ASC Broadband Services Access Platform

The New Edge

of Network Access

asc
Advanced Switching Communications

Market Situation

The explosion of the Internet and customer demand for bandwidth is revolutionizing service provider network architectures.

The existing public network infrastructure carries data and voice traffic from customer premise to switching center over separate, dedicated circuits. Even where these circuits share the same physical connection, data and voice are separated onto distinct channels and switch connections.

This separation hinders innovation in integrated services. Further, when individual voice and data applications don't use their bandwidth, line capacity is wasted. With growing data traffic, the waste is more pronounced, costing service providers and their customers millions of dollars annually. That's the legacy of a network designed for voice.

Service providers need a better way to get in the game.

The solution — a new edge of network access that converges voice, data, and video traffic and supports integrated services far below traditional costs. How? A next generation platform designed to extend broadband service delivery capabilities as close to the customer as possible, in switching centers, central offices, and multi-tenant buildings.

ASC has built a product line from the ground up, focused squarely on providing broadband access with these features:

- Space efficient and cost effective
- Able to support voice, video and data services
- Adaptable to both legacy and emerging technologies
- Remotely manageable and configurable
- Scaleable to a wide range of customer densities

Unlike traditional vendors' scaled-down versions of 'Big Iron' equipment, ASC's broadband services access platforms have the right capabilities to give service providers a new edge.

ASC Broadband Services Access Platform

Benefits

Optimize Bandwidth. ASC's groundbreaking MultiStream™ technology offers maximum flexibility at the new edge to provide just the right access bandwidth for voice, video and data traffic — from fractional T1/E1 to NxT1/E1 levels. MultiStream software lets service providers add incremental bandwidth capacity and select connection protocols port by port — easily and remotely — with no interruption in service.

Provide flexible services. With MultiStream, service providers can offer affordable broadband Internet access and private line replacement services over universally available facilities, as well as integrated voice, video and data services. Customers needing more bandwidth than a T1/E1 don't have to make the costly step to T3/E3 or use expensive, proprietary solutions. ASC's MultiStream gives customers a smooth migration path from fractional T1/E1 to high speed broadband services.

Offer Range of Protocols. MultiStream includes the first standards-based, fully interoperable implementation of multilink frame relay (MFR) as well as inverse multiplexing over ATM (IMA). MFR provides a standard way of bundling multiple frame relay physical connections together into a single, higher-speed logical connection. Since MultiStream supports and interworks ATM and frame relay, customers can flexibly migrate to higher broadband speeds using the service they prefer. Each ASC platform with T1 connections can also support multiple NxT1/E1 bundles. Both MFR and IMA can be simultaneously supported on the same equipment.

Pay as You Grow. As service providers enter a market, initial customer density is low and grows over time. This can mean underutilized equipment that consumes expensive co-location space and egress trunks. The ASC approach scales the point of presence (PoP) from initial to full deployment. Not only does ASC offer compact and affordable entry-level systems, MultiStream NxT1/E1 technology ensures that PoP-to-PoP connections are "rightsized" from both a cost and traffic capacity perspective. ASC can then grow to support thousands of users, offering industry-leading density and value at every scale.

Expand Your Reach. The expense and effort of co-location in central offices and multi-tenant facilities can be daunting. ASC entry-level products are complete carrier class, NEBS compliant systems in a compact one rack-unit high enclosure. They are ideal for opening "Micro PoPs" in multi-tenant buildings or for tier 2-4 city central offices.

Adapt to the Future Service providers must establish their presence in an environment of uncertainty and change. To accommodate change in the architecture of core networks, tariffs, and customer demand for services, the ASC platform is designed to incorporate new functions and protocols via software loads.

