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# Multiservice Core

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# Drivers in Telecom Networking



- **Today - stable PSTN growth, exploding Internet. Ubiquitous IP-based services coming soon**
- **CLEC/ILEC/IXC/ISP → Integrated services carrier**
- **Internet & E-commerce requires new business models for telecom and data service customers**
- **Telecommunications deregulation has created increased competition**
- **CLECs and ISPs must offer advanced services to compete. Price-only advantage will not last**

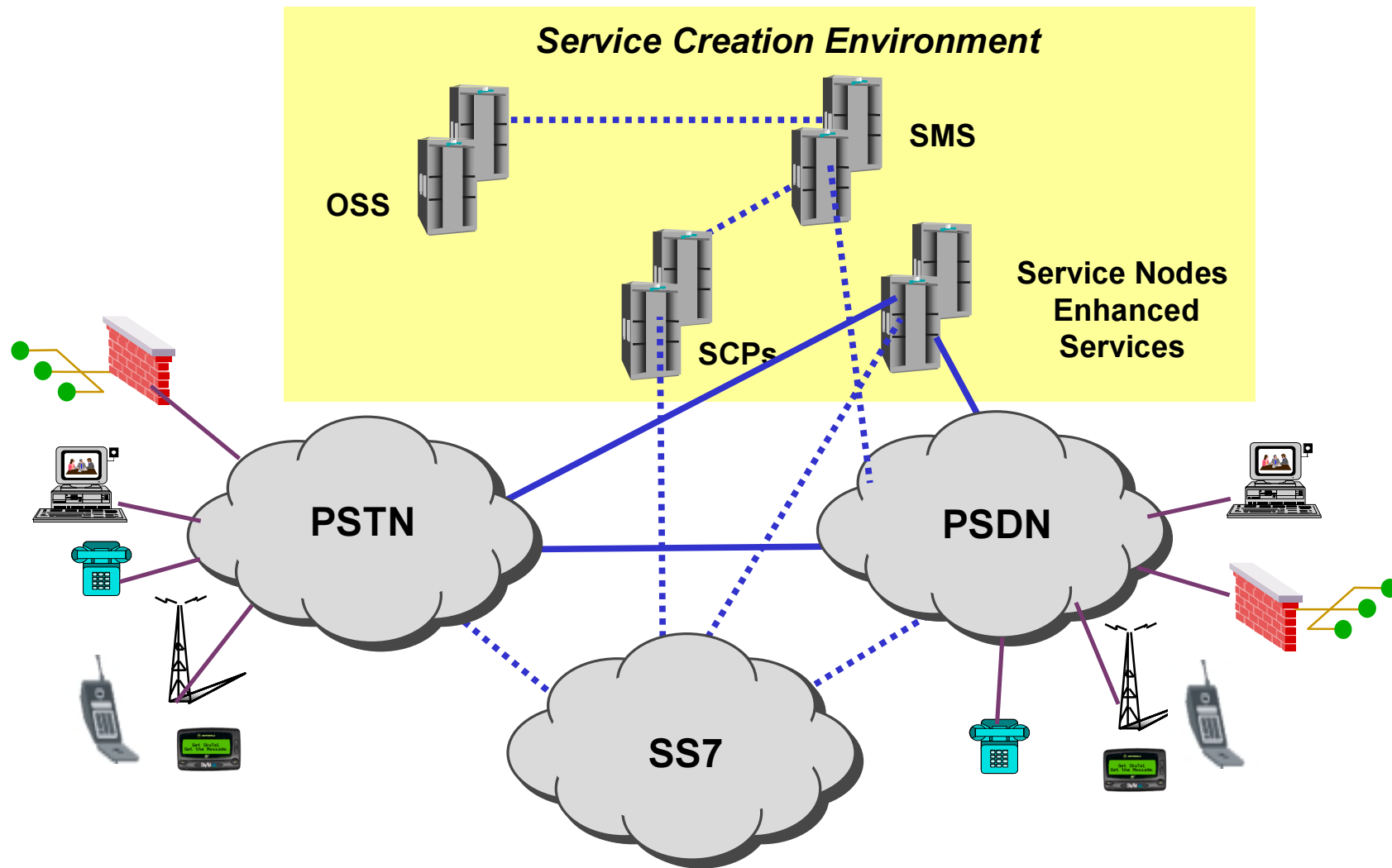
# Service Provider Challenge



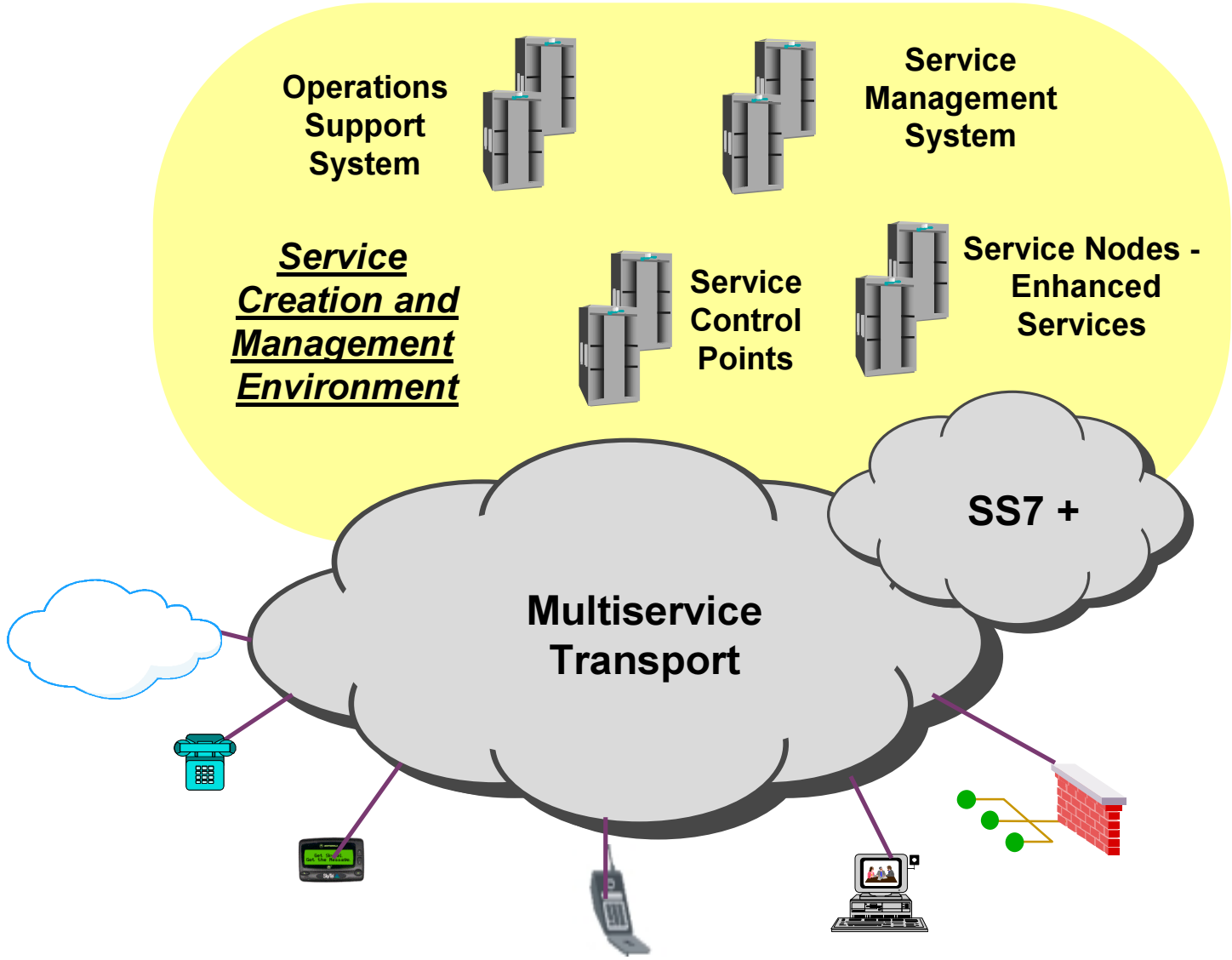
- Service Providers operate in a ***competitive environment*** and must minimize costs of operations and maximize control efficiencies in network infrastructures
- Service Providers need to create new ***high-value, revenue generating services*** being demanded by their customers
- Service Providers must ***maximize return on investment*** of the network infrastructure
- Service Providers need a ***flexible position for future*** network requirements & service opportunities

***Opportunity: Adopt new technology and evolve business models to streamline and operate in this new data-centric environment***

