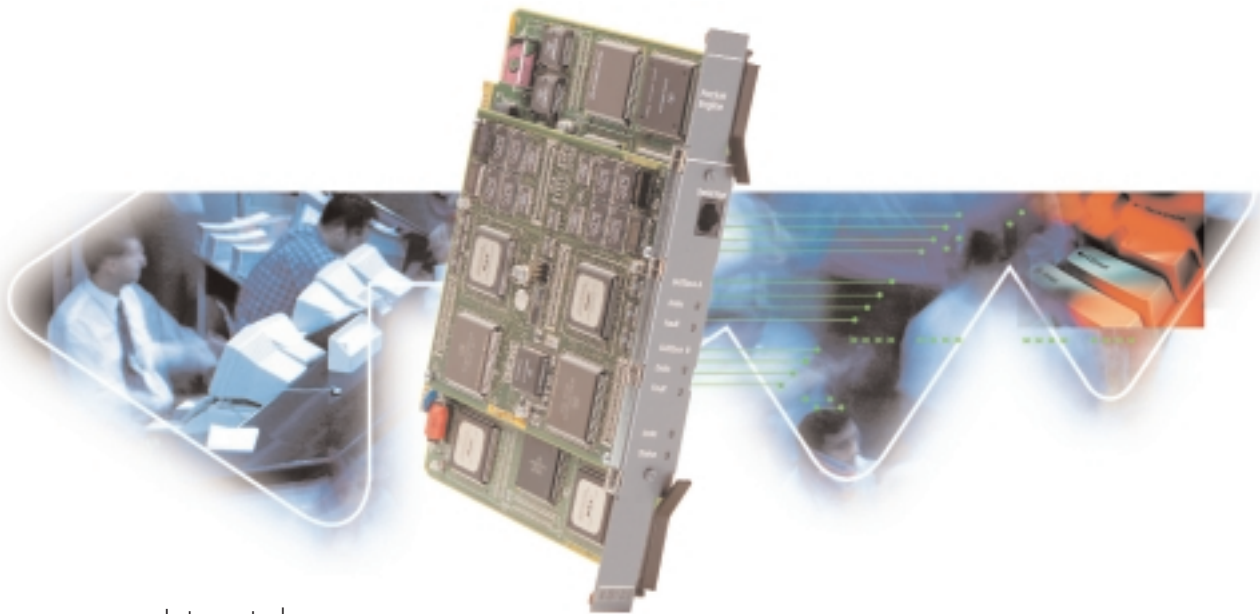


Alcatel's MainStreet X.25 Service is a high-performance, feature rich, standards-compliant X.25 product suitable for public switched data networks, large service provider networks, and corporate data networks.

The MainStreet X.25 Service is based on a distributed packet processing architecture. All X.25 call processing and switching occurs on the Packet Engine (PE) card. The PE — a switch on a card — is a full featured packet switching subsystem that supports both frame relay and X.25 services simultaneously.

Up to 64 PE cards can be connected via a FASTbus ring to create a high capacity X.25 and frame relay switching node with high speed interfaces to the MainStreet frame relay-to-ATM (FRATM) Interworking Unit for asynchronous transfer mode (ATM) connectivity. The system architecture enables advanced protocol encapsulation and conversion features — X.25/FR/ATM network and service interworking are supported on a single platform.



Integrated  
interfaces to  
frame relay, TDM,  
ISDN and ATM



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The MainStreet X.25 Service affords the following major benefits:

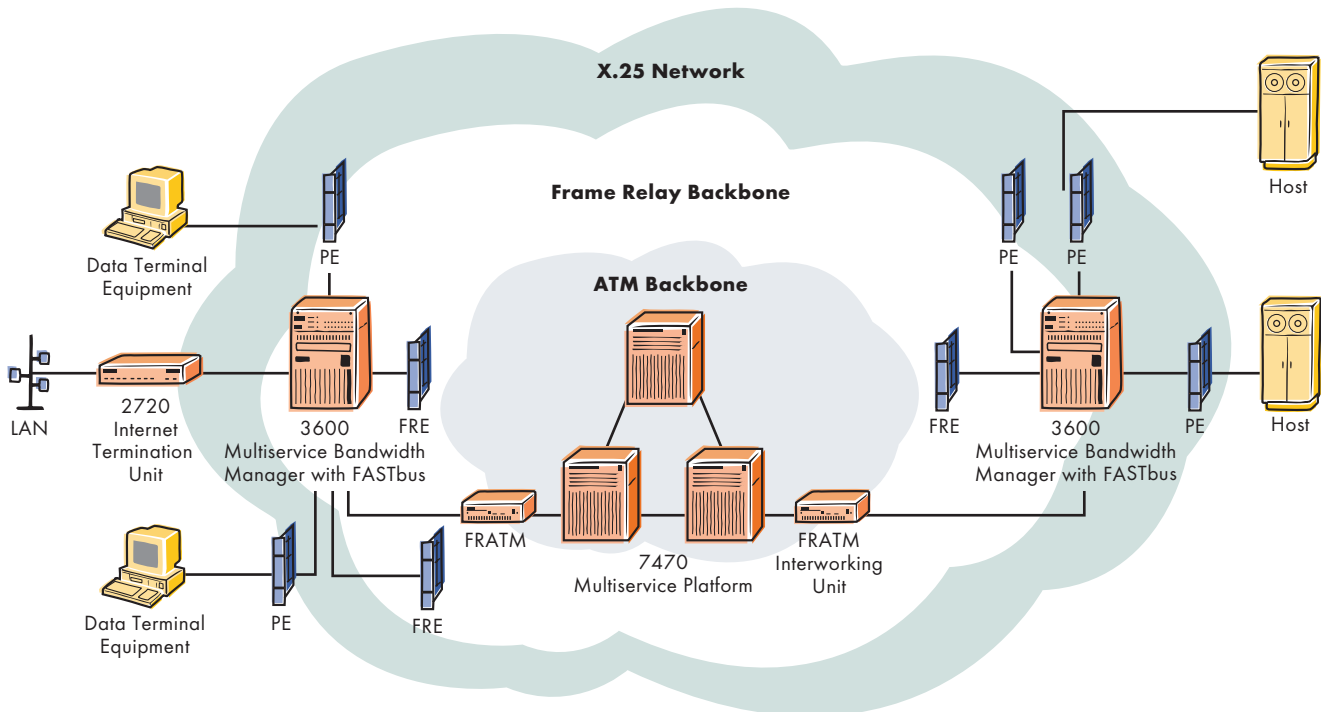
- ▼ **Flexibility** – It is the most flexible X.25 product available, offering seamless interworking with all other standards-based X.25 products and networks.
- ▼ **Versatility** – It supports both X.25 and frame relay services simultaneously and interchangeably on the same card; ports can be reconfigured through software as service needs change.
- ▼ **Simplicity** – The simplicity of the installation, operation, and support is unsurpassed with full graphical user interface (GUI)-based network management and software-driven configuration.
- ▼ **Scalability** – Each service – X.25, frame relay, TDM, ISDN, and ATM – can be individually introduced and scaled to cost-effectively meet the requirements of a large range of network applications. This reduces the initial risk of investment while maintaining a linear cost per port as application demands increase.
- ▼ **Reduced Costs** – Significant cost savings can be achieved through consolidation of X.25 and other services on an integrated and fully managed MainStreet network.

### Integrating X.25 with frame relay and ATM

The MainStreet X.25 Service uses frame relay permanent virtual circuits (PVCs) and ATM virtual circuit connections (VCCs) as highly reliable virtual trunks between network nodes. An advanced routing system provides features such as dynamic routing, instantaneous rerouting and load balancing on a packet-by-packet basis, rather than a call-by-call basis. The MainStreet X.25 solution offers an immediate migration path from traditional low speed lines and trunks to high speed backbone networks operating at rates of up to E3/T3. This approach provides the benefits of X.25 error correction combined with the high capacity and low delay of frame relay and ATM.

