

# Broadband Access Product Overview



April 1998



# ATM Access Market Opportunities

***“For the period 1996-2000, the worldwide ATM service segment is projected to grow at a Compounded Annual Growth Rate of 99%”***

**Vertical Systems Group, 1998**

***“The high speed ATM access concentrator market is one of the fastest growing market segments in wide area networking”***

**Dataquest, 1998**



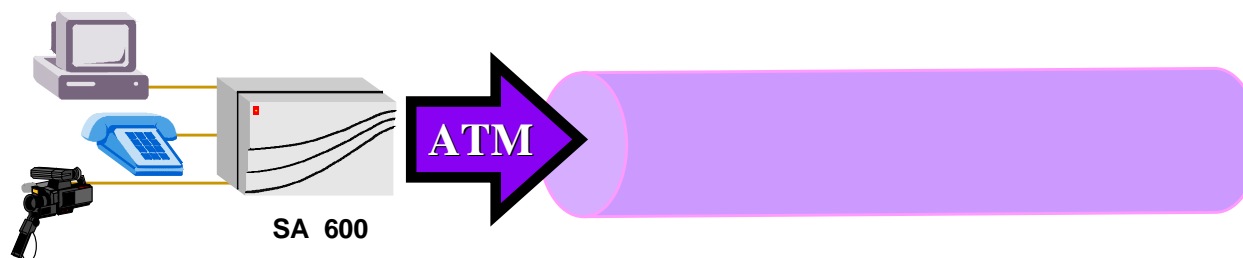
# ATM Access Market Drivers

- Private TDM networks are running out of gas
- Carriers committed to ATM core infrastructure
- ATM Access concentrators expand a carrier's service portfolio with minimal incremental cost
- Customer trend toward WAN consolidation
- ATM is proven and offers QoS
- "ATM is the ideal technology for integrated access"



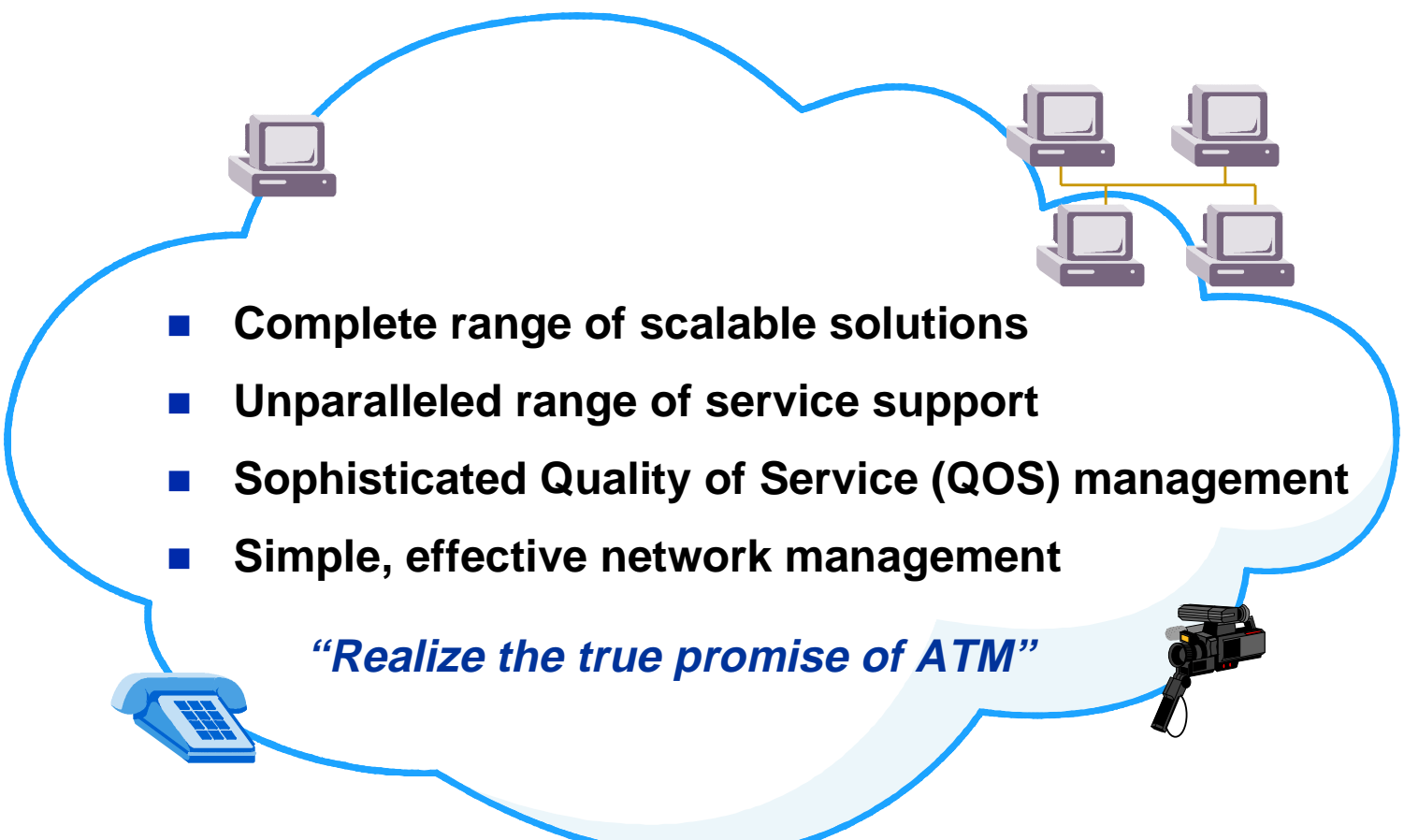
# Broadband Access Solutions Need To...

- Lower service cost through network consolidation and ease of operation
- Hide ATM's complexity from end-users
- Provide multiple Service Level Agreement (SLA) offerings
- Connect existing applications to ATM network
  - ◆ Legacy Data
  - ◆ Video
  - ◆ Voice
  - ◆ Native ATM