# Service Elements in Carrier Networks Today

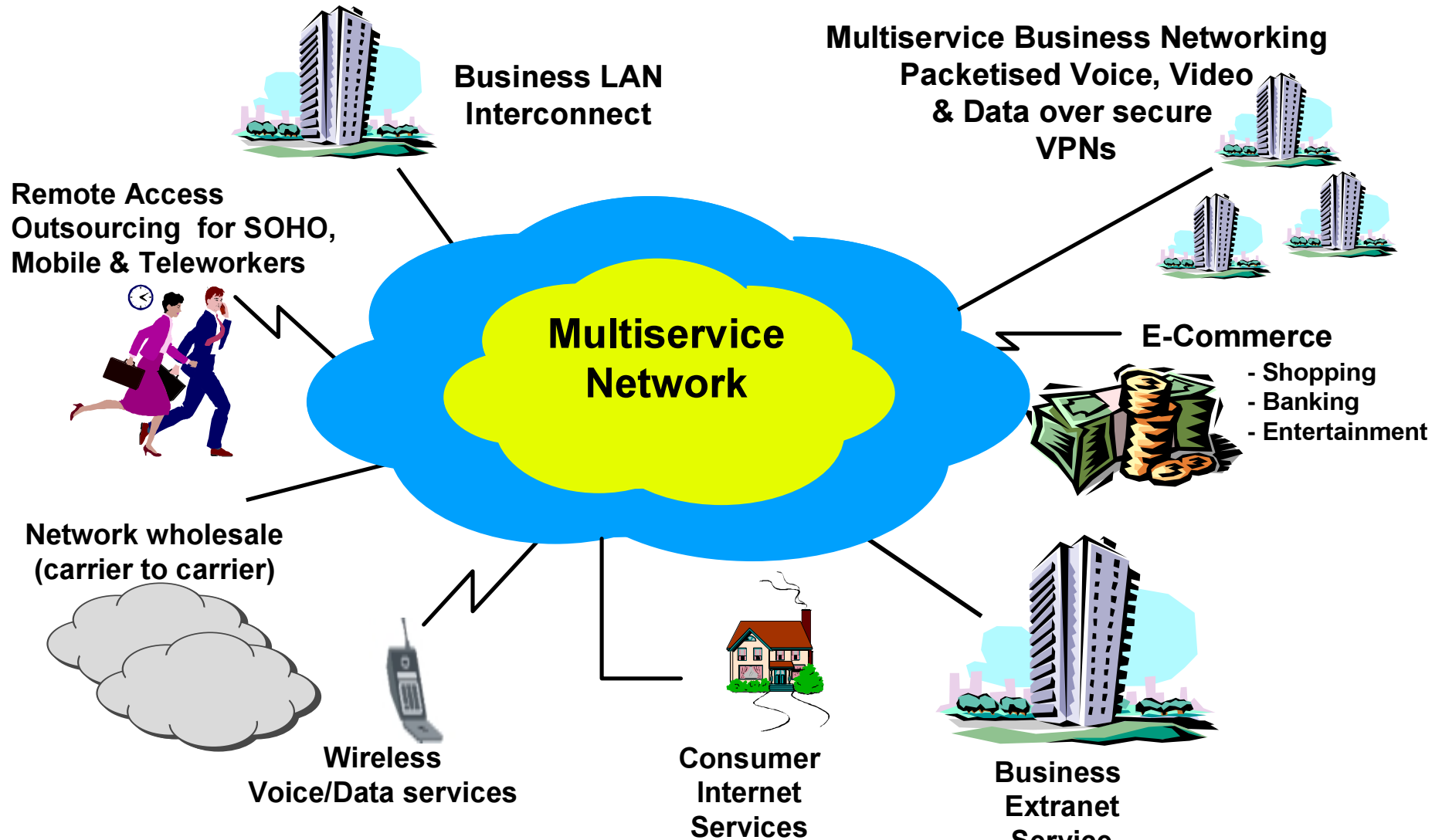


# Service Elements in the New Public Network

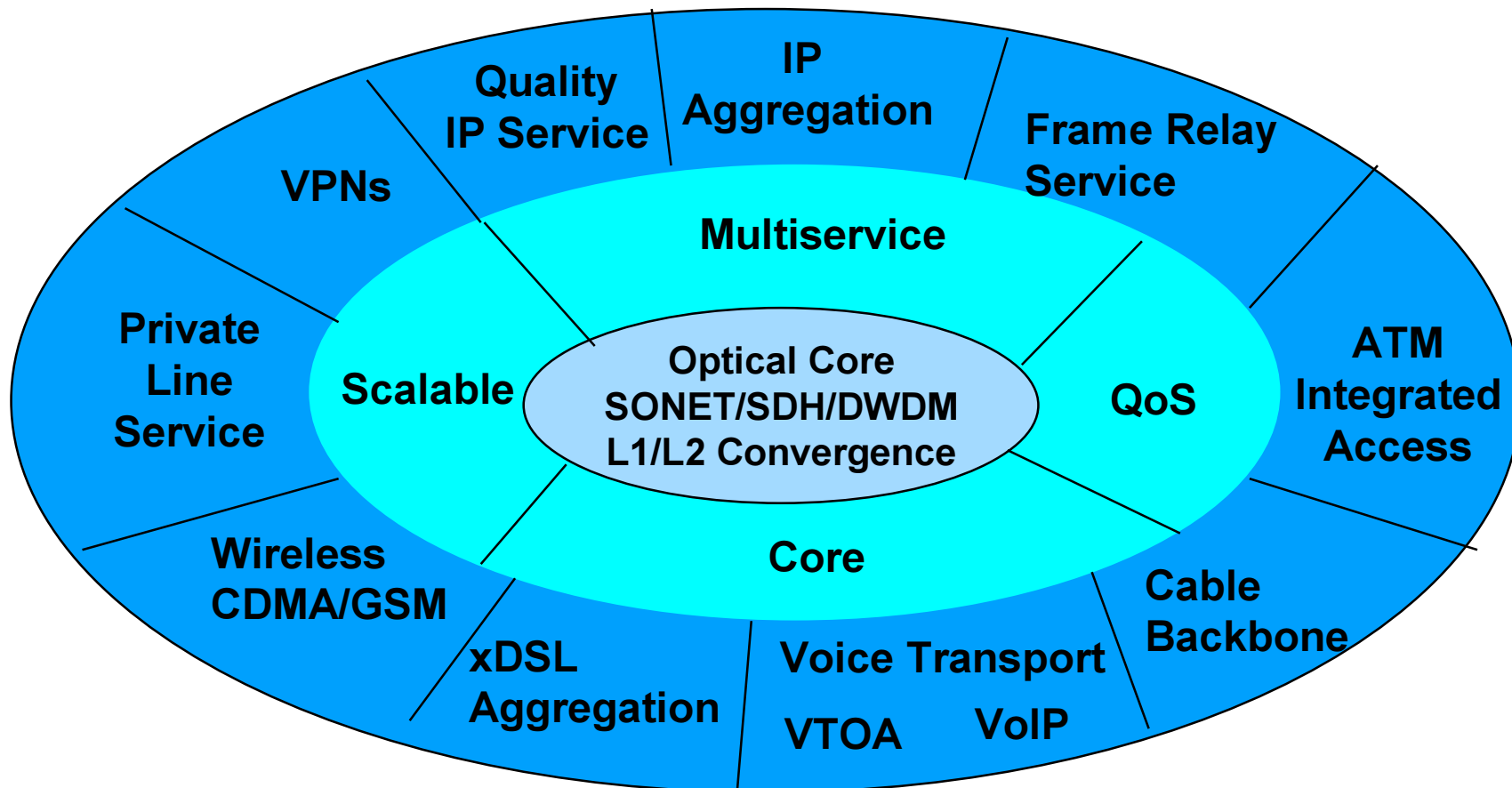
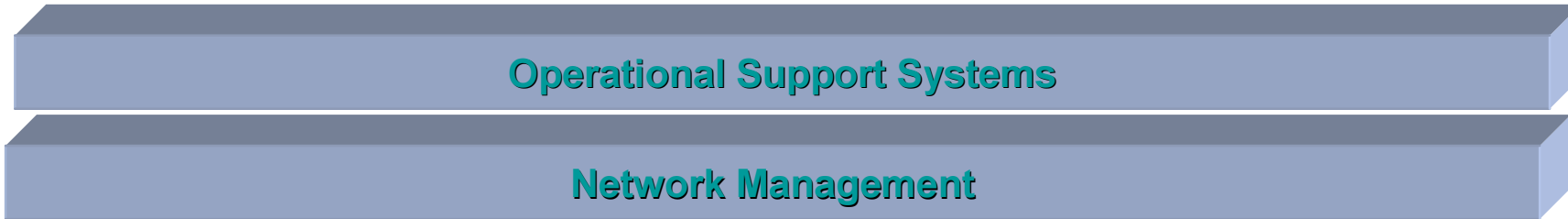


# Solution: Multiservice Network

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# Multiservice Core Service Offers

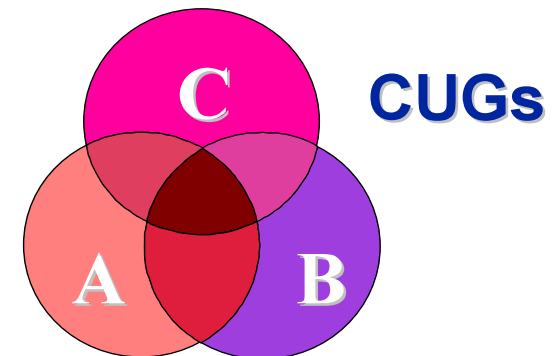
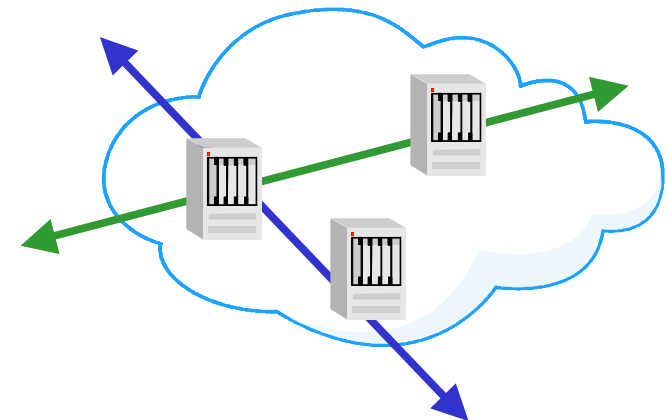


