

Alcatel-Lucent MainStreet Business Access Portfolio

Doing Business on MainStreet

Alcatel·Lucent 



“The Alcatel-Lucent MainStreet access portfolio of products, including multiservice access platforms (MAPs), integrated access devices (IADs) and network termination units (NTUs), addresses the needs of service providers who target enterprise customers requiring mission-critical services.”

RADHA VICHARE, RESEARCH ANALYST, IDC

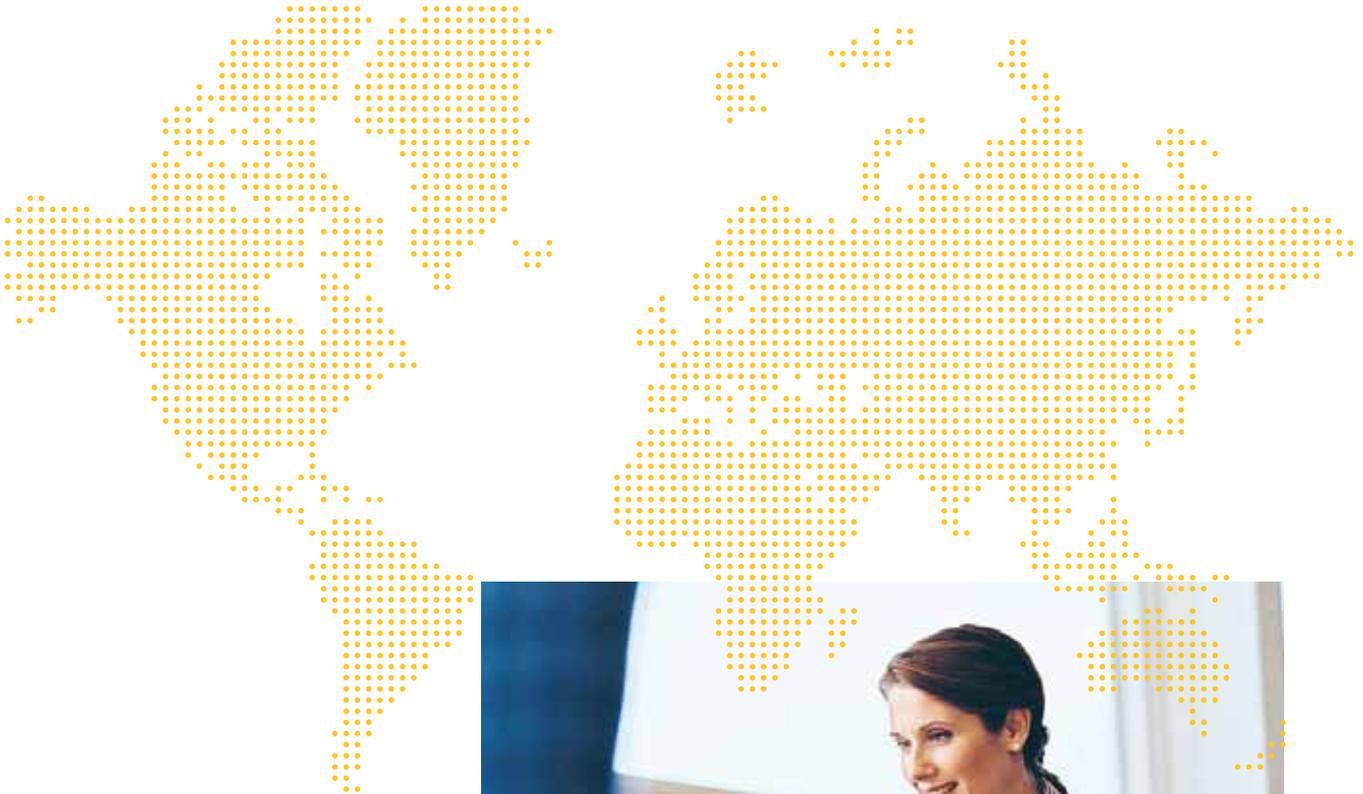


Doing Business on MainStreet

The Alcatel-Lucent MainStreet business access portfolio addresses the requirements of service providers — both wireline and wireless — and a variety of enterprise customers. Enterprise customers from government, financial, utilities and natural resources exploration industries, among others, are already benefiting from MainStreet in their networks — not to mention more than 300 service providers worldwide who have helped make Alcatel-Lucent MainStreet the most successful digital overlay platform ever built.

With the Alcatel-Lucent MainStreet business access portfolio of products, service providers and enterprise customers benefit from network solutions that are:

- Manageable: easy to deploy, provision, manage and maintain
- Available: field-proven with $\geq 99.999\%$ availability
- Profitable: cost-effective and revenue-ready for frame relay, private line services and applications



Key Benefits for YOUR Business

The Alcatel-Lucent MainStreet business access portfolio encompasses stable, reliable and field-proven products. Equally important, Alcatel-Lucent MainStreet delivers the key benefits that service providers and enterprise customers demand, including

consolidation, cost savings, investment protection and simplified operations. Table 1 shows how the Alcatel-Lucent MainStreet business access portfolio delivers features that provide the benefits service providers require.

Table 1. Benefits and Associated Features of the Alcatel-Lucent MainStreet Business Access Portfolio

BENEFITS	FEATURES
Voice and data convergence in a single product	<ul style="list-style-type: none"> • Full support for analog voice and legacy data interfaces, including: <ul style="list-style-type: none"> → Voice: E&M, FXS (LGS), FXO (LGE) → Data: V.35, X.21, EIA/TIA-449, EIA/TIA-232 and EIA/TIA-530 • Resource cards allow for voice compression, data multiplexing and data switching • Advanced frame relay features, such as QoS and DLCI multiplexing, optimize converged packetized voice and data services
Cost savings through statistical multiplexing	<ul style="list-style-type: none"> • Multiple subrate interfaces can be multiplexed into a single time slot • Data interfaces can support subrate and superate data at varying speeds from 800 b/s to 2 Mb/s • E1 and T1 interfaces can be accommodated in the same platform
Cost savings through network consolidation	<ul style="list-style-type: none"> • Multiservice, multitechnology platforms that deliver advanced services for global carrier and enterprise customers, including frame relay, ATM, TDM, xDSL, IP, VoFR, ISDN and G.SHDSL
Protects investment in infrastructure while supporting network evolution	<ul style="list-style-type: none"> • Enables customer networks to take up emerging technologies, such as ATM and IP, through integration or network consolidation rather than migration • Easy migration to higher-speed interfaces for an existing installed base • Easy migration from TDM to packet/cell services
Simplified and cost-effective operation	<ul style="list-style-type: none"> • Full network management by the industry-leading Alcatel-Lucent 5620 Network Manager (NM), which provides user-friendly support for end-to-end installation and maintenance • Easy-to-use GUI means operations are consistent across nodes and services, for faster service delivery • Point-and-click across multivendor, multi-access, edge, aggregation and multicore networks • Continuous synchronization with the network • Proactive management solves problems before customers even know about them
Reliability	<ul style="list-style-type: none"> • Field-proven performance, with > 99.999 percent availability, enabling service providers to offer low-risk service level guarantees • The most successful digital overlay platforms ever built: the worldwide installed base stands at more than 250,000 nodes, and growing • More than 800,000 NTUs deployed worldwide
High value	<ul style="list-style-type: none"> • Alcatel-Lucent MainStreet products aggregate multiservice traffic, eliminating the need for multiple leased lines; they are key elements for network optimization

