Cost-effective Frame Relay solution

IBM 2219 Nways Frame Relay Switch Model 250

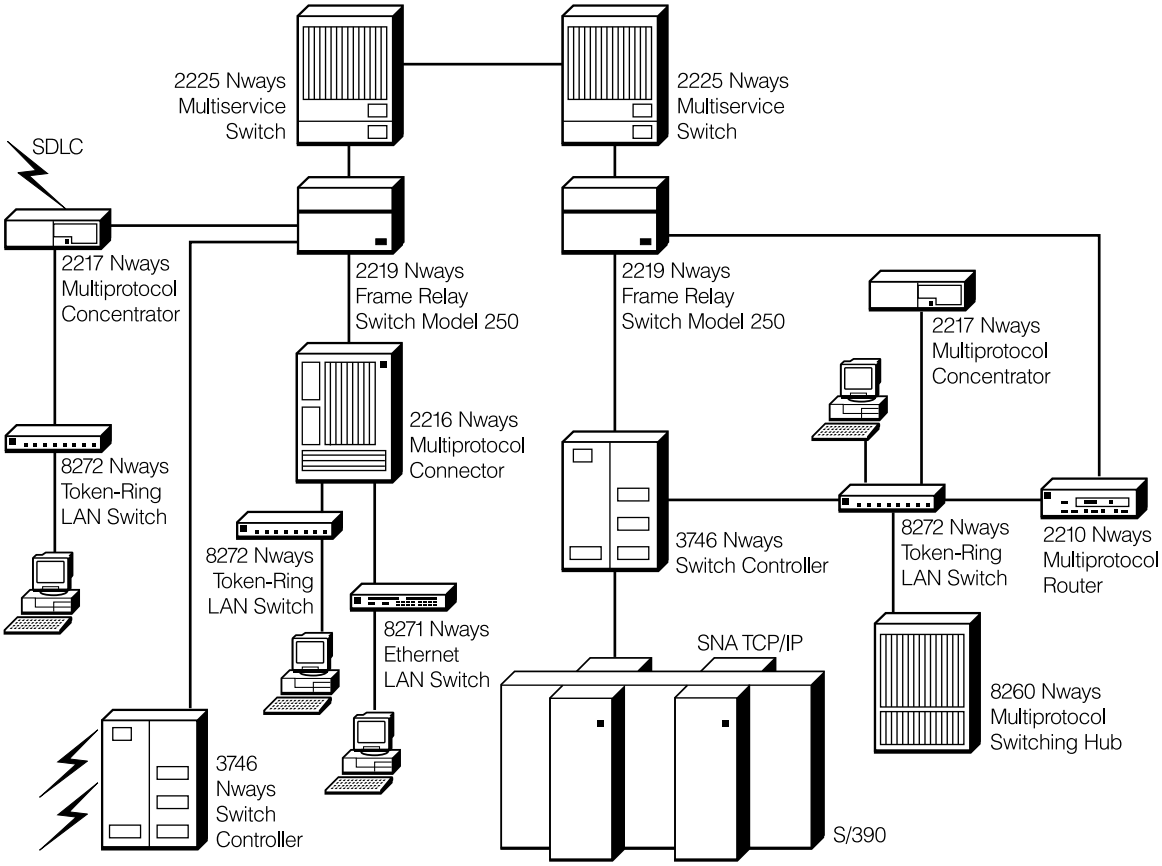
Highlights

- ***Provides a Frame Relay interface from existing networks to the WAN***
- ***Eases expansion through modular design***
- ***Allows any port to be a user or trunk interface for flexibility***
- ***Minimizes upgrade and repair time with hot-swapping and live insertion of all cards***
- ***Simplifies operations with automatic OSPF re-routing and load balancing***
- ***Fully manageable using SNMP***
- ***Eases software upgrade and management with remote software download***
- ***Controls congestion through avoidance, recovery and rate monitoring***
- ***Provides Frame Relay permanent virtual circuit (PVC)***
- ***Allows Frame Relay port flexibility with DTE, DCE and NNI interfaces***
- ***Supports hybrid, private and public Frame Relay networking***
- ***Supports Frame Relay rate-monitoring and enforcement functions***
- ***Assigns priorities to individual virtual circuit traffic***

