FPS-8

Multiprotocol Fast Packet Switch for X.25 / Frame Relay / IP / Async / HDLC

RAD

FEATURES

- 8-port synchronous-link Frame Relay/Packet Assembler/Disassembler (FRAD/PAD) and multiprotocol packet switch

- Allow legacy protocols, such as X.25 and Frame Relay to run over IP networks

- Protocols supported: Frame Relay, X.25, IP, HDLC, SLIP, PPP, ML-PPP and asynchronous

- Each multiprotocol port operates at data rates of up to 2 Mbps

- Throughput of over 3000 Packets Per Second (PPS) in Frame Relay mode

- IP networking using:
  - RIP1, RIP2 and static routing
  - Standard IP encapsulation over Frame Relay (RFC 1490), or X.25 (RFC 1356) networks

- Optional ISDN support: Transmits Frame Relay, X.25, PPP and ML-PPP over ISDN media

- Standard bridging

- Supports up to 50 remote sites

- Built-in Telnet client/server to support terminal/server applications

- Managed via an ASCII terminal or RADview-PC/HPOV, RAD's SNMP-based network management system

- Optional built-in Ethernet for easy integration of LAN segments

- Flash memory for software upgrades

DESCRIPTION

- FPS-8 is a fast multiprotocol packet switch, intended for the regional/central office environment. Each of its eight ports can be configured for any of the supported protocols and operate at data rates of up to 2 Mbps.

- Typical applications include Frame Relay concentration and Frame Relay switching at high throughput, while supporting up to 50 remote sites.

FRAME RELAY

- FPS-8 provides access and switching to public or private Frame Relay networks, with the ability to consolidate asynchronous, HDLC, IP and X.25 protocols over the Frame Relay networks.

- As a Frame Relay switch, the unit can integrate DLCIs from several sources into a single port. It can also support BECN/FECN signaling for congestion avoidance.

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- A unique funneling mechanism adjusts feeder throughput to CIR levels.

- For each DLCI, an optional backup Frame Relay link is available.

- The Frame Relay multicasting feature (complies with FRF-7) enables multicasting frames from one DLCI onto several DLCIs. The feature supports one-way, two-way and broadcast communication options.

- LMI and ANSI PVC management protocols are supported in compliance with ANSI T1.606, T1.618, T1.617 Annex D, and ITU Rec. Q.922, Annex A.

- FPS-8 supports CLLM management protocol and complies with ITU REC Q.933, Annex A.

X.25

- X.25-configured links support permanent virtual circuits (PVCs) and switched virtual circuits (SVCs). The link packet size is up to 4096 bytes.

- FPS-8 supports both mandatory and additional ITU X.25 facilities.

- Dial-up X.25 links are established via a dial-up modem, controlled by a DTR signal or V.25 bis commands.

- X.25 multicasting is fully supported.

X.32

- The X.32 protocol can be used for establishing an X.25 dial-up link. This enables users to access an X.25 network remotely via a dial-up modem using X.32, or use the dial-up backup link over an X.25 or Frame Relay network.

HDLC TRANSPARENT ACCESS

- Each port can be programmed to operate in transparent HDLC mode for connecting bridges, routers and other HDLC communication devices over X.25 or Frame Relay networks. The HDLC protocol is encapsulated over X.25 or Frame Relay, providing end-to-end transparent operation.

ISDN

- Frame Relay, X.25 and PPP traffic can be transmitted over ISDN media.

- The ISDN data rate is up to 128 kbps (bundle two B channels).

ASYNCHRONOUS ACCESS

- All asynchronous channels can act according to X.3, X.28 and X.29 profiles at traffic speeds of up to 115.2 kbps. Asynchronous traffic can be packetized directly over the Frame Relay network, or the X.25 network. All channels are configured and monitored by the management agent of FPS-8.

- Each one of the FPS-8 ports can be configured to SLIP or PPP modes, operating at data rates of up to 115.2 kbps.

- IP PAD facilities allow easy migration of terminal/server applications to an IP environment.

IP ROUTING

- IP datagrams can be routed over Ethernet, PPP or SLIP links and over Frame Relay networks (according to RFC 1490) or over an X.25 network (according to RFC 1356).