Reduce Costs. Because ASC aggregates trunks close to the customer, more traffic can be delivered on fewer, less costly facilities — greatly expanding the utilization of bandwidth and expensive core switch ports. What's more, ASC also handles protocol interworking, supporting diverse services while allowing the core network to be optimized for a single protocol. And, by choosing protocols and configuring ports remotely, you speed provisioning and eliminate costly onsite visits.
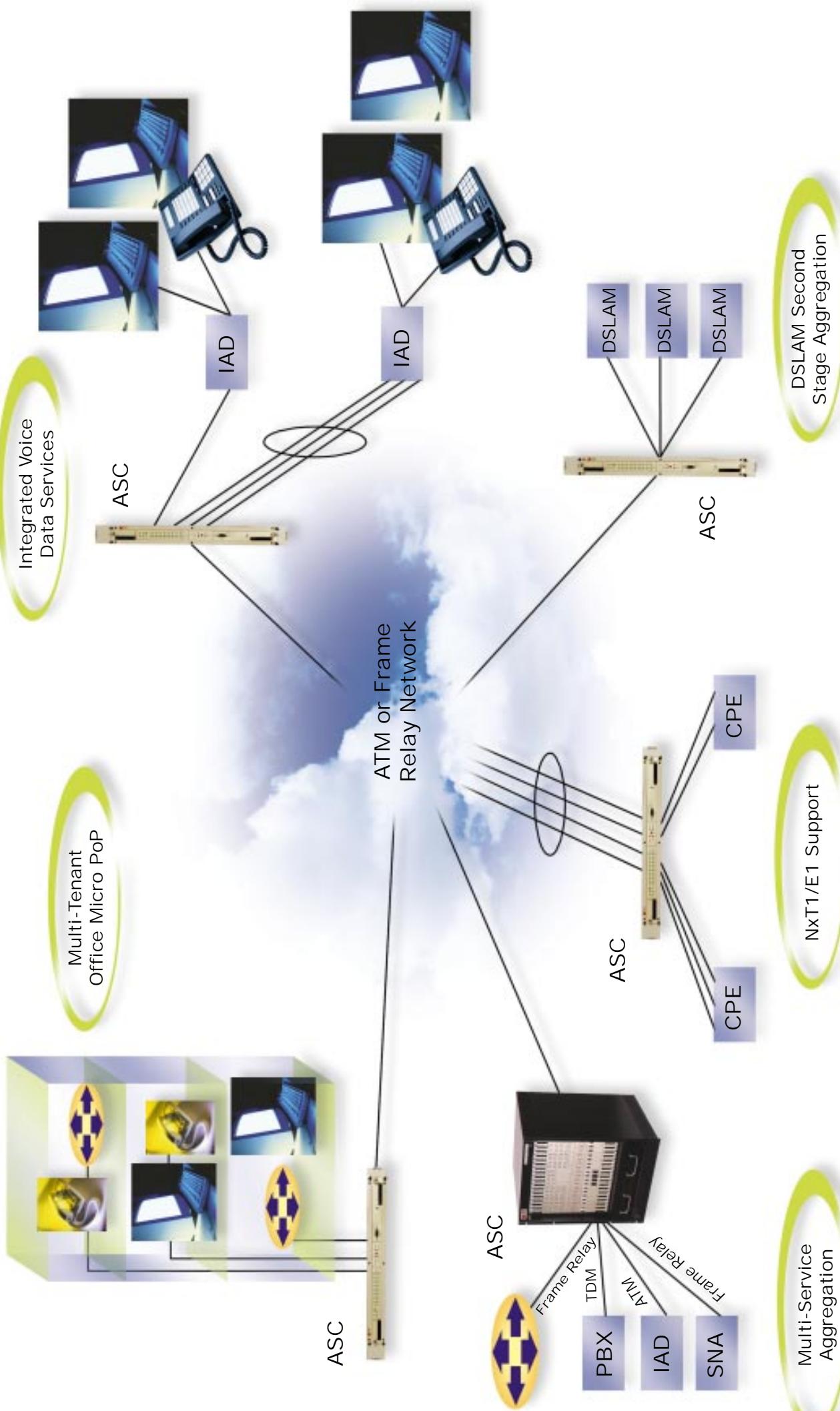
A-1000

A-1240

A-2000

A-4000

Integrated Voice Data Services

IAD

IAD

ASC

DSLAM Second Stage Aggregation

DSLAM
DSLAM
DSLAM

ASC

Multi-Tenant Office Micro PoP

ASC

ATM or Frame Relay Network

ASC

CPE

CPE

NxT1/E1 Support

ASC

Frame Relay
TDM
ATM
Frame Relay

PBX
IAD
SNA

Multi-Service Aggregation

Multi-Tenant Office "Micro PoP". Aggregates traffic from multiple customers in an office complex, making it more economical for a service provider to deliver services, and enabling faster provisioning. This strategy allows for innovative marketing arrangements with the office developer, and can result in selling advantages for the service provider.