The Alcatel-Lucent MainStreet Business Access Portfolio

The Alcatel-Lucent MainStreet business access portfolio encompasses high-value access and customer premises products designed to help customers take advantage of current and future telecommunications opportunities. As shown in Table 2, the portfolio comprises a feature-rich and comprehensive range of products, including multiservice access platforms (MAPs), integrated access devices (IADs) and network termination units (NTUs).

The Alcatel-Lucent MainStreet installed base is more than 250,000 nodes and more than 800,000 NTUs worldwide.

With the introduction of G.SHDSL on multiservice access platforms, Alcatel-Lucent MainStreet enables service providers to leverage their installed base to provide lower-cost private line/leased line services to customers using any vendor's G.SHDSL-compliant customer premises equipment (CPE).

Table 2. Alcatel-Lucent MainStreet Business Access Portfolio

MULTISERVICE ACCESS PLATFORMS	
Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager	<ul style="list-style-type: none"> An integrated voice and data multiplexer, a frame relay and X.25 switch, a low-capacity ATM access node, an intelligent channel bank and a digital cross-connect switch
Alcatel-Lucent 3600+ MainStreet Multiservice Bandwidth Manager	<ul style="list-style-type: none"> All the capabilities of the Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager plus fiber optic and electrical interfaces at STM-1/OC-3 speeds, support for a wide range of circuit- and packet-based voice and data services, and full compatibility with the Alcatel-Lucent 3600 MainStreet Bandwidth Manager, for seamless integration into existing networks and protection of equipment investment
INTEGRATED ACCESS DEVICES	
Alcatel-Lucent 3630 MainStreet Primary Rate Multiplexer (PRM)	<ul style="list-style-type: none"> A high-performance, compact, intelligent T1 (1.544 Mb/s) or E1 (2.048 Mb/s) multiplexer, terminating up to 30 voice or data circuits
NETWORK TERMINATION UNITS	
Alcatel-Lucent 2902 MainStreet Network Termination Unit (NTU)	<ul style="list-style-type: none"> Delivers managed bandwidth access of up to 2 Mb/s over existing copper pairs (HDSL) or E1 facilities
Alcatel-Lucent 2750-series MainStreet IDSL DTUs	<ul style="list-style-type: none"> Provides services of up to 128 kb/s to remote sites: <ul style="list-style-type: none"> → Alcatel-Lucent 2751 MainStreet DTU: TIA/EIA-232 (RS-232) user ports → Alcatel-Lucent 2752 MainStreet DTU: X.21 user ports → Alcatel-Lucent 2753 MainStreet DTU: V.35 user ports

At Your Service

The Alcatel-Lucent MainStreet business access portfolio addresses the mission-critical needs of wireline and wireless service providers as well as private network operators.

The multiservice nature of the portfolio enables a very wide range of applications. While a comprehensive list is shown in Table 3, here are a few applications that address the needs of service providers for high reliability and proven technology in their wireline and wireless networks:

- Private line/leased line
- Metro optical
- Mobile transport networks, including billing overlay
- Enterprise access services
- Voice and data convergence over frame relay
- Flexible small-to-medium enterprise (SME)/multi-tenant unit (MTU) access distribution and aggregation
- Signaling System No. 7 (SS7) signaling transport

Private Line/Leased Line

One of the main applications of the Alcatel-Lucent MainStreet business access portfolio is private line/ leased line services (see Figure 1), which allow the service provider to offer customers CPE that is connected into the network to backhaul data from a remote site to headquarters. Very often, this is used for LAN-to-LAN or LAN-to-host connections where the remote site is accessing databank information, headquarters-controlled applications and access to the Internet. The Alcatel-Lucent MainStreet products can be used in voice, data or integrated voice-and-data networking, and can be deployed in point-to-point, point-to-network and point-to-multipoint topologies. Benefits of this type of configuration include centrally controlled firewalls, version control of applications and control of Internet content and access speeds.

Figure 1. Alcatel-Lucent MainStreet Private Line Application

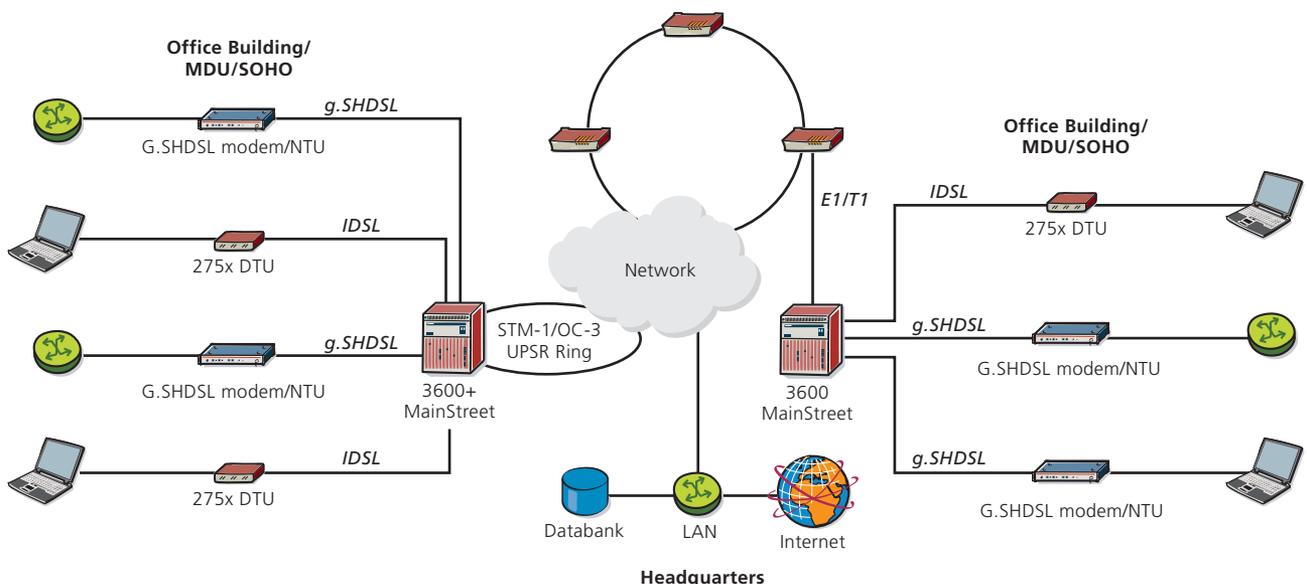




Figure 2 shows a typical leased line network requiring business site connectivity. Typical requirements include dedicated voice services, data terminal-to-server connections and remote LAN connectivity. Bandwidths among the various locations are leased from telecom carriers. These lines are connected to the local point of presence (PoP) in the enterprise network.