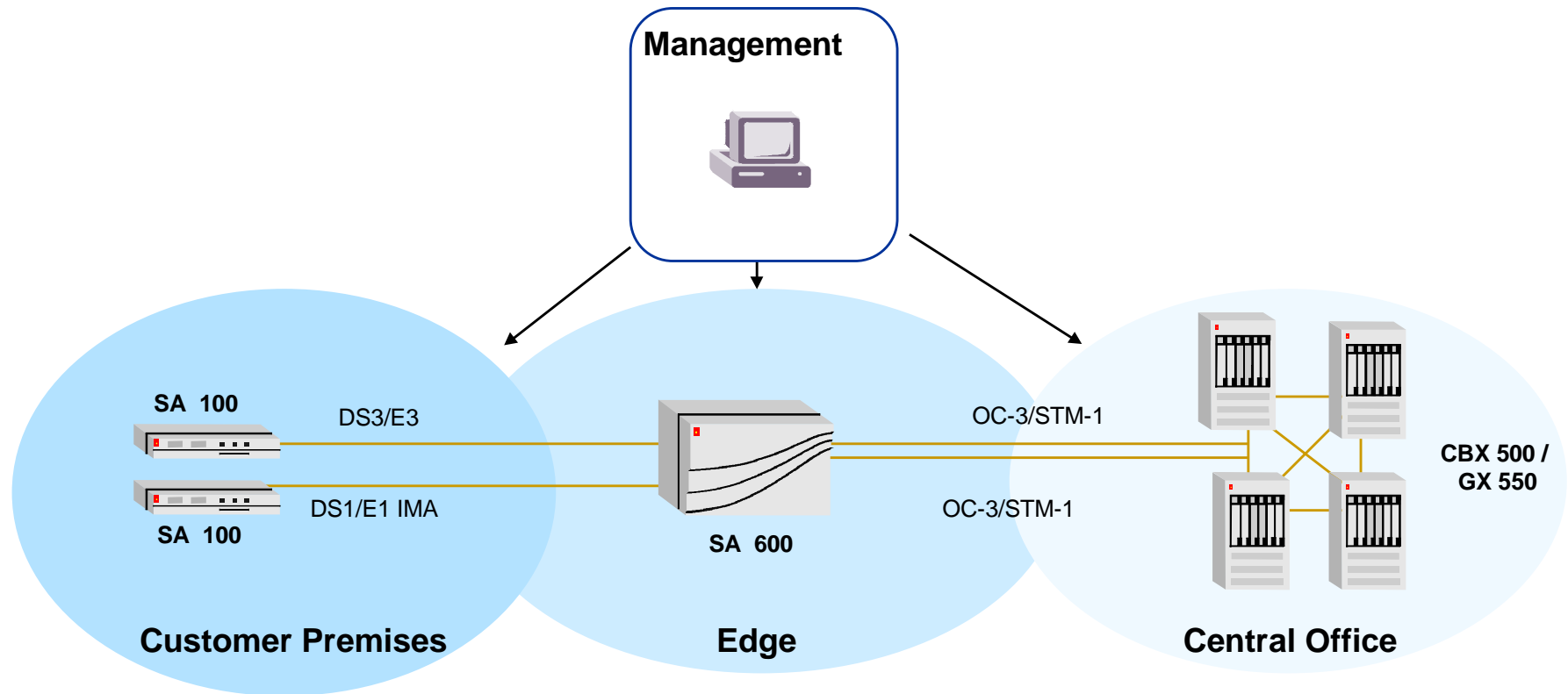
# The Ascend Broadband Access Advantage

- 
- Complete range of scalable solutions
  - Unparalleled range of service support
  - Sophisticated Quality of Service (QOS) management
  - Simple, effective network management

*“Realize the true promise of ATM”*



# Ascend - Broadband Access Portfolio



- Common hardware
- Common software
- Common management



# System Architecture

## ■ Flexible

- ◆ Broad range of services supported
- ◆ Broad range of interfaces supported
- ◆ Plug & Play services and capacity

## ■ Scalable

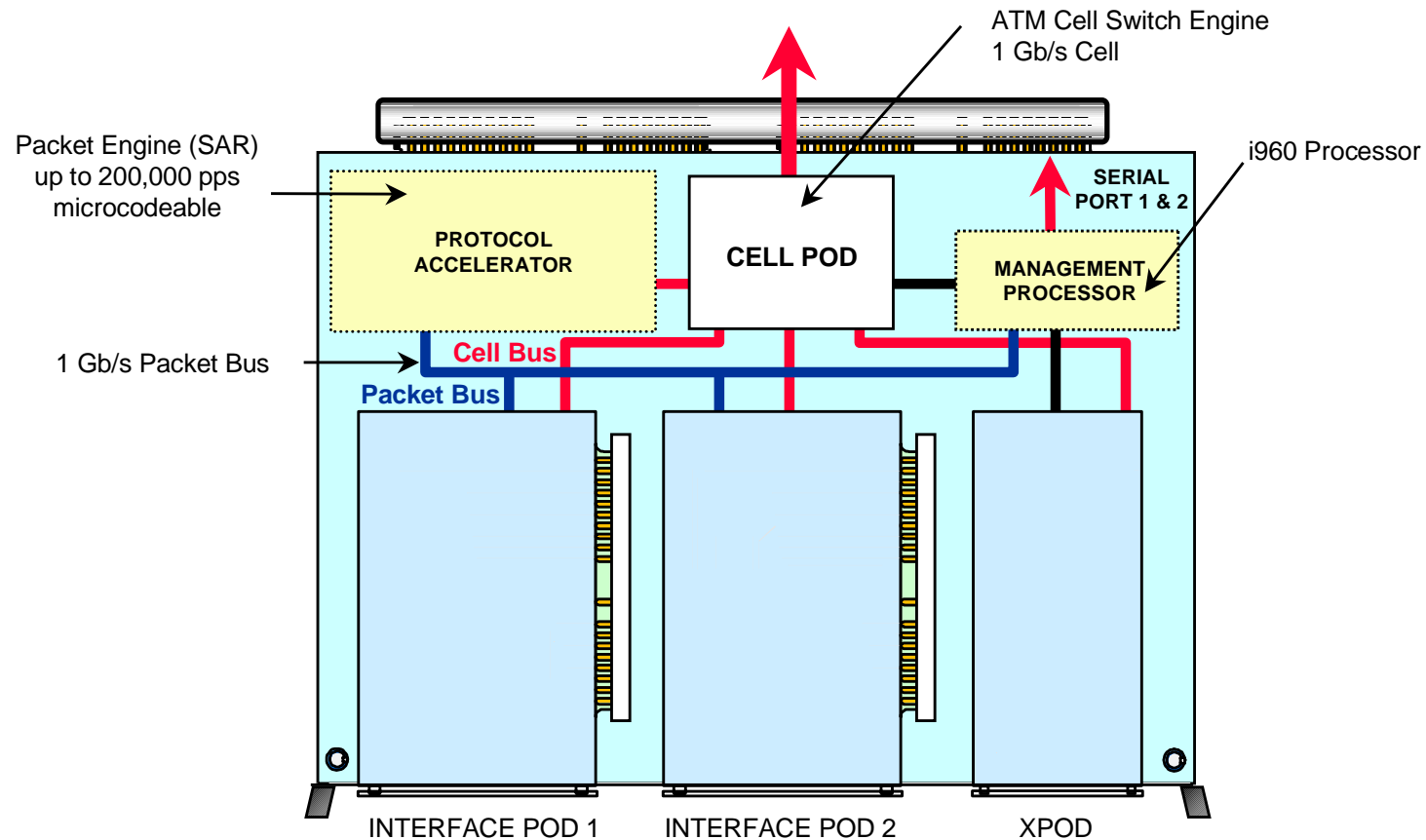
- ◆ Hardware & software commonality
- ◆ Bandwidth interface rates from 1200 bps to OC-3/STM-1
- ◆ Port density ranges from 2 to 57

## ■ Distributed Processing

- ◆ Switch fabric
- ◆ Management
- ◆ Adaptation services



# Interface Control Module



- Each ICM provides up to 1 Gb/s of cell processing and 1 Gb/s of packet processing.
- Unique Protocol Accelerator™ provides cross-flow translation.
- PODs have access to packet and cell subsystems.





