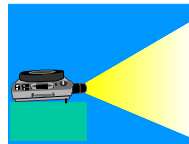


Leadership in IBM Enterprise Server Gateway

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Apr 1997





Content

▶ Part 1 - IBM S/390 Gateway Leadership

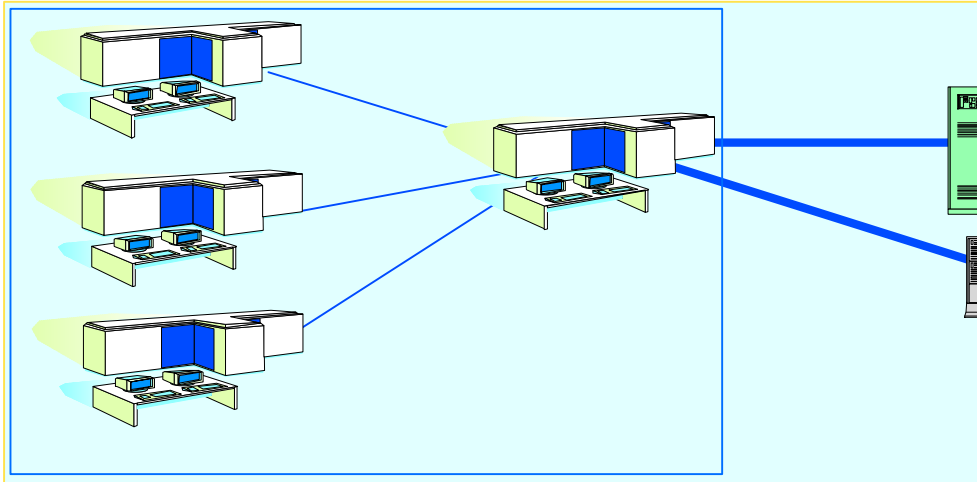
- Considerations for S/390 Channel Attachment
- Extensive TCP/IP support
- Leadership in SNA

▶ Part 2 - IBM S/390 Gateway Leadership

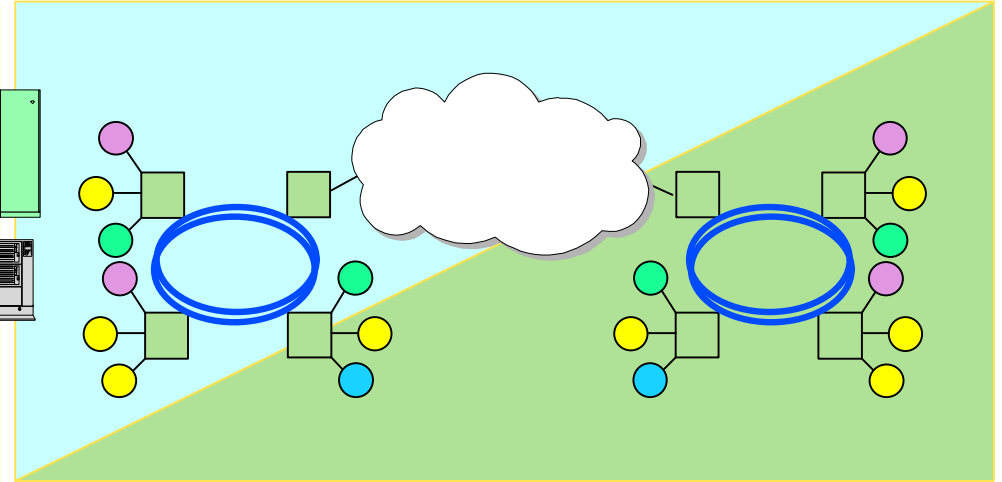
- Performance testing against Cisco channel attached routers
- Leadership of IBM Channel Attachment solution

Today's Dilemma: Different Organizational Goals

Datacenter



Networking

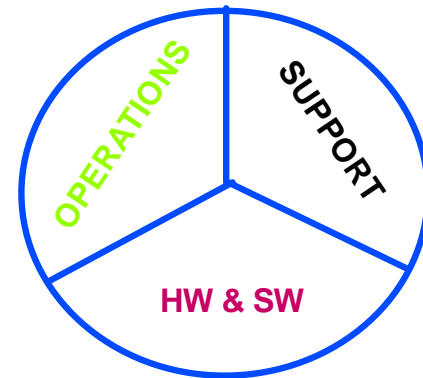


- ✓ Transaction Systems Processor
- ✓ Corporate Data Repository
- ✓ Large Scale Enterprise Server
- ✓ Internet/Intranet host
- ✓ Network Resource Management

- ✓ Multiprotocol Support
- ✓ Internet/Intranet Access
- ✓ High Bandwidth Connections
- ✓ Bandwidth Efficiency
- ✓ Offload Host Functions/Cycles
- ✓ Maintain Service Levels

Decision Factors

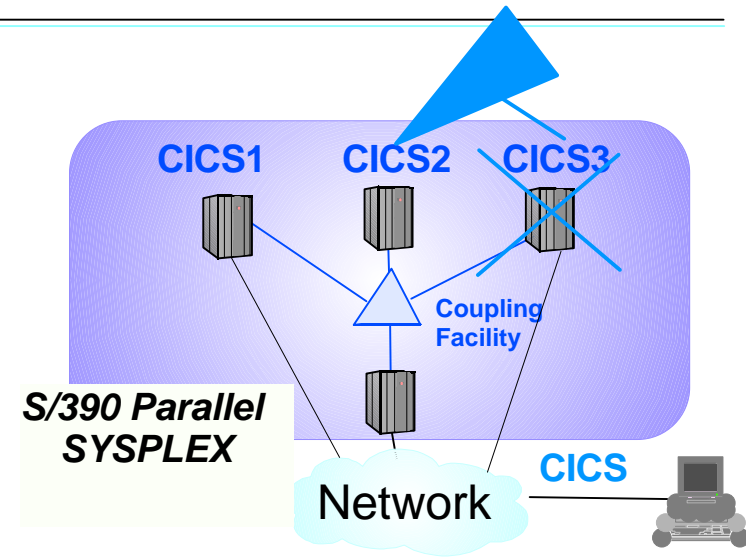
- ▶ **Costs of ownership**
 - ✓ **Hardware/software**
 - ✓ **Host cycles**
 - ✓ **Bandwidth**
 - ✓ **Training/migration**
- ▶ **Hardware/Software Platform**
- ▶ **Reliability/Technology maturity/Risks**
- ▶ **Network/Application support Scalability**
- ▶ **Performance/Service levels**
- ▶ **Functionality/Connectivity**
- ▶ **Management/Complexity**