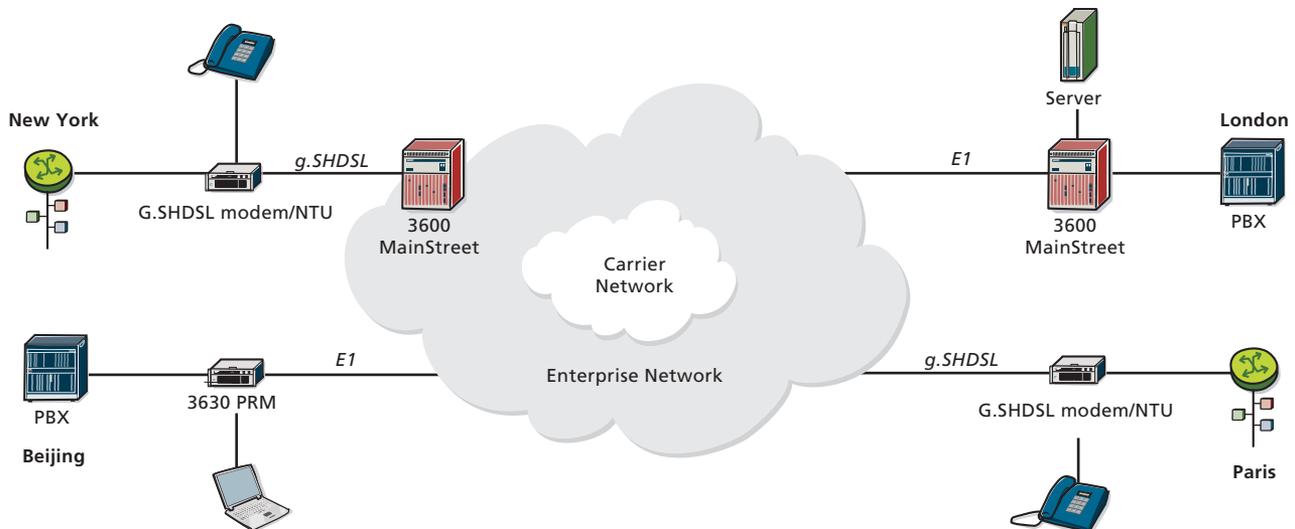
G.SHDSL, which is fast becoming a dominant standard for private line and leased line applications, provides low latency, guaranteed bandwidth and low cost through a standardized protocol. The Alcatel-Lucent 3600 and Alcatel-Lucent 3600+ MainStreet Multiservice

Bandwidth Managers offer a fully managed, end-to-end G.SHDSL solution with selected CPE vendors, such as Symmetricom, that further lowers service providers' costs through superior service provisioning, performance monitoring and service level assurance capabilities. The G.SHDSL solution can be deployed with any CPE that is compatible with the G.SHDSL standard, enabling a migration path for carriers to offer symmetric DSL services to their customers.

Metro Optical

Metro optical is of interest to service providers within the context of their metropolitan area networks (MANs).

Figure 2. Alcatel-Lucent MainStreet Leased Line Application





2G Mobile Aggregation, Billing and Backbone Networks

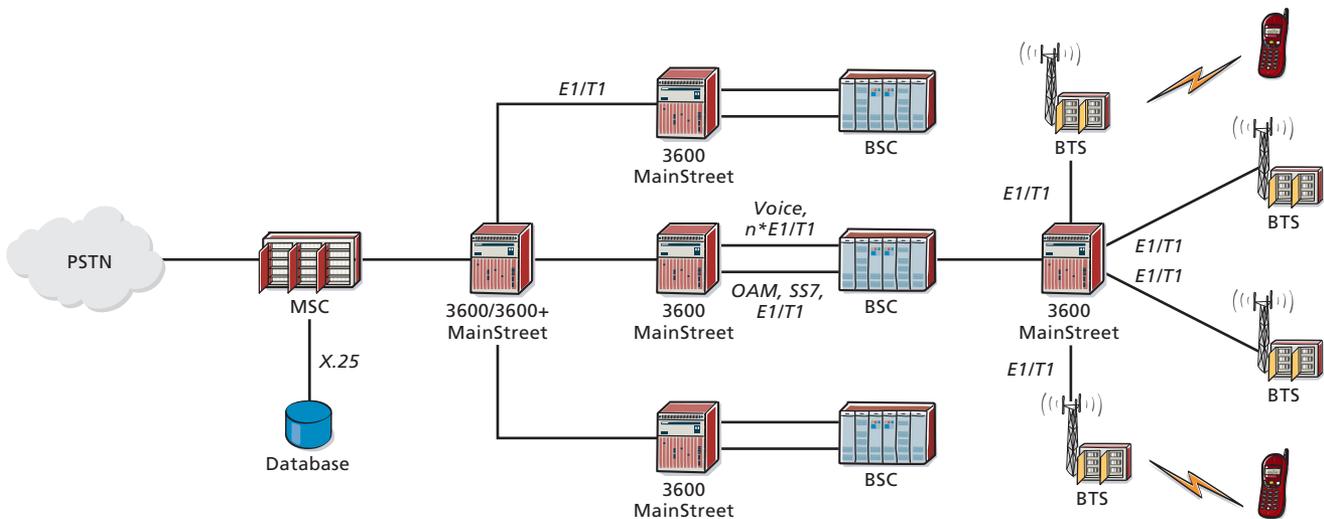
The Alcatel-Lucent MainStreet business access portfolio offers the opportunity to take advantage of the aggregation, billing and backbone network support requirements of mobile networks.

