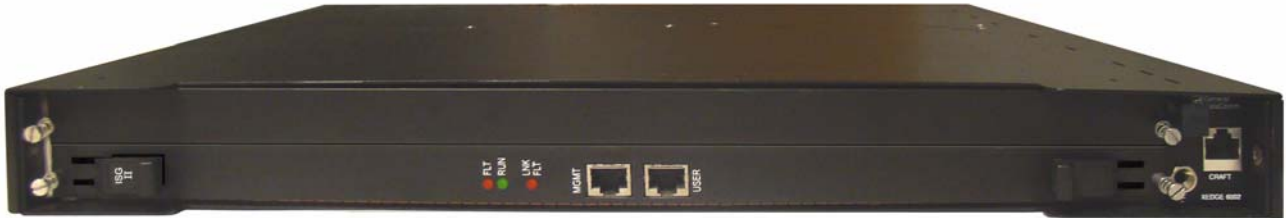


Figure 1: Xedge IP Services Gateway

INTRODUCTION

A major challenge for planners of multiservice wide area networks (WANs) is the efficient deployment of resources to accommodate network traffic and connectivity growth while maintaining service guarantees in bandwidth-constrained environments. But the burgeoning demand for Ethernet connectivity across the WAN can add unwelcome stress to centralized router resources.

Planners must target agreed service levels for IP flows transported over a multi-protocol and multiservice switching environment as geographically dispersed network endpoints (branch offices, schools, remote industrial operations, government agencies, etc.) compete for access to information resources. As a matter of course, planners need efficient means of connecting subnets to the WAN without sacrificing service quality or incurring prohibitive costs for service performance guarantees.

The Xedge ISG2 Solution

The Xedge IP Services Gateway ISG2 provides cost-effective and reliable means of transporting IP flows across wide-area networks. ISG2 offers network managers and operators a flexible tool to successfully design, build out and future-proof multiservice WAN applications.

Xedge Reliability & Scalability

The Xedge ISG2 is designed to perform consistently across the Xedge platform. The ISG2 plugs into a single slot of Xedge 6000 AC- or DC-powered shelves: Xedge 6002 (2 slots), Xedge 6160 (4 slots), Xedge 6280 (7 slots) and the 16-slot Xedge 6640/6645 shelves.

FEATURE HIGHLIGHTS

- Lowers costs of branch/remote IP access-to-centralized routing resources
- OSPF, RIP2 Routing, and deterministic static routing
- Guarantees quality of service by routing IP traffic across Xedge networks based on destination IP address and IP classification
- Reliably extends IP connectivity and services on converged networks that transport voice, multimedia, and low-speed data applications that require explicit service quality
- Traffic shaping; IP QoS
- Supports Secure Shell (SSH)
- Provides two physical Ethernet ports
- Supports up to 128 Ethernet or IP tunnels
- Supports up to eight bridges
- Establishes a resilient architectural foundation for future applications and features
- Provides standard-based SNMP management interface for Xedge switches (SNMP V1 and SNMP V3)
- Secure configuration and management via standards-based SNMP or MIB editor over Telnet/craft connection, or the ProSphere Network Management System.

Figure 1 shows Xedge ISG2 deployed in the compact Xedge 6002 chassis.

ISG2 Routing

The Xedge IP Services Gateway determines routes across the Xedge6000 network based on IP destination addresses. ISG2 builds layer-3 tunnels across the Xedge cloud to other ISG2s and other selected layer-3 devices, such as centralized router resources and external routers connected to the network via MPLS or ATM interfaces.

Xedge tunnels between ISG2s may be established by using non-deterministic OSPF or RIP2 routes, or deterministic MPLS or ATM routes, or by selecting a specific ISG2 tunnel as a local site's default gateway. ISG2 can be configured to operate with its sophisticated auto re-route feature, or with variations on limited and restricted re-routing, depending on end-user requirements.

