# IBM 3746 Nways Multiprotocol Controllers Models 900 and 950

September 9th, 1997
Announcement
(Revision 1)

Link your Servers and Critical Applications to your Network

0. Contents - Sept. 9th, 1997 Announcement

IBM
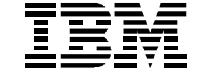
0. Customer Value/Customer Needs

1. Network Evolution Strategy

2. September 9th, event content: 3746-900 and 3746-950
- **Multiaccess Enclosure enhancements**
- **New MAE value add functions**
- **MAE other enhancement**
- **New adapters TYPE 3**
- **Increased APPN/ISR Box Connectivity**
- **APPN Session Services Extended (SSE)**
- **Machine Availability improvements**

3. Reminder (up to September 1997 announcement)
- **IBM 3746 Nways Multiprotocol Controllers**

4. Preview
- **Multiaccess Enclosure Enhancements**
- **New High Speed link adapters**

5. Summary
- **Single Access Platform**

0 - IBM 3745/3746 - Customer Value

IBM

- **Leverage Customer's Investment in 37xx Product Family**

- **Enhance Leadership in Server Access**

- **High Speed Networking**

- **Prime S/390 access platform for IP and SNA**

- **Strengthen current Multiprotocol and Attachment Support**

- **Within IBM Strategies**
  - **IND SVN**
  - **IBM NC**

- **3746 Evolution**

| 95	96	97 => 98
SNA	SNA-HPR-IP	High-Speed

0. Customer Needs

- **Adopt the Intranet/Internet (IP) model**

- **Access to critical SNA applications**

- **Network support simplifications**
  - **Reduce number of protocols**
  - **Any to Any Communication**
  - **Workstation mono stack**

- **Bandwidth increase**
  - **Servers into the Network**
  - **New applications (Image, Web, ADSM, DB2, ...)**
  - **Traffic growth (back-up, code distribution, more users, ...)**

- **Easy to use // Easy to change**

- **Applications availability**

1. IBM Multiprotocol Strategy

IBM

Separate Networks

Network Computing

Network Computing

Multiprotocol router integration

SNA

Leased X.25

3745 3746 900

3745 3746 900

3745

Intranet Frame Relay

Internet

Routed LANs

Intranet FR ATM

Internet

S S S S

PBX

AS/400

Switched Virtual Networking accross Campus and WAN

Natural path from SNA, IP to SWITCHING
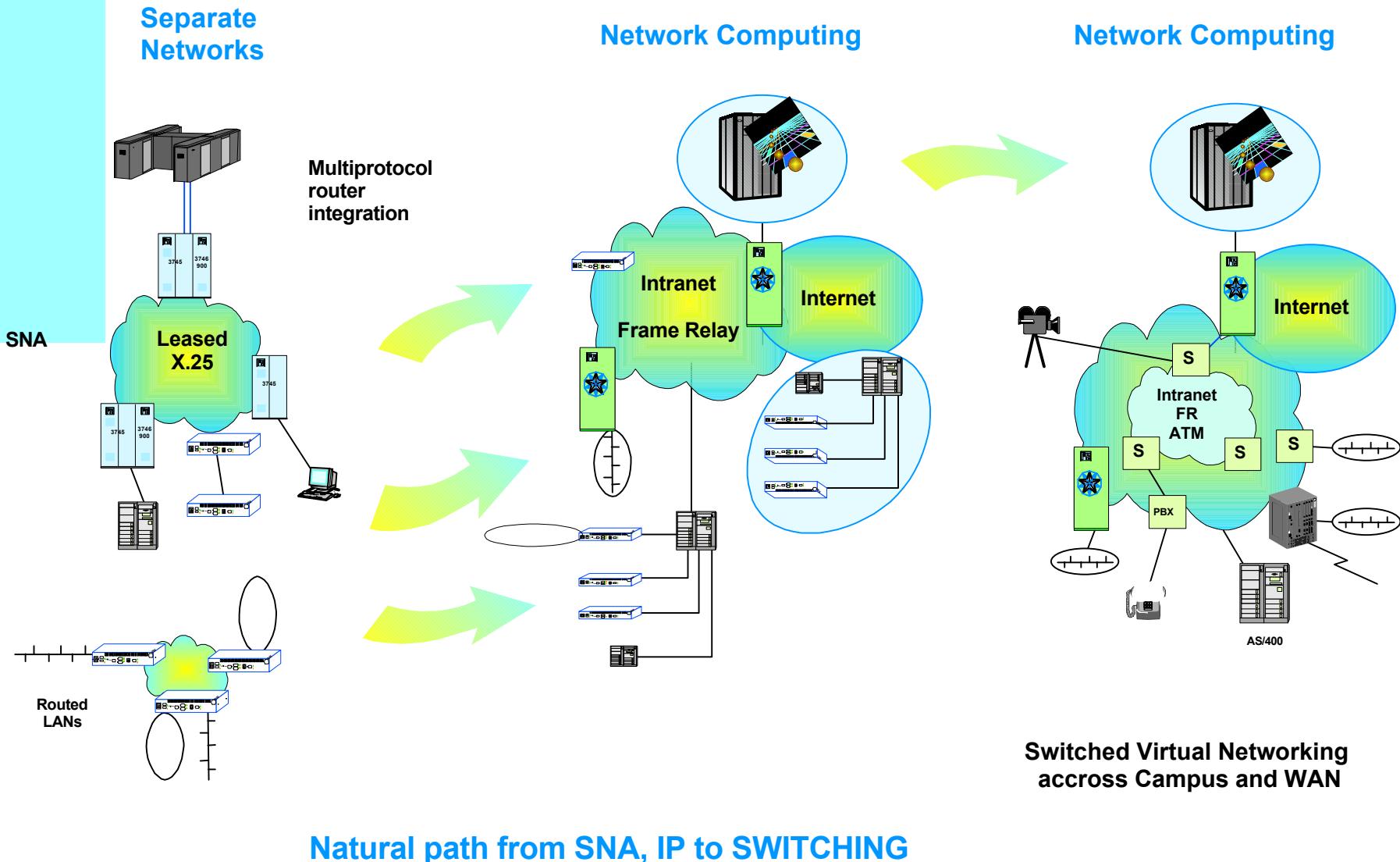
1. IBM 3746 - Multiprotocol Evolution

Servers

VTAM
TCP/IP

Servers

3745   3746-900

3746-9X0

ATM Campus
FDDI, F-Enet

SNA, APPN/HPR
IP

SDLC

3745
372x

2218

Frame Relay
X25
ATM

2216

IP

HPR

3174

router

2210

3746-950

2210

SDLC

3174

IP

HPR

IP

372x

SNA

SNA

SNA

2216

SDLC

IPX

SNA

SNA
APPN

IP
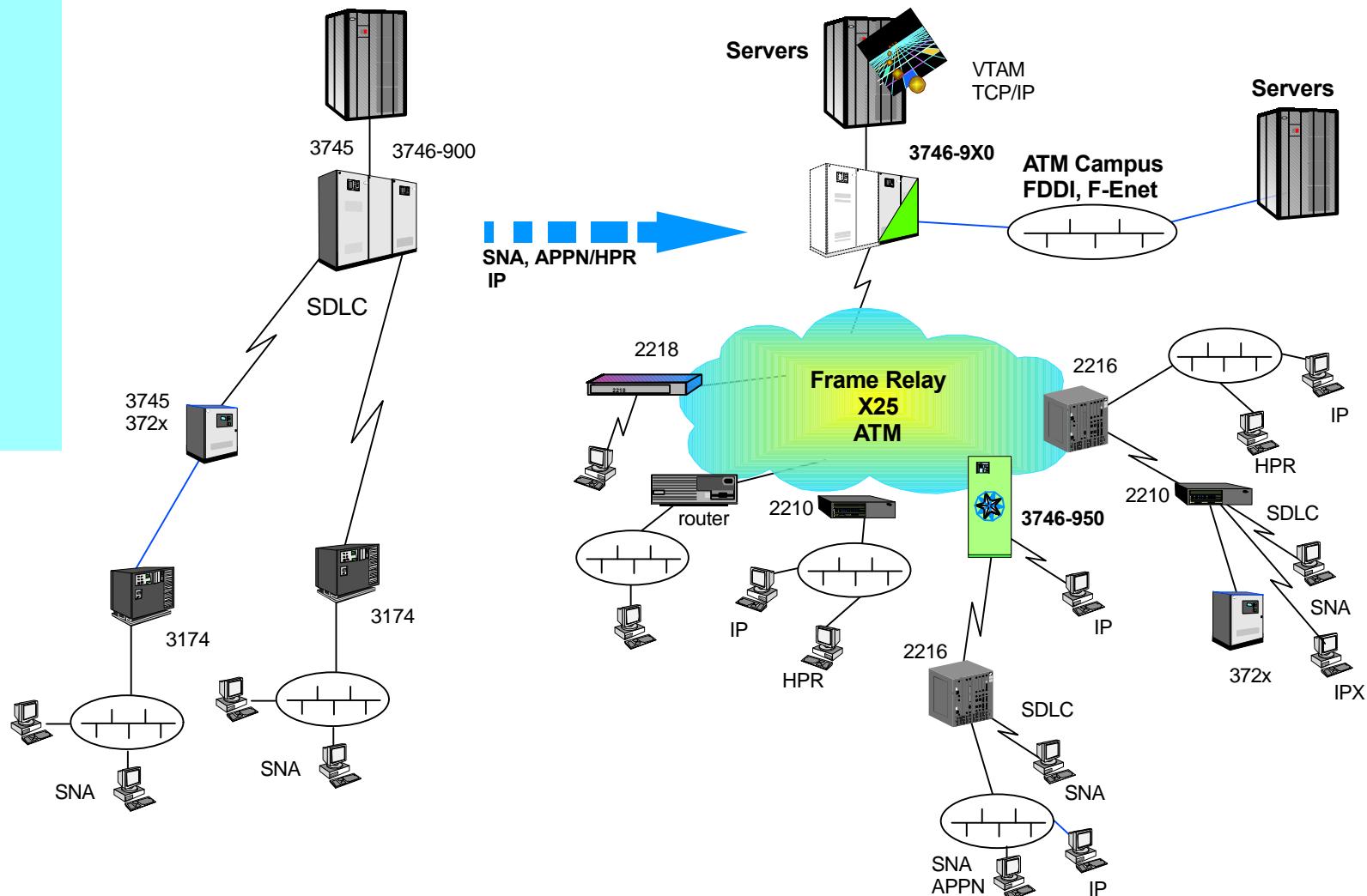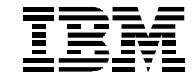
- **Multiprotocol routing over LAN/WAN/ESCON**
  (SNA/APPN, HPR, IP)

- **High Speed LAN/WAN/ESCON**

1. IBM 3745/3746 - Controllers Evolution

IBM

SNA/Subarea (NCP)	SNA/APPN (NCP)	SNA/APPN + APPN NN	SNA/APPN + HPR NN + IP

210-410   **310-610**   **21A-41A 31A-61A**   **3745/3746-900**   **3745/3746-900 (NNP)**   **3745/3746-900 (NNP) MAE**

**Channel
TR,Enet
SDLC, X.25
BSC, Async**

**16 MB per CCU
Service Processor**   **FR**   **TR
FR
SDLC
ESCON**   **HPR (ANR)   X.25
Euro-ISDN**   **APPN
DLUR**

**IP (SNMP)
ANR, RTP
Network dispatcher**

APPN NN

3746-950 (NNP)