# Network Service Delivery: ATM and Frame Relay Services

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- Premium, Differentiated Data Services
- PVCs
  - Provisionable semi-permanent services
  - QoS, BW, and Availability- priority reroute
  - Resilient UNIs
- SVCs
  - Closed User Groups and Security Screens
  - Usage-based and Flat-rate billing
  - PVC to SVC interworking
  - Virtual UNIs and Carrier Selection
- PVC/SVC ports





# Integrated Service Delivery: Extending Carrier's Edge

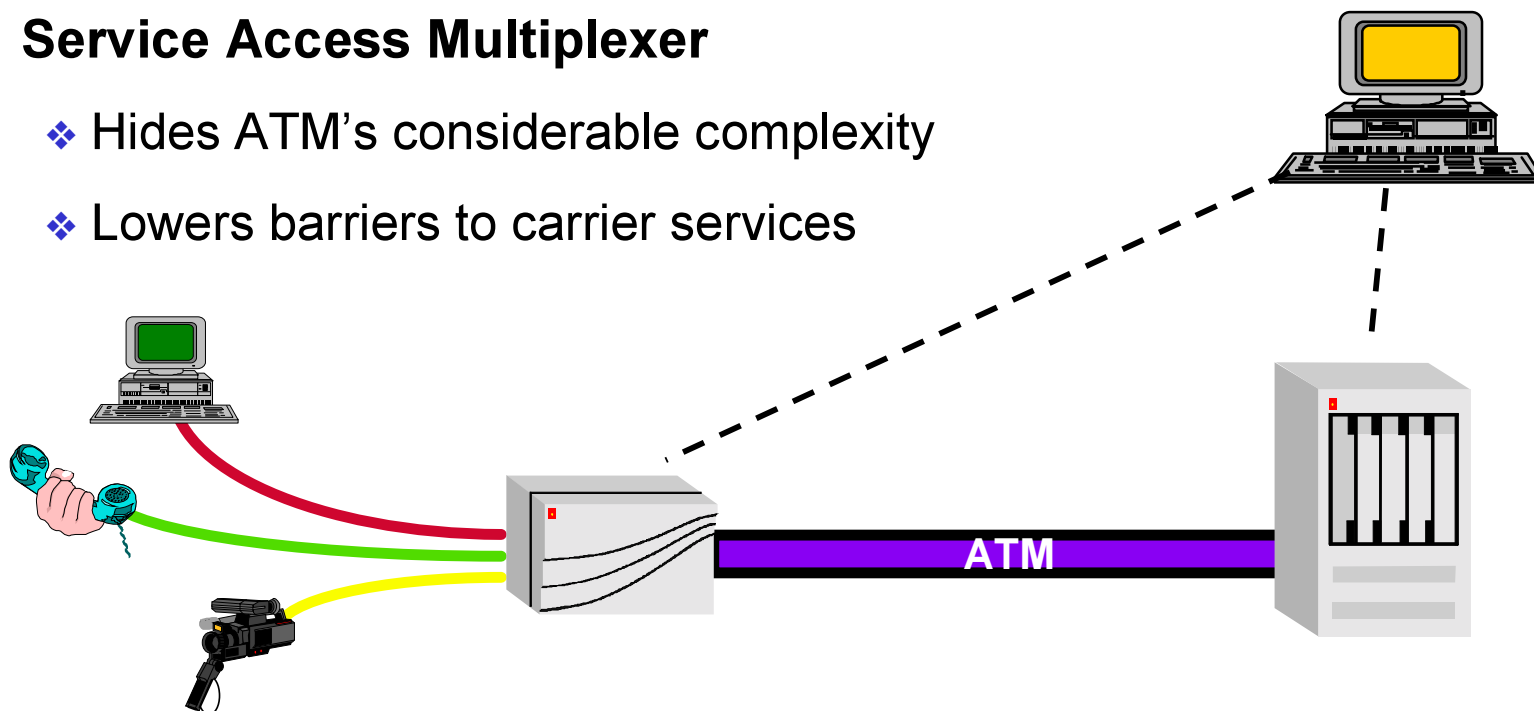
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- ❑ ATM access = service consolidation
- ❑ Provisioning & diagnostics system required to ease delivery
- ❑ Service Access Multiplexer
  - ❖ Hides ATM's considerable complexity
  - ❖ Lowers barriers to carrier services

Common NMS

*End-to-end  
provisioning*

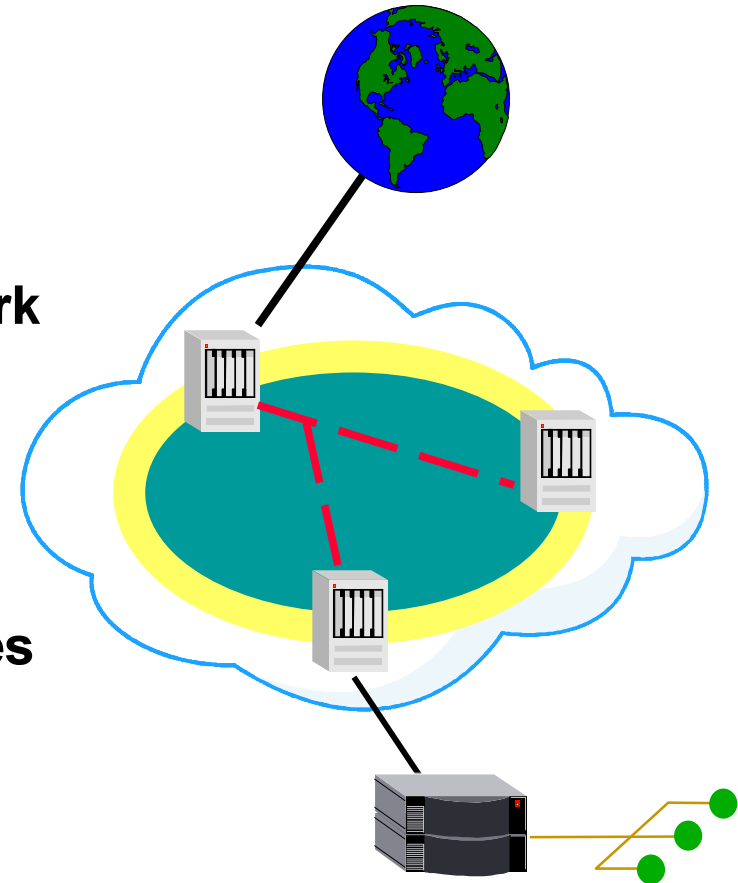


# Network Service Delivery: IP Services

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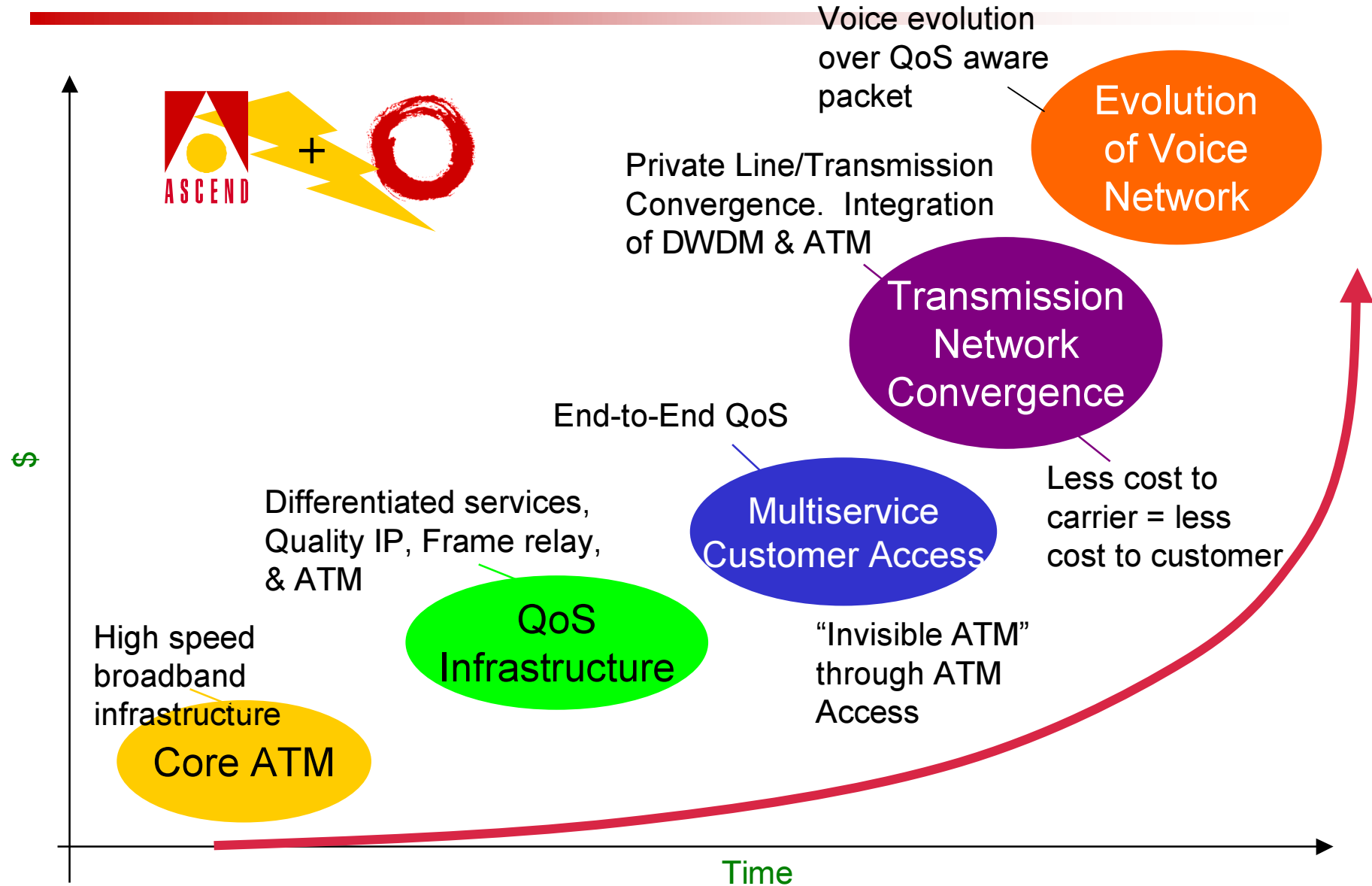