# Ascend Broadband Access Family

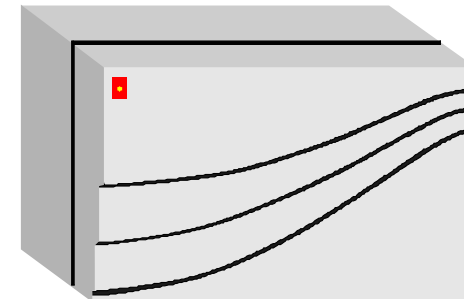
## ■ SA 100 Broadband Service Unit

- ◆ Single ICM
- ◆ 1 Gb/s Packet, 1 Gb/s cell
- ◆ Up to 5 OC-3s non-blocking
- ◆ Up to 17 interface ports



## ■ SA 600 Service Concentrator

- ◆ 3 ICMs
- ◆ Up to 57 interface ports
- ◆ Distributed processing
- ◆ Power supply, common logic, interface redundancy





# Speeds & Feeds

## ■ Circuit

- ◆ T1 circuit emulation (2 or 4 ports)
- ◆ E1 circuit emulation (2 or 4 ports)
- ◆ V.35/X.21 serial circuit emulation (2 ports)



## ■ Packet

- ◆ 10/100 Ethernet RFC-1483 bridging (4 ports)
- ◆ Universal Serial Frame (2 ports)
- ◆ T1 Compressed Voice (1 port)
- ◆ E1 Compressed Voice (1 port)



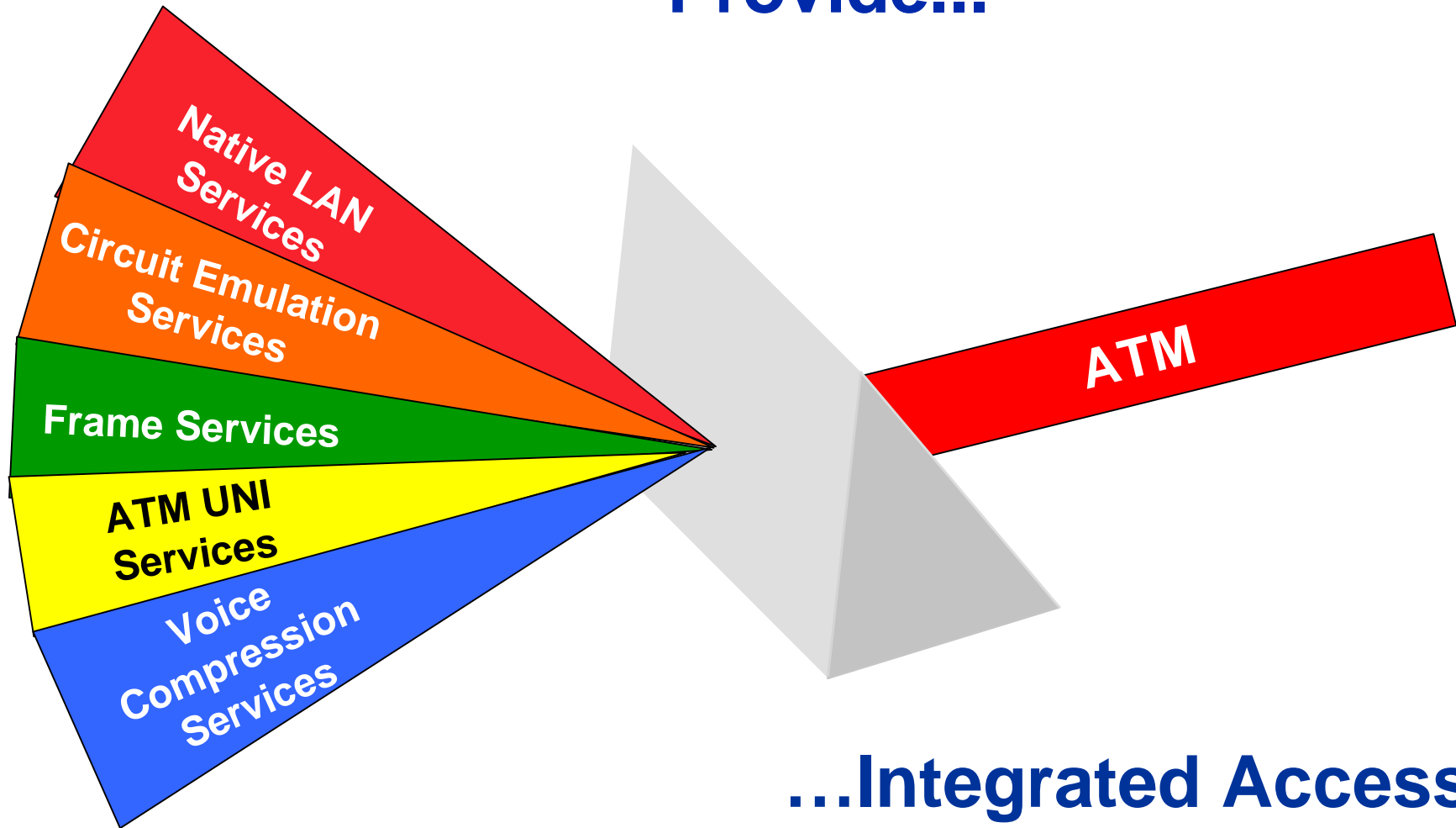
## ■ ATM CELL

- ◆ OC-3/STM-1 UNI (1 or 2 ports)
  - single/multimode
  - SR, IR, LR
- ◆ T3 UNI (1 or 2 ports)
- ◆ E3 UNI (1 or 2 ports)
- ◆ T1 UNI (1 or 2 ports)
- ◆ E1 UNI (1 or 2 ports)
- ◆ T1 IMA (4 or 8 ports)
- ◆ E1 IMA (4 or 8 ports)