Figure 3 shows how, in a 2G mobile network, the Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager and the Alcatel-Lucent 3600+ MainStreet Multiservice Bandwidth Manager are used to consolidate and groom voice and low-speed data traffic from many base transceiver station (BTS) sites onto an aggregate E1/T1 for transport to the mobile service switching center (MSC). The Alcatel-Lucent 3600 and 3600+ MainStreet Multiservice Bandwidth Managers have a fully interconnected, nonblocking switching matrix that enables connection of incoming, underutilized

BTS T1/E1 lines to be switched to any time slots on the aggregate E1/T1 going to the MSC. One of the strengths of the Alcatel-Lucent 3600 and 3600+ MainStreet Multiservice Bandwidth Managers is their ability to switch down to the DS0 and to 800 b/s granularity when certain resource cards are present.

The Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager also has functionality that allows it to carry call detail records (CDRs) from the BTS to the billing center at the MSC. Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager packet services can also be used to their advantage by providing the statistical gain of switched packet traffic through the backbone. Adding frame relay to the Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager is as simple as installing an additional card.

Figure 3. Alcatel-Lucent MainStreet Aggregation of Voice and Billing Information of a 2G Mobile Network



As shown in Figure 4, Alcatel-Lucent MainStreet products enable a straightforward transition from a 2G to a 2.5G network. Adding packetized data to the Alcatel-Lucent 3600 or 3600+ MainStreet Multiservice Bandwidth Manager is as simple as adding a card. Alcatel-Lucent MainStreet allows service providers to protect their initial investment and provides a natural evolution from 2G to 2.5G services.

In Figure 5, the Alcatel-Lucent 3600 MainStreet is used between two MSCs to provide savings by compressing voice traffic between the sites.

Figure 4. Alcatel-Lucent MainStreet Aggregation of Voice and Billing Information in 2G to 2.5G Evolution

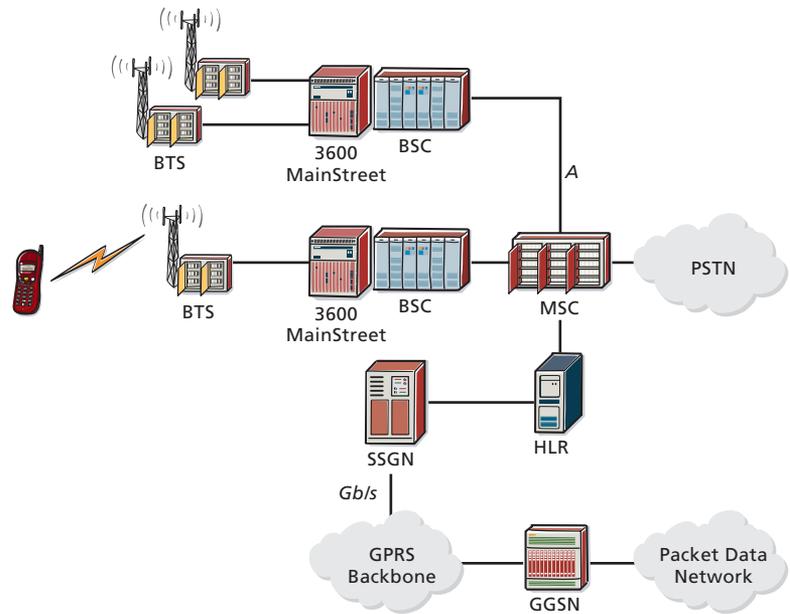
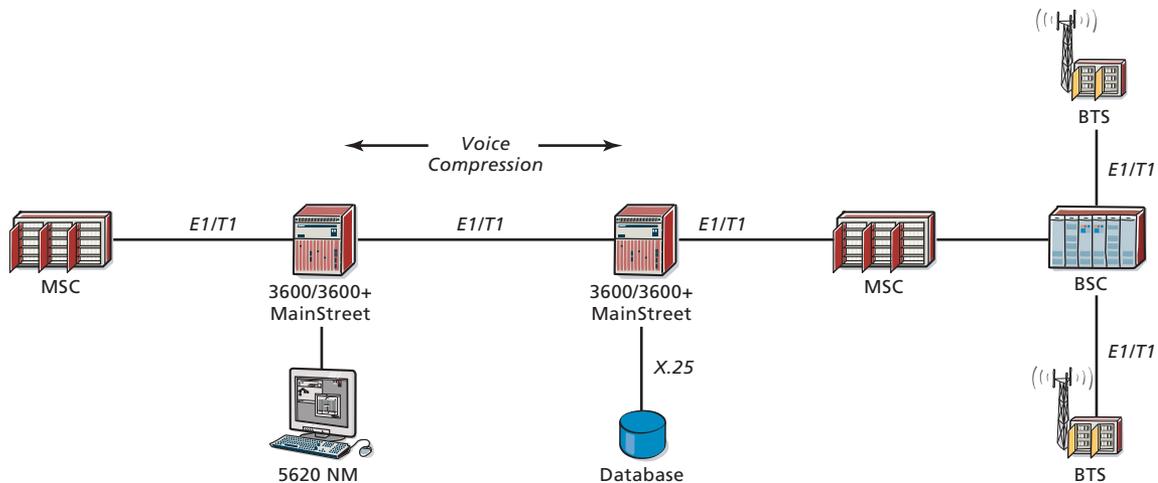


Figure 5. Alcatel-Lucent MainStreet Voice Compression MSC-to-MSC



Enterprise Access Services

The enterprise access services application shown in Figure 6 is deployed for Verizon, who brand it FlexGrow. It is promoted as an innovative service offering for small- and medium-sized businesses to simplify their communications networks by eliminating the need for separate voice and data connections.

Voice and Data Convergence over Frame Relay

The comprehensive range of Alcatel-Lucent MainStreet products is ideally suited for converged voice and data services over frame relay. Frame relay combines the best features of circuit switching and packet switching to provide improved response times and dramatically reduced transmission costs for a variety of applications. Frame relay, which is ideal for applications that involve bursty data traffic from LANs, can be easily integrated into existing networks.

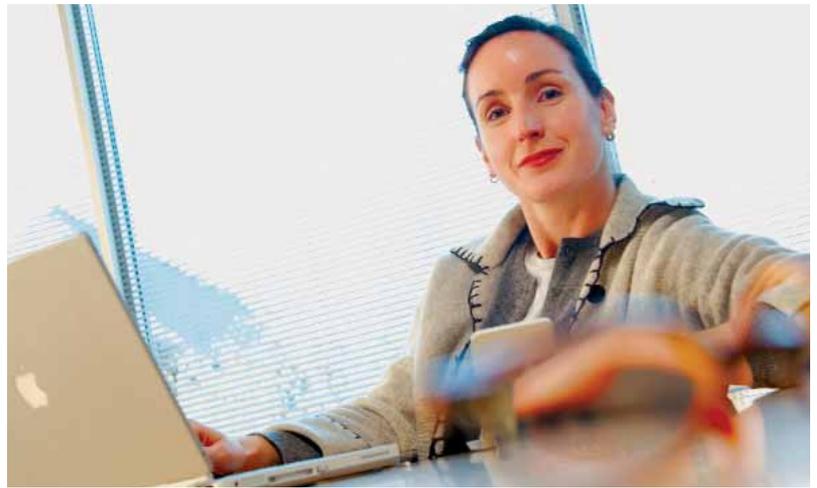


Figure 7 shows a common network topology, with several branch sites connected across a high-speed backbone. The Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager connects to another 3600 MainStreet node to transmit voice, fax and data traffic between the central site and the branches.