Cost of Computing

Superior Sysplex Implementation

- Improved scalability
- Improved availability
- Improved access
- 24x7x365 objective
- Significantly reduced costs



MNPS

(Multi Node Persistent Session)

VIPA

Generic Resource

Net.Dispatcher

OSA

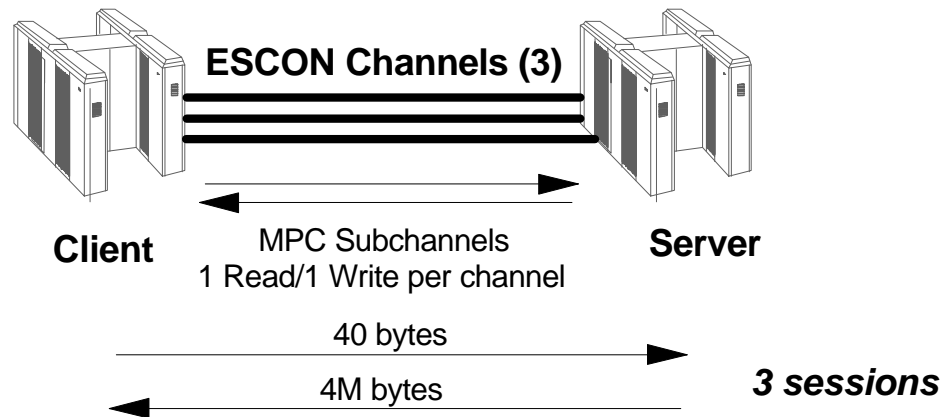
(Open Systems Adapter)

MPC+

(Multi Path Channel)

VTAM V4R4 HPDT and MPC Performance

Configuration: Host-to-Host Connection
 3 CPs (LPAR) on 9672-RX3 for client and Server
 17 MBytes/sec ESCON channel



Performance Measures:

	VTAM V4R4	VTAM V4R3	Improvement
Throughput	41.51 Mbytes/sec	35.82 Mbytes/sec	15.9%
Utilization			
Client	43.09% (per engine)	85.02% (per engine)	56.3%
Server	31.85% (per engine)	74.61% (per engine)	63.2%

HPDT - High Performance Data Transfer



Cisco's CMPC

- **Cisco endorses MPC as the channel protocol of choice in APPN/HPR environments**
 - Enables nondisruptive rerouting around failed data center resources

- **CMPC is based on IBM implementation of MPC in VTAM V4R3**
 - IBM support in 374X-9X0 is based on MPC+ implementation in VTAM V4R4
 - IBM design is expected to have significant improvement in performance over the channel

- **Cisco's implementation requires multiple routers in the data center**
 - Cisco 4700/7200 to terminate DLSw partners in the network
 - Cisco 7XXX with CIP to attach to the channel
 - Token-Ring / Ethernet / FDDI to connect these two routers

- **Cisco implementation to be available in 2H 97 !!!**



IBM competency in routing

- ✓ Routing SNA for well over 2 decades
- ✓ IBM was the key player in setting up NSFnet - the Internet foundation
- ✓ IBM provides extensive product and technology support for TCP/IP
- ✓ IBM 2210 has been a rocksolid performer in the field
- ✓ IBM products 2210, 2216, MSS, and 3746-9X0 all share common routing code base
- ✓ IBM MSS has been chosen **GRAND WINNER**
 - Best of Show - NetworkWorld + Interop, Atlanta (9/96)
 - Best of Show - NetworkWorld + Interop, Paris (10/96)



Market Trends

- ▶ TCP/IP mainframe will grow from 30% in 1995 to 96% in 2000 per IDC
- ▶ Over 70% of current mission critical business applications currently run on SNA
- ▶ 61% of all data networks run on SNA
- ▶ 90% of Banking applications are still SNA
- ▶ Internet/Intranet revolution

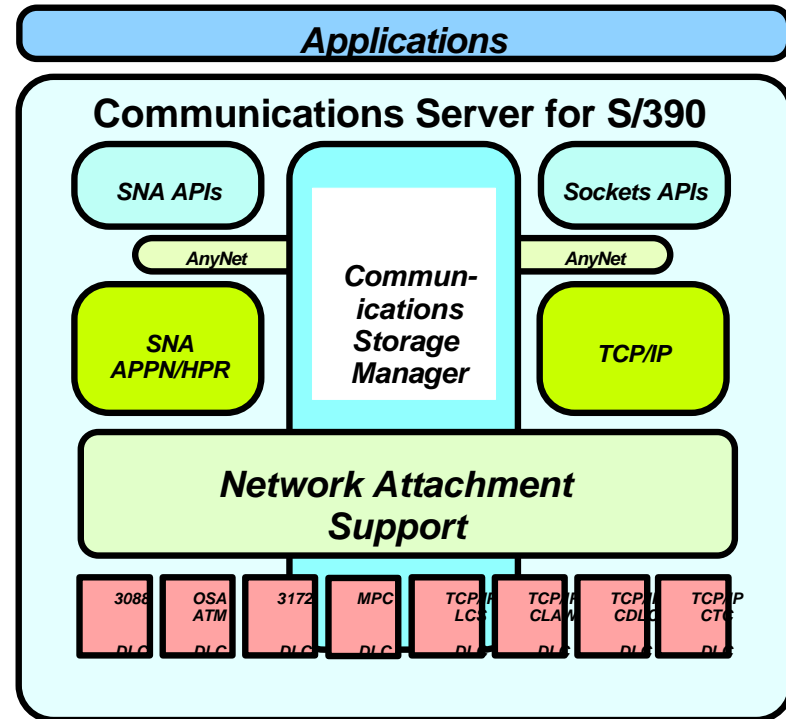
OS/390 Directions

Integrated Services

- Provide common services within the S/390 Communications Server
 - Storage Management
 - Network attachment
- TCP/IP and SNA integration
 - TN3270
 - Internal optimizations