HPR NN + IP

**3746-950 (NNP)
MAE**

**X.25
ISDN (WW)
Ethernet
ATM
ESCON MPC+**

**APPN
DLUR

ESCON
TR
SDLC
FR**

**TN3270E *
FDDI *
F-ENET *
T3/E3 (HSSI) ***

17A

- **Smooth Evolution**
- **Multiprotocol Through Frame Relay**
- **Protect Customer's investment**
- **Migration Towards Stand Alone HPR Network Node**

MAE : Multiaccess Enclosure

130-150-170   160

NCP V5   **NCP V6**   **NCP V7...**

* Preview

2. Sept. 9th, 1997 Announcement

- **Multiaccess Enclosure**
  - Attachment hardware to 3746 switch — **6/12/98**
  - Single IP router image — **6/12/98**
  - New Faster ATM adapters — **12/12/97**
  - RIP V2 on MAE ports — **12/12/97**
  - HPR over ATM — **12/12/97**
  - Network Dispatcher — **12/12/97**

- **New 3746 Processor Type 3**
  - ESCP3, CLP3, TRP3, CBSP3 — **9/16/97**

- **APPN Box connectivity**
  - 5K PUs / 30K LUs Sessions — **10/30/98**
  - 240 lines (IP and APPN) — **10/30/98**

- **3746 Machine availability improvement**
  - Active and non active code selection — **12/12/97**
  - 80% time reduction for code upgrade — **12/12/97**

- **Mutiaccess Enclosure Enhancements (*)**
  - FDDI, HSSI (T3, E3), F-Enet
  - TN3270e
 - UDP over MPC+
  - IP over MPC+
  - Enterprise extender

Target 1H98

IBM 3746

- **APPN Enhancement**
  - SSE (Session Service Extended) — **10/30/98**
  - Single APPN/HPR image 3746/MAE — **Preview**
  - APING from CCM — **12/12/97**

- **3746 IP internal coupling to 3745** — **9/16/97**
 - With NCP V7R6

(*) Preview

2. IBM 3746 - Multiaccess Enclosure Customer IBM added value

6/12/98

**Multiaccess Enclosure**

- **Strengthen 3746 connectivity/scalability**
  - **Add 8 new adapter capacity**
  - **Deliver ATM 155 Mbps adapters**
  - **Add new ESCON capabilities**
    - **MPC+ for APPN/HPR**
    - **SNA passthrough**
  - **Expand Protocols/interface support**
    - **IPX, DLSW, Enterprise extender (*)**
    - **WW ISDN, more T1/E1**
- **Strengthen 3746 performances**
  - **MAE directly connected to the 3746 switch**
  - **Deliver high speed adapters**
    - **ATM, FDDI (*), HSSI (*), F-ENET (*)**
- **Strengthen 3746 Server Access functions**
  - **Network dispatcher for Intranet/Internet**
  - **TN3270e (*) for SNA applications**

The Path to the High Speeds

(*) Preview

2. IBM 3746 - Extend 3746-9x0 Connectivity with Multiaccess Enclosure
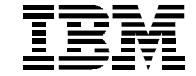
6/12/98
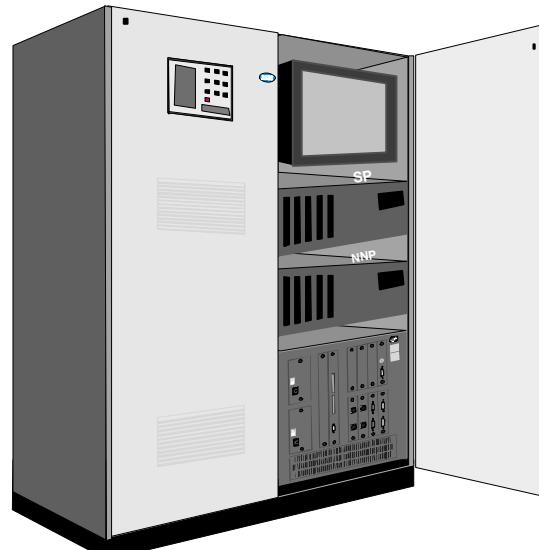
Multiaccess Enclosure

- **Improved performance (x3+)**
  - **Hardware coupling to 3746 switch**   `New`
  - **Offload Power PC routing protocols**

- **Deep Integration**   `New`
  - **Single IP image/router**
  - **Single configurator entry**
  - **MAE seen as a NEW SUPER processor**
  - **Distributed routing for IP and APPN/HPR (*)**
  - **Release Token Ring requirements for IP and APPN/HPR (*) between 3746/MAE**

- **Investment protection**
  - **Re-enforce 3746 strategic role**
  - **Field upgradable**
 - **Free upgrade to hardware coupling for FC3000**
  - **Reuse all MAE adapters**

The Path to the High Speeds ➡

(*) Preview

2. IBM 3746 - Multiaccess Enclosure Enhancements

6/12/98

NEW

3746-9x0

Controller Base

Controller Expansion

Multiaccess Enclosure

S W I T C H

P P P P P

Expansion Enclosure

CBSP (2080)   P P P P

TIC3

Base Enclosure

Token Ring Port   **Serial Port**

**SP**   **Serial Port**

NNP

Service Ring
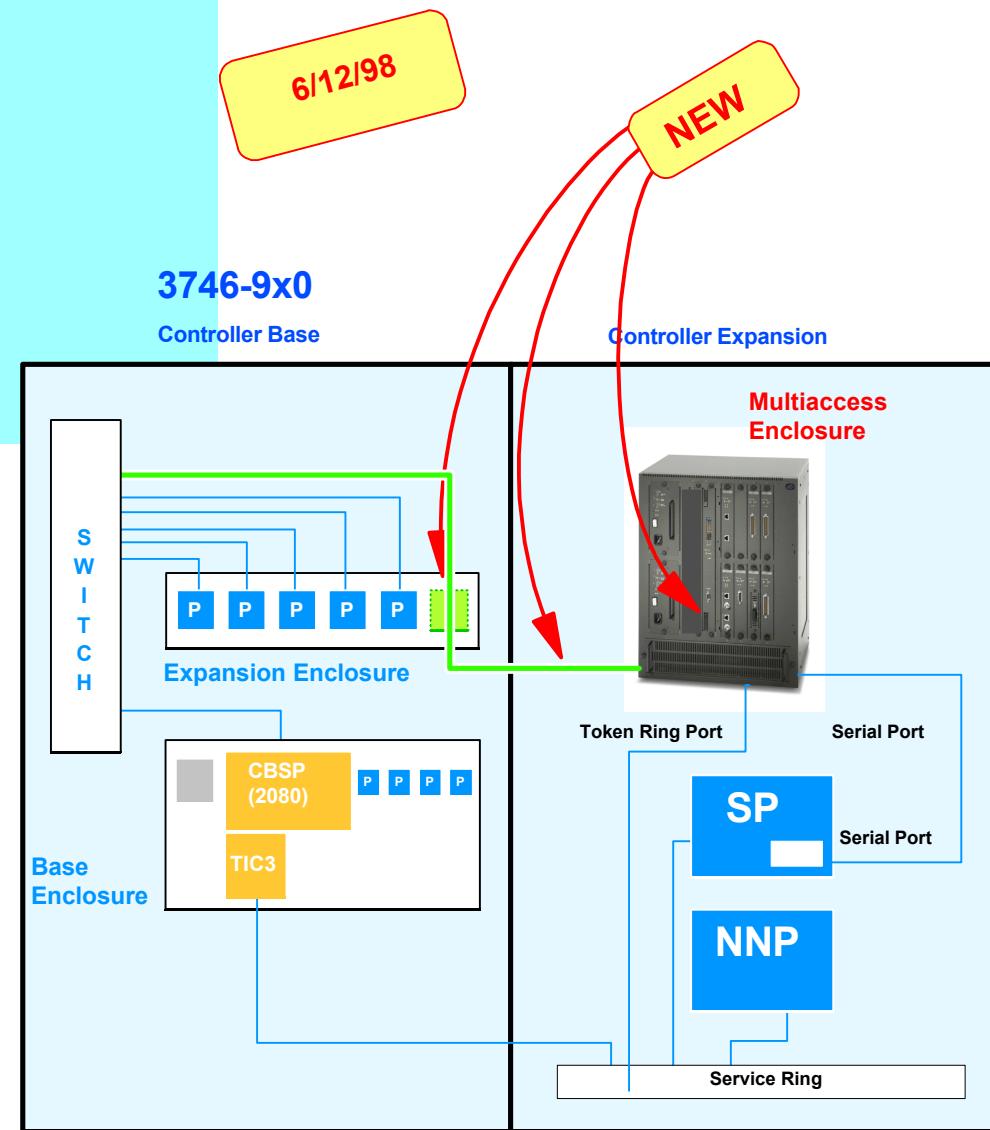
- **MAE hardware coupling**
  - 2 cards provided
    - Switch Interface Extended (3746)
    - Switch Access Card (MAE)
  - MAE can be 6 meters away of the 3746

- **MAE IP resources**
  - Own by 3746 IP "Control Point"
  - Configured from Service Processor
  - Single Router IP image

- **MAE maintained from Service Processor**

- **Pre-requisites**
  - 3746-900 + NNP or 3746-950
  - 3746 IP Routing (FC #5033)
  - SP upgrade for FC 5020 & FC 5021
  - 1 EMPTY 3746 Processor slot