Ethernet Bridging

The Xedge ISG2 supports Ethernet Bridging. Up to eight Ethernet bridges can be established using a single ISG2 module. The ISG2 can be used as a data module in any slot of the Xedge chassis.

Diagnostics

The Xedge ISG2 is part of GDC's Xedge6000 family of products. All Xedge slot controllers support standard network diagnostics. The system administrator can collect ISG2 configuration, status and operation information for informed maintenance and troubleshooting.

Secure & Flexible Management

Xedge ISG2 is securely configured and monitored via SNMP or the GDC ProSphere NMS. Both SNMP V1 and SNMP V3 are supported.

The SNMP interface provides password-protected access to the Xedge ISG2 via a craft or Telnet connection. Menu-

based SNMP utilizes both standard MIBS and GDC's proprietary MIBs that define the management data available from the Xedge ISG2 and other co-located network elements installed in the Xedge chassis.

ProSphere Network Management System (NMS) is GDC's Java-based management software that allows multiple clients to access a ProSphere Server located on a remote PC or SUN workstation. ProSphere facilitates the configuration and monitoring of users, communications and Xedge devices via an intuitive graphical user interface.

Reliable & Scalable Packaging

Xedge ISG2 is a modular, single-slot controller designed to perform consistently across the Xedge6000 hardware/software platform. This seamless integration enables simplified, scalable and cost-effective network maintenance, sparing and operation. Xedge ISG2 plugs into one front slot of an AC- or DC-powered Xedge6000 chassis.

At central sites, the ISG2 can be installed in higher density Xedge chassis that can accommodate up to 16 Xedge slot controller modules. The interoperable Xedge family of multiservice devices support high-speed Ethernet, IP Voice, Video and legacy TDM/ATM, enabling operators to migrate legacy services over a secure, resilient Ethernet, MPLS or ATM backbone. In conjunction with other Xedge6000 modules, the ISG2 can be a cost-effective solution to common applications problems.

Example Applications

Compact, low-cost Xedge ISG2 can be used in a variety of applications for the efficient transport of voice, video, and data.

Figure 2 shows Xedge ISG2 solutions in three example applications:

Voice over IP (VoIP) and Traditional Telephony

Xedge ISG2 enables packet voice in conjunction with traditional telephony devices. By combining the packet voice features of the companion Xedge6000 Voice Service module with the ISG2 packet engine, customers can achieve a very cost effective migration to packet voice without sacrificing quality, reliability, and valuable existing infrastructure.

IP Video Applications

The Xedge ISG2 employs traffic shaping IP QoS to support the multi-faceted IP video applications that are in demand today, such as IP video for conferencing, surveillance and live video feeds.

Low-cost IP/ATM SCADA Transport

Compact, 1RU Xedge ISG2 can serve as low-cost IP transport between existing ATM infrastructure and IP-enabled devices, such as those found in Supervisory Control and Data Acquisition (SCADA) networks.