Multiprotocol Solutions

- Sockets (TCP/IP) Applications
 - OpenEdition offers S/390 users access to a wide range of UNIX-based applications over a TCP/IP or APPN/HPR network
- SNA Applications
 - SNA applications are supported over the SNA and APPN/HPR network or TCP/IP network



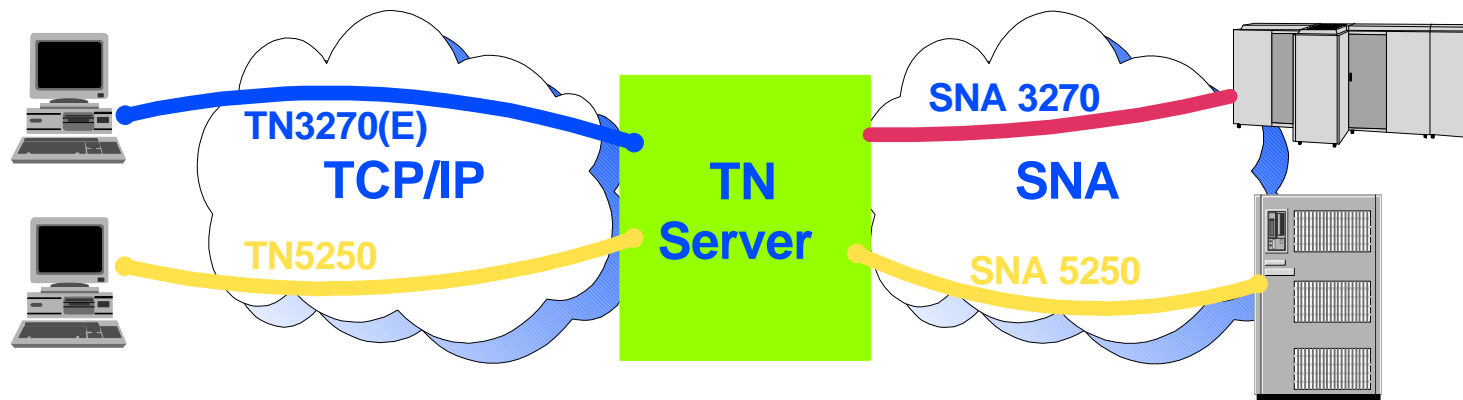
TCP/IP rewrite from IBM

- Protocol stack rewritten for performance
 - Base for further significant improvements
- Multi-processing capability

TCP/IP Release	3.1 Non-OE	3.1 w/ PTF Non-OE	3.1 OE	3.2 Non-OE	3.3 OE	3.+ OE Non-OE
GA Date	9/94	8/95	12/95	9/96	3/97(LA)	9/97
TCP	Base	20%	40%	65%	70%	Cont.
UDP	Base	20%	50%	65%	UDP 80% UDP/MPC 90% UDP-SAP 95%	Cont.

- Pathlength reductions for send/receive
- Check it out on www.raleigh.ibm.com/tcm/tcmprod

What is a Telnet Server?

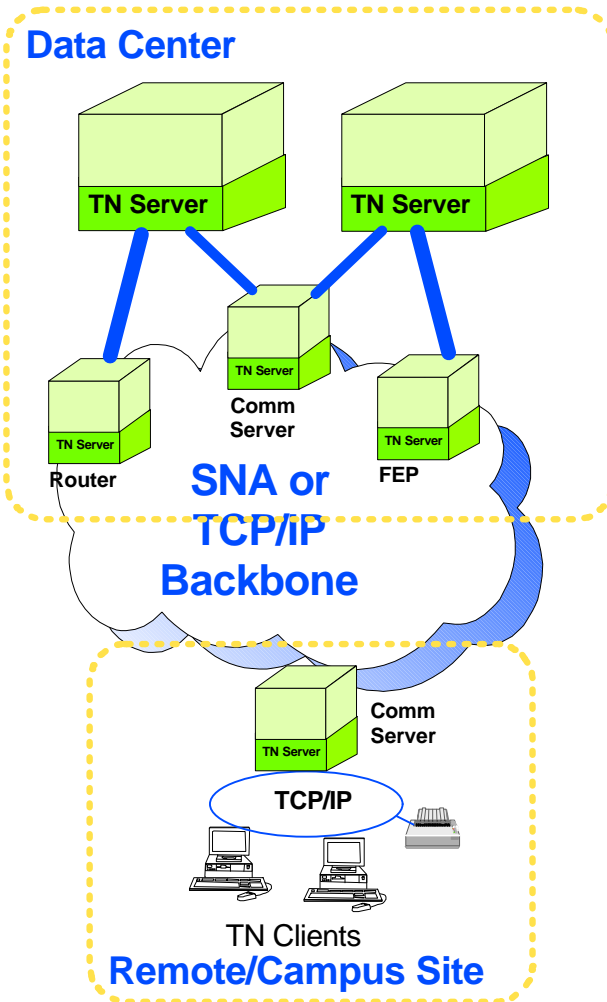


Gateway that enables clients and workstations on a TCP/IP network to access applications in an SNA network

- ▶ **3270 applications on a mainframe in an SNA network**
- ▶ **5250 applications on an AS/400 system in a peer-to-peer network**

Provides TCP/IP to SNA protocol conversion for SNA 3270 and 5250

Where can a TN Server be?