2. IBM 3746 - MAE Value add Function Network Dispatcher

IP SERVERS

3746

IP

SP

NNP

MAE

END USERS
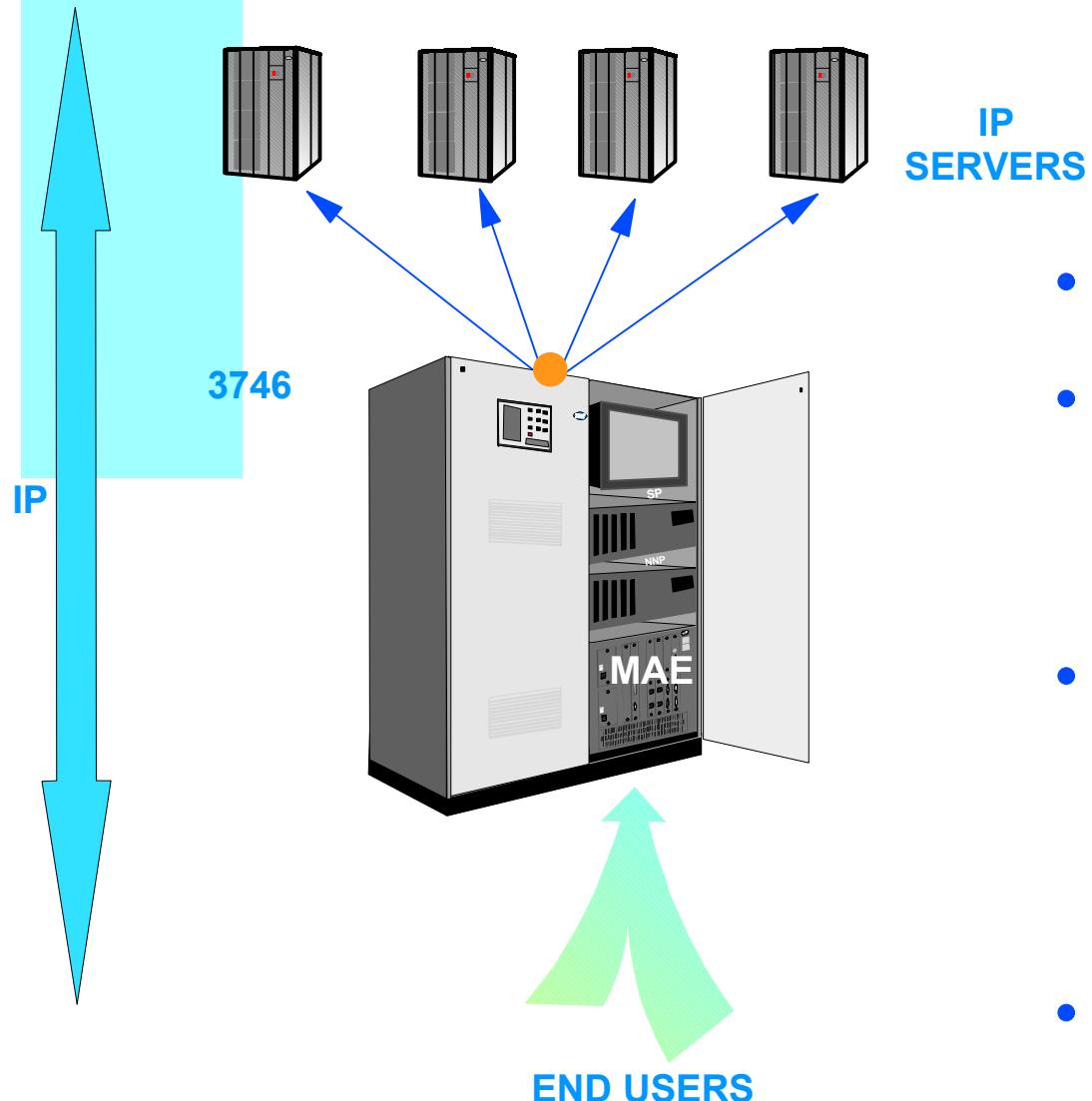
- **IBM UNIQUE function**

- **Strengthen servers efficiency**
  - S/390
  - Other servers

- **Used by IBM for Web sites access**
  - 1996 olympic Web site
  - 1997 "Deep blue" Web site

- **Spray IP traffic load to the servers**

2. IBM 3746 - MAE Value add Function
Network Dispatcher

WEB Servers
- **Internet**
- **Intranet**

12/12/97

Subnet 1

TCP Connections

Subnet 2

ESCON
LAN
WAN   **3746**

MAE

IP

IP

- **Allow IP packet balancing on Servers**
  - **Thru all interfaces**
  - **Including 3746 and MAE**
  - **Including ESCON/LAN**

- **Load balancing based on**
  - **Round robin algorithm**
  - **Failure of server (back-up)**
  - **No response from a server (back-up)**

- **End users will see/know a single IP address for the set of servers**

Network Dispatcher

3746

LogicalView
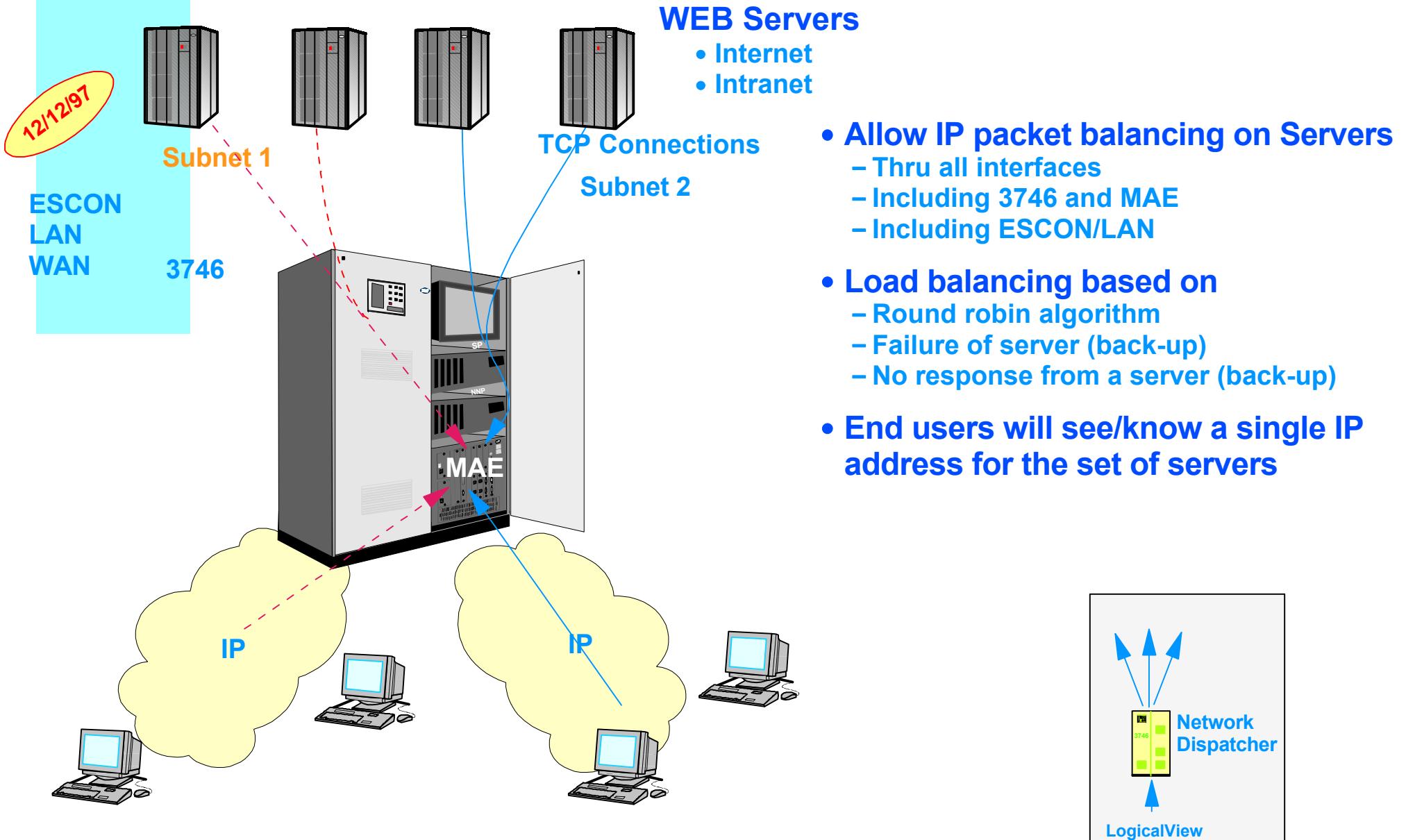
2. IBM 3746 - Multiaccess Enclosure ATM enhancements

Parallel Sysplex

TCP/IP MVS

12/12/97

SNA   HPR   IP

ESCD

3746

SP

NNP

MAE

CAMPUS   **ATM**   **WAN**

155 Mbps Network

HPR

IP

SNA

- **New high performance ATM adapters**
  - SMF/MMF
  - 15% to 25% performance improvement for small packet

New

- **Native HPR thru ATM**
  - AIW 8192 compliant
  - No need of LAN emulation/classical IP
  - HPR benefits thru ATM network

New

- **Next Hop Resolution Protocol (NHRP)**
  - Short cut router for IP over ATM
  - Zero Hop routing for end station with NHRP

New

- **3746 ATM full solution**
  - LAN emulation client
  - Classical IP
  - Native HPR over ATM

2. IBM 3746 - The APPN/HPR to ATM Interface

An IBM suggestion:

(Implemented with VTAM V4R4 and common code base)   NEW
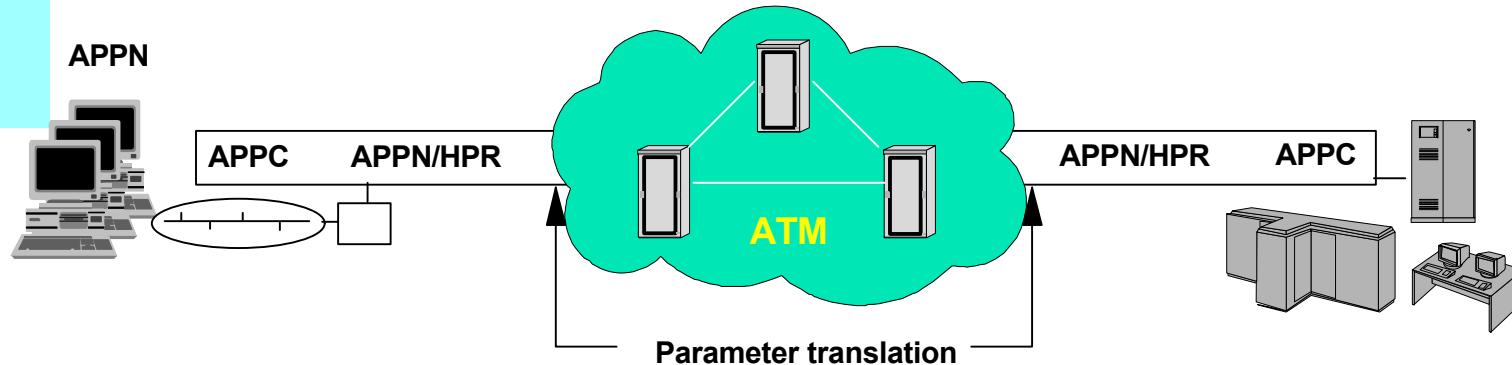
- The ATM adresses are put into the APPN directory
- The ATM nodes and links are put into the APPN Topology DB
- The attributes of the ATM nodes and links are used with the APPN route computation
- The APPN Class of Service is translated to the ATM Quality of Service