- FPS-8 support RIP1, RIP2 and triggered acknowledgment RIP messages (according to RFC 1058, 1723 and 1724). The RIP support enables easy IP connection while minimizing IP user configuration. The triggered RIP reduces the overhead associated with the RIP mechanism, by minimizing the number of periodic messages sent.
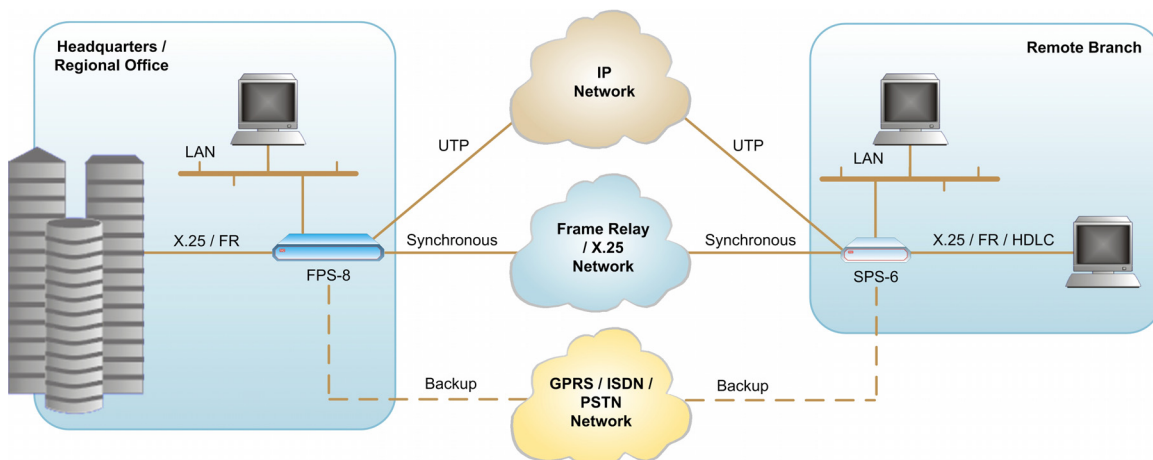
Figure 1. FPS Serving as a Concentrator in a Multiprotocol Environment

Multiprotocol Fast Packet Switch for X.25 / Frame Relay / IP / Async / HDLC

- Static IP routing is supported. IP packets are routed to destination via SLIP, PPP, LAN (Ethernet), X.25 or Frame Relay link, according to the IP address.

ETHERNET

- The Ethernet interface enables bridging and/or routing of LAN packets over a Frame Relay network (according to RFC 1490) and over an X.25 network (according to RFC 1356).

MANAGEMENT CAPABILITIES

- FPS-8 contains an SNMP agent, which enables remote configuration, collection of statistics/status reports, and diagnostics. The management agent can be programmed to periodically send statistics and status reports to a maximum of five management stations.

- A management station can be connected directly to FPS-8 using LAN, PPP or SLIP.

- Configuration, monitoring and controlling of all network resources can be performed via an ASCII terminal or by using RADview-PC/UNIX, RAD's SNMP-based management system.

- The SNMP agents support private and standard MIBs, including MIB II with RFC 1213, RFC 1381 and RFC 1382 for X.25, and RFC 1315 for Frame Relay.

BACKUP

- Enhanced backup facilities include PSTN/ISDN/GPRS support.

- The main facility links are automatically restored after a network recovery.

SPECIFICATIONS

SYNCHRONOUS LINKS

- **Number of Ports**
  8

- **Data Rate**
  Up to 2 Mbps for each port

- **Throughput**
  Over 3000 Packets Per Second (PPS) for Frame Relay

- **Interfaces**
  RS-232/V.24, V.35, V.36, X.21, RS-530

- **Connectors**
  V.24:   25-pin, D-type, female
  V.35:   34-pin, D-type, female
  X.21:   15-pin, D-type, female
  RS-530: 25-pin, D-type, female

- **Protocols**
  - Compatibility: X.25, Frame Relay, HDLC, STM, asynchronous, IP, PPP, ML-PPP
  - X.25: complies with 1988 ITU X.25 LAP-B
  - Frame Relay: supports CLLM, LMI, and ANSI PVC management protocols; complies with ANSI T1.606, T1.617 Annex D, T1.618, ITU Rec. Q.922 Annex A, and Q.933 Annex A