- **IP Service ports**
  - Provisionable service parameters
  - Quality of Service
- **IP Navigator / Pathstar MPLS network**
  - Layer 3 routing at the edge
  - Layer 2 switching and QoS inside
  - Multi-Point Trees
  - VPN, Multicast, Traffic Engineering
- **Transmission independent interfaces**
  - ATM, FR, Ethernet, PPP
- **Multi-service ports : ATM & IP, FR & IP**





# Multiservice R/Evolution



# Multiservice Core Networks The Lucent Advantage

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- **QoS**: End to end quality aware transport
- **Control**: Fully instrumented for end-to-end engineering
- **Efficiency**: Converged infrastructure leads to operational efficiency
- **Quality IP**: Delivery of next generation IP services and architecture
- **Evolution**: Network elements maximize return on investment
- **Carrier Class**: Availability and reliability expected from Lucent
- **Management**: End to End Service Creation and Billing
- **Best of Breed**: Market leadership and unparalleled technology



GX 550



CBX 500



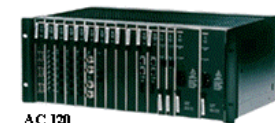
BSTDX 9000



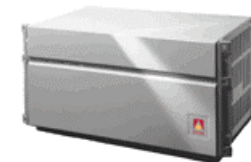
WaveStar



PacketStar IP Switch/  
IP Navigator MPLS



AC 120



AC120/SA100/600

# Detailed Multiservice Applications

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- **Frame Relay Applications**
- **ATM Service Applications**
- **Internet and IP Network**
- **Voice Service Delivery**

# Offers for Frame Relay Services

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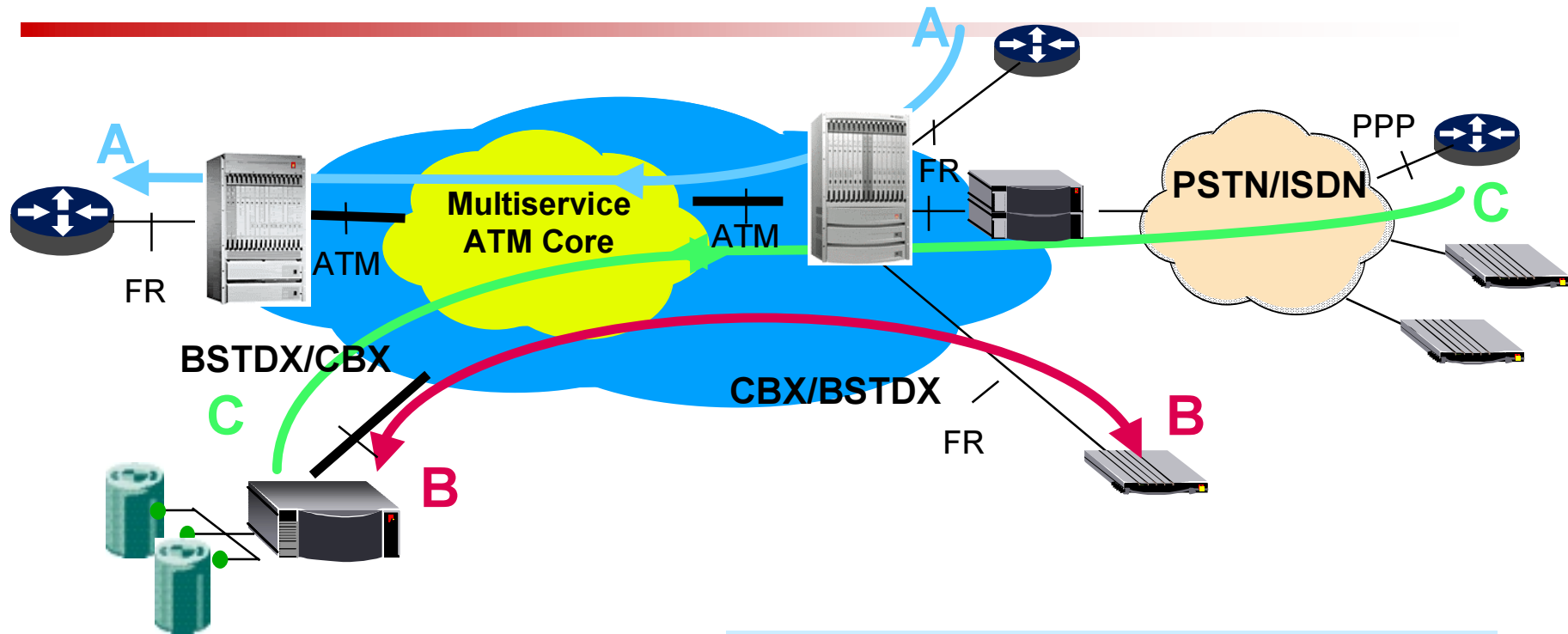
- **Leading Frame Relay equipment vendor to service providers**
  - **Differentiated Frame Service (Frame QoS)**
  - **Frame SVCs**
  - **Layer 2 VPNs**
  - **Customer Network Management**





# Frame/ATM Interworking Service

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**A** FRF.5 (FR UNI to FR UNI )

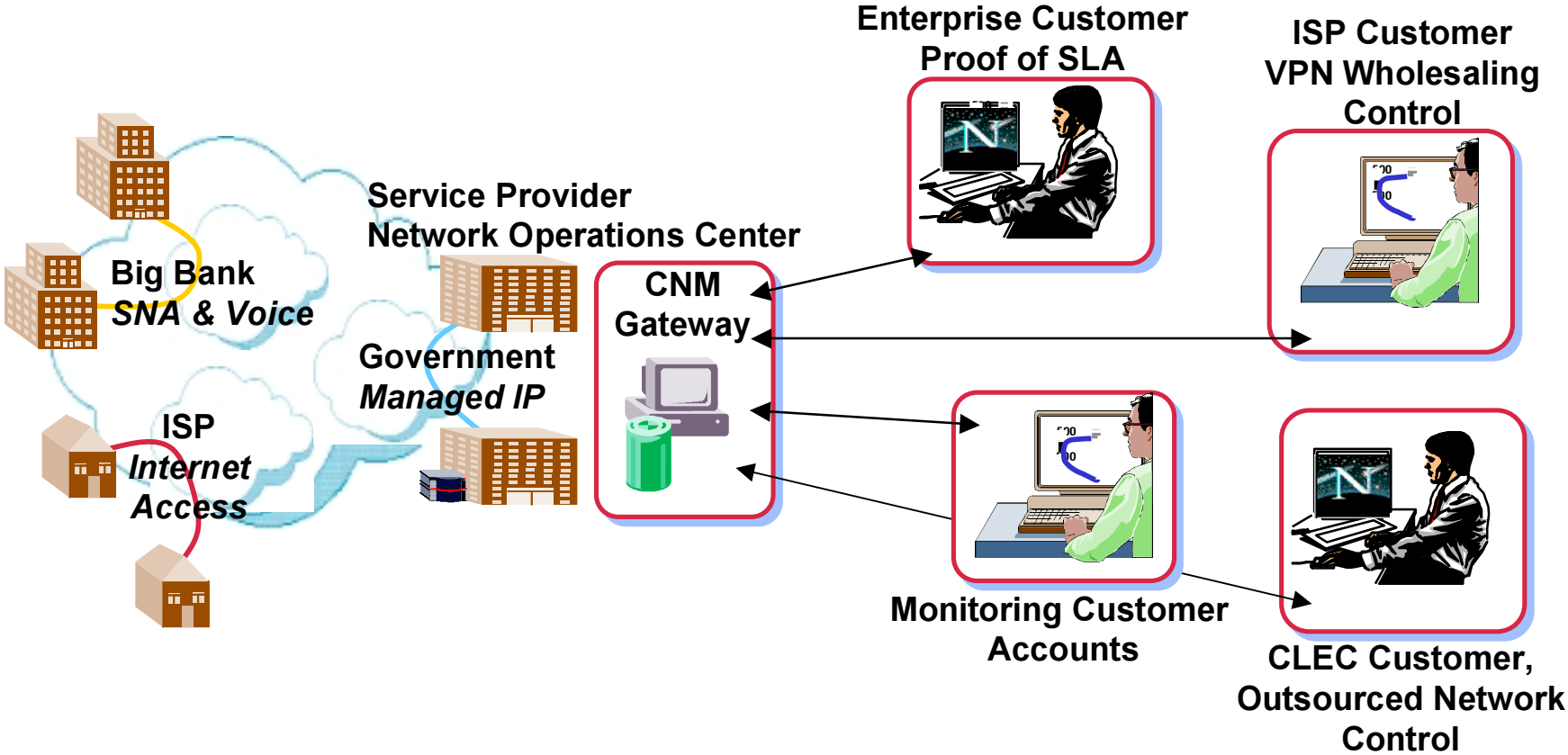
**B** FRF.8 (FR UNI to ATM UNI )