2. IBM 3746 - ATM Solution Scenario

IBM

Solution

- **Use 3746-9x0 to provide new ATM connectivity**

- **Use Multiprotocol Switched Services for SVN ATM campus**

Decision Factors

- **Number of SNA PUs**

- **Connectivity to multiple hosts**

- **ESCON/Parallel channels**

Protocols

- **IP**

- **SNA, APPN/HPR**

ESCD

NEW

3746

MAE

ATM

8210 MSS

WAN

LAN

ATM

NEW

AS/400

Switch

IP servers

3174

2210

IP

PS/2

PS/2

SNA
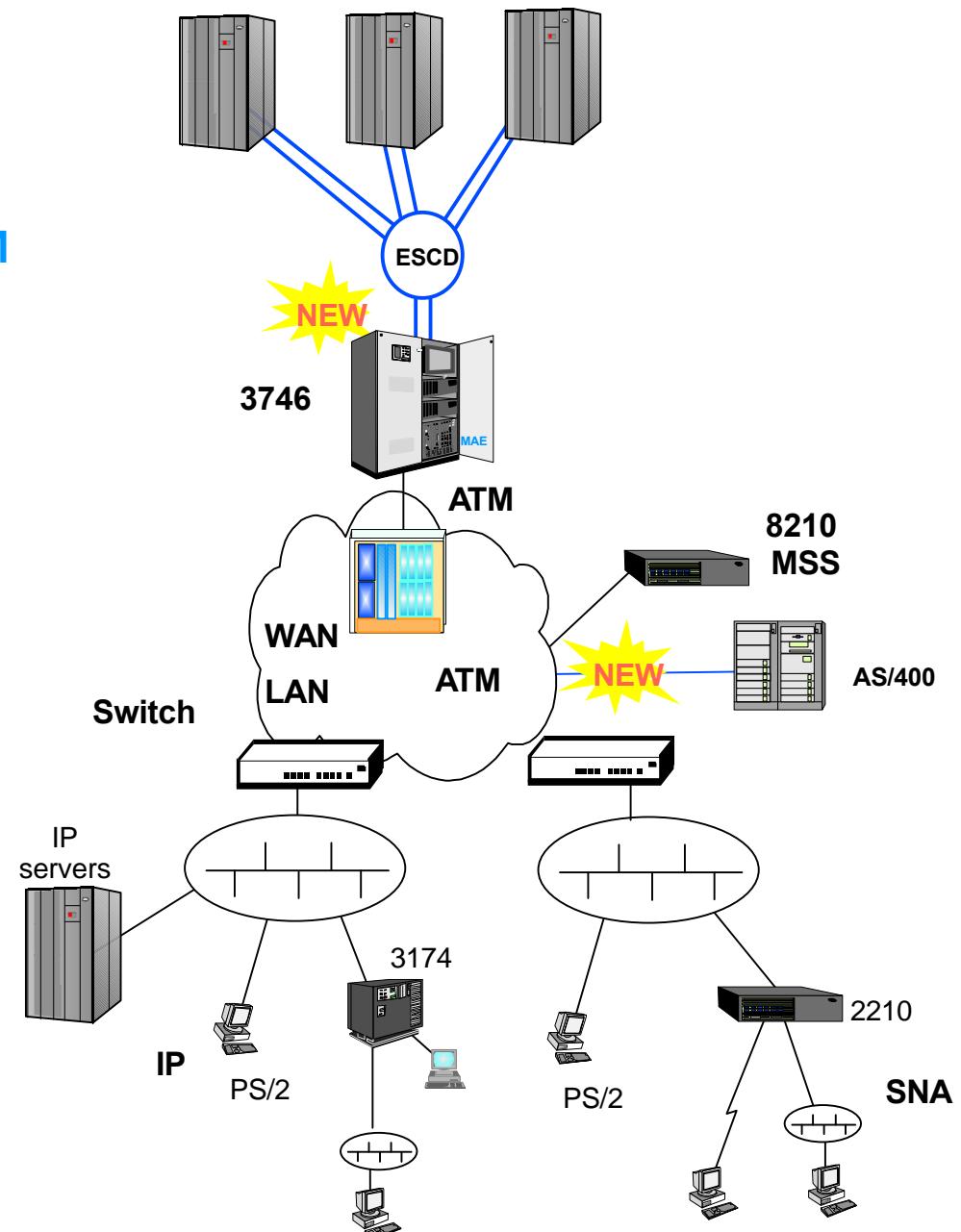
2. IBM 3746 - MAE value add IP function

IBM

TCP/IP   V3R2

12/12/97

Subnet 1

ESCON
LAN
WAN   3746

Subnet 2

R

SP

NNP

MAE

IP   IP
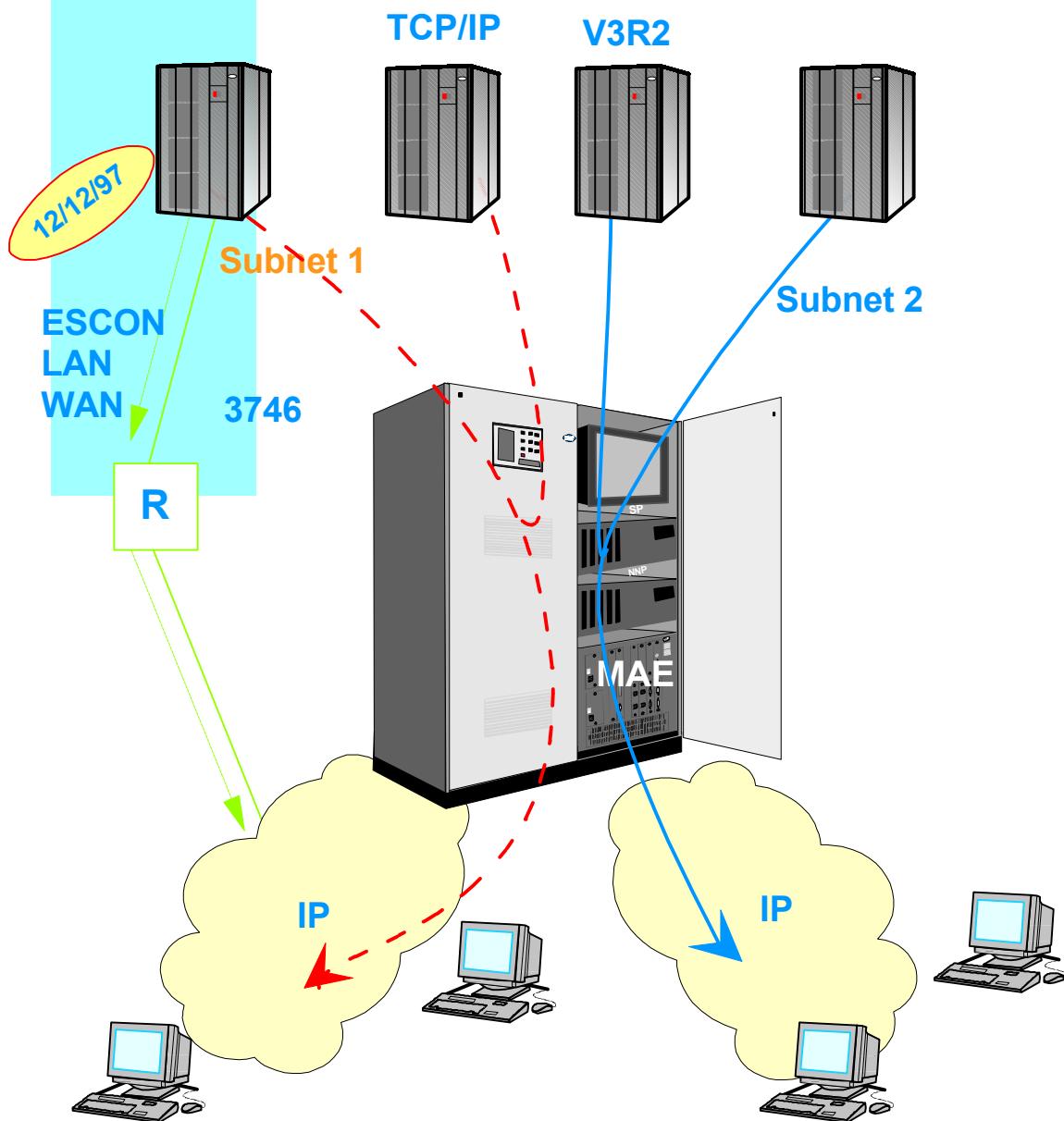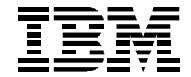
- **RIP V2**
  - TCP/IP V3R2 + PTFs min level
  - Thru all MAE interfaces

- **Extend 3746/MAE Routing protocol support**
  - RIP V1, RIP V2
  - OSPF V2
  - BGPV4

- **RIP V2 add subnetting capability to RIP V1**
  - Available on all MAE ports (on FC3000 only)

2. IBM 3746 - MAE value add function - DLSW

IBM

VTAM   TCP/IP   **Parallel Sysplex**

CDLC   ESCD   MPC+/LSA

SNA
HPR
APPN

3746

SP

NNP

MAE

IP

EN

Router

IP

DLSW

PU2.0

2210

EN

SNA

EN

2216

PU2-0

- **Remove need of a Front end Router**
- **Help customers with Router Backbone installed**
- **APPN/HPR over ESCON (MPC+, CDLC, LSA)**
- **DLSW V2 available**
- **DLSW packets can come thru**
  - 3746 links
  - MAE links
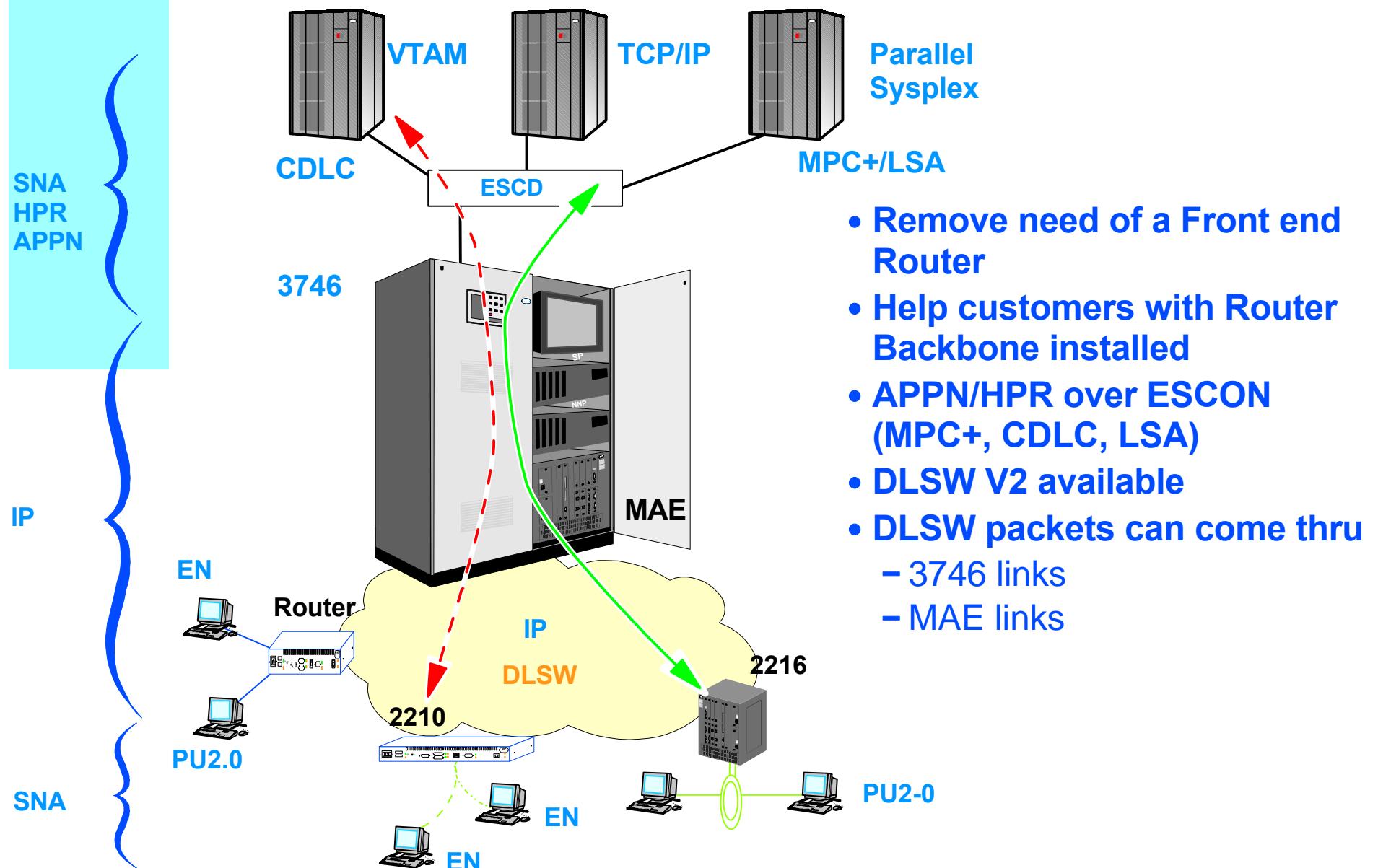
2. IBM 3746 - ESCON Protocols