  Note: *Each port is user-selectable.*

- **Packet Size**
  Up to 4,096 bytes

- **Services Supported**
  X.25: PVC, SVC
  Frame Relay: PVC

CONTROL PORT

- **Interface**
  V.24 (RS-232)

- **Connector**
  RJ-45

- **Data Rate**
  300 bps to 115.2 kbps

- **Flow Control**
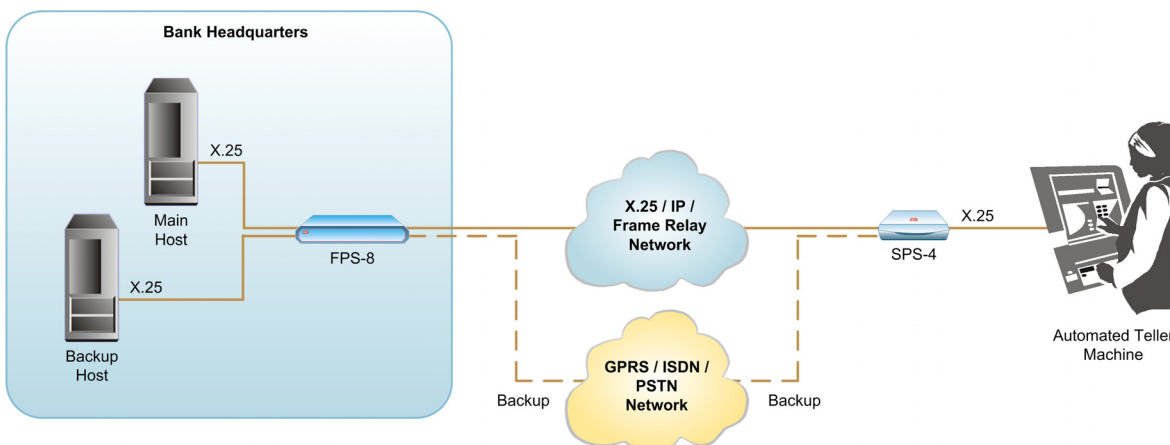 XON/XOFF, CTS/RTS

- **Command Modes**
  X.28, X.29

Figure 2. FPS-8 Serving as an X.25 Traffic Concentrator

FPS-8

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GENERAL

- **Controls and Switches**
  Front panel: Reset button
  Rear panel: Power button

- **Indicators**

PWR (green)	ON when the unit is powered
ERR (red)	ON when failure in operation is detected
OVF (red)	ON when overflow is detected
SYNC (green)	ON when synchronization is achieved in the protocol layer

- **Power**
  100–230 VAC (±10 %),
  47–63 Hz

- **Power Consumption**
  20W

- **Physical**
  Height: 44 mm (1.7 in)
  Width: 432 mm (17.0 in)
  Depth: 246 mm (9.5 in)
  Weight: 2.2 kg (4.8 lb)

- **Environment**
  Temperature: 0°–45°C (32°–113°F)
  Humidity: up to 90%,
  non-condensing

FPS-M/#
FPS interface module

Specify interface type:
  V24D for dual V.24 port
  V35D for dual V.35 port
  V35V24 for dual V.35 and V.24 port
  530D for dual RS-530 port
  V36D for dual V.36 port
  X21D for dual X.21 port
  UTP/UTP for dual UTP port

  Note: All X.21, V.35 and V.36 interfaces include an adapter cable (see Supplied Accessories).

SUPPLIED ACCESSORIES

Power cable

CBL-RJ45/D9/F/STR
Adapter cable for converting RJ-45 control to DB-9 control

CBL-8H/F
Adapter cable for V.35 (if V.35 interface is ordered)

CBL-530/499/F
Adapter cable for V.36 (if V.36 interface is ordered)

CBL-530T/21C/F
Adapter cable for X.21 (if X.21 interface is ordered)

ORDERING

FPS-8/*/$
8-port Fast Packet Switch

* Specify optional DC power supply:
  24 for 24 VDC
  48 for 48 VDC

$ Specify optional LAN interface:
  UTP for 10BaseT port
  BNC for 10Base2 port
  UTP/BNC for 10BaseT and
    10Base2 ports
  UTP/UTP for dual 10BaseT ports

RAD
data communications

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Specifications are subject to change without prior notice.