# High Performance Adaptation Services Provide...



...Integrated Access



# Native LAN Services

**Provide Transparent Extension of LAN Across ATM Network**

## Features

- **Wire speed performance**
  - ◆ 10 Mbps, 100 Mbps
- **RFC 1483 transport bridging**
- **Traffic shaping**
- **Familiar customer DEMARC**
- **Multiple LAN groups on a single platform**

## Benefits

- **Enables high-speed data services**
- **Ease of provisioning & administration**
- **Traffic contract enforcement**
- **Simplifies customer interface**
- **Multi-customer support**



# Circuit Emulation Services

**Provide Private Line Services for Voice, Video and TDM Networks via T1, E1, V.35, X.21**

## Features

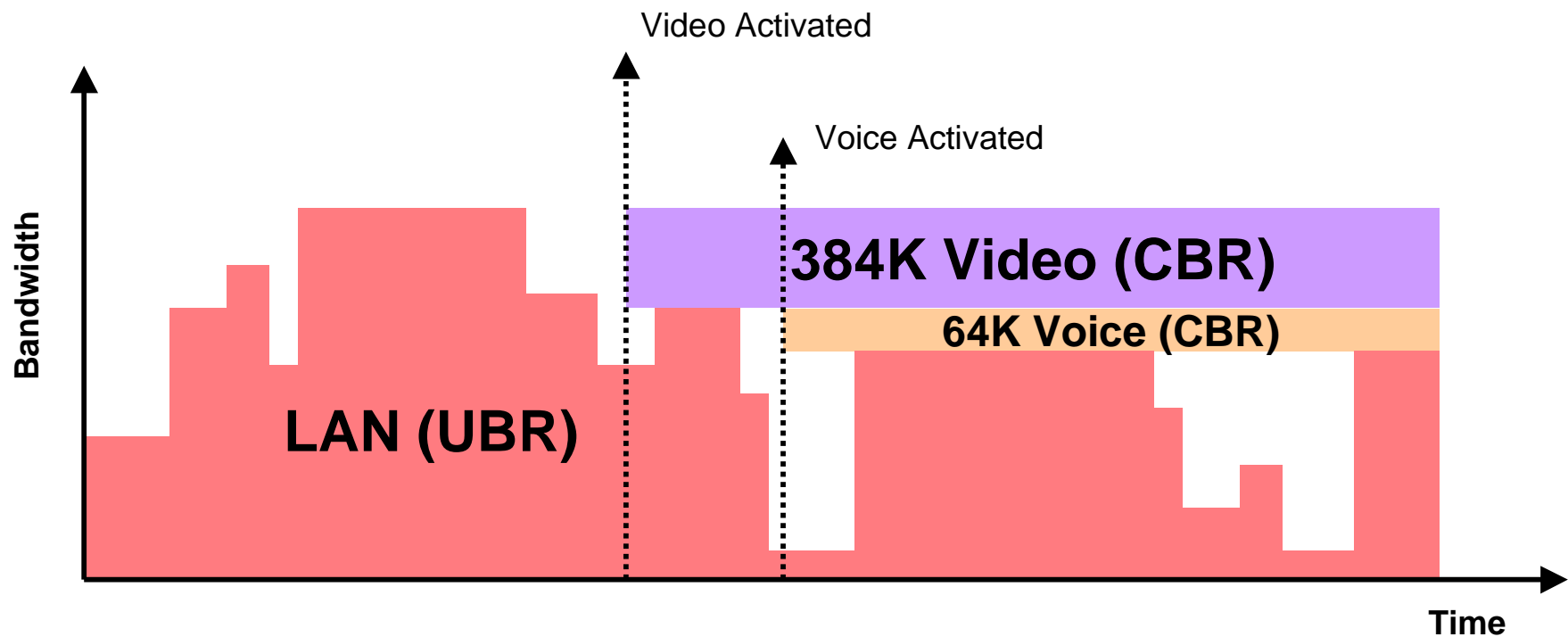
- **Structured services**
  - ◆ Nx56/64 Kbps
  - ◆ DACS-like Aggregation
- **Unstructured services**
- **Dynamic Bandwidth**
  - ◆ Voice and video activation
- **Minimal SAR delays**
- **ATM forum compliant**
- **Signaling support**
  - ◆ CAS / CCS

## Benefits

- **Fractional services, aggregation services**
- **Clear channel services**
- **Maximize bandwidth utilization**
- **No inherent Echo Cancellation requirements**
- **Interoperability**
- **Compatibility with existing infrastructure**



# Dynamic Bandwidth for CES



**T1/E1 Trunk bandwidth usage by application**



# Frame Services

**Provide support for all Frame base devices, Frame to ATM interworking, Frame relay aggregation via RS-232, RS-530, V.35, X.21**

## Features

- **Frame transport**
  - ◆ Tunneling of all Frame protocols
- **Up to 10 Mbps throughput**
- **Universal serial interface**  
**Frame to ATM interworking**
  - ◆ Network interworking
  - ◆ Service interworking
- **Minimal SAR delays**
- **Frame Relay forum complaint**

## Benefits

- **Legacy services**
- **High-speed data services**
- **Minimal sparring**
- **Enhanced services, Frame Relay aggregation**
- **Interoperability**



# ATM UNI Services

**Provide direct UNI Services, UNI Aggregation, Integrated Access Services via T1, E1, T1 IMA, E1 IMA, E3, OC-3/STM-1**

## Features

- **Service class support**
  - ◆ CBR, VBR-rt, VBR-nrt, UBR, ABR
- **Traffic policing**
- **Congestion management**
  - ◆ Configurable per service class, per VP, per VC
- **Minimal SAR delays**
- **Connection Admission Control**
  - ◆ Configurable overbooking

## Benefits

- **Integrated access service package**
- **Traffic contract enforcement**
- **Bandwidth management flexibility**
- **1.2 Gb/s ATM switch per ICM**
- **Small footprint ATM switch**





# Voice Compression Services

Provide enhanced voice service offerings via T1, E1

## Features

### ■ Standards-based compression

- ◆ G.711, G.726, G.729A, G.723.1

### ■ Silence detection/suppression

- ◆ Voice Activity Detection (VAD)
- ◆ Comfort Noise Generation (CNG)