Host   **Host**   **Host**   **Host**

VTAM V4R3
(1)

TCP/IP V3R2

VTAM 4.4
(4)

TCP/IP V3R2

CDLC   **MPC+**   **LSA**   **LCS**

(3)   HPR

SNA/APPN/HPR   **SNA/DLUR, APPN**   **(2)**   IP

IP   **(2)**   **HPR**

New

**3745**   **3746**

SP

NNP

NCP

MAE
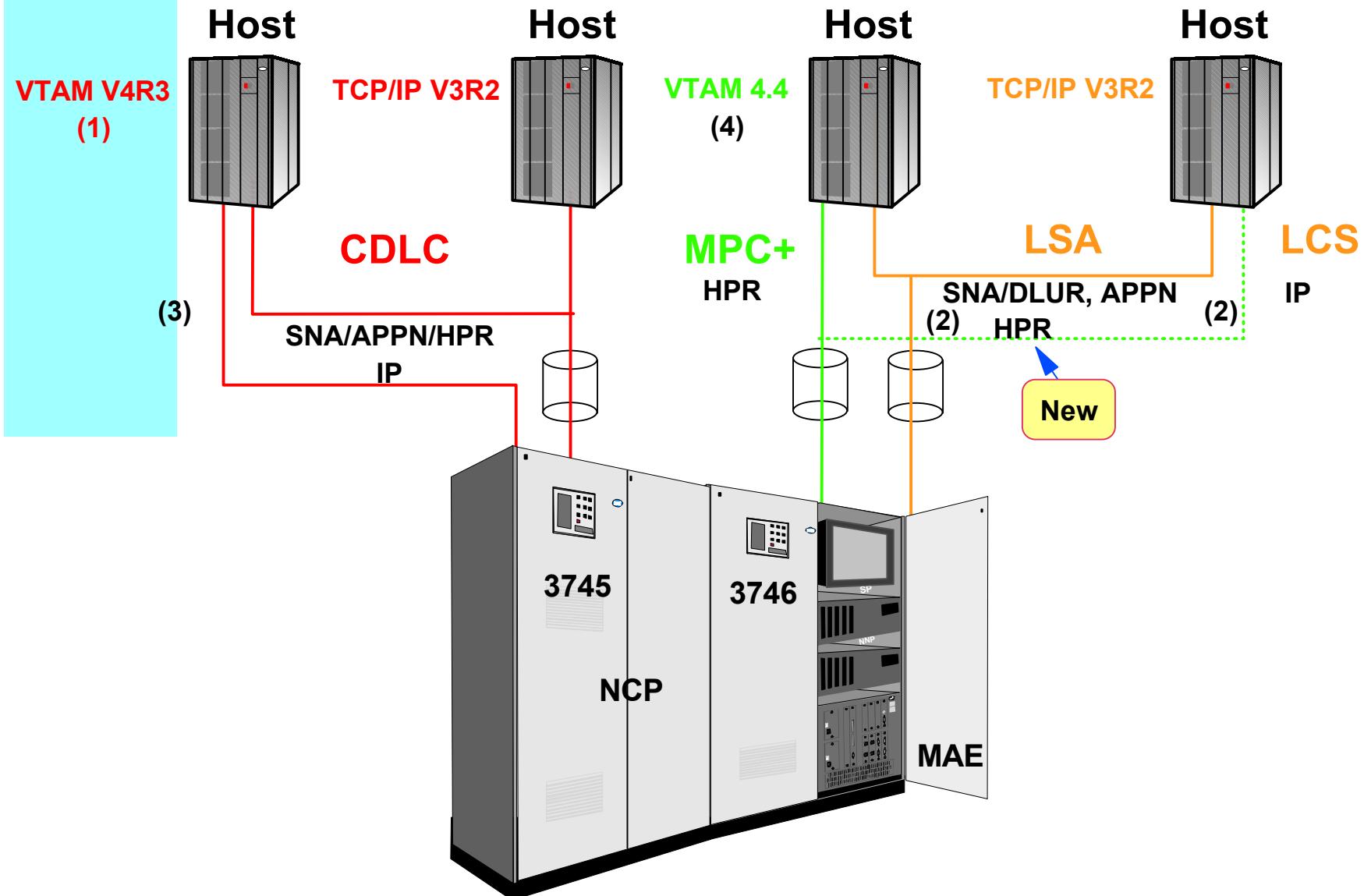
(1) Minimum level for HPR support

(2) Same ESCON can share MPC+, LSA ands LCS during Migration
period (Not Recommended for long term)

(3) CDLC is also supported on 3745 BCCA/CADS Channels

(4) Minimum level for MPC+ and HPR over LSA

2. IBM 3746 - High Speed Multiaccess Enclosure

S/390

VTAM | TCP/IP

3745-xxA   **3746-900**

NCP

NPSI

NCP

NPSI

P | S W I T C H | P

NNP

P

(3)

ESCON Channel
TR/ENET
SDLC
Frame Relay
PPP
X25

A | PPc | A | A

A | A | A | A | A

ATM 155 Mbps(1)
PRI-ISDN(1)
ESCON (MPC+)(2)
F-Ethernet 100 Mbps(4)
HSSI (T3/E3)(4)
FDDI(4)

Multiaccess Enclosure

S/390

VTAM | TCP/IP

3746-950

P | S W I T C H | P

NNP

P

(3)

ESCON Channel
TR/ENET
SDLC
Frame Relay
PPP
X25

A | PPc | A | A

A | A | A | A | A

ATM 155 Mbps(1)
PRI-ISDN(1)
ESCON (MPC+)(2)
F-Ethernet 100 Mbps(4)
HSSI (T3/E3)(4)
FDDI(4)

Multiaccess Enclosure

P   Processor (+ Coupler)

A   Adapter (=Coupler)

  Empty processor slot

NNP   Network Node Processor

PPc   Power Pc

(1)   Available 6/30/97
(2)   Available 9/16/97
(3)   Available 6/12/98
(4)   Product Preview

2. IBM 3746 - New Enhanced Processor TYPE3 IBM

NEW

9/16/97

Performance
Connectivity

Connectivity: up to 200%
Performance: up to 100%

Type 3

IP
APPN/HPR
NCP

Type 2

ISR
DLUR

Type 1

1993   1995   **9/97**
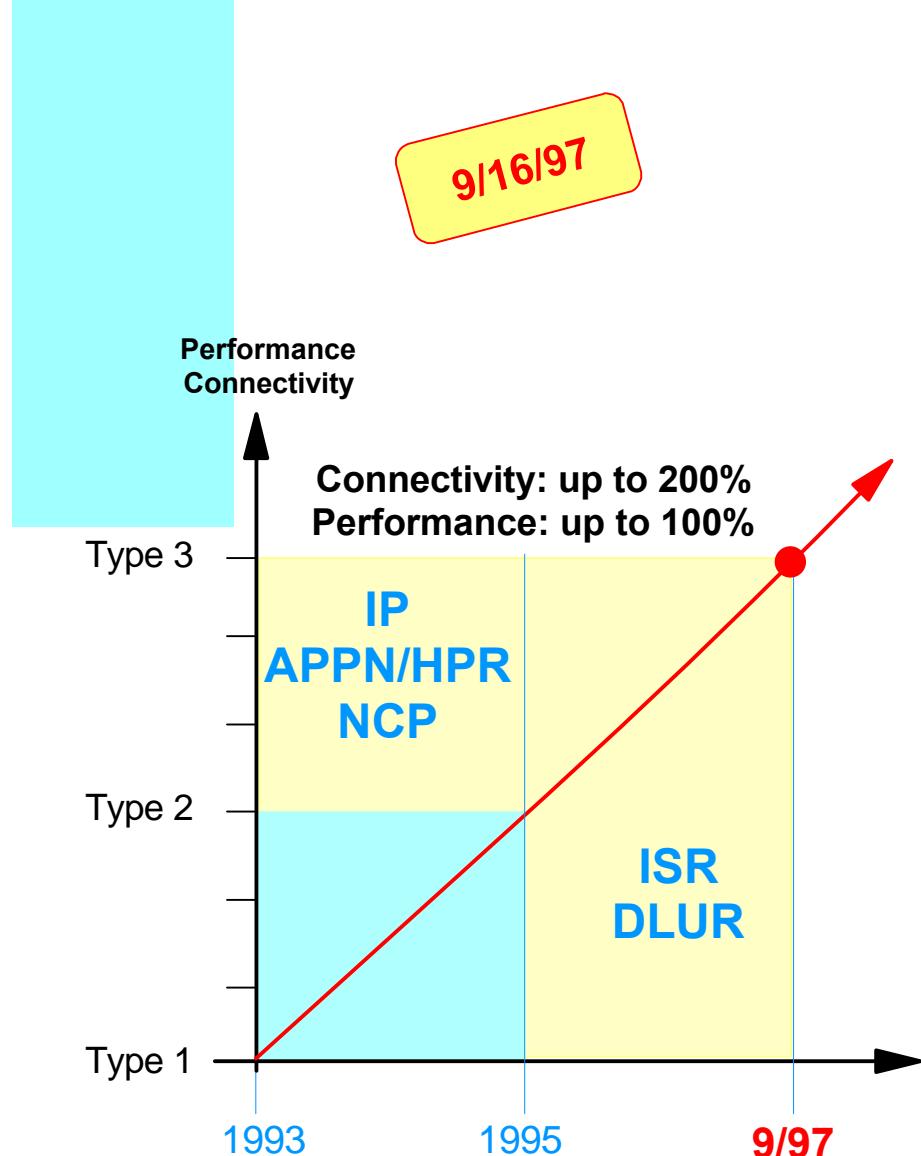
- **New TRP3, ESCP3, CLP3, CBSP3**

- **Performance increase by up to 100%**

- **APPN connectivity per adapter increased by up to 200%**
  - **ESCP3: 16 PUs and 15000 ISR/DLUR**
  - **TRP3: 2000 PUs and 8000 ISR/DLUR**
  - **CLP3: 1000 PUs and 8000 ISR/DLUR**