**C** FRF.8 (PPP to FR UNI to ATM UNI )

◆ Service Interworking provides connectivity from branch offices connected by Frame relay to Head end offices with high-speed ATM

◆ Allows for seamless integration and migration to ATM

# VPN Customer Visibility & Control



# Offers for ATM Services

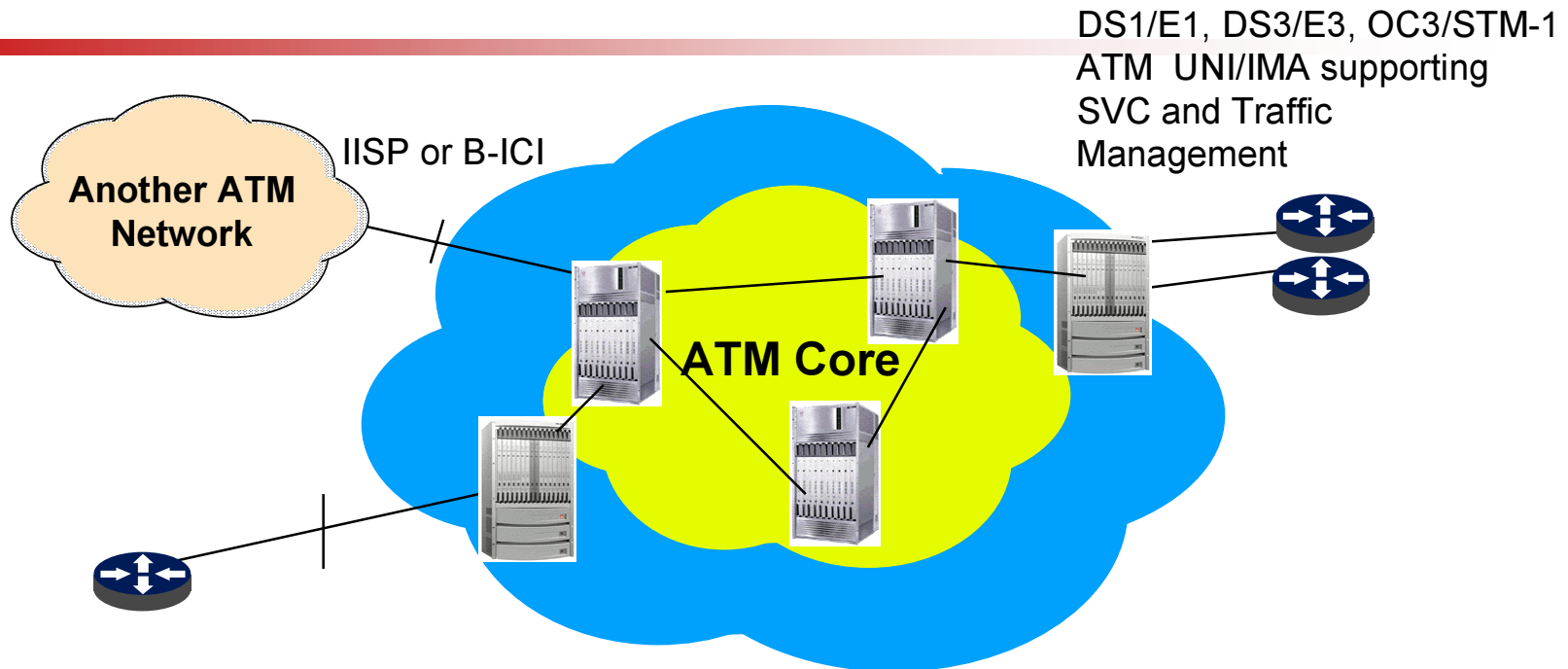
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- **Carrier ATM Services**
- **“Invisible ATM” - Integrated Access Services**
- **Tailored Access Bandwidth - ATM Inverse Multiplexing**
- **Transparent LAN Service**
- **Circuit Emulation: Private Line Service**

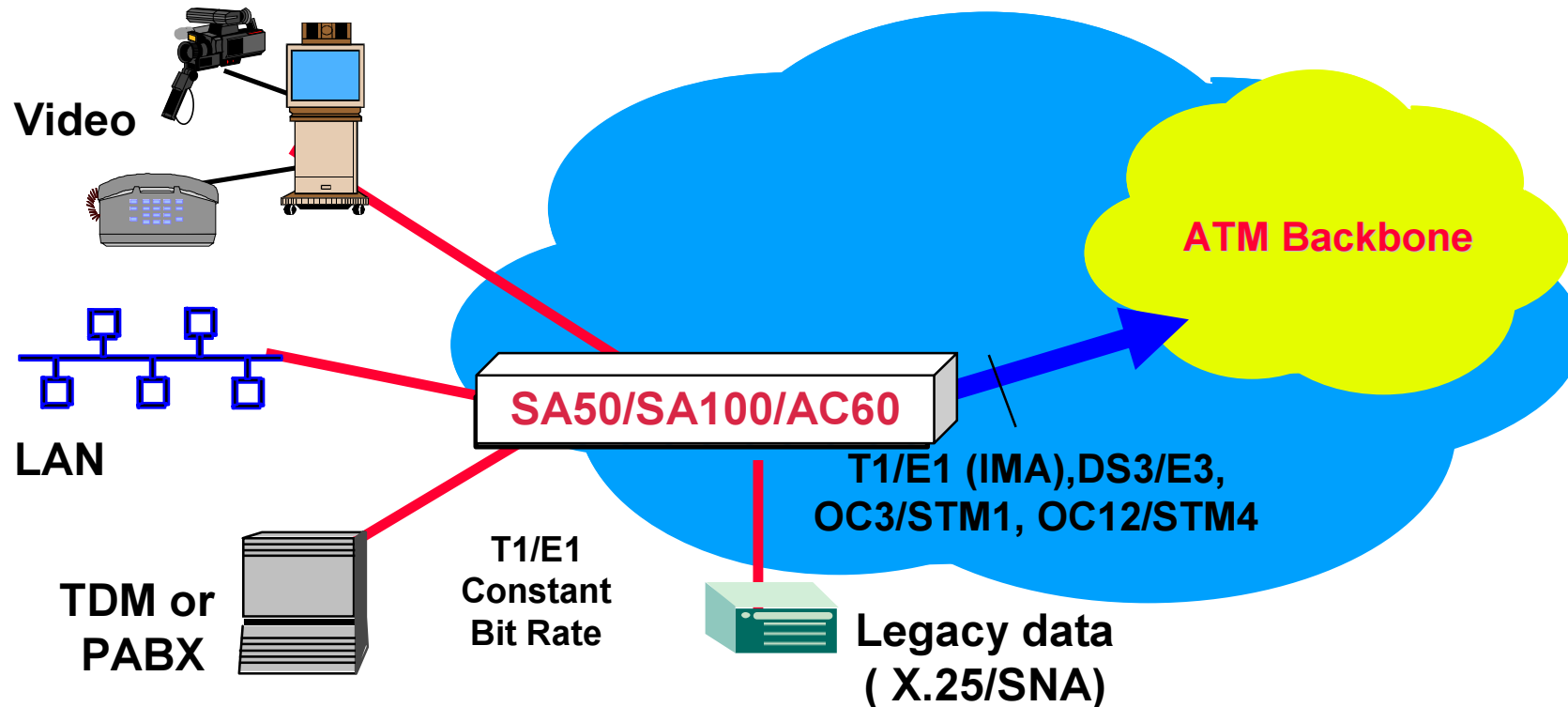
# Carrier ATM Service

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- Scalable bandwidth DS1/E1 to OC48/STM16
- QoS Control across all service classes
- High Availability: Dynamic rerouting, SONET APS recovery, Rapid Upgrade™ hitless software upgrades
- Advanced Traffic Management support for bursty data (TM 4.0, EPD, PPD)
- Service Management, Provisioning, and Accounting, and Customer Network Management