Xedge ISG2

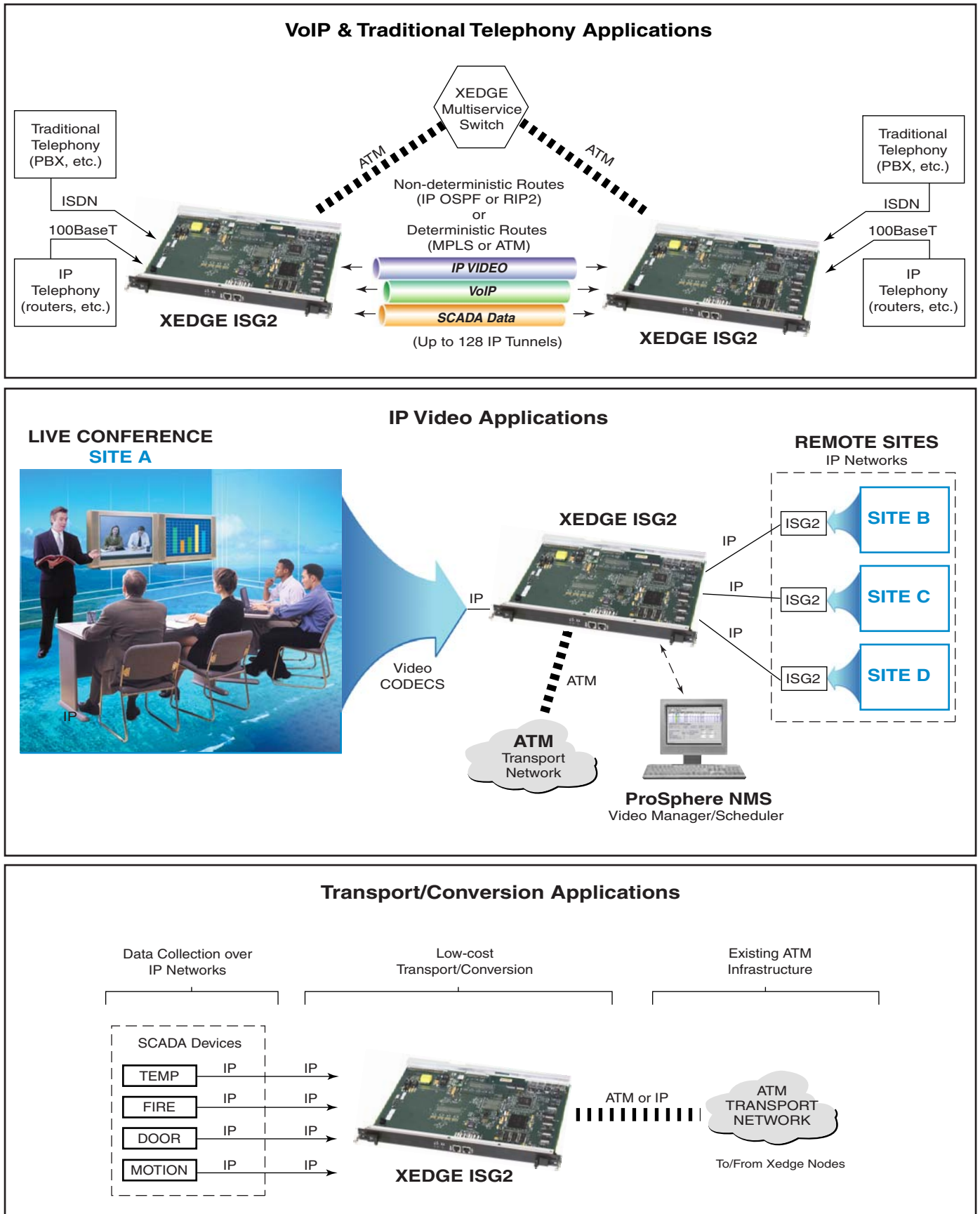


Figure 2: Examples of Xedge ISG2 Applications

Physical Specifications

Xedge ISG2 Slot Controller Module Only

(Horizontally Installed)

Single-slot Height: 20.32 mm (0.8 in.)

Width: 395.73 mm (15.58 in.)

Depth: 233.68 mm (9.2 in.)

Weight: 0.79 kg (1.75 lbs.)

Xedge ISG2 in Xedge 6002 Chassis

Width: 482.61 mm (19.0 in.)

Height: 40.38 mm (1.59 in.)

Depth: 482.6 mm (19.0 in.)

Weight: TBD

Environmental Specifications

Non-Operating

Temperature: -40 to 70 degrees C (-40 to 158 degrees F)

Relative Humidity: Up to 95%

Altitude: up to 12,191 m (40,000 ft)

Operating

Temperature: 0 to 50 degrees C (32 to 122 degrees F)

Relative Humidity: Up to 95% non-condensing

Altitude: -60 to 4,0000 m (-197 to 13,123 ft)

Electrical Specifications

Power Consumption: 19.5 Watts, max.