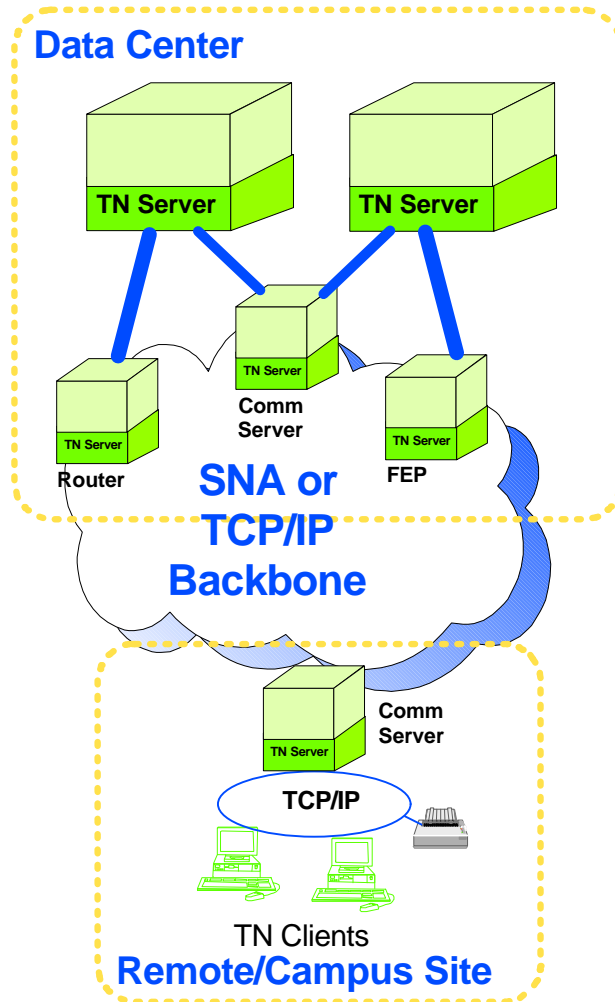
Data Center:

- ▶ On-board mainframe gateway
- ▶ Channel Attached Communications Server gateway
- ▶ Channel -attached gateway or router

Remote Site:

- ▶ Remote Communications Server gateway

The Total TN Server Solutions Available from IBM



TCP/IP for Mainframe:

TCP/IP for MVS
TCP/IP for VM
CS for OS/390
CS for MVS/ESA

TN Server:

TCP/IP for Mainframe
CS for AIX with SNA Client Access
CS for NT
CS for OS/2 Warp
NetWare for SAA

Previewed:

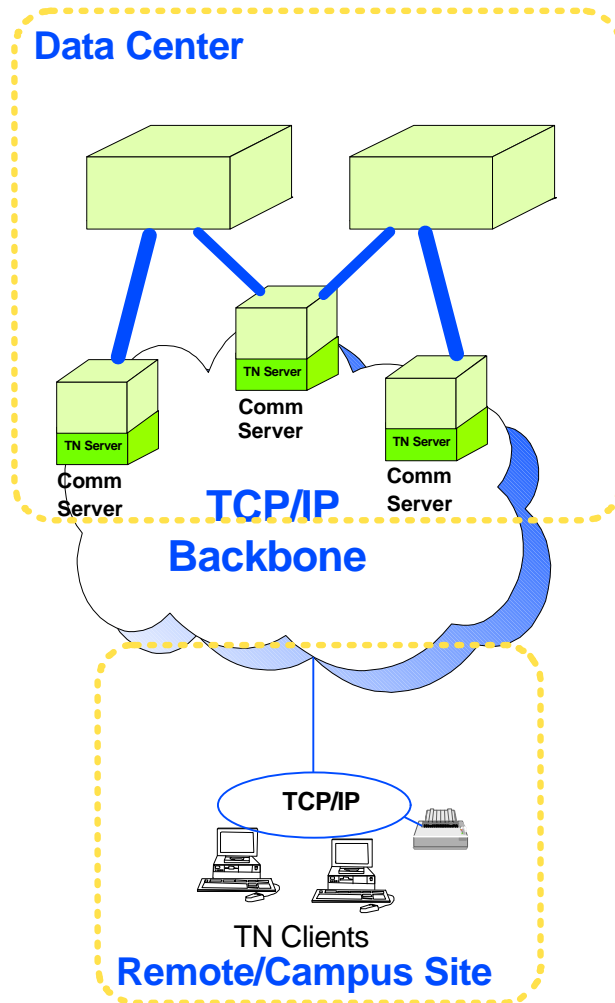
- ▶ 2216
- ▶ 3746 900/950

Emulation:

Host On-Demand
Personal Communications
Other TN3270 Clients

... where
you want
it!

Data Center: Comm Server Gateway options



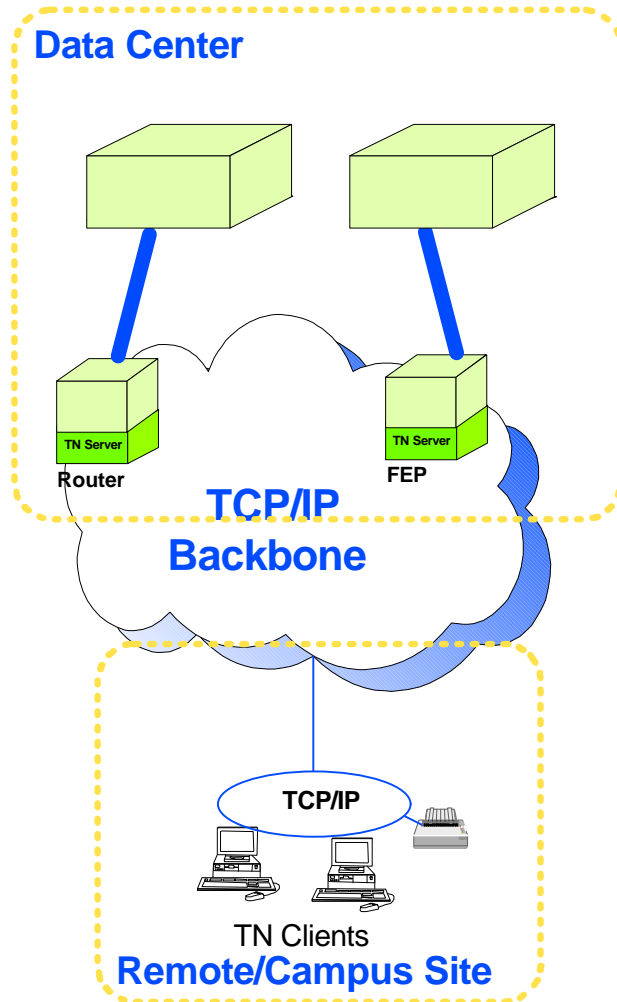
TN Server:

- CS for AIX with SNA Client Access
- CS for NT
- NetWare for SAA

Influencers:

- + Host CPU workload reduction
- + TN3270E support
- + Enterprise gateway to S/390 and AS/400 applications
- + Large number of sessions; Load balancing available on some platforms
- + TCP/IP backbone
- + Higher performance (vs. remote)
- Increased network complexity; multiple TN servers may be necessary

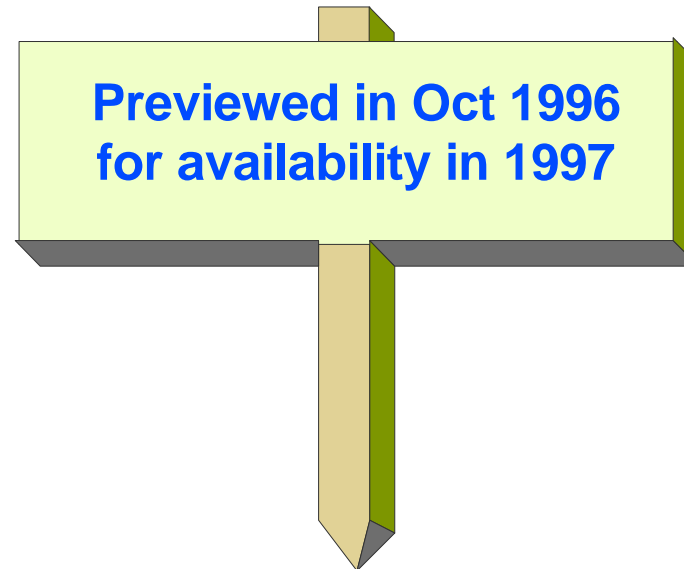
Data Center: Channel-attached Gateway or Router



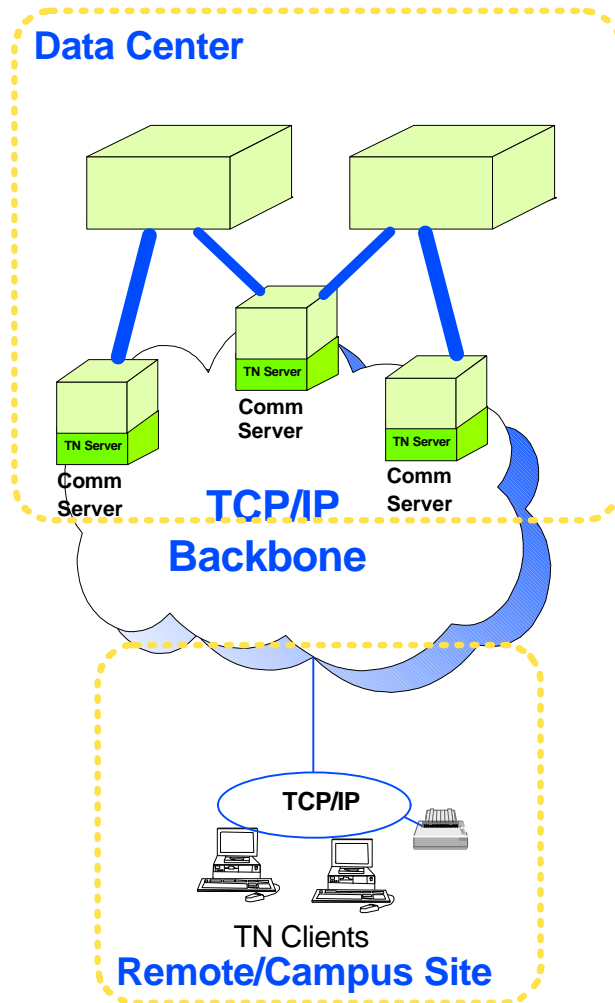
TN Server:

2216

3746 900/950



Data Center: Channel Attached Comm Server Gateway



*CS for AIX with SNA
Client Access*

Influencers:

- + Dynamic Load balancing across multiple servers; supporting tens of thousands of concurrent sessions
- + Scalability and power for RS/6000 hardware; Single server capable of supporting 10,000+ TN sessions
- + High availability of SMP hardware
- + Channel MPC support (2Q97 plan)
- + Response Time Monitoring support
- + APPN and AnyNet support
- TN clients can't utilize APPN network



Strengths of IBM's TN3270 solutions

- ▶ **Total Solution from a single vendor**
- ▶ **Support for MVS, VM and VSE**
- ▶ **Enterprise Gateway Support for S/390s and AS/400s**
 - ◆ **TN Server**
 - ◆ **SNA Gateway**
 - ◆ **Multiprotocol support**
- ▶ **Solution Scalable to Customer needs**
- ▶ **Host On-Demand Java-based emulator supported by all Communications Servers**
- ▶ **Both TCP/IP and SNA backbones supported**
- ▶ **TN Server where you want it**
- ▶ **Multiple platform support**



IBM Leadership in TCP/IP

System 390	OS/390 built-in communications capabilities Communication Server for MVS
RS/6000	TCP/IP in the AIX operating system Communications Server for AIX
AS/400	TCP/IP for OS/400
OS/2	TCP/IP in OS/2 WARP Communications Server for OS/2
Windows 3.x and Windows 95	Internet Connection Corporate Kit for Windows 3.1 and Windows 95
Windows NT	Communications Server for NT
IBM 2210/2216/MSS	Common Routing Code *(TCP/IP Sprayer, HPR/IP, Web page caching, TN3270)

*- Planned for future delivery

IBM Confidential



Cisco's SNA Selling Strategy

▶ Lead with Cisco DLSw+

- Cisco's premier SNA Internetworking product
- Go easy with APPN marketing
 - Cisco is the leader - Over 50K routers using DLSw+
 - Several SNA reference accounts
 - Received "Tester's Choice" award from Tolly group
 - Cisco has the only solution that scales
 - Cisco custom queuing is the " best of breed"
 - Supports SDLC to LAN and Tunneling.