- **Benefits to NCP traffic**
  - **NCP line weights divided by up to 1.9 (CLP3)**
  - **Performance increased by up to 90% (*)**

- **Field upgradable (Type x to Type 3)**

- **Type1, Type2, Type3 can co-exist**

(*) expected

2. IBM 3746 - Processor Type 3 Connectivity

ESCP

- **Connectivity : Up to 3 X**

Example	ESCP2	ESCP3	Ratio
PUs (Stations)	16 and	16 and	X1
Sessions	5000	15000	X3

(16 = MAX)

TRP

- **Connectivity : Up to 3 X**

Example	TRP2	TRP3	Ratio
PUs	650 and	2000 and	X3
Sessions	2600	8000	X3

(2000 = MAX)

2. IBM 3746 - CLP3 vs CLP Connectivity

IBM
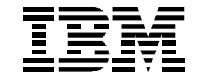
- **Connectivity : Up to 3 X**

Example	CLP	CLP3	Ratio	
Lines (SDLC)	20 and	60 and	X3	
PUs (SDLC)	300 and	1000 and	X3	**(1000 = MAX)**
Sessions	2500	8000	X3	

Example	CLP	CLP3	Ratio	
Lines (FR, X25)	(*) 120 and	(*) 120 and	X1	**(120 = MAX)**
PUs (FR, X25)	650 and	2000 and	X3	**(2000 = MAX)**
Sessions	2000	8000	X3	

Limits	CLP	CLP3	Ratio
Lines	120	120	X1
PUs (SDLC)	1000	1000	X1
PUs (FR, X25)	1000	2000	X2
DLCIs	500	2000	X4

(*) Limit can be reached in any configuration of Lines/PUs/Sessions

2. IBM 3746 - Box Connectivity Increase

IBM

10/30/98

(PUs / Sessions)

ANR
(No session limit)

x 10

5000 /30000

5000 /15000

4000 /12000

3000 / 9000

ISR
DLUR

2000 / 6000

1000 / 3000

11/95   3/96   11/96   6/97   **10/98**
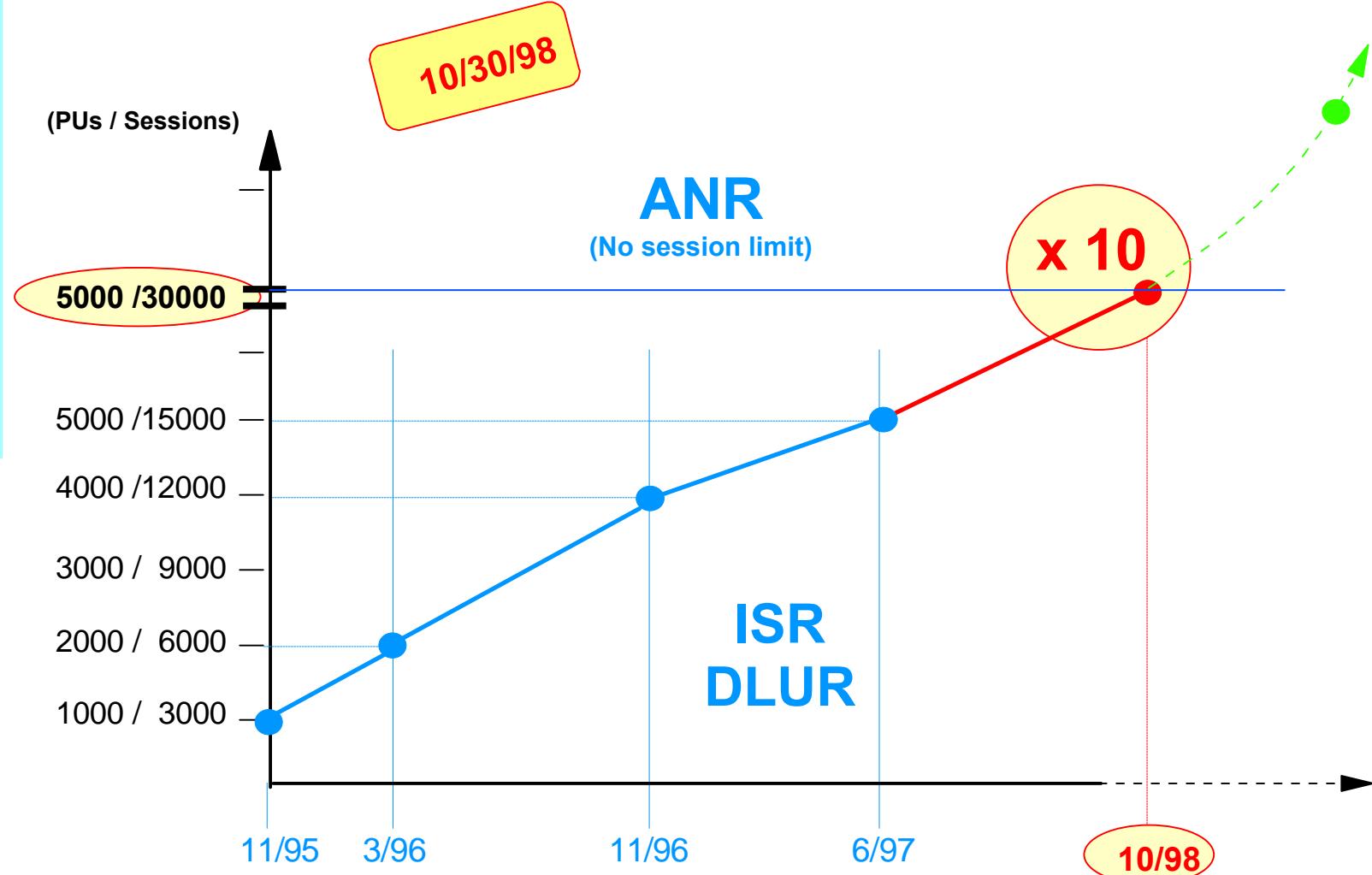
- **Connectivity increase**
  - 30000 Sessions (APPN/ISR, DLUR)
  - 240 lines (3746 NN and IP)

- **Prerequisite :**
  - Network Node Processor Type 2 (FC #5122)
  - CBSP3

2. IBM 3746 - Session Services Extended (SSE)

Net a

Net b

NEW

VTAM

ICN or CNN

Border Node

VTAM

SSE

3745

10/30/98

3745

3746-900

3746-900
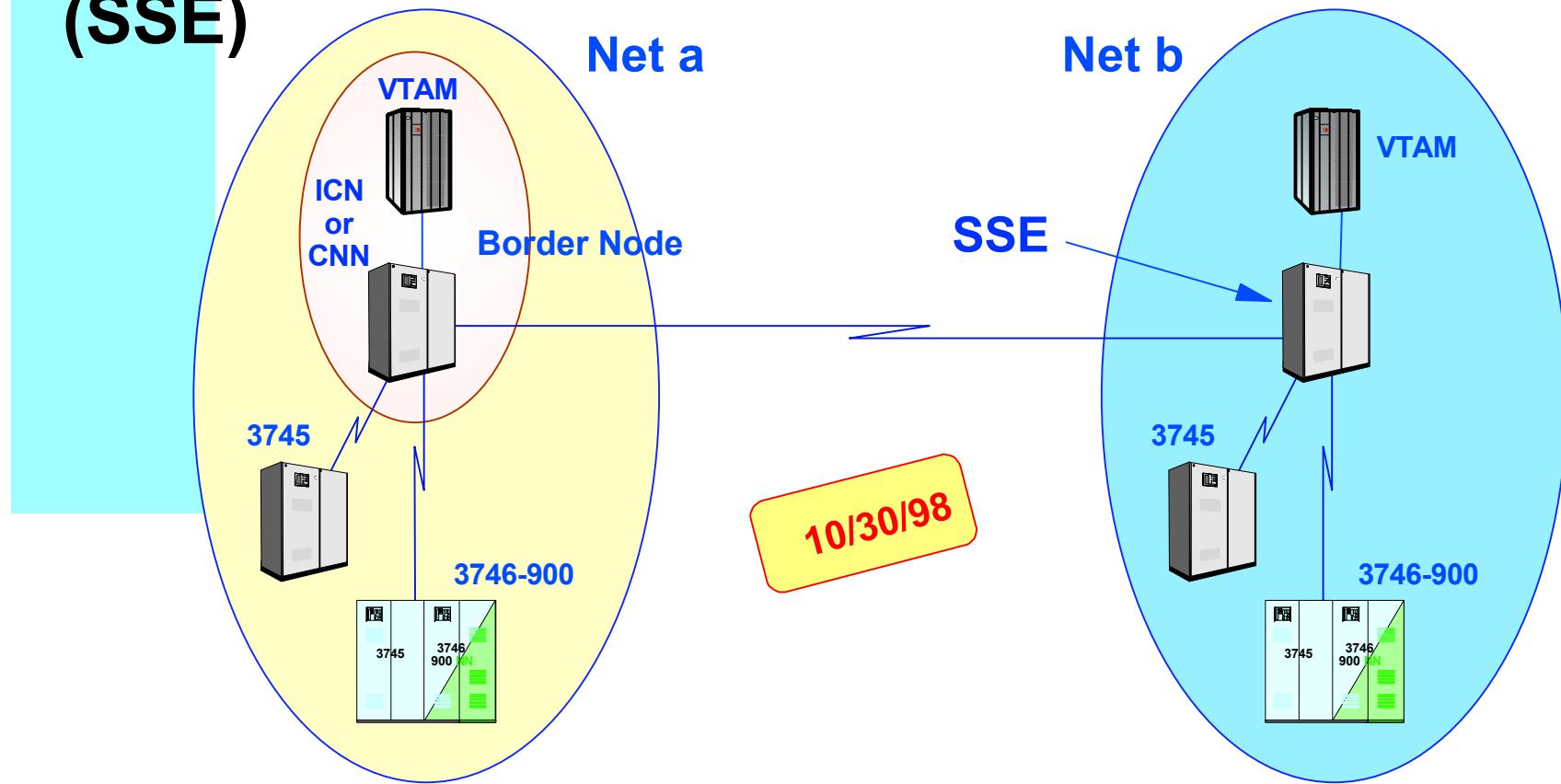
Mixed Subarea/APPN Network

APPN Network

- **Link different Networks**
- **Allow SNA environment migration**
- **Allow multiple SNA domains migration**
  - **SNI**

- **Offload VTAM cycles**
  - **EBN required only in one side**
- **APPN scalability implementation**