Linking existing networks to WANs

Networks often evolve over time to support new applications rather than according to a master plan. As a result it's not unusual for a single facility to have multiple networks, such as router networks, bridged networks, SNA networks and X.25 networks, each incurring its own line charge. At the same time public network carriers charging for those lines are extending their services from their core backbone to central offices that are closer to their customers for greater flexibility, cost-effectiveness and manageability. Broadband packet technologies have emerged as the solution for connecting these multiple





networks with a common infrastructure, allowing you to build regional to international public networks as well as private enterprise networks for transmission of that data.

The 2219 Nways™ Frame Relay Switch Model 250 can help you make the transition from existing networks to a common infrastructure by linking the existing networks to either public carrier-provided or privately managed WANs. It is a fully featured, high-performance and cost-effective platform for building today's Frame Relay networks.

Product description

The 2219 Model 250 is a six-slot, modular Frame Relay switch platform with interface modules to suit the particular needs of the user. The Packet Processor uses one slot, with the remainder of the slots available for I/O modules.

A RISC processor powers the Packet Processor module for high-performance packet-switching. The switch uses the industry-standard OSPF routing protocol as the basis for Frame Relay virtual circuit routing.

The symmetrical architecture gives any port on the module the flexibility to act as a user port, a network port or an interswitch trunk.

Numerous reliability features have been designed into the switch, such as live insertion and hot-swapping of all modules including I/O modules, power supplies and fan modules. It has redundant fans and optionally redundant power supplies. These systems can be configured in a hot standby mode to maximize network uptime.

Software installations, network reconfigurations and upgrades can be loaded locally or remotely from a network management station (NMS) to flash memory. Flash memory increases reliability by minimizing moving parts, ensures consistent software revision distribution and keeps upgrade costs low.

The software base delivers sophisticated, standards-based capabilities for managing and controlling WANs while integrating easily with existing network management systems. The application component supports a native SNMP agent that accesses the Enterprise MIB. The network management capabilities include: standards-based OSPF, Frame Relay virtual circuit, rate-monitoring, sophisticated congestion management and usage statistics generation.

The switch allows for in-band management via an Ethernet port directly connected, through an IP network connected via Frame Relay, and out-of-band management via an EIA 232 port. The EIA 232 port supports a terminal interface for local configuration control or remote management access via a dial modem.

Frame Relay connectivity

I/O modules can act as DCE or DTE at transmission rates of 2.4 Kbps to 4.096 Mbps, providing comprehensive Frame Relay PVC functions such as: Frame Relay feeder interface (UNI-DTE), Frame Relay switch interface (UNI-DCE), Frame Relay network-to-network interface (NNI), leased-line trunk or interswitch trunk over a public Frame Relay service. If the incoming traffic is a protocol such as X.25 or SNA/SDLC, which are not Frame Relay, the switch encapsulates the data links into Frame Relay format (FRAD). Included is the unique Translation FRAD function that converts protocols such as PPP and encapsulated protocols (such as IP, IPX and transparent bridging) to Frame Relay standards based on the Frame Relay Forum's implementation agreement for multiprotocol encapsulation over Frame Relay. The Encapsulation FRAD and Translation FRAD functions provide consolidation of all WAN data traffic carried on a single broadband packet backbone.

The system supports the most robust set of Frame Relay rate-monitoring and enforcement functions, including:

- Committed Information Rate (CIR)
- Committed Burst Size (Bc) and Excess Burst Size (Be) rate-monitoring
- Congestion avoidance through Forward Explicit Congestion Notification (FECN) and Backward Explicit Congestion Notification (BECN)
- Congestion recovery mechanisms according to ANSI and ITU standards

The network operator also has the option to pass Excess Burst Rate packets through the network to optimize the use of available bandwidth.

I/O modules

A variety of I/O modules accommodate numerous interface specifications, speeds and protocols.