▶ Sell BAN support for Frame Relay & X.25 networks

- Claim leadership in these technologies
 - Local acknowledgment at remote reduces time-outs
 - Reduction in unnecessary WAN traffic

▶ Sell APPN only , if you must , to

- AS/400 & OS2 networks,
- SNA networks where DLSw+/RSRB has failed,
- LU 6.2 application development shops and
- Customers with VTAM 4.1 & 4.2
 - Cisco supports APPN, DLUR, HPR and APPN over the channel
 - Uses IBM code
 - Investing in Staff & Skill to be in "the business"
 - Supports bandwidth reservation for other protocols, in addition to IBM COS for SNA networks



IBM's SNA Leadership

- ▶ **IBM is the leader in delivering SNA applications, Hardware and Software**
 - Over 70% of mission critical business data is SNA

- ▶ **IBM is enhancing SNA to changing Customer networking requirements**
 - Examples: Leadership in standardizing DLSw, APPN, HPR, DLUS/DLUR
APPN/HPR over ATM, BAN

- ▶ **IBM strategy is to promote Open architectures like SVN and deliver products that will interoperate with other vendors' products .**
 - **Customer Benefits:**
 - Investment protection
 - Smooth and orderly migration
 - Lower cost of ownership
 - High network performance
 - Effective network management and operation
 - Easy adoption of new technologies like ATM....

What Cisco will say about APPN.....

- ▶ **APPN provides effective COS ;**
 - But ... few customers consider them of value
 - COS applies to traffic between FEPs & in the host only
 - COS is SNA specific, no multi-protocol support

- ▶ **HPR provides high performance & non-disruptive path switching**
 - But.... to exploit these, most of the network must support HPRs
 - Requires alternate paths available for rerouting

- ▶ **APPN is a single protocol solution**
 - No design for encapsulation of other protocols
 - Use of AnyNet is limited by the availability of function in the network

- ▶ **APPN uses lots of memory**

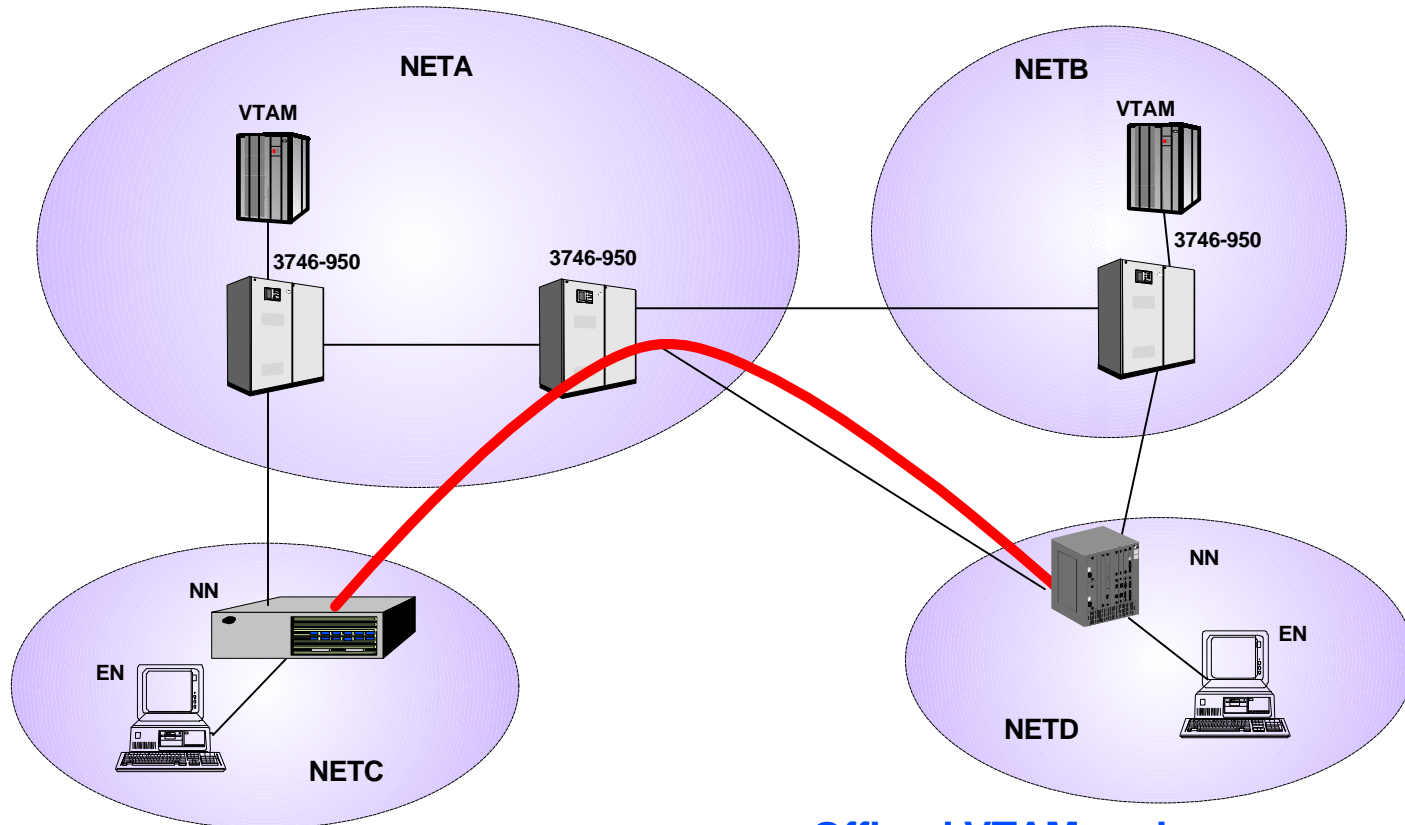
- ▶ **APPN does not scale without border node**
 - IBM claimed a maximum of 300 NNs