### ■ Echo Cancellation

### ■ Fax relay/modem bypass

### ■ Modular architecture

- ◆ Field upgradeable

## Benefits

### ■ Interoperability & maximum bandwidth efficiency

### ■ Enhanced utilization of bandwidth

### ■ Eliminates need for external Echo Cancellation

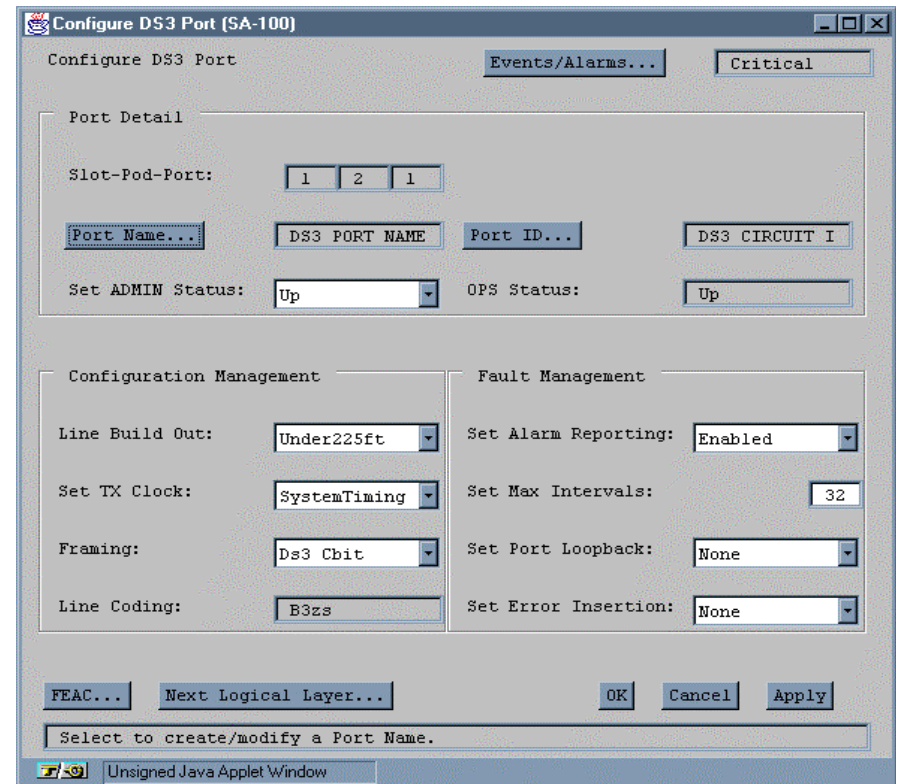
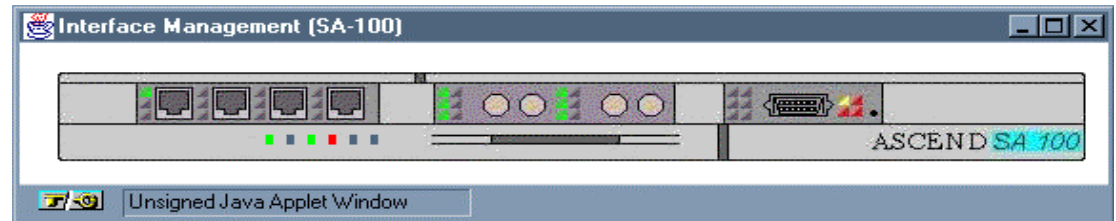
### ■ Expand service definition

### ■ Controls cost



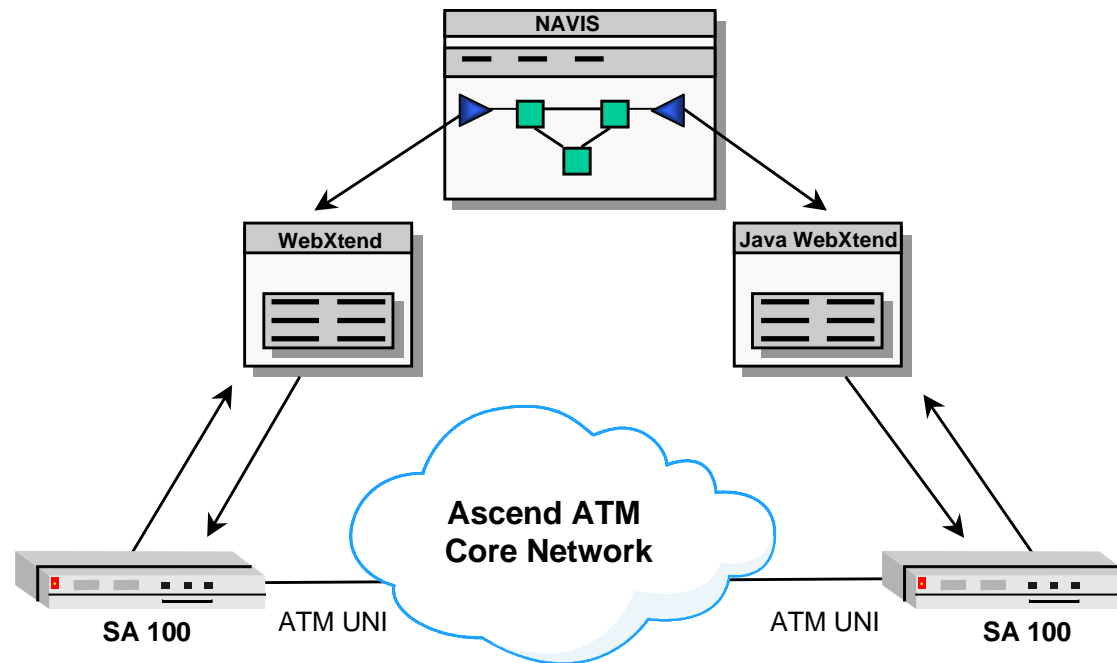
# Broadband Access Product Management

- Provides easy to use GUI interface
- Integration with existing management platforms
- Can be used by centralized or field-based network management staff
- Platform independent: UNIX, Windows NT, Windows 95