If a public frame relay network is being used, the network needs to provide a frame relay quality of service (QoS) control function. Service providers can use either an Alcatel-Lucent 3600 MainStreet or Alcatel-Lucent 3600+ MainStreet with a FASTbus or an Alcatel-Lucent 7470 Multiservice Platform (MSP) because both support the standardized frame relay QoS functions according to ITU-T Recommendation X.146.

Figure 6. Alcatel-Lucent MainStreet Enterprise Access Service Application

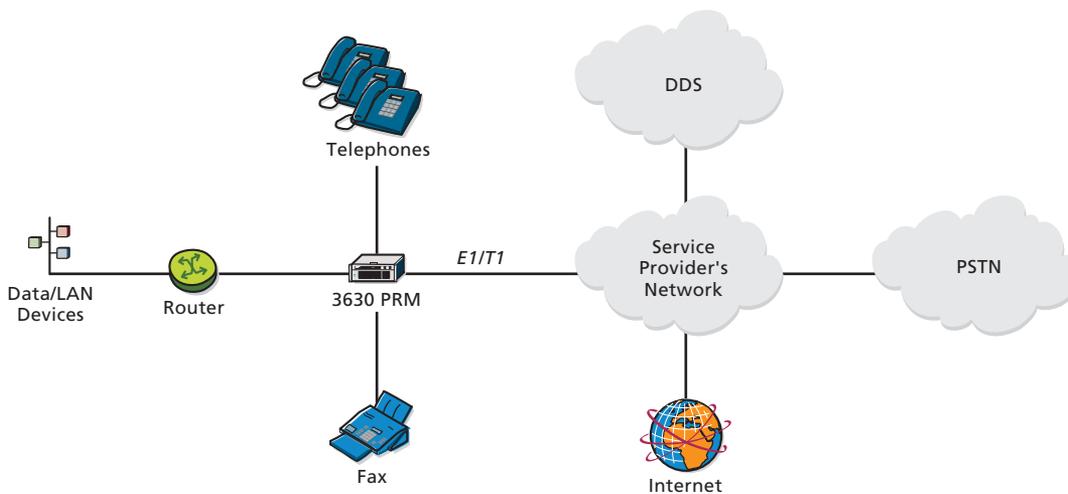
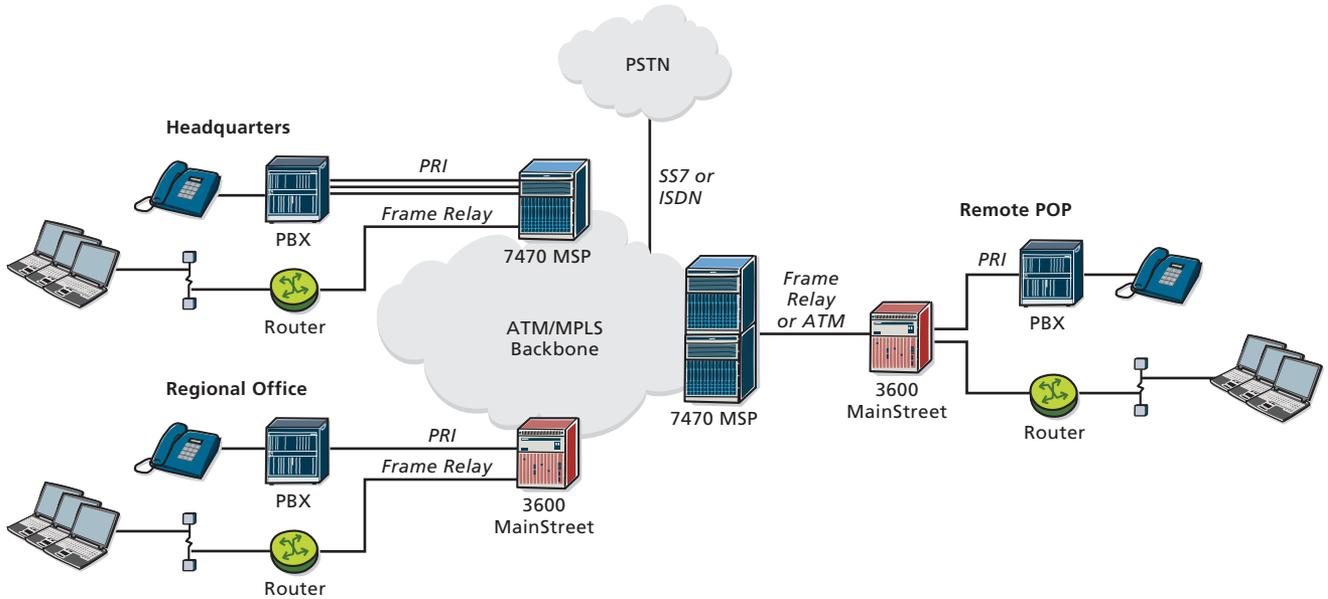


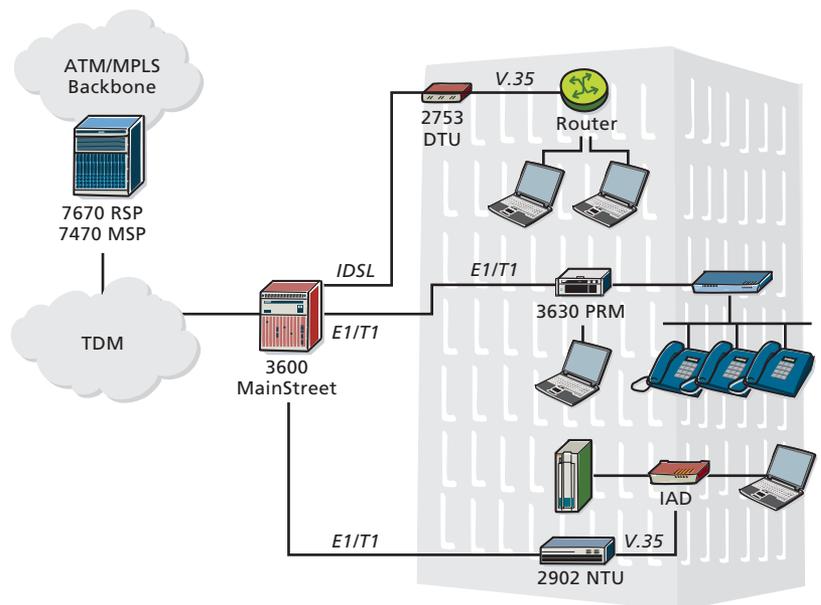
Figure 7. MainStreet Voice and Data Convergence Over Frame Relay