- ▶ **APPN is a IBM proprietary protocol**

IBM 3746 - Extended Border Node

Preview

EBN

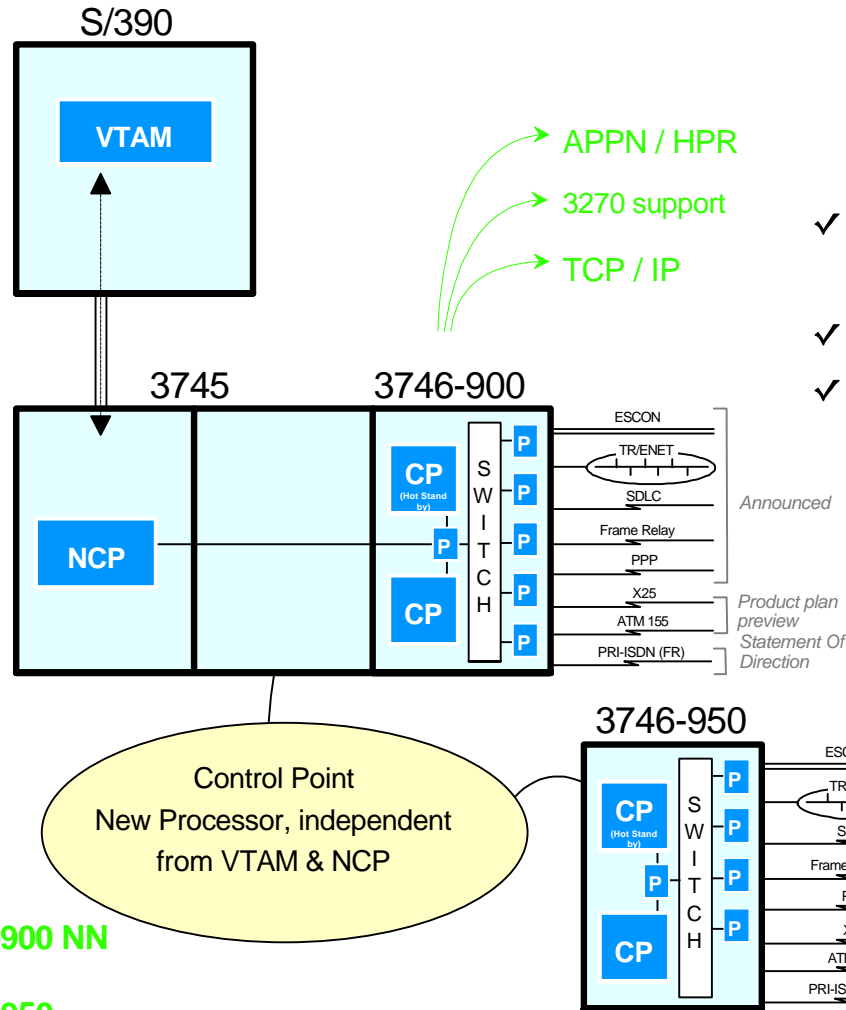


- Link different APPN domains
- Allow SNA environment migration
- Allow multiple SNA domains migration

- SNI

- Offload VTAM cycles
 - EBN offloaded from VTAM
- Tremendous APPN scalability improvement

3746-900/950 Architecture



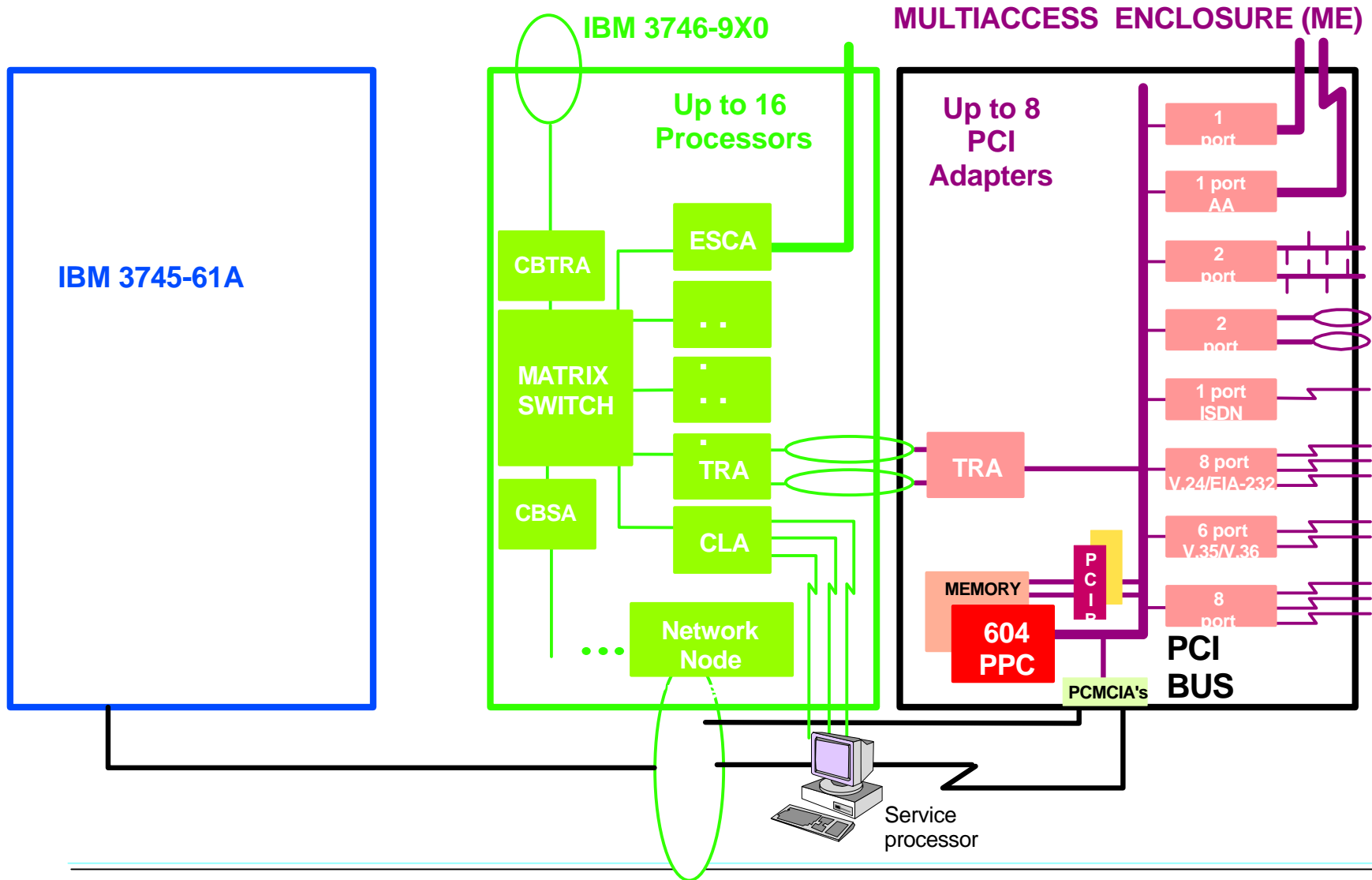
- ✓ 1 Gigabit Non Blocking Switch
- ✓ Deep I/O Processor
- ✓ Fully Fault Tolerant