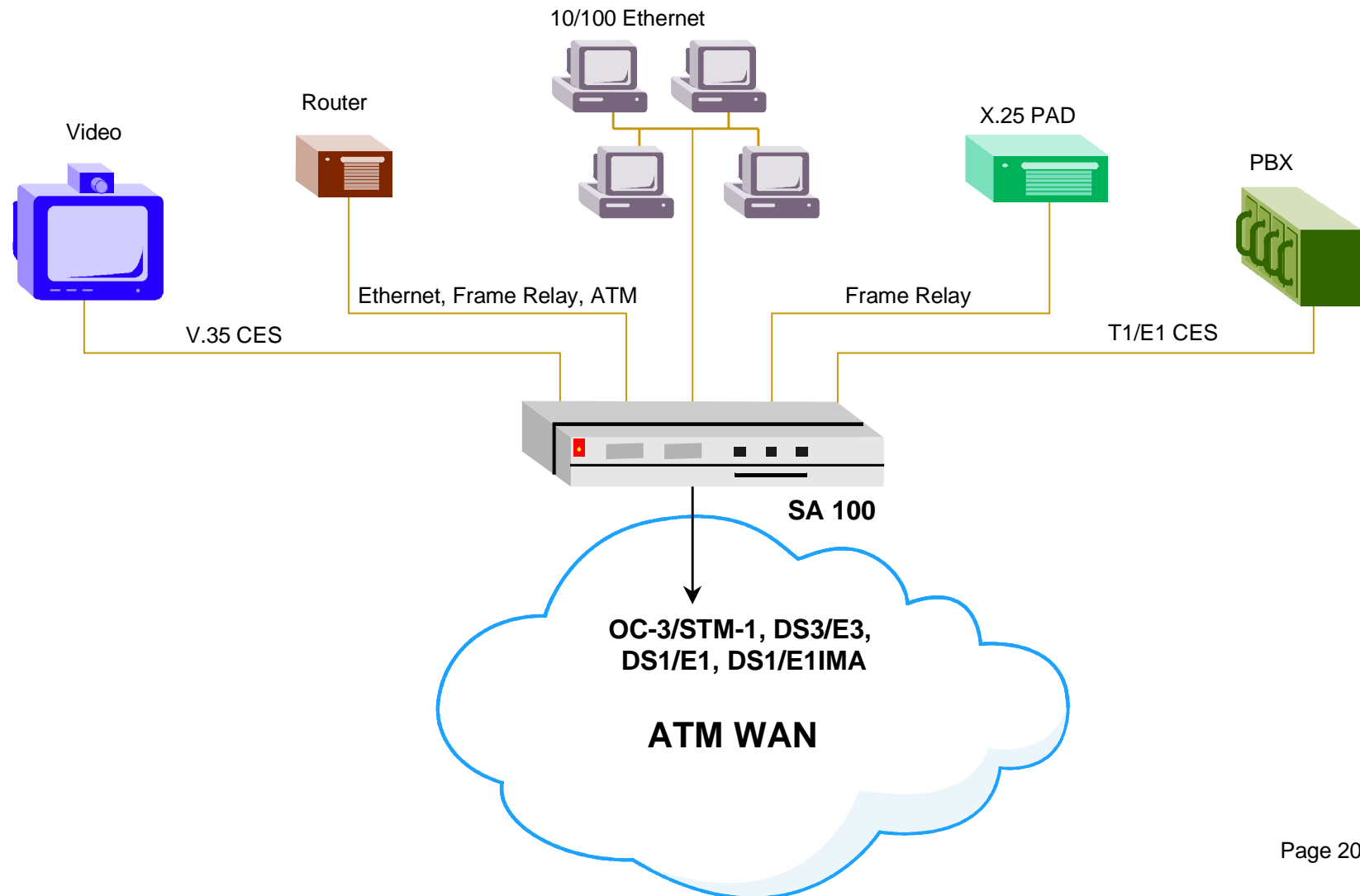
# Navis Management Integration



- Element centric management via WebXtend™
- Managed SA icons on HP OpenView / NavisCore™ Map
- Database/MIB/Trap integration
- Integrated under NAVIS™