Integrated Services Traffic Aggregation. ASC enables next generation converged network services with sophisticated QoS capabilities. Voice, video, and data traffic can be carried over the same circuits, with QoS prioritizing time-sensitive traffic such as sending voice before time-insensitive traffic such as email. ASC is interoperable with a wide variety of customer premise-based integrated access devices (IAD) that deliver multiple services over a single connection.

DSLAM Second Stage Aggregation. Because egress trunks from DSLAMs are often lightly loaded, it's not cost-effective to backhaul them directly to core switches. A-2000 acts as a second-stage aggregator for DSLAMs, aggregating traffic to a single, more fully utilized trunk. Since the A-2000 offers a choice of either T3/E3 or OC-3c/STM-1 for its network trunk, the service provider can control the level of oversubscription as business conditions dictate. And ASC adds QoS capabilities to support value-added service level agreements.

NxT1/E1 Support. More and more, customers are demanding higher than T1/E1-level bandwidth, but are not able to afford a full T3/E3. ASC bridges the bandwidth gap with MultiStream™ NxT1/E1 technology. MultiStream can support inverse multiplexing over ATM (IMA) and multilink frame relay (MFR) for both access and network connections.

Multi-Service Aggregation. ASC can interwork frame relay and ATM traffic, as well as carry TDM traffic over ATM circuits with standards-compliant circuit emulation services.
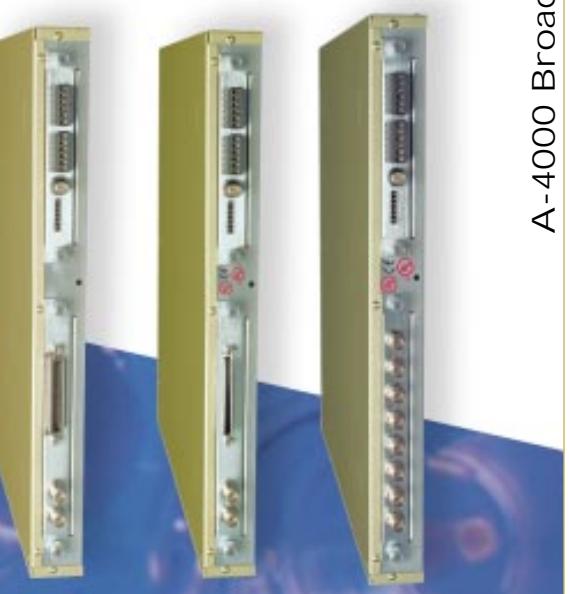
Innovative, Flexible Packaging

ASC's "system-on-a-card" modules fit both a pizza-box sized single slot chassis and the A-4000 multi-slot chassis. This approach offers outstanding density and value at every scale, and saves costly space in the central office, point of presence, or multi-tenant building.

With this innovative packaging, you avoid paying the "common equipment tax", you don't have to fill a chassis to get the lowest cost per port.

Single-Slot Chassis Systems

Entry-level ASC models use a system-on-a-card design. They're housed in a one rack unit-high chassis, with up to 24 access ports.

Model	Access Ports	Optional Port	Protocols
A-1000	12 T1/E1	T3/E3	ATM, IMA, FR, MFR, VLAN
	1 Ethernet		
A-1240	24 T1/E1	T3/E3	ATM, IMA, TDM, FR, MFR, VLAN
	1 Ethernet		
A-2000	4 T3/E3	OC-3c	ATM, FR, VLAN
	1 Ethernet		

A-4000 Broadband Services Access Platform

The same cards in the single-slot series fit the multi-slot ASC-4000 chassis. ASC boasts the industry's highest port density. With up to 336 T1/E1 ports per chassis, over 1000 T1/E1 ports are supported in a standard seven-foot rack.