2. IBM 3746 - Session Services Extended (SSE)

NEW

10/30/98

VTAM   VTAM   VTAM

EN   EN   EN

3746-9x0 NN

**SSE**

Network SNA/APPN
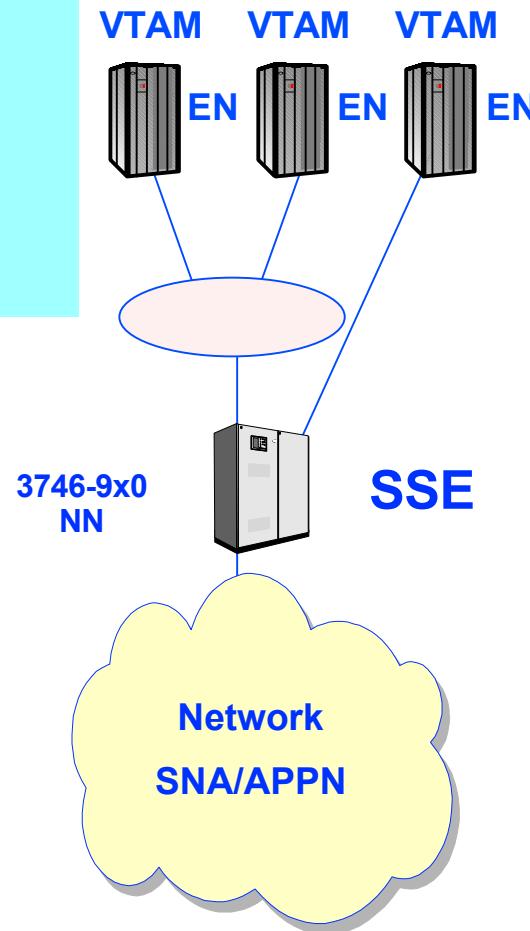
- **Offload VTAM cycles**
  - **No need to Maintain Topology**
  - **Route selection offloaded**

- **Can be Network Node Server of VTAM EN**
  - **No need of VTAM-VTAM direct connection**
  - **Reduce cost of APPN implementation**

- **Take full advantage of parallel sysplex**

2. 3746 - Microcode upgrade Improvements - Increase availability

Duration

145mn

>20mn

-80%

12/12/97

SP 2 Gbytes hard-disk required

Machine interruption time for microcode upgrade
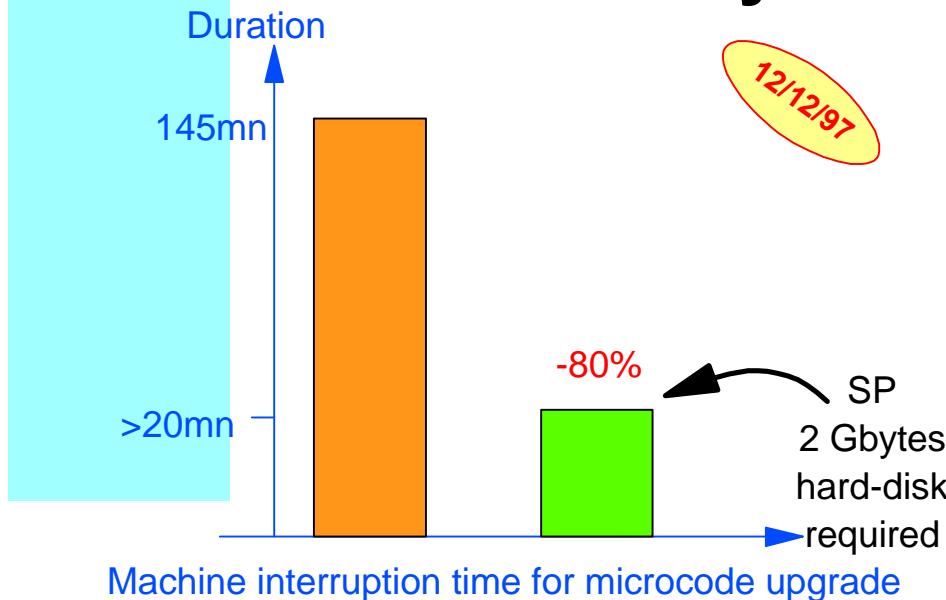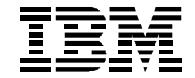
- **Reduce by 80% machine microcode upgrade**
- **Machine interruption equal to a general IML**
- **Reduce maintenance window requirements**
- **End users, applications availability improved**
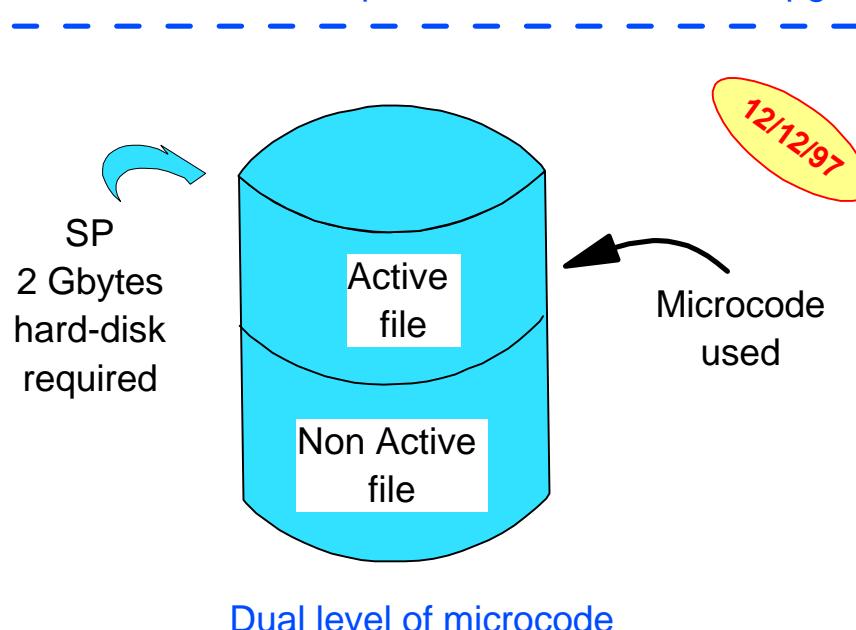
- **Protect your production code level**
  - Upgrade done on non active level
  - Operator switching control
  - Easy switch back in case of pb
- **Improve machine time efficiency**
  - Unused machine time dedicated to trial
    - New level of code
    - new function
  - Production level not impacted

SP 2 Gbytes hard-disk required

12/12/97

Active file

Non Active file

Microcode used

Dual level of microcode

2. IBM 3746 - Service Processor & Network Node Processor

Available
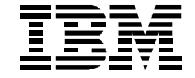
- **New SP FC 5052**
  - Previous functions supported
  - 96 MB base memory
  - Smaller than previous 5020 and 5021
  - Service processor 5021 no more orderable

- **New NNP FC 5122**
  - Previous functions supported
  - Enable for 1998 APPN enhancements
  - Smaller than previous 5022
  - NNP 5022 no more orderable

3. June/October, 1996, March 1997 Announcements

- NCP V7R5   Available

  - PRI-Euro ISDN (LIC16)   Available
  - Up to 16 Processors   Available
  - Ethernet Port   Available

- **High Performance Routing (HPR)**
  - ANR   Available
  - RTP   Available
  - ARB   Available
  - MLTG   Available

- **SNA/DLUR, APPN/HPR Routing**
  - over TR, ESCON, SDLC, FR   Available
  - over X25   Available

- **IP Routing**
  - over TR, ESCON   Available
  - over PPP(LL), FR   Available
  - over X25   Available
  - BRS   Available

- **Frame Relay**
  - FRFH   Available
  - CIRT+   Available

- **Hardware Feature**
  - NNP memory Expansion   Available
  - SP Memory Expansion   Available
  - X.25 Support for 3746-950   Available
  - Service Processor upgrade   Available
  - New Network Node Processor   Available
  - New Service processor   Available

IBM 3746

- **Box Connectivity**
  - 5000PUs/15000 ISR sessions   Available
  - Adapter type 2 connectivity/ performance improvment   Available

- **Multiaccess Enclosure**
- **ATM, ISDN, LAN, WAN**   Available
- **ESCON (MPC+)**   9/16/97

- **Preview***
  - **Box connectivity beyond 5000PUs/15000 ISR sessions 240 lines***
  - **MAE enhancements (FDDI, HSSI, F-Ethernet, TN3270e Server)**
  Direct attachment to the switch

3. IBM 3746 - Full Fledged IP Router

Available

WEB Server

MVS WEB Server

TCP/IP

Native IP

Internet

ESCON

IP

WEB Server

RFC 1490

FR

Ethernet

Token Ring

PPP leased

Intranet
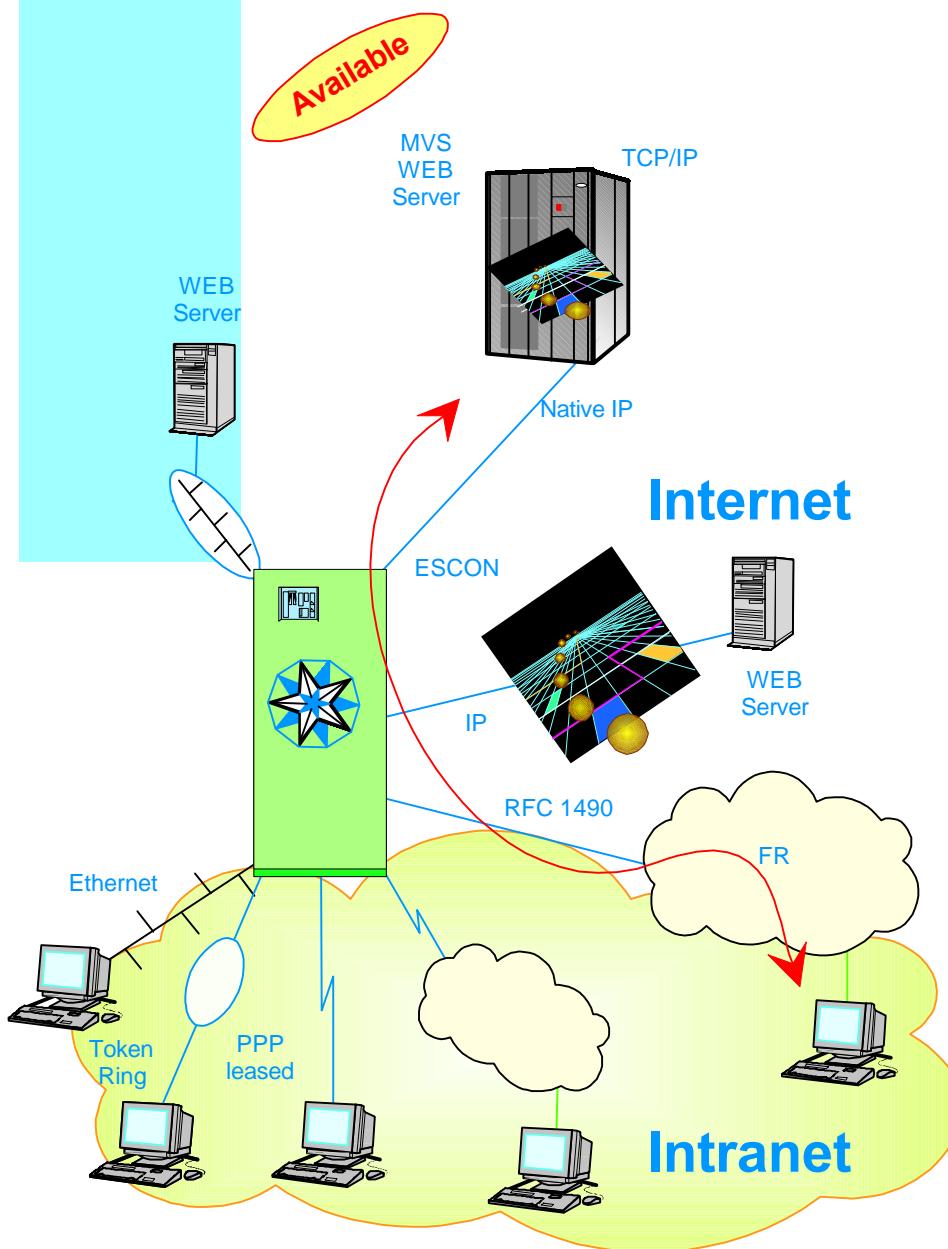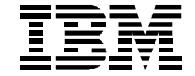
- **Native IP routing over**
  - **LAN : Token-Ring, Ethernet**
  - **Channel: ESCON**
  - **WAN : Frame Relay, PPP (Leased Line)**