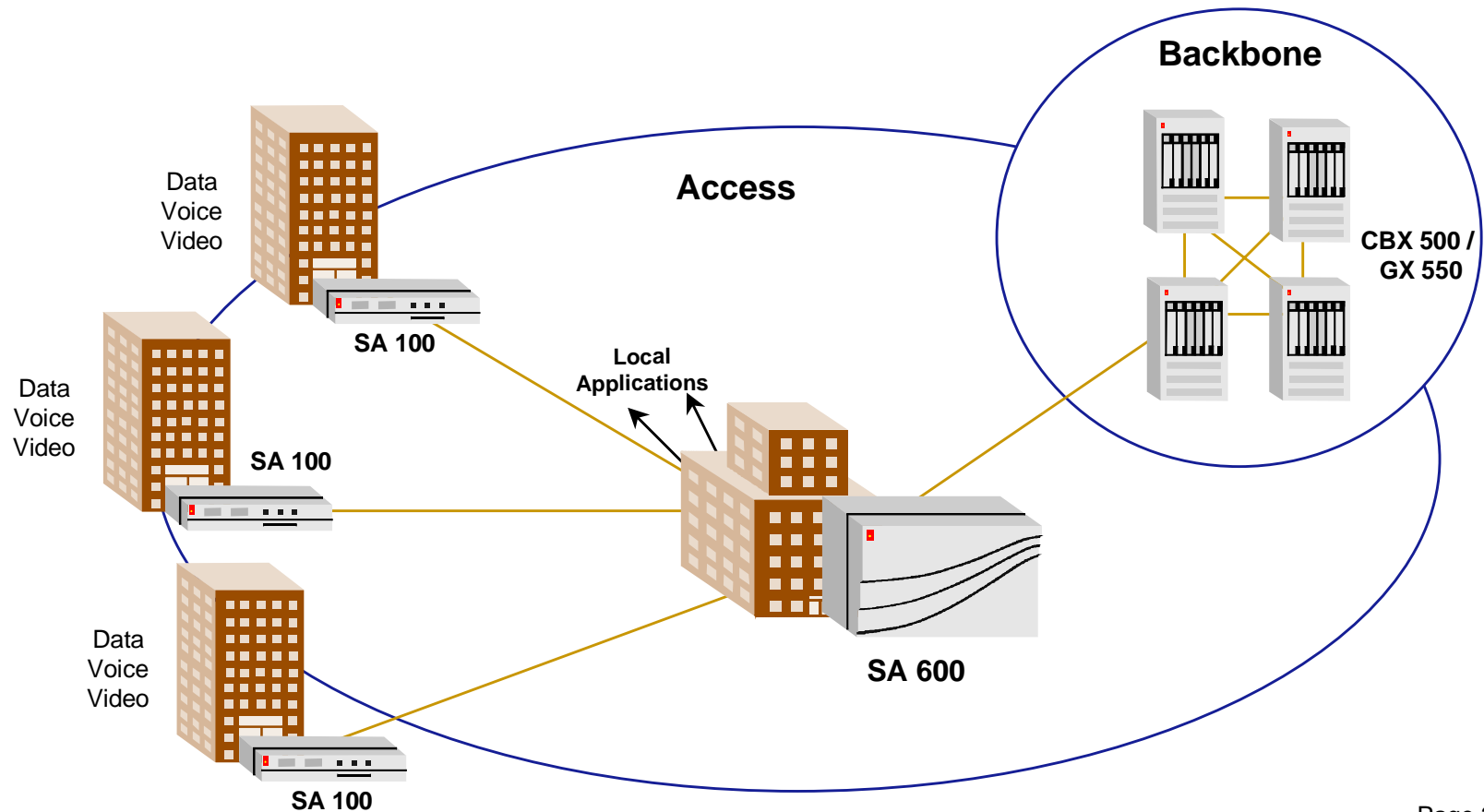


# High Mix / Low Cost Integrated Access



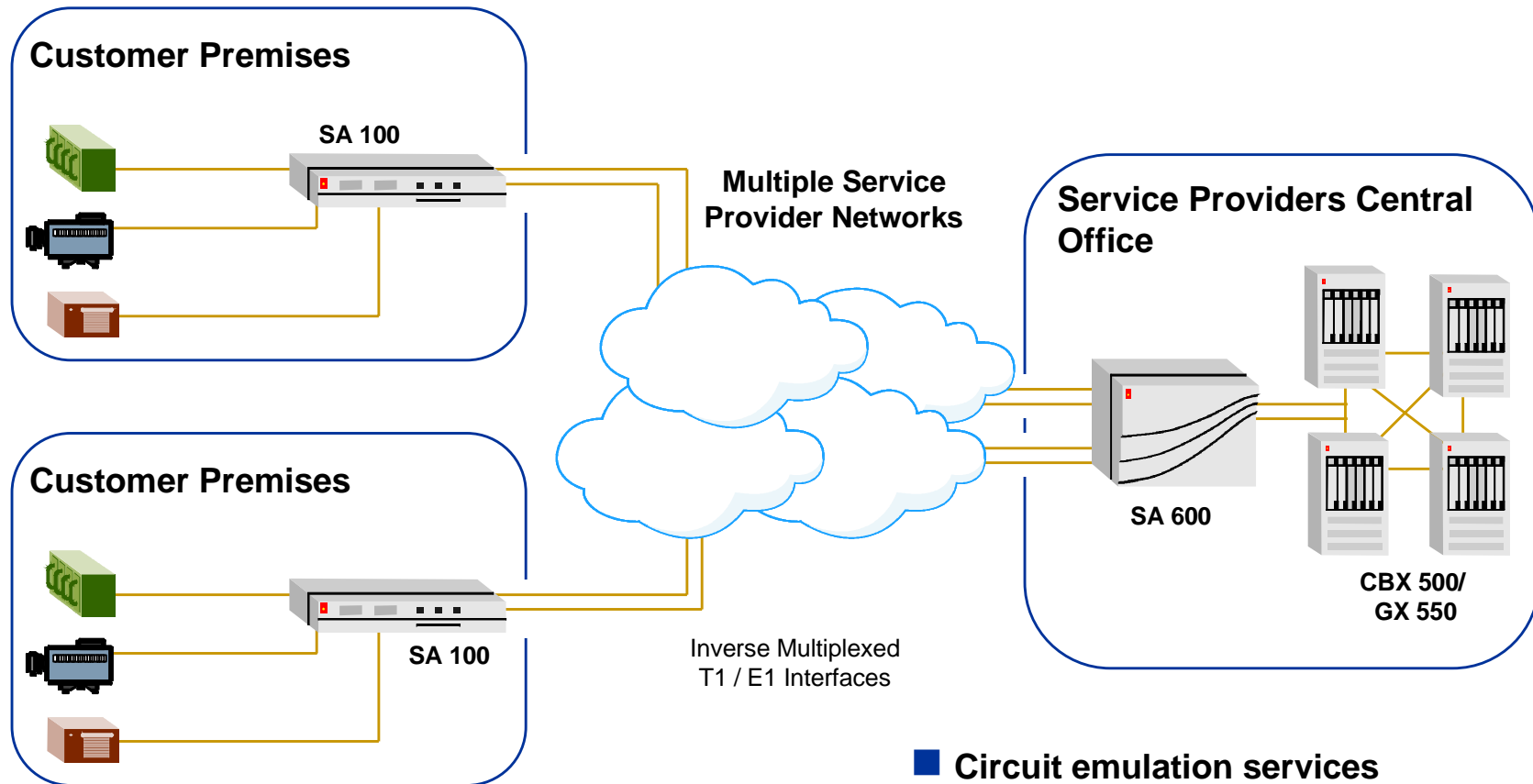


# Service Concentration and Switching Concentration





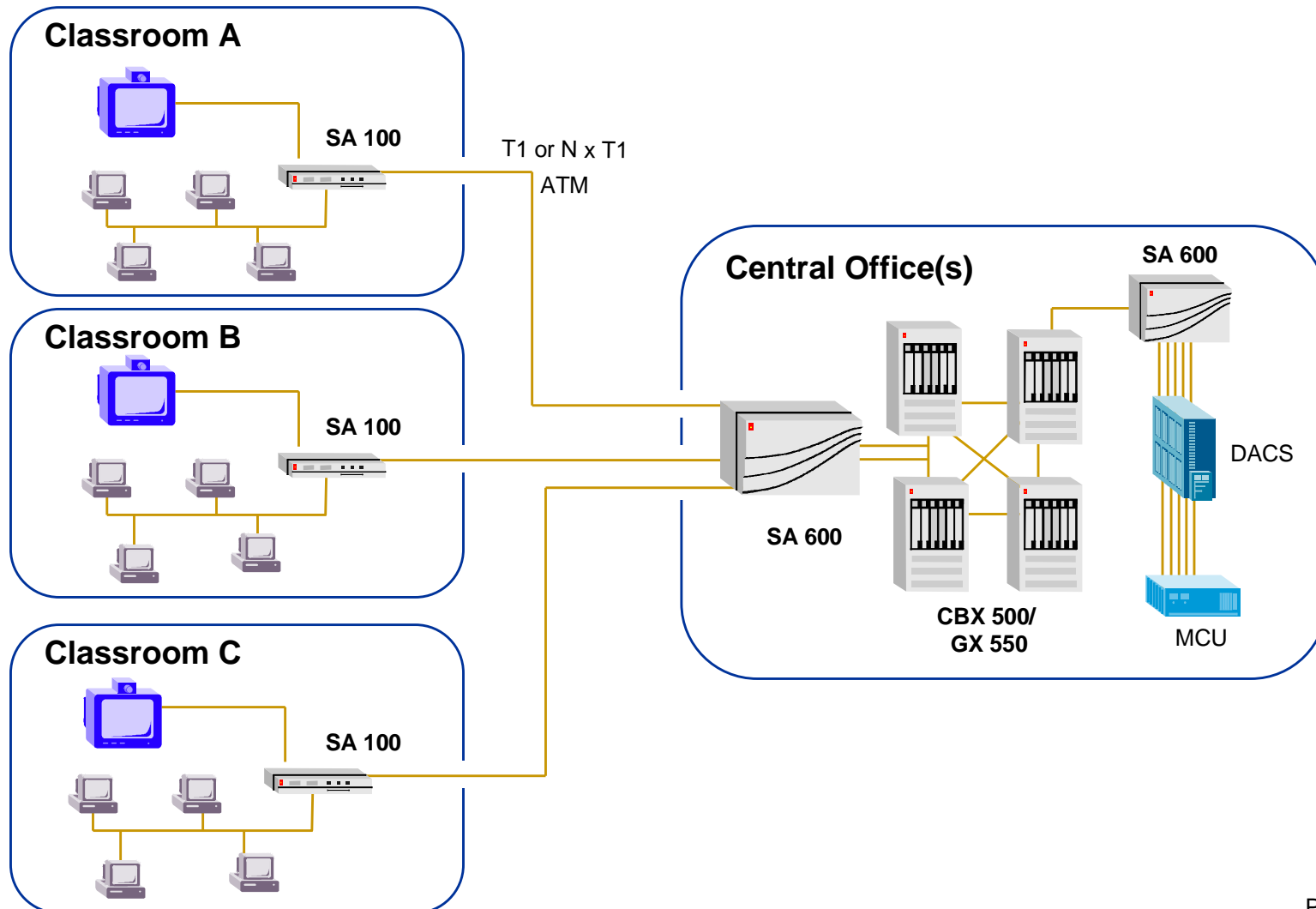
# ATM Service Concentration



- Circuit emulation services
- ATM UNI services
- IMA services

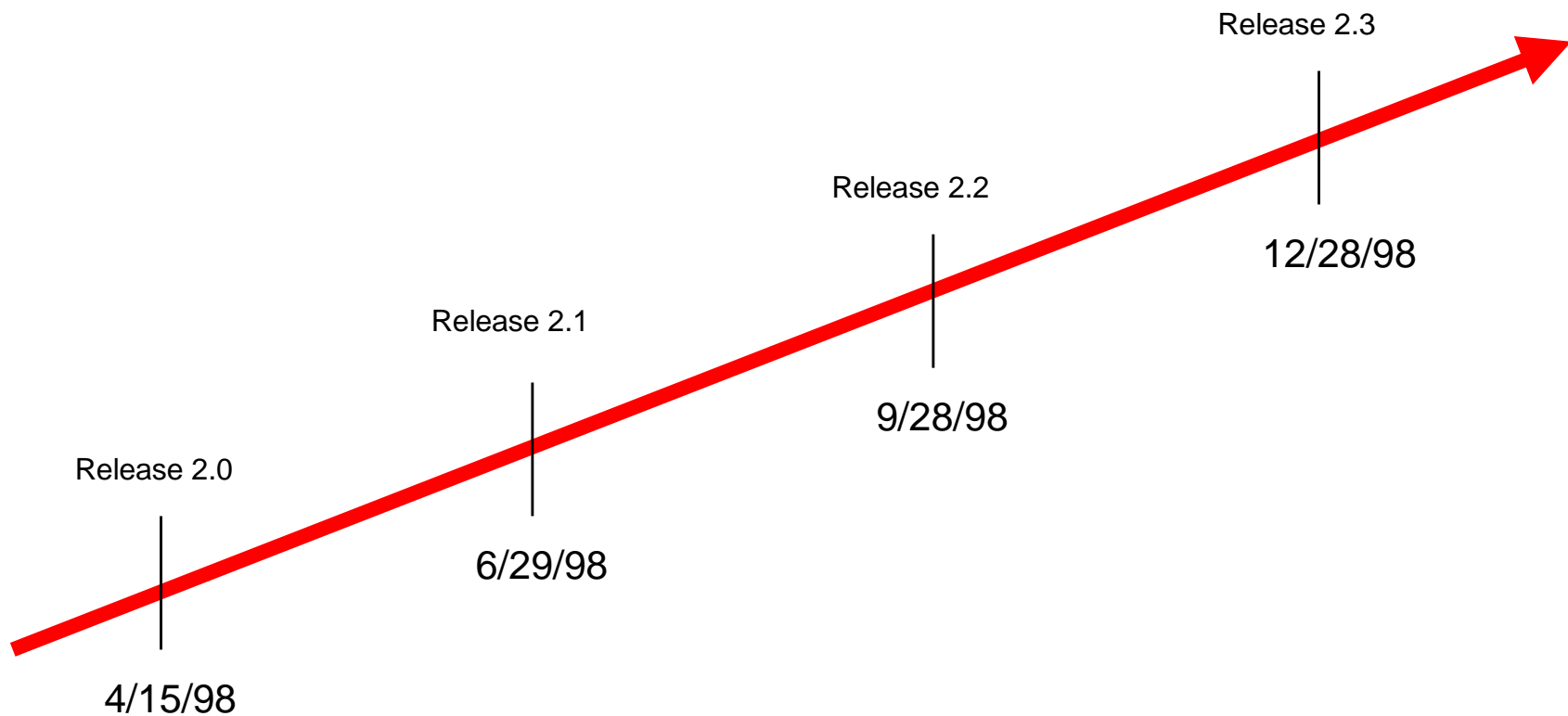


# Public Video Distribution Services





# Broadband Access Product Roadmap Snapshot FCS Dates







# Broadband Access Product Roadmap Release 2.0

- **FCS: 4/15/98**
- **Major new supported hardware platforms**
  - ◆ SA 600 with multi-ICM capability
- **Major features**
  - ◆ Universal Frame IPOD, Phase I
  - ◆ IMA, Phase II
  - ◆ Serial CES IPOD
  - ◆ DS1 XPOD w/ integral CSU
  - ◆ Dual DS1 CES XPOD, Dual E1 CES XPOD



# Broadband Access Product Roadmap

## Release 2.1

- **Scheduled FCS: 6/29/98**
- **Major new supported hardware platforms**
  - ◆ SA 1200 with multi-ICM capability