Both the Packet Processor and the I/O modules utilize passive I/O adapters that allow any failed I/O module, power supply or fan module to be removed under power without disconnecting cables. This results in low mean time to repair (MTTR) for Nways switches.

IBM 2219 NWAYS Frame Relay Switch Model 250 at a glance

Interface specifications	• ITU V.35 (ISO 2593) 34-pin • E1G.703 coaxial 75-ohm unbalanced DB-15 connector or G.703 symmetrical pair 120-ohm balanced DB-15 connector • EIA-449 ITU V.36 (ISO 4902) 37-pin D sub, ITU X.21 15-pin D sub • ISO 2110 V.24 25-pin female connector • ISO 4903 X.21 15-pin female connector • T1 per ATT TR 62411 Accunet 1.5 Service Description and Interface Specification
Performance	800-Mbps backplane 12-Mbps, full-duplex throughput 24 000 packets per second throughput
Physical specifications	Width: 444.5 mm (17.5 in.) Depth: 286 mm (11.25 in) Height: 222 mm (8.74 in.) Weight: 23 kg (50.7 lb)
Rack-mounting options	EIA 19-inch rear-, mid- or front-mount or 23-inch central office style option
Power requirements	120/230 V ac or -48 V dc 3 amps at 120 V ac
Thermal dissipation	300 watts maximum
Operating environment	Operating temperature: 0°–49°C (32°–120°F) Relative humidity: 10%–80% (non-condensing)

I/O Modules	**Port Speed**	**Frame Relay**
Channelized T1/E1	24 or 30 56/64-Kbps channels	Yes
6 Port V.35	Up to 4 Mbps	Yes
8/18 Port V.24/X.21 Universal I/O	2.4 to 128 Kbps	Yes

Network standard protocols supported

- ANSI T1.606 (and the corresponding ITU 1.233) Frame Relay Architectural Framework
- ANSI T1.606 Addendum 1 (and the corresponding ITU 1.370) for congestion management
- ANSI T1.617/Annex D (and the corresponding ITU Q.933/Annex A) for Local Management Interface (LMI) processing
- Local Management Interface (LMI) Revision 1
- ANSI T1.618 (and the corresponding ITU Q.922) Core Aspects of Frame Protocol for Frame Relay Service
- ITU 1.365.1 Frame Relay Service Specific Convergence Sublayer (FR-SSCS)
- ITU 1.555 Frame Relay Bearer Service Interworking Specifications
- Frame Relay Forum Frame Relay PVC
- Multicast Service (FRF.7)
- Frame Relay Forum Multiprotocol Encapsulation over Frame Relay Implementation Agreements
- Frame Relay Forum UNI (FRI.1)
- Network-to-Network Interface (NNI) (FRI.2) Implementation Agreements
- Internet Standard RFC 1157 (SNMP Protocol) and RFC 1213 (MIB II) for network management communications
- Internet Standard RFC 1247 (OSPF V 2 Protocol) for virtual circuit and path routing
- Internet Standard RFC 1490 (Multiprotocol Routing over Frame Relay)

Network management application

Network management is implemented using the SNMP protocol. Configuration management, fault management and performance monitoring are provided by Nways Wide Area Element Manager for HP OpenView/Solaris.

For more information

To find out more about the IBM 2219 Nways Frame Relay Switch and other high-performance IBM communications and networking products, contact your IBM representative or call IBM Direct at 1 800 IBM-CALL (1 800 426-2255). You can also access the IBM Networking Home Page at http://www.networking.ibm.com.

Copies of this and other related product specification sheets can be obtained from the IBM FAX Information Service by dialing 1 800 IBM-4-FAX (1 800 426-4329) in the U.S. or Canada or by dialing (415) 855-4329 outside the U.S. and Canada and requesting any of the following document numbers:

- 4491: IBM 2219 Nways Frame Relay Switch Model 250
- 4492: IBM 2230 Nways ATM Switch Models 600 and 650
- 4493: IBM 2225 Nways Multiservice Switch Models 400 and 450



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