Flexible SME/MTU Access Distribution and Aggregation

Reliable and flexible access to remote sites, whether small office/home office (SOHO) or SME/MTU, is a fundamental requirement in every public network. As shown in Figure 8, the Alcatel-Lucent MainStreet products support a range of scalable, cost-effective solutions for traditional E1/T1 services as well as xDSL technologies.

Figure 8. Alcatel-Lucent MainStreet Flexible SME/MTU Access Distribution and Aggregation





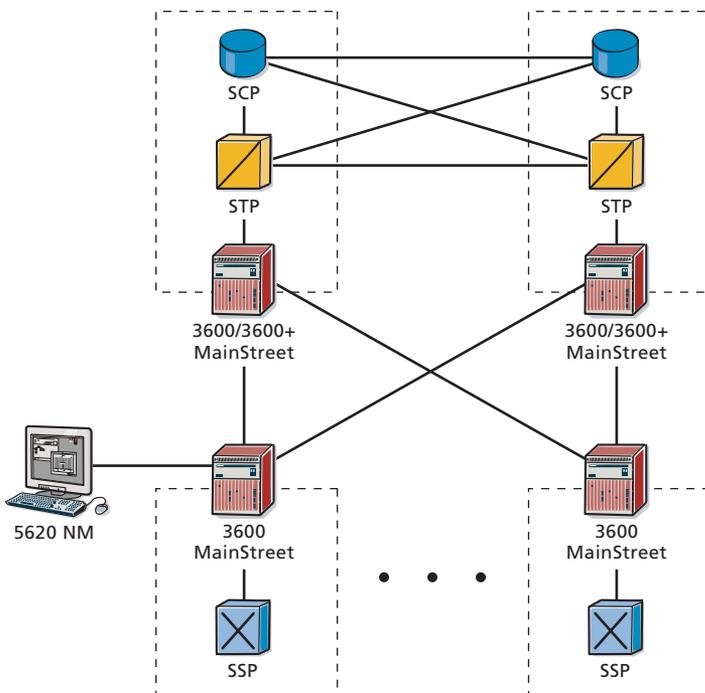
SS7 Signaling Transport

All basic and advanced services rely on SS7 networks, which carry signaling for all landline and mobile telephone service providers. The SS7 network is the basis for transporting information that service providers use for billing. It is mission-critical, demanding the highest standards in reliability and maintainability.

The Alcatel-Lucent 3600 and 3600+ MainStreet Multiservice Bandwidth Managers, offering a wide variety of user interfaces, have proven reliable in SS7 networks around the world. Figure 9 shows the Alcatel-Lucent MainStreet SS7 application in a wireline environment.



Figure 9. Alcatel-Lucent MainStreet Wireline SS7 Application



An Enterprising Portfolio

The Alcatel-Lucent MainStreet business access portfolio addresses the needs of defense and public safety, transportation, government, financial, utilities and natural resources exploration enterprise customers, among others.

“This new network will allow us to share much more information between many more agencies. It is arriving at a time when homeland security efforts are much more important than ever before”

A. JAMES WALTON, COMMISSIONER, VERMONT DEPARTMENT OF PUBLIC SAFETY

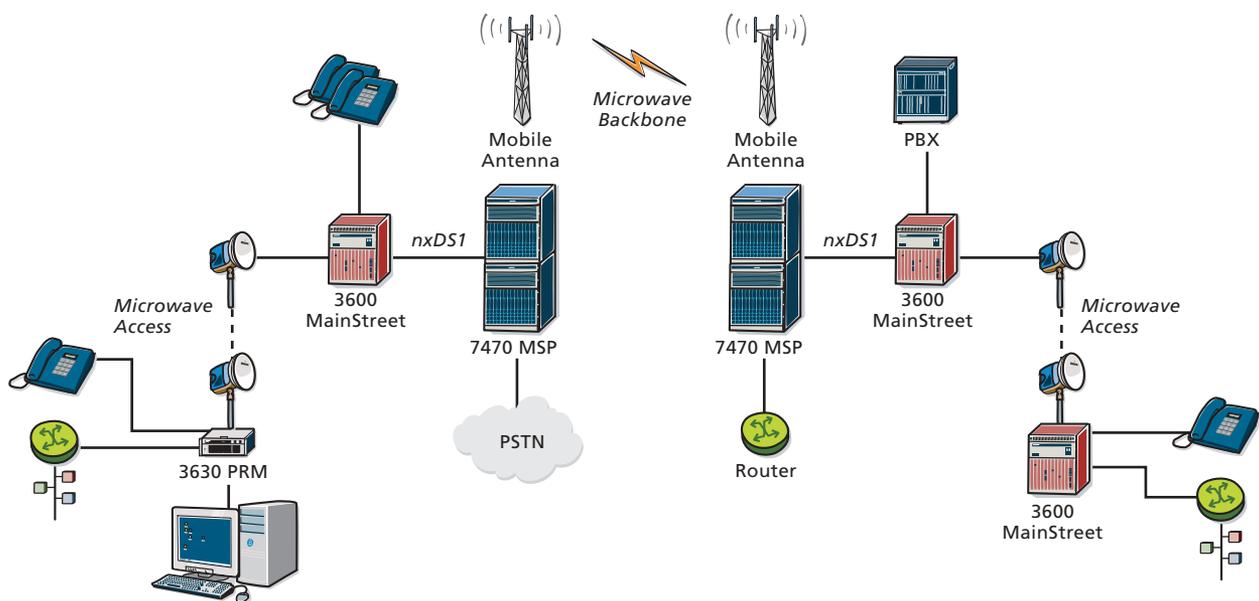
Government

Defense and Public Safety/Regional Government/Law Enforcement/Transportation Authority Application

The State of Vermont’s integrated voice, data and video network shown in Figure 10 replaces the state’s existing analog system and includes the Alcatel-Lucent 3600 and 3600+ MainStreet Multiservice Bandwidth Managers, the Alcatel-Lucent 7470 MSP, the Alcatel-Lucent 7270 Multiservice Concentrator (MSC) and Alcatel-Lucent microwave radio equipment. This network

enables the State of Vermont to provide faster emergency response and increase public safety. Traffic from hundreds of public offices, including the Department of Public Services, National Guard, police stations, fire halls, ambulance barns and utilities across the state will be handled through the communications headquarters in Waterbury, VT.