- **Major features**
  - ◆ SVC Support, Phase I
  - ◆ Tri Combo IPOD
  - ◆ Universal Frame IPOD, Phase II (FRF.5)
  - ◆ IMA, Phase III
  - ◆ DS1 Voice Compression IPOD



# Broadband Access Product Roadmap

## Release 2.2

- **Scheduled FCS: 9/28/98**
- **Major new supported hardware platforms**
  - ◆ SA 600 Redundancy, Phase I
- **Major features**
  - ◆ SVC Support, Phase II
  - ◆ E1 Voice Compression IPOD
  - ◆ Universal Frame IPOD, Phase III (FRF.8)
  - ◆ VP Shaping, OC3 XPOD
  - ◆ NMS Integration, Phase I (Provisioning, Fault Server)
  - ◆ ATM 25 IPOD
  - ◆ Analog Voice Compression IPOD



# Broadband Access Product Roadmap

## Release 2.3

- **Scheduled FCS: 12/28/98**
- **Major new supported hardware platforms**
  - ◆ SA 600 / 1200 Redundancy, Phase II
  - ◆ Hi Density Line Cards, Phase I (ICM/PODs, UNI, IMA)
- **Major Features**
  - ◆ NMS Integration, Phase II (Statistics, Accounting Server)
  - ◆ VP Shaping: DS3 / E3 XPOD
  - ◆ HSSI Frame IPOD