• CP Hot Stand By

• Field upgrades :

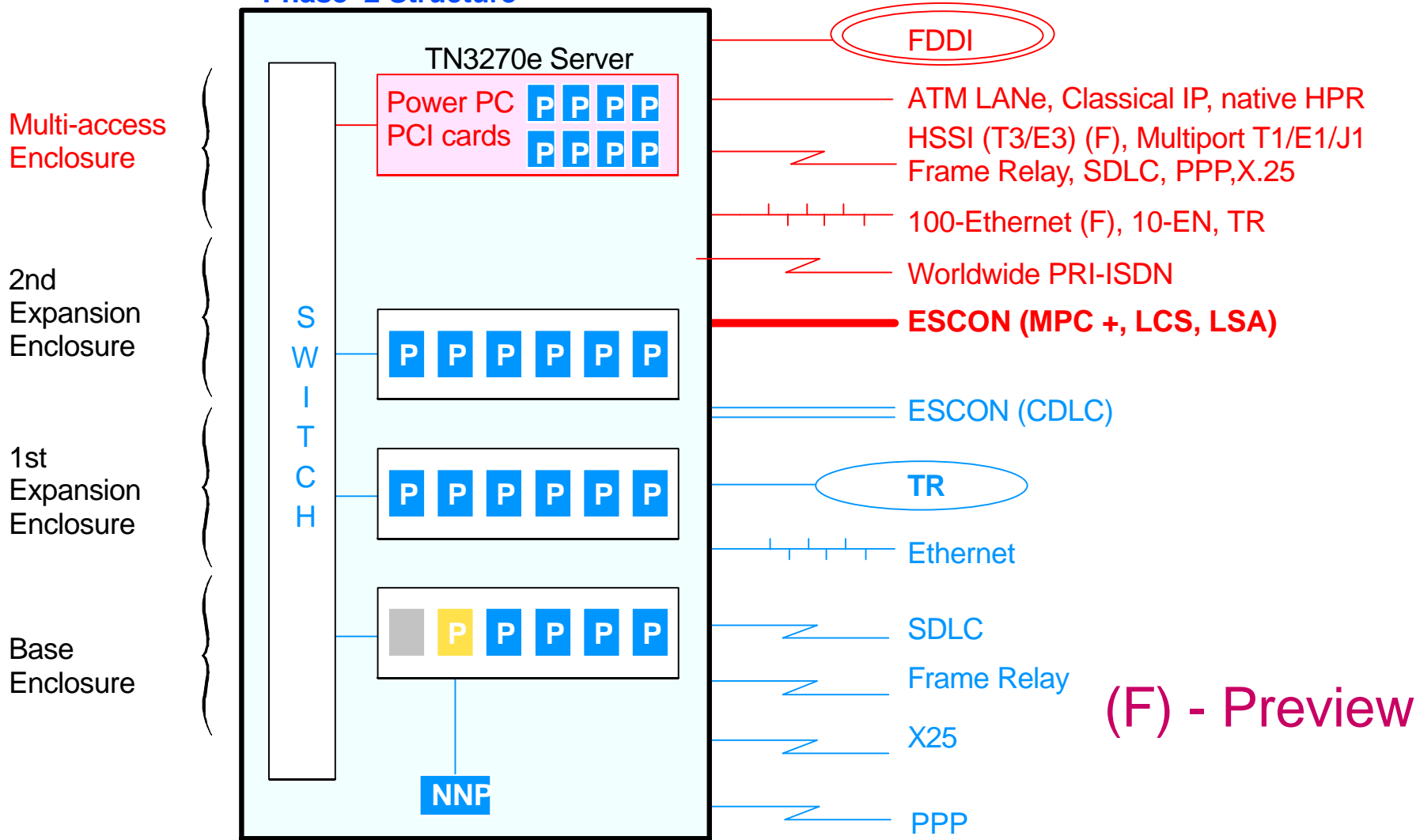
- > 3746-900 to 3746-900 NN
- > 3746-900 NN to 3746-950
- > 3746-900 to 3746-950

3746-900/950 Architecture Evolution.....



3746-900/950 Architecture Evolution

Phase 2 Structure



IBM 3746 - Evolutionary Migration

Accelerate your Move To Network