Figure 10. Alcatel-Lucent MainStreet Defense and Public Safety/Regional Government/Law Enforcement/Transportation Authority Application





The multipurpose Alcatel-Lucent MainStreet business access portfolio provides switching, grooming and access services. The Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager connects to lower-speed microwave links that enable the government network to access smaller, remote offices. These offices could be police or fire stations, libraries or other government facilities. At these remote sites, an IAD (the Alcatel-Lucent 3630 MainStreet PRM) is used to allow access for numerous government services to the regional or provincial network. The highly flexible and configurable Alcatel-Lucent 3630 MainStreet PRM provides a wide variety of voice and data interfaces, which is ideal for smaller branch offices. Phone, Internet and other services can be provided and optimized by these IADs.

Financial

Financial Dealer Boards or “Hoot and Holler” Application

The world’s most extensive financial services network, an existing Alcatel-Lucent customer, is deploying the Alcatel-Lucent 3630 MainStreet PRM, the Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager and the Alcatel-Lucent 3600+ MainStreet Multiservice Bandwidth Manager to expand its global network and provide coverage to the world’s key financial centers.

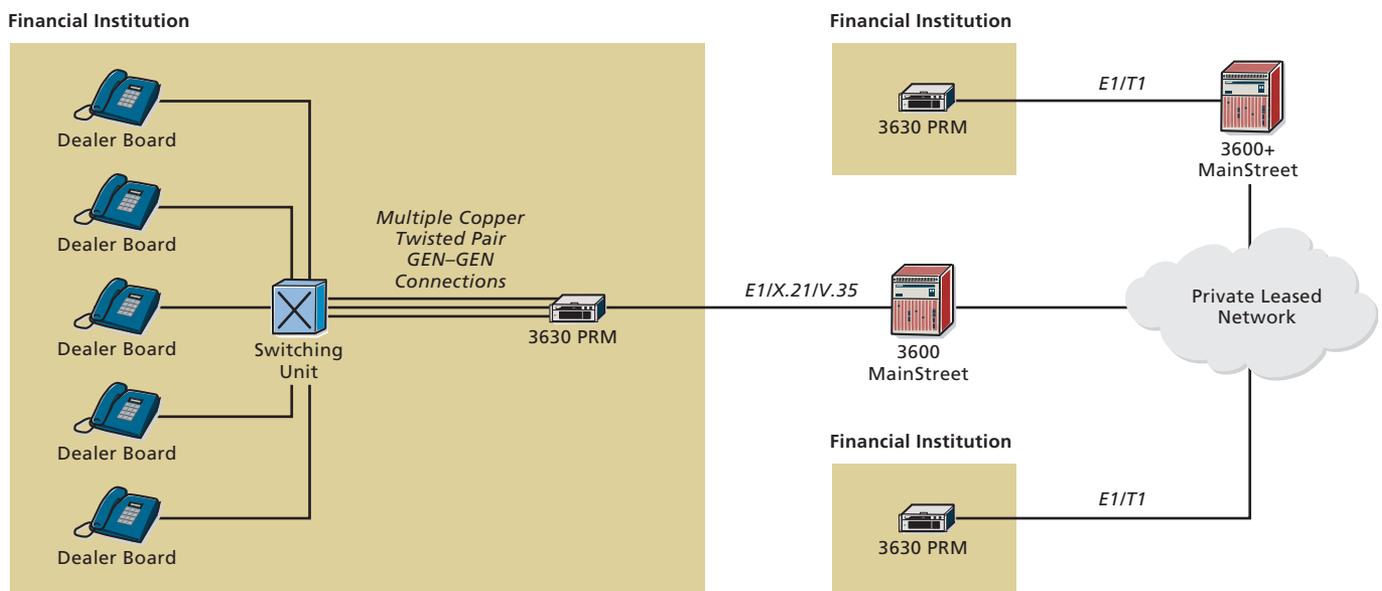
The ability of Alcatel-Lucent MainStreet to address their mission-critical requirements was key to the contract win.

These financial dealer boards or “hoot and holler”, shown in Figure 11 are a key MainStreet application for enterprise customers in the financial industry. The Alcatel-Lucent 3630 PRM can be used to provide the primary E1 link or V.35 for North American applications.

Leased Line/Private Line Applications

The financial industry also uses the Alcatel-Lucent MainStreet business access portfolio in leased line/private line applications. These applications were discussed earlier in the “At Your Service” section.

Figure 11. Financial Dealer Boards or “Hoot and Holler” Application





Utilities

Metro Optical Application

Utility companies are uniquely positioned to leverage their established rights of way (ROW) to accommodate their enterprise network requirements. An example of a key application that addresses the requirements of a utility network is the metro optical application shown in Figure 12.

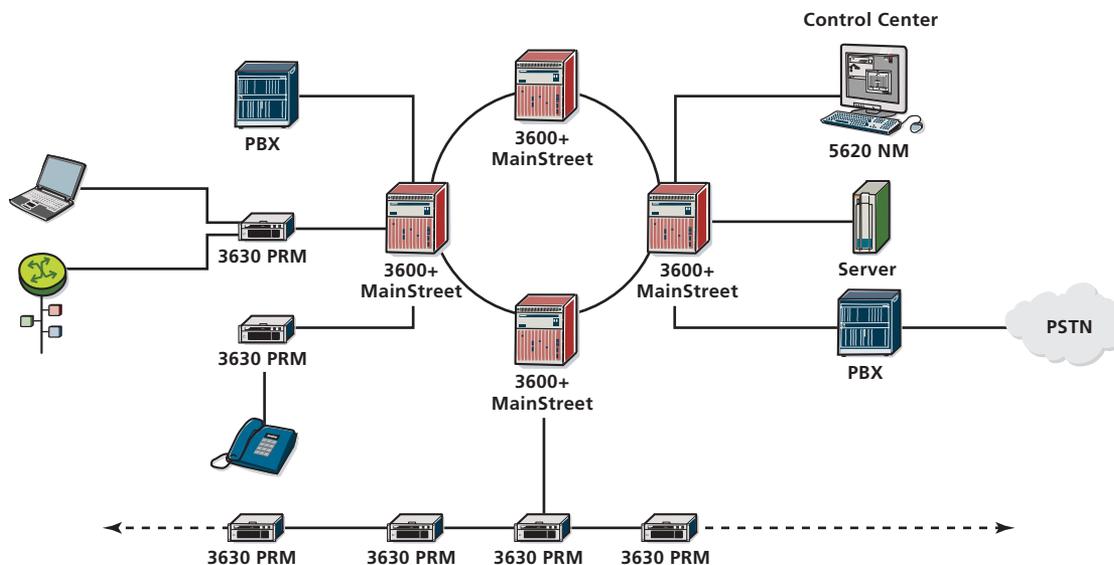
The metro optical application is common in utility networks where voice and data circuits from various locations are inserted and dropped along the route. The Alcatel-Lucent MainStreet products support linear drop-and-insert ring mode as well as point-to-point configurations.