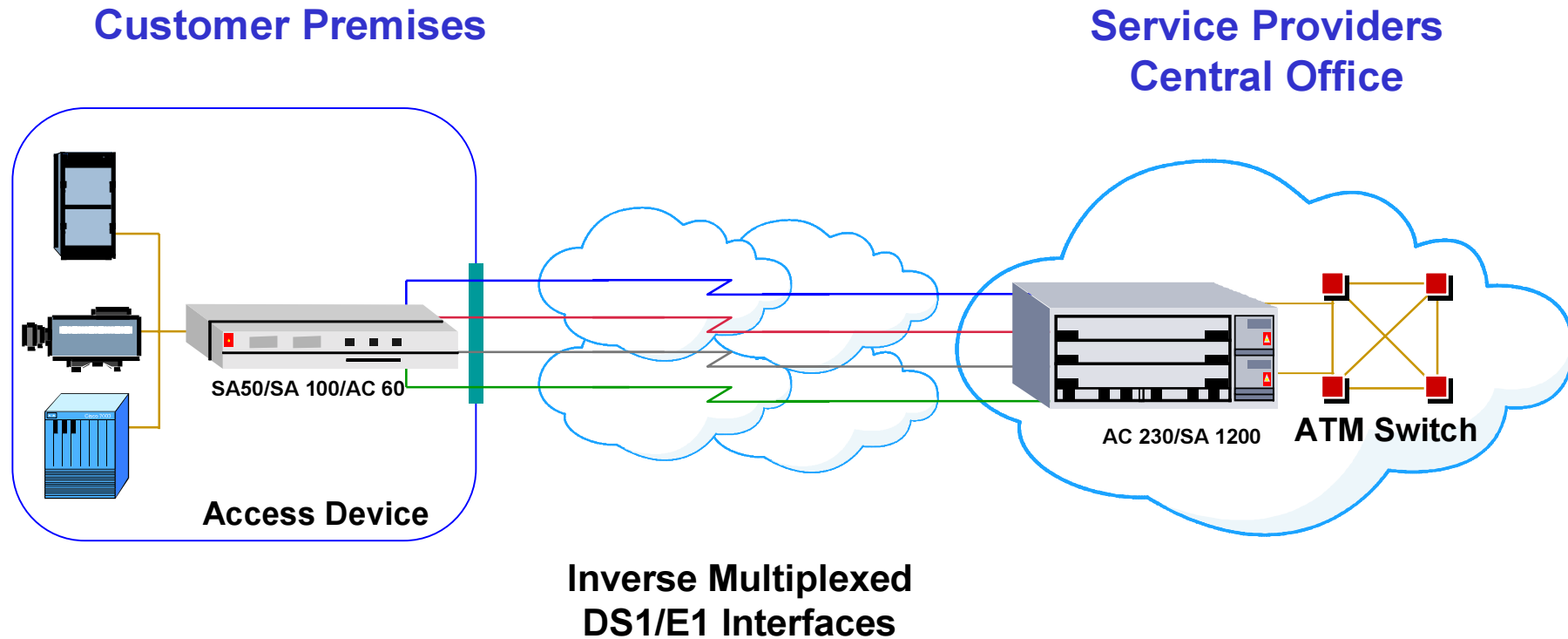
# Integrated ATM Access



## ■ ATM Integrated Access

- ◆ Hide complexity of ATM via Customer Located Equipment
- ◆ Lower overall delivery cost for a package of services - extend the WAN to the customer premise
- ◆ Fulfill ATM promise of a common transmission method for voice video and data traffic
- ◆ Controllable quality of service with statistical bandwidth on demand

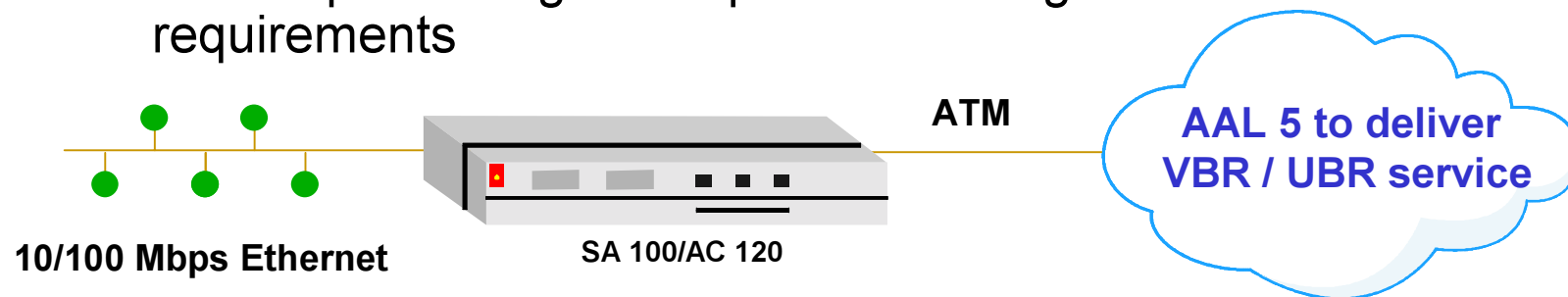
# ATM Services: Inverse Multiplexing (IMA)



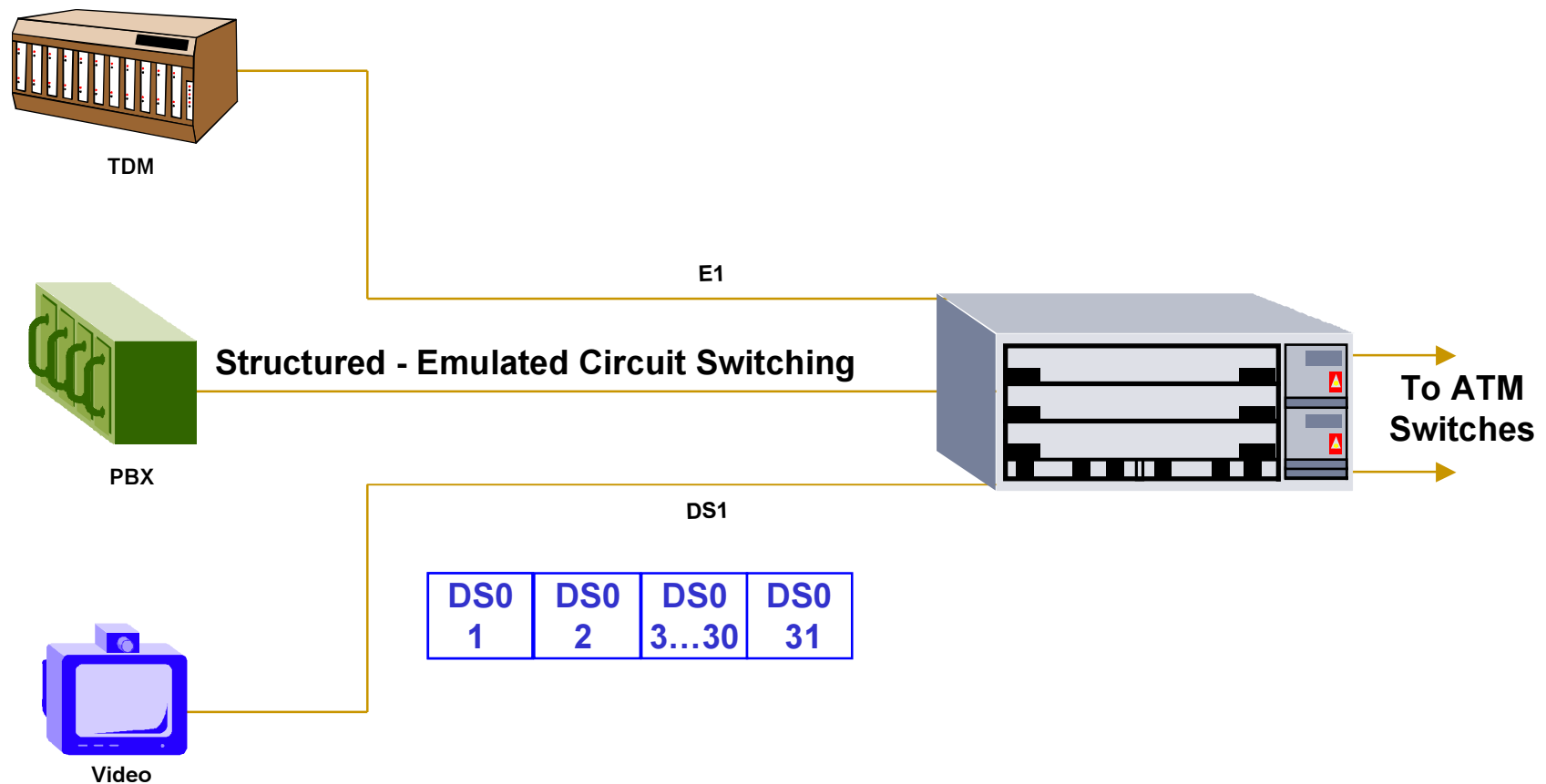


# Native LAN Services

- Driven by customer demand to move away from complex WAN networks
- Wire speed data transfer (10/100 Mbps)
- RFC 1483 MAC bridging
- Target customers
  - 10 Mbps — Small to medium sized companies with diminishing WAN resources
  - 100 Mbps — Larger companies with high bandwidth requirements