	Model	Ports	Protocols	ASC-4000 Capacity with/without redundancy
	A-1000	12 T1/E1	ATM, IMA, FR, MFR	168 T1/E1 or 144 T1/E1 redundant
14 Access Slots	A-1240	24 T1/E1	ATM, IMA, TDM, FR, MFR	336 T1/E1 or 288 T1/E1 redundant
	A-2000	4 T3/E3	ATM, FR	56 T3/E3 or 48 T3/E3 redundant
4 Network Slots	A-2000	4 T3/E3	ATM	16 T3/E3 or 8 T3/E3 redundant
	A-5010	1 OC-3c	ATM	4 OC-3c or 2 OC-3c redundant

Key ASC Features

MultiStream™ Broadband Technology. MultiStream provides a standards-based, multiprotocol path from fractional T1 speeds, starting at 64 Kbps, up to broadband speeds of 16 Mbps — all using the same physical equipment ports, and without customer service interruption.

- Fractional T1/E1 (Nx64 Kbps)
- NxT1/E1 IMA and MFR services
- Multiple NxT1/E1 bundles per card
- Multiple protocol interworking — FRF.5 and FRF.8 support for ATM, IMA, frame relay and MFR interworking

Device Management. For service providers managing services delivered from multiple remote PoPs, intelligent device management is key. ASC provides multiple methods for local and remote access that allow operators to configure ports and connections, and report operational statistics and alarms:

- Embedded HTML-based manager
- SNMP agent with extensive MIB support
- Command line interface (CLI)
- File transfer protocol client for configuring from an ASCII flat file

Quality of Service Support. ASC supports QoS for both ATM and frame relay allowing service providers to offer integrated voice and data services. ASC supports multiple ATM classes of service, conforming to the ATM Forum TM 4.0 specification with 16 priority levels, as well as connection access control and policing. For frame relay, ASC supports committed information rate (CIR), committed bit rate (Bc) and excess burst rate (Be).

Soft-Configurable Ports. ASC ports are individually and remotely protocol selectable through a Web-based manager. This lets the service provider dedicate a port's function as business conditions demand, and change a connection's protocol, such as from frame relay to ATM, without costly site visits. By supporting a range of ports and connections, it lets service providers choose the right trunks — copper or fiber, single or multiplexed, packets or cells — to reach their customers.

Virtual Path Cross Connect. The ASC manager offers a configuration shortcut to establish multiple identical connections. The virtual path cross connect (VPCC) feature allows a mapping of connections from an access port to the mux port, creating a range of permanent virtual connections in one step. The VPCC is transparent to downstream and upstream devices, simplifying the configuration task of that equipment.

Virtual Lan (VLAN) Support. ASC's A-1240 model supports multiple virtual LANs over Ethernet, mapping each VLAN to a separate virtual circuit, providing QoS and traffic policing. This function integrates IP and other LAN-based traffic from routers and Ethernet switches to a shared wide area network (WAN) infrastructure.

Carrier-Class Network Synchronization. All ASC models support an internal stratum level 3 clock. This guarantees network synchronization between upstream and downstream devices that are interconnected through ASC products. All ASC products also support loop timing derived from any port, or dual BITS clock timing to provide the synchronization required for any application. The hierarchy of timing sources is user definable.

Legacy TDM Support. ASC's A-1240 and A-4000 supports time division multiplexing (TDM) traffic with circuit emulation service (CES). ASC modules support structured and non-structured circuit emulation services (CES) for fractional and full T1/E1 TDM traffic.

NEBS Compliant. All ASC models are designed to NEBS-3 standards, and are either NEBS-3 certified or pending certification.

ASC is a market and technology leader of solutions for broadband services access from the new edge.

For carriers and service providers worldwide, ASC's broadband services access platform dramatically lowers the cost of delivering broadband services.

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