Other power specifications dependent on Xedge Chassis used.

Functional Specifications

Physical Interfaces: RJ-45, 10base-T, 100base-TX, Auto-negotiated

Operating Mode: Half or Full Duplex, Auto-negotiated

Data Rates: 10Mbps, 100Mbps

Encapsulation: VC Multiplexing per RFC 2684; RFC 1483

Port Capacity: 2 Interfaces (1 User Port, 1 Management Port)

IP Protocols: OSPF and RIP2

Diagnostics: Status monitoring

Status LEDs: Fault (red LED); Run (green LED)

Alarms and Performance Monitoring: Loss of Signal

Conforms to RFC 1884 IPV6 addressing schemes

Routing Operation

Up to 128 IP tunnels per IP Services Gateway module

Dynamic OSPF, RIP2, and deterministic static routes

Configurable and reliable auto re-route

Management Interfaces

SNMP Manager, Telnet, or local craft port via ASCII terminal

Internal SNMP agent supports: Standard MIBs:RFC 1156 (MIB I), RFC 1213 (MIB II), Enterprise-specific MIBs for Xedge6000 devices

GDC ProSphere Network Management System

Housing Options

Xedge 6645 Switch Chassis (16 I/O slots, DC Power)

Xedge 6640 Switch Chassis (16 I/O slots, AC Power)

Xedge 6280 Switch Chassis (7 I/O slots, AC or DC Power)

Xedge 6160 Switch Chassis (4 I/O slots, AC or DC Power)

Xedge 6002 Switch Chassis (2 I/O slots, AC or DC Power)

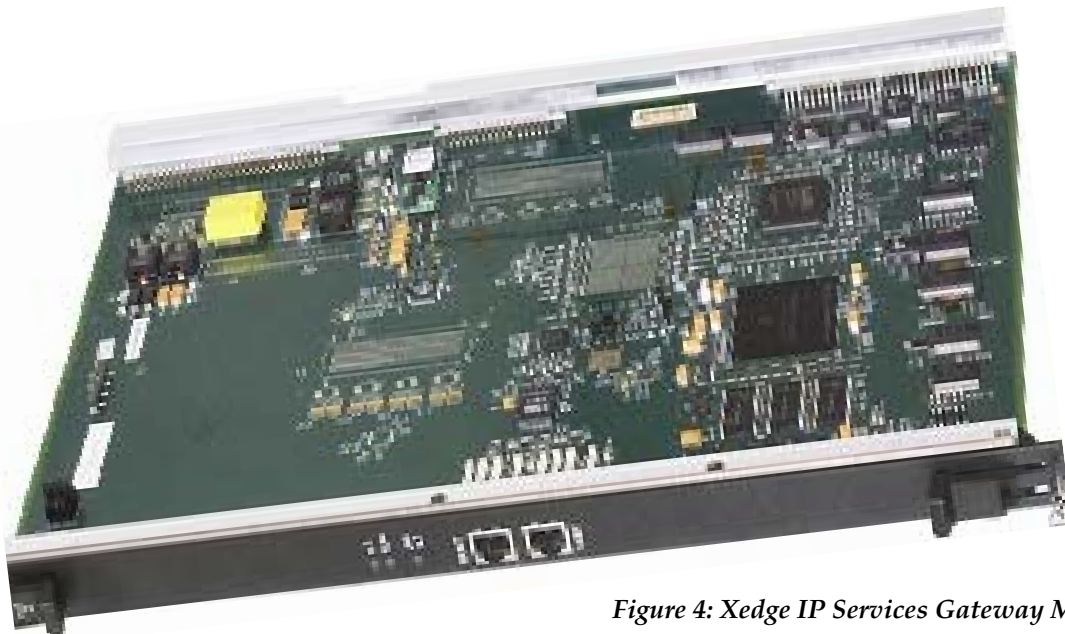


Figure 4: Xedge IP Services Gateway Module