# Circuit Emulation Services— Private Line Services





# Offers for Internet and IP Services

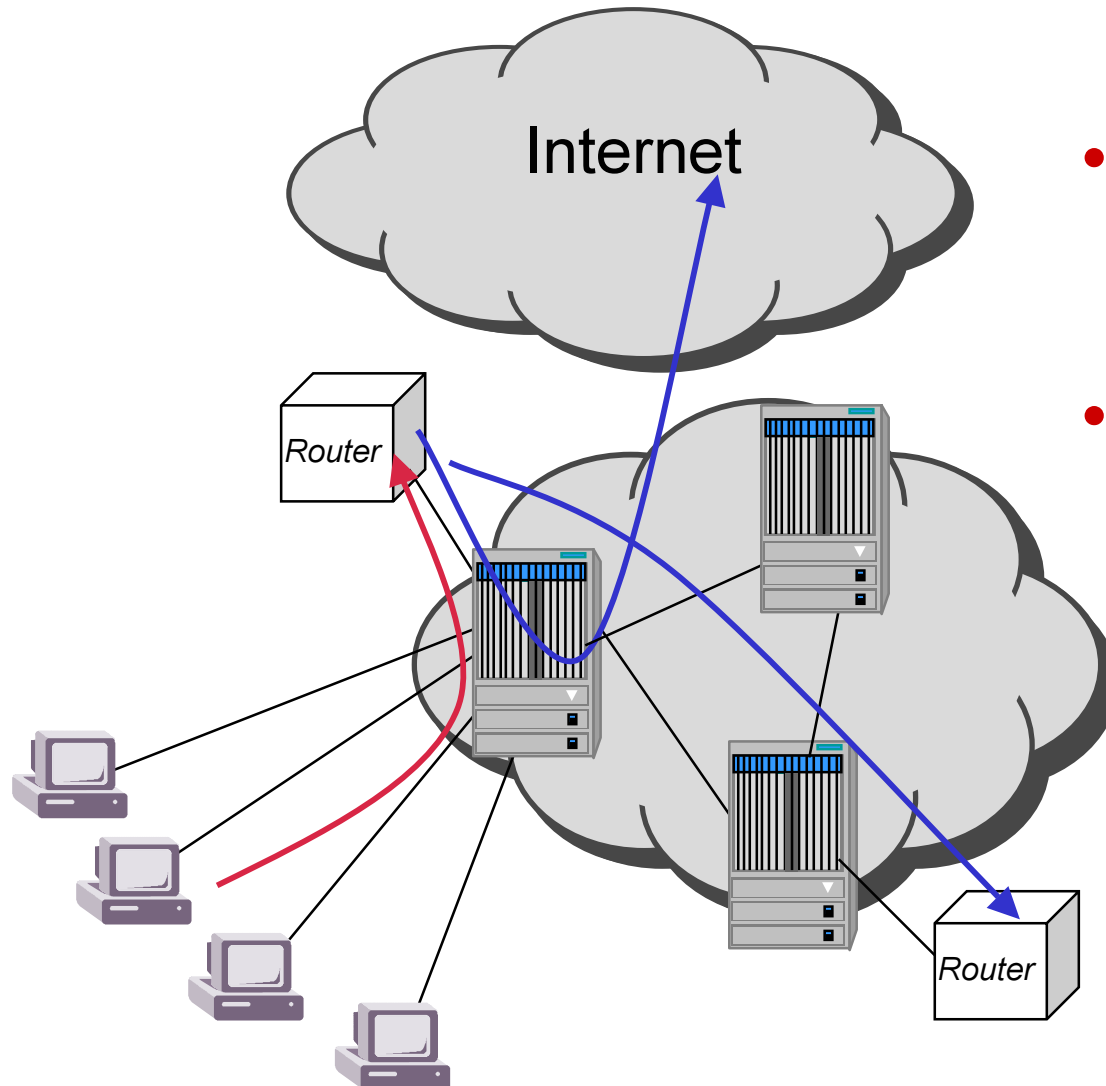
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- **Hybrid Routing and Switching Networks**
- **Quality IP MPLS Networks**
- **Universal UNI - IP VPNs**
- **Scalable Content Delivery - IP Multicast**

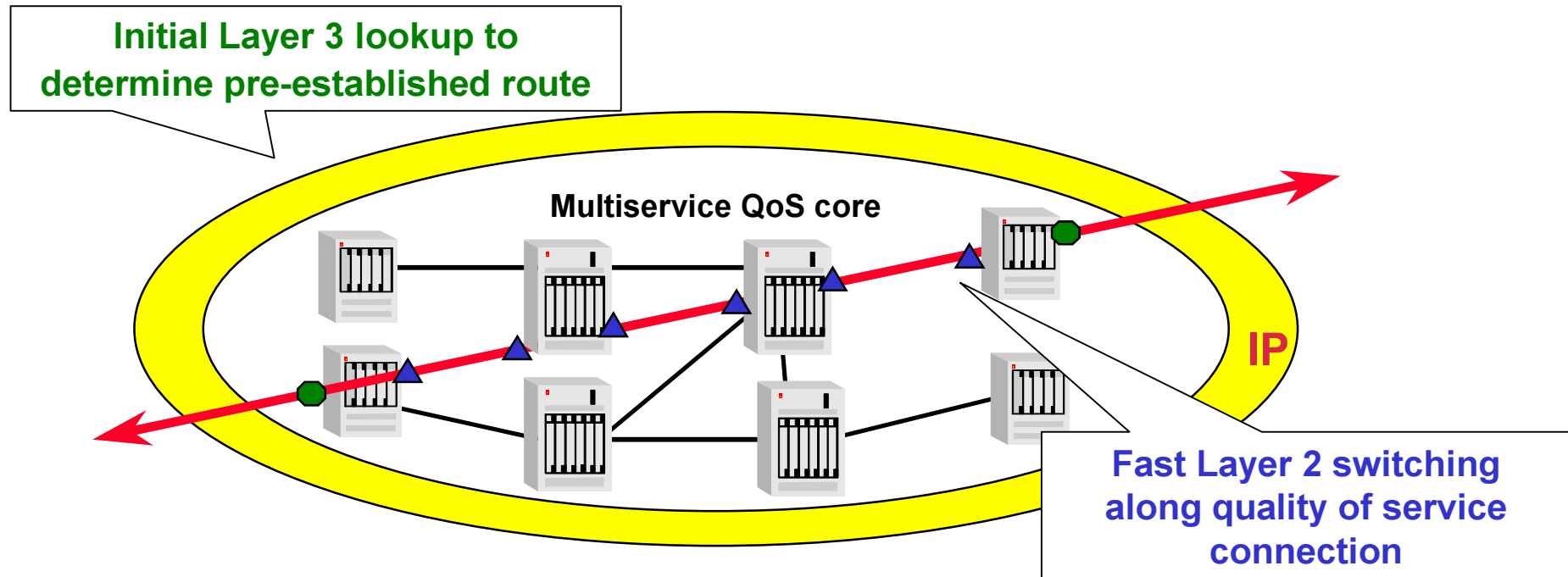
# Layer 2/Layer 3 Hybrid Networks

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- **Internet/IP Dedicated Access aggregation provides cost effective subscriber fan-out**
- **Layer 2 infrastructure allows for measurement and control of the resource sold by the service provider**

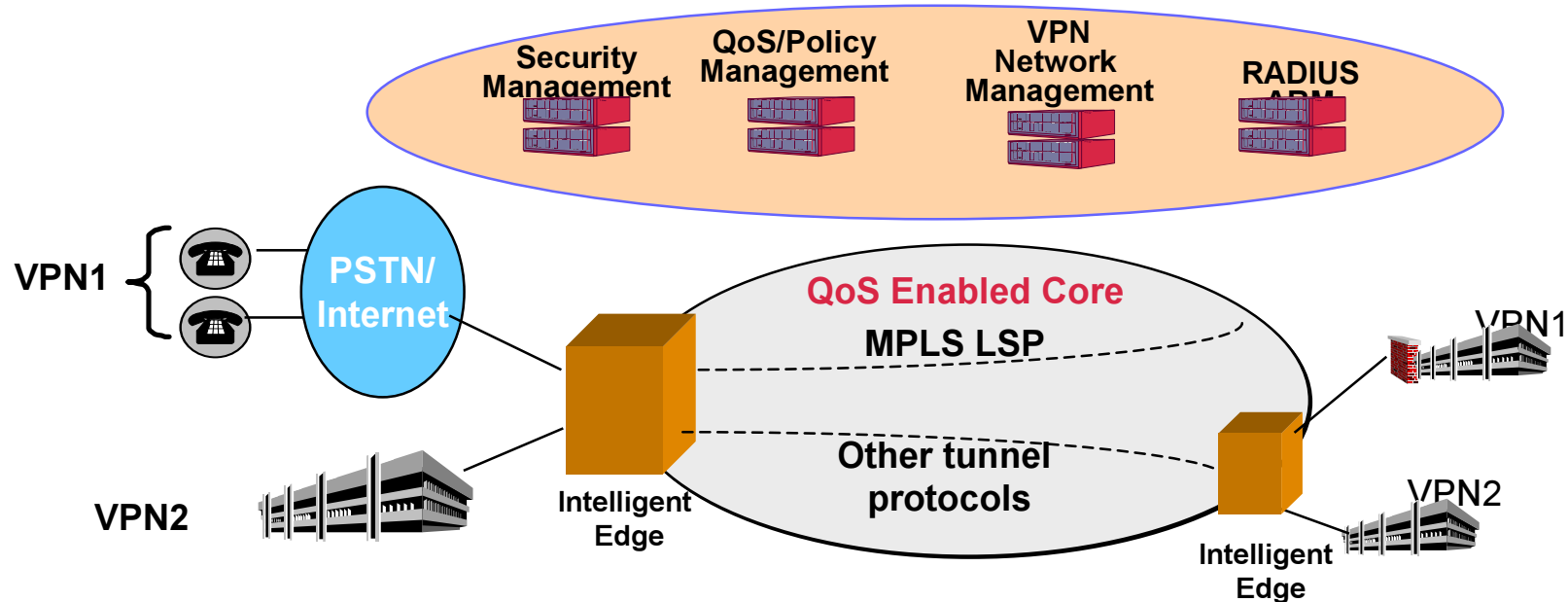
# Quality IP Infrastructure: IP Navigator MPLS