With the FASTbus option, up to 64 PE cards and multiple shelves can be interconnected to form a high capacity X.25 and frame relay switching node, with high speed interfaces to the FRATM Interworking Unit for ATM connectivity. Featuring a state-of-the-art design, the MainStreet system is unique in offering advanced protocol interworking capabilities, such as X.25/FR/ATM network and service interworking, on a single platform.

- ▼ **X.25 traffic carried by frame relay and ATM using the 3600 MainStreet Multiservice Bandwidth Manager configured with the Packet Engine card, the Frame Relay Engine card, the FRATM Interworking Unit and the Alcatel 7470 Multiservice Platform (MSP), formerly the 36170 Multiservices Switch\*.**



## High performance X.25 switching

The technology underlying the MainStreet X.25 Service is several generations newer than the installed base of legacy equipment, bypassing the capacity and performance limits imposed by the 1970s' and 1980s' designs of existing X.25 equipment. Call setup and packet throughput rates are 10 to 15 times higher than other competing systems. The MainStreet X.25 Service supports access speeds up to 2 Mb/s, easily saturating T1/E1 links. A fully provisioned MainStreet system can employ 64 PE cards, for a total switching capacity of 100,000 packets per second and up to 12,800 call setups per second per system.

## Cost-effective deployment and migration

Where a 3600 MainStreet network is already in place, the MainStreet X.25 solution is highly cost effective. By simply adding a PE card to any 3600 MainStreet series node, X.25 switching capability is achieved. In fact, many existing X.25 networks use MainStreet equipment as the transport infrastructure. These networks offer ideal opportunities to consolidate packet and TDM services on a single platform.

For networks that do not currently have MainStreet equipment, MainStreet X.25 represents a critical part of a multiservices strategy at a very low cost. 3600 MainStreet nodes can be deployed as edge devices on a high capacity Alcatel 7470-based FR/ATM backbone infrastructure. Network operators can choose to replace legacy X.25 equipment altogether or gradually migrate subscribers to a MainStreet X.25 network, while maintaining current service offerings and the associated revenues.

An integrated multiservice network significantly reduces logistics and maintenance expenses. Because the PE card supports X.25 and frame relay services simultaneously and interchangeably on each port, X.25 subscribers on a MainStreet X.25 network can easily migrate to frame relay through software configuration changes without disrupting service. The physical access lines and switch hardware remain untouched. This eliminates the typical costs involved in co-ordinating hardware and software upgrades in large networks.

## Integrated network management

The Alcatel 5620 Network Manager (NM) provides end-to-end service management of X.25, frame relay, TDM, ISDN, and ATM networks. The powerful GUI allows new facilities to be added in seconds, performs traffic control operations and fault detection, monitors connections and gathers statistics. The 5620 NM provides comprehensive change management to facilitate scheduled or immediate service provisions.

## Billing mediation

The Alcatel SVC Billing Mediation platform, formerly the Data Collector, provides accounting record collection and aggregation services for MainStreet X.25 networks. Capabilities include:

- ▼ secure collection of SVC and PVC usage-based accounting records generated by the X.25 switches
- ▼ subsequent processing, aggregation, formatting and validation of the collected accounting records
- ▼ distribution to downstream billing applications

The SVC Billing Mediation platform connects to the X.25 switches via X.25 SVCs.

## Network user identification validation from Nexus Telecom

In partnership with Nexus Telecom, a premier supplier of public and private network support applications, Alcatel has integrated its MainStreet X.25 Service with the NexusPASS NUI (network user identifier) validation server. The NUI validation server provides authentication of user access via a secure database containing NUIs, passwords, and associated facilities. This partnership offers access to state-of-the-art NUI support as an integral aspect of the MainStreet X.25 Service.