Figure 12 shows a typical utility network where connectivity between a central site and numerous remote sites is required. Typical requirements include voice services, data terminal-to-server connections, telemetry monitoring and remote LAN connectivity.

Regional Government Variation

The regional government application discussed earlier is also applicable to utilities customers. In fact, a variation of the State of Vermont network is deployed for both hydro and railroad utility customers.

Figure 12. Alcatel-Lucent MainStreet Metro Optical Application



Natural Resources Exploration

Oil and gas exploration companies have similar network requirements to those in the government and utilities vertical markets. They require reliable, robust networking solutions for their internal traffic. A variation on the regional government application is often a good fit for these high-value customers to deliver mission-critical data to remote locations.

One of the world's largest producers of crude oil is deploying the Alcatel-Lucent 3600 MainStreet Multiservice Bandwidth Manager to extend the reach of their network to remote locations while providing absolute reliability. In this case, it is the Alcatel-Lucent 7390 Local Multipoint Distribution System (LMDS) solution rather than the Alcatel-Lucent MDR-8000 microwave radios that provides the wireless portion of the network.



Table 3. Alcatel-Lucent MainStreet Business Access Portfolio Applications, Architecture and Interfaces

PRODUCT CATEGORY	MAP		IAD	NTU	
	3600	3600+	3630	2902	275X
PRODUCTS					
Government Applications					
Regional government	•	•	•	•	•
Lottery	•	•	•		
Education networks	•		•	•	
Integrated communications solutions	•		•	•	
Multiservice consolidation	•		•	•	
Financial Applications					
Financial dealer boards	•	•	•		
Leased line/private line	•	•	•	•	•
Branch office networking	•		•	•	
Voice and data convergence	•	•	•	•	
Utilities Applications					
Regional government variation	•	•	•	•	•
Metro optical	•	•	•	•	
Surveillance and telemetry	•		•	•	
Linear add/drop networks	•	•	•	•	
Service Provider Applications					
Private line	•	•	•	•	•
Metro optical		•			
Mobile aggregation, billing and backbone networks	•	•			
Enterprise access services	•	•	•	•	
Voice and data convergence over frame relay	•	•			
Flexible SME/MTU access distribution and aggregation	•	•	•	•	•
Leased line	•	•	•	•	•
SS7 signaling transport	•	•			
Add/drop multiplexing	•	•	•	•	
Digital access and cross-connect (DACs)	•	•			
Business-class xDSL access	•	•	•	•	•
ATM access	•	•			
Cellular base station aggregation and grooming	•	•	•		
Voice and data convergence	•	•	•	•	
Voice compression	•	•			
Managed data services	•	•	•	•	•
Data network consolidation	•	•	•	•	•
General (Maximum)					
# of universal card slots	128	16			
# of E1 ports	256	128	2		
# of T1 ports	256	128	2		
# of E3 ports	16				
# of T3 ports		3			
# of circuits			30		
Maximum speed				2048 Mb/s	128 kb/s
Aggregate Interfaces					
1.544 Mb/s T1 (D4, ESF, 64 kb/s chan.)	•	•	•		
DS3		•			
E3	•				
2.048 Mb/s E1 (CAS, CCS, 64 kb/s chan.)	•	•	•	•	
X.21 PRI	•	•			
V.35 PRI	•	•			
S/T BRI	•	•			
U BRI	•	•	•		

PRODUCT CATEGORY	MAP		IAD	NTU	
	3600	3600+	3630	2902	275X
PRODUCTS					
Voice Interfaces					
T1 (D4 and ESF formats)	•	•	•		
E1 CAS and CCS, R2D (E&M)	•	•	•	•	
E&M	•	•	•		
4WTO	•	•			
FXS (LGS)	•	•	•		
FXO (LGE)	•	•	•		
MRD	•	•	•		
U BRI	•	•			
GEN-GEN	•	•	•		
G.SHDSL	•	•			
Data Interfaces					
RS422	•	•			
T1A/E1 A-232	•	•	•	•	•
E1 G.703	•	•	•	•	
2B1Q (for NTU connections)	•	•	•	•	
OCU-DP	•	•	•		
DSO-DP	•	•			
X.21	•	•	•	•	•
V.35	•	•	•	•	•
Frame relay	•	•			
G.SHDSL	•	•			
SONET/SDH					
SONET OC-3		•			
SDH STM-1		•			
DSP Applications					
Voice compression					
8 and 16 kb/s HCV compression	•	•			
8 kb/s A-CELP (ITU-T Rec. G.729)	•	•			
16 kb/s LD-CELP (ITU-T Rec. G.728)	•	•			
ADPCM (ITU-T Rec. G.721) 32 kb/s	•	•			
G3 fax support (V.17) over compressed voice (14.4 kb/s max.)	•	•			
Modem (v.32 bis) tones support over compressed (CELP) voice (14.4 kb/s)	•	•	•		
Subrate multiplexing	•	•			
Switching of compressed voice and data	•	•			
Echo cancellation (26 ms, G.165)	•	•			
Voice conference bridging	•	•	•		
Mu/A-law companding conversion	•	•			
Multidrop PCM data bridging	•	•	•		
1.460 (n*8 kb/s transparent) multiplexing	•	•			
High capacity multiplexing (HCM)	•	•	•	•	
DDS and X.50 rate adaptation	•	•	•		
Packet Services					
Frame relay switching	•	•			
Subrate frame relay (DDS, X.50, HCM)	•	•			
Transparent HDLC encapsulation	•	•			
Voice over frame relay (FRF.11)	•	•			
QoS (X.146)	•	•			
Frame relay fragmentation (FRF.12)	•	•			
DLCI multiplexing (FRF.11)	•	•			
Frame relay/ATM network interworking (FRF.5)	•	•			
Frame relay/ATM service interworking (FRF.8)	•	•			
AAL1 and AAL5 adaptation	•	•			
Inverse multiplexing over ATM (IMA)	•	•			

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