- Converged QoS aware network for IP, Frame Relay, ATM and Voice
- MPLS (Multi-Protocol Label Switching) for switched IP in the WAN

**3rd Generation - Converged Switching for Quality IP services**

# IP VPN Solutions



- Combines advantages of secure tunneling and FR based IP VPNs
- Provides end to end QoS and service differentiation
  - Achieved by using MPLS explicit routing capabilities
- Supports connectionless forwarding over same infrastructure with service differentiation (DiffServ)

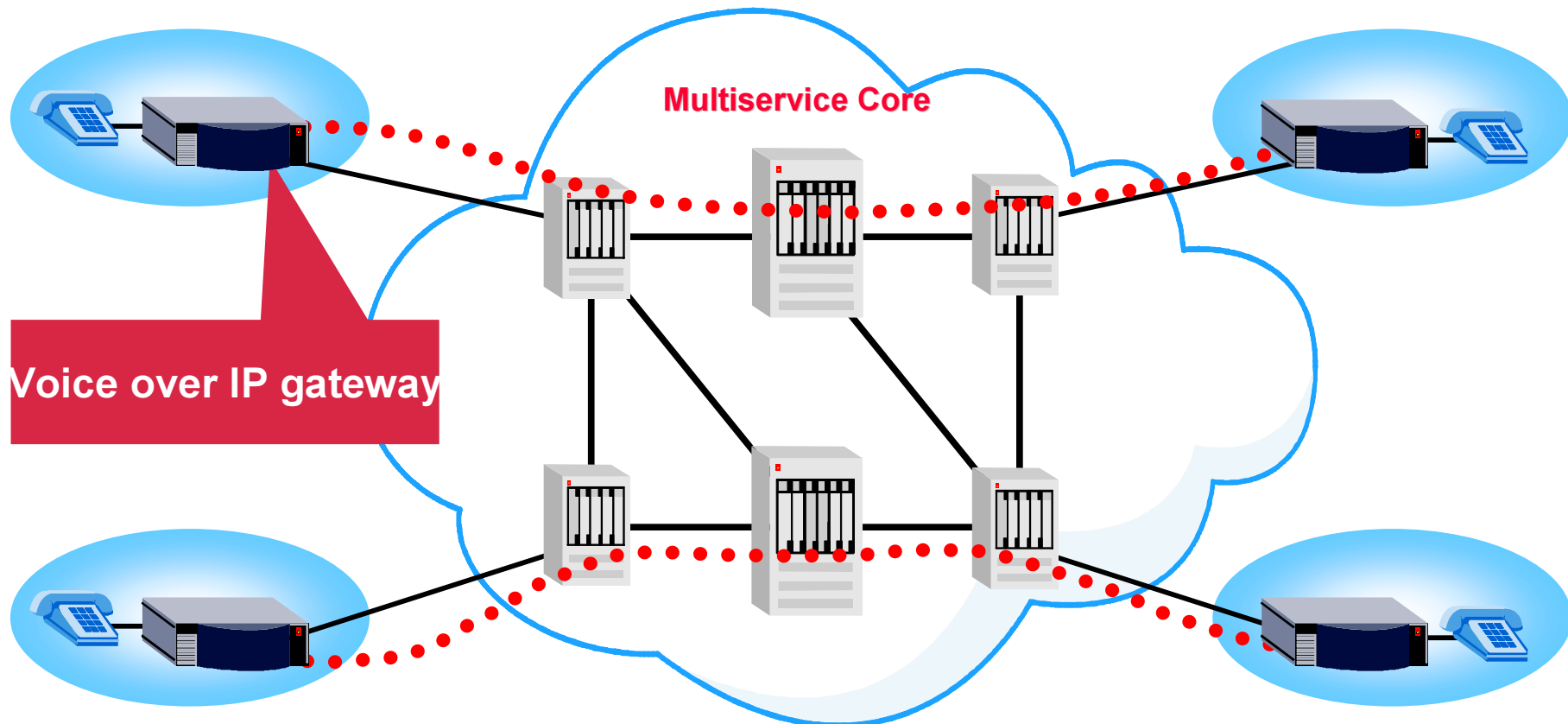
# Offers for Voice Services

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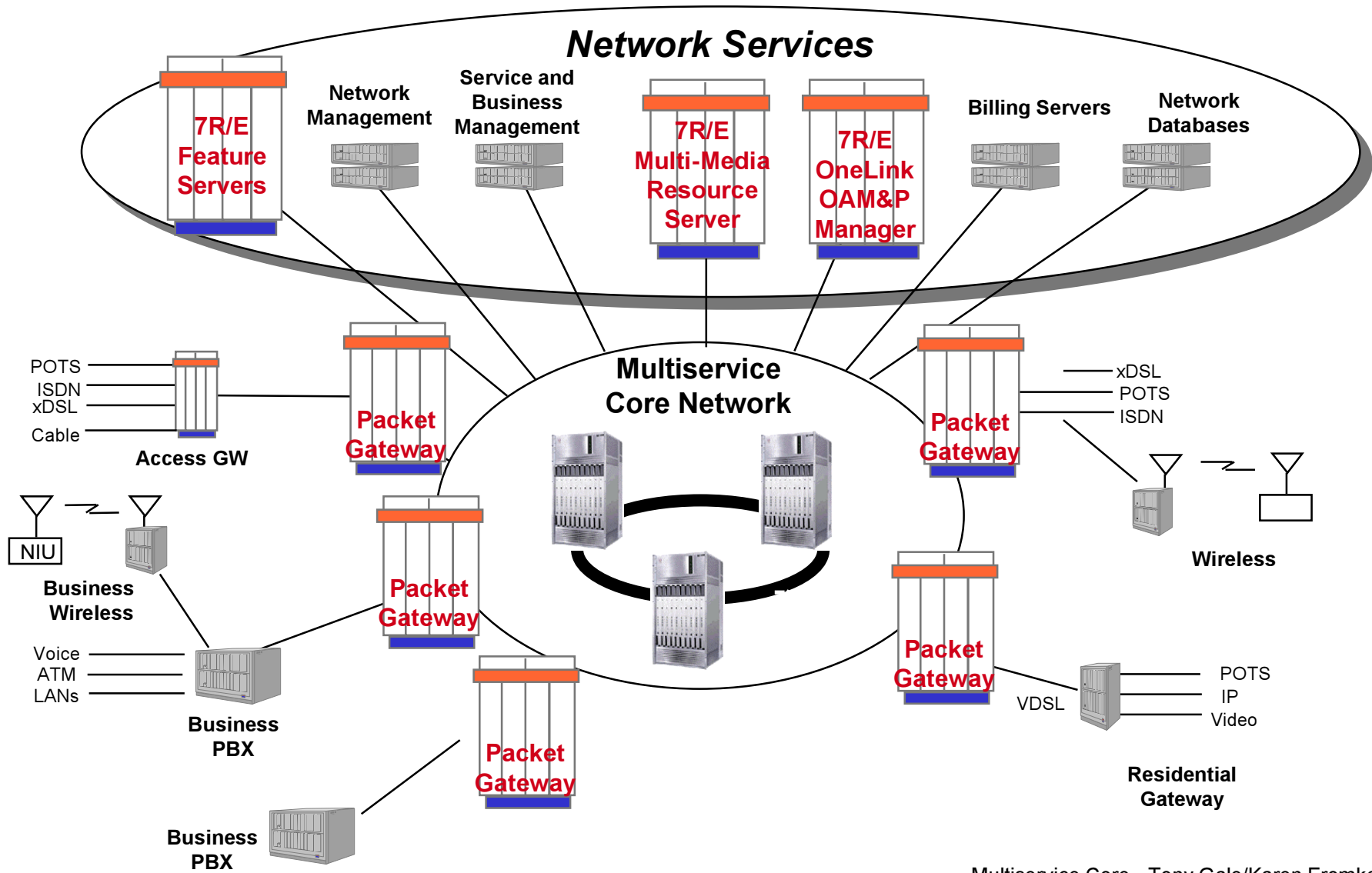
- **Voice over IP Quality IP Infrastructure**
- **VTOA - Voice Transport Over ATM**
- **Internet Call Diversion**

# End-to-End Toll Quality Voice over IP



***IP Navigator/MPLS "QoS on Demand" capability sets up Toll-Quality circuit for IP***

# R/Evolutionary Voice and Data



# Advantages



- **A Lucent ATM Multiservice network provides the QoS aware infrastructure for delivering the next generation network services**
- **Provides the integration vehicle for evolving any current network services and network elements**
- **Comprehensive Service Management, Service Provisioning, Accounting, and Billing minimize operations costs**
- **Netcare Professional Services and Support provide integration support**