## Multiprotocol support

Alcatel's 36110 and 36111 MainStreet Multiprotocol Concentrators (MPC) are an integral part of the Alcatel packet switching portfolio, extending the range of access of the network by supporting synchronous and asynchronous terminals, system network architecture (SNA) and LANs in conjunction with MainStreet X.25.

The 36110 and 36111 MainStreet MPC products are designed to handle the ever-increasing volume of data traffic on today's networks. They support a wide range of protocols both on the user side (PAD, X.25, SNA, IP, IPX) and on the WAN (X.25, frame relay, ISDN).

Both the 36110 and 36111 MainStreet MPCs are fully modular and can provide flexible access to the network.

The 36110 and 36111 MainStreet MPC products are managed by the Alcatel 5620 NM as part of an end-to-end solution.

\* This product belonged to the Newbridge family. Newbridge was acquired by Alcatel in May 2000.

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## Technical Summary

### Features

- ▼ X.25 service compliant with 1984, 1988, 1992 and 1996 ITU-T X.25 recommendations
  - ▼ Full support of X.25 SVC and PVC services
  - ▼ Standards-based intranetwork reliable transfer protocol (RTP) that operates over backbone trunks using frame relay
  - ▼ Comprehensive routing system that operates in connectionless mode on a per-packet basis
  - ▼ X.25 access speeds from 1200 b/s to 2 Mb/s
  - ▼ Remote protocol monitoring via trace agent circuits and NexusTRACE
  - ▼ Virtual private networks (VPNs) support
  - ▼ Support for X.121 and E.164 address formats with flexible address translation and call screening
  - ▼ Centralized NUI validation with called/calling address substitution and NUI associated with a CUG
- ▼ Comprehensive support of all widely used X.25 network facilities and features including:
    - closed user groups
    - hunt groups
    - call redirection
    - reverse charging
    - fast select
    - packet, window and throughput negotiation
    - accounting and statistics
    - protocol encapsulation
  - ▼ X.25 to frame relay service interworking, enabling an X.25 user to send data to a frame relay PVC user

### Network Interconnection

- ▼ ITU-T recommendation X.35 (1993) covering X.25 gateway operation for X.25 interconnection with other networks
- ▼ ITU-T recommendation X.75 conforming to 1984, 1988, 1992 and 1996 X.75 versions for interworking between public data networks

### Rate Adaption for Subrate Circuits

- ▼ Support for all rates between 1.2 kb/s and 56 kb/s
- ▼ High capacity multiplexing (HCM)
- ▼ Dataphone Digital Service (DDS) (DS0A and DS0B)
- ▼ X.50 (Div. 2, Div. 3, Div. 5, and BIS)

### Access Protocols

- ▼ Standards-compliant X.25 interface
- ▼ X.25 encapsulation in frame relay
  - ANSI T1.617a Annex G, encapsulation of ITU-T X.25/X.75 over frame relay
  - ANSI T1.617a Annex F, multiprotocol encapsulation over frame relay
  - RFC 1490, multiprotocol interconnect over frame relay

### Physical Access Interfaces and Rates

- ▼ V.28, TIA/EIA-232; V.24, TIA/EIA-422 (up to 64 kb/s)
- ▼ V.35/X.21 (up to 1.544 Mb/s)
- ▼ Fractional T1 ( $n * 56/64$  kb/s)
- ▼ Fractional E1 ( $n * 56/64$  kb/s)
- ▼ Full T1 (1.544 Mb/s)
- ▼ Full E1 (2.048 Mb/s)
- ▼ Channelized T3, 28 interfaces at T1 (45 Mb/s)
- ▼ Channelized E3, 16 interfaces at E1 (34 Mb/s)
- ▼ Unchannelized T3 via FRATM (45 Mb/s, ATM)
- ▼ Unchannelized E3 via FRATM (34 Mb/s, ATM)



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