- **RIP (V1), OSPF (V2), BGP (V4)**

- **Filtering, Access Control**

- **Multiple IP addresses per interface**

- **Header compression on WAN**
  - **RFC 1144**

- **Variable length subnet addresses**

- **IP application prioritization**
  - **Bandwidth Reservation System (BRS)**

- **Routing in the 3746 adapters**

- **Adapter sharing between IP/SNA/APPN/HPR**

- **SNMP support**
  - **Netview for AIX**

3. IBM 3746 - HPR (100% Availability Solution) IBM

Available

RTP

HPR

ANR

RTP

RTP
ANR
ISR

3746
RTP
ANR
ISR

NN
ISR

3746
DLUR
RTP
ANR

3746
DLUR
RTP
ANR

ANR

2210
RTP

PU2

PU2

2216
ANR
DLUR
RTP

2217
ANR

EN

CS/2
RTP

PU2

CS/2
RTP
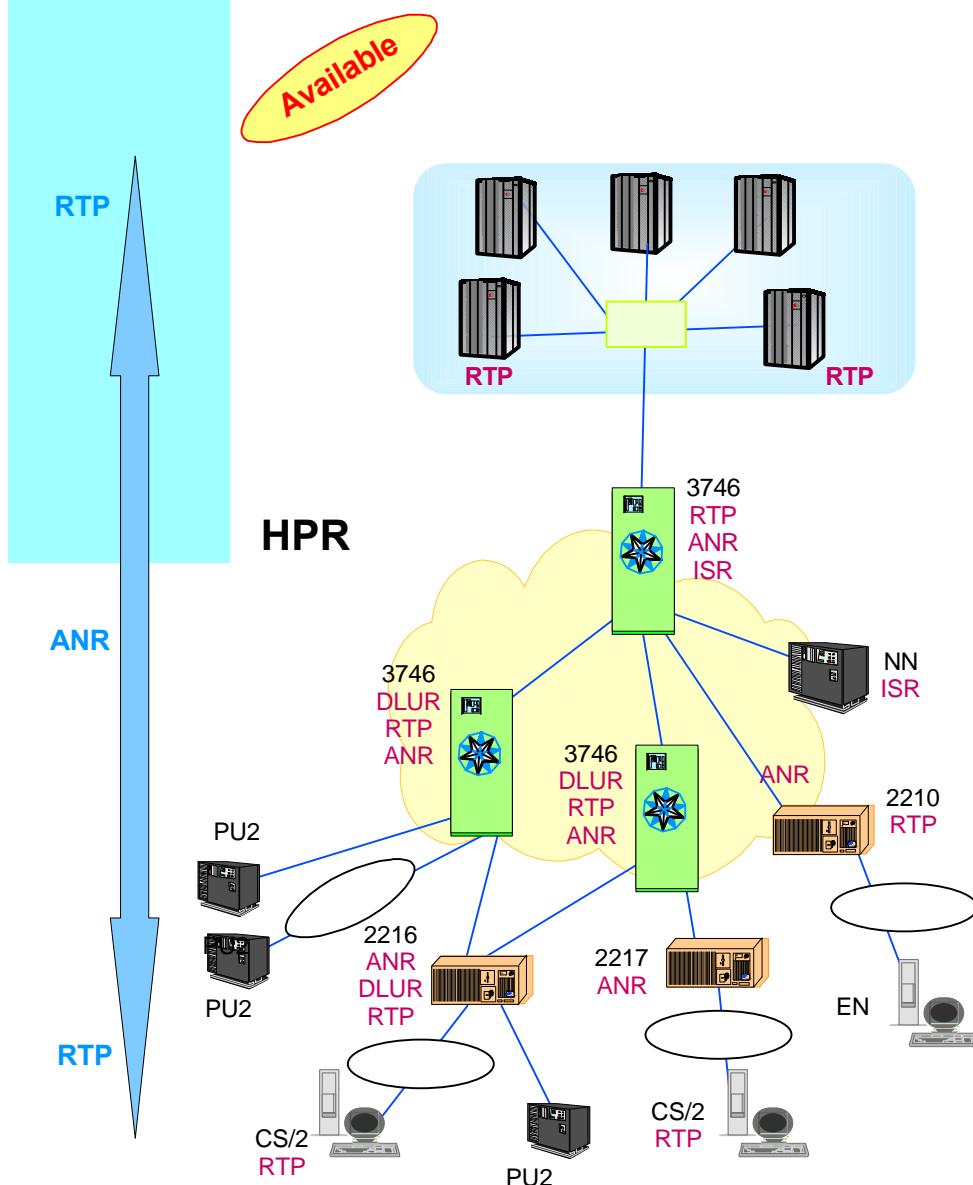
- **Network availablility**
  - 24x7x365
  - **HPR end to end non-disruptive session switching**
  - **Full APPN dynamics for routing**

- **DLUR support for non_APPN nodes**

- **APPN support (ISR) for non HPR nodes**

- **Automatic Network Routing (ANR)**
  - **Fast routing: x3 (vs APPN)**
  - **Unlimited number of ANR sessions**

- **Rapid Transport Protocol (RTP)**
  - **HPR pipe for: dependent PUs, APPN nodes**
  - **End to end error recovery**

- **Adaptive Rate Based (ARB)**
  - **Network congestion control (end to end)**
  - **Maximizes link utilisation**

3. IBM 3746 - HPR MultiLink Transmission Group

Available

RTP

ANR

RTP

RTP   RTP

Parallel
TGs

3746
RTP
ANR
ISR

3746
DLUR
RTP
ANR

**HPR
MLTG**

3746
DLUR
RTP
ANR

CS/2 (*)
RTP

3746
DLUR
RTP
ANR

CS/2 (*)
RTP

(*) Future
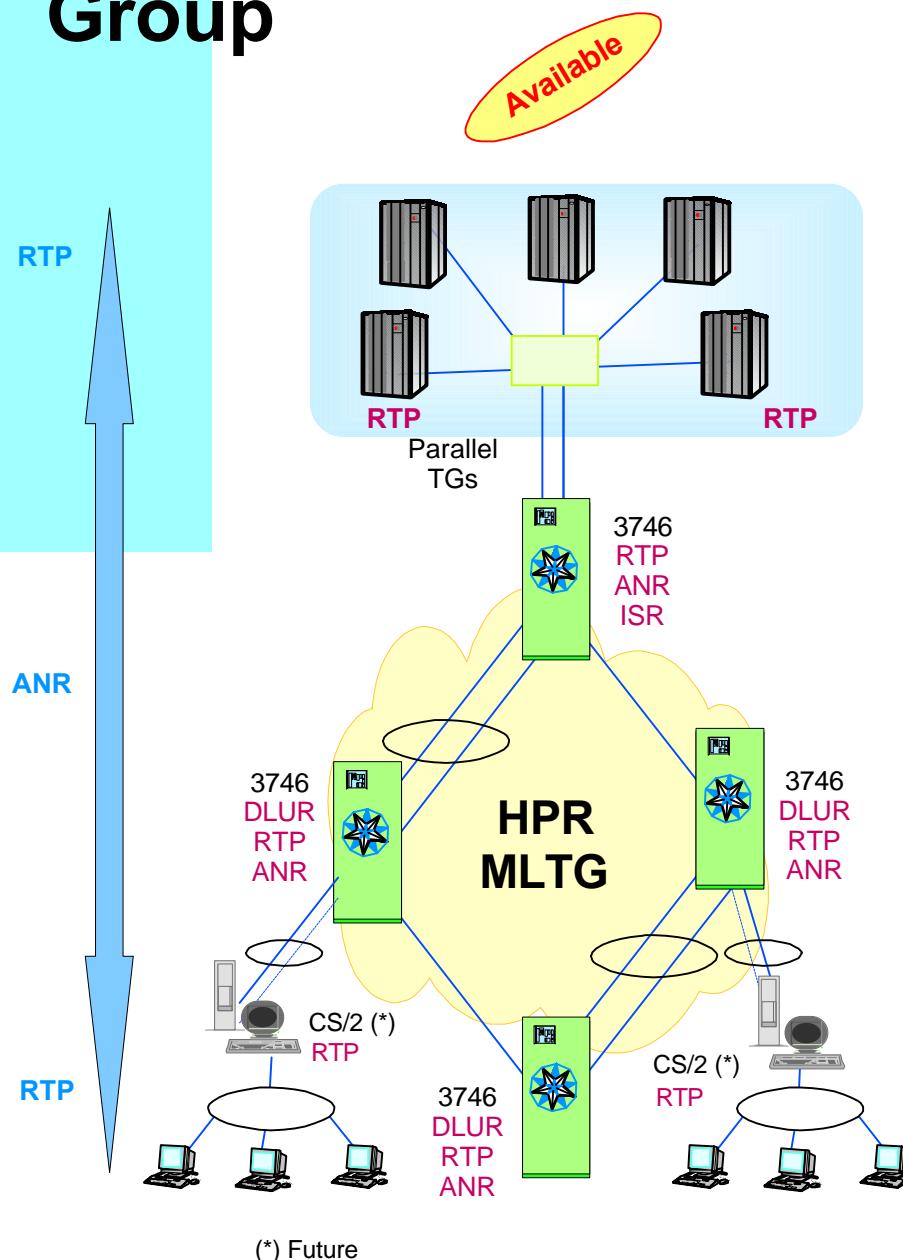
- **Higher Bandwidth**
  - **Multiple physical links = 1 Single logical link (MLTG)**

- **Increased Bandwidth per session**
  - **packets distributed over multiple links**

- **Additional Bandwith on demand**
  - **Dynamic adding/deleting (switched) links**

- **Load Balancing**
  - **Weighting mechanism between links of different speed**

- **Data resequencing by RTP end points**
  - **Use of MLTG indicator**

- **Topology Database Update (TDU)**
  - **when individual TG add/delete**
  - **to change MLTG characteristics**

- **MLTG on SDLC, FR, X.25, TR/Ethernet**
  - **Parallel TGs on ESCON channels**

3. IBM 3746 - Frame Relay Support

IBM

Available

S/390 TCP/IP   S/390 SNA   S/390 TCP/IP

3745/3746-900 NN

NCP

3746-950

Frame Relay

3746-950

IP

2210

2216

SDLC

IPX

2218

2216

SNA

SNA

3720
3725
3745

SNA

IPX

IP

SNA

APPN

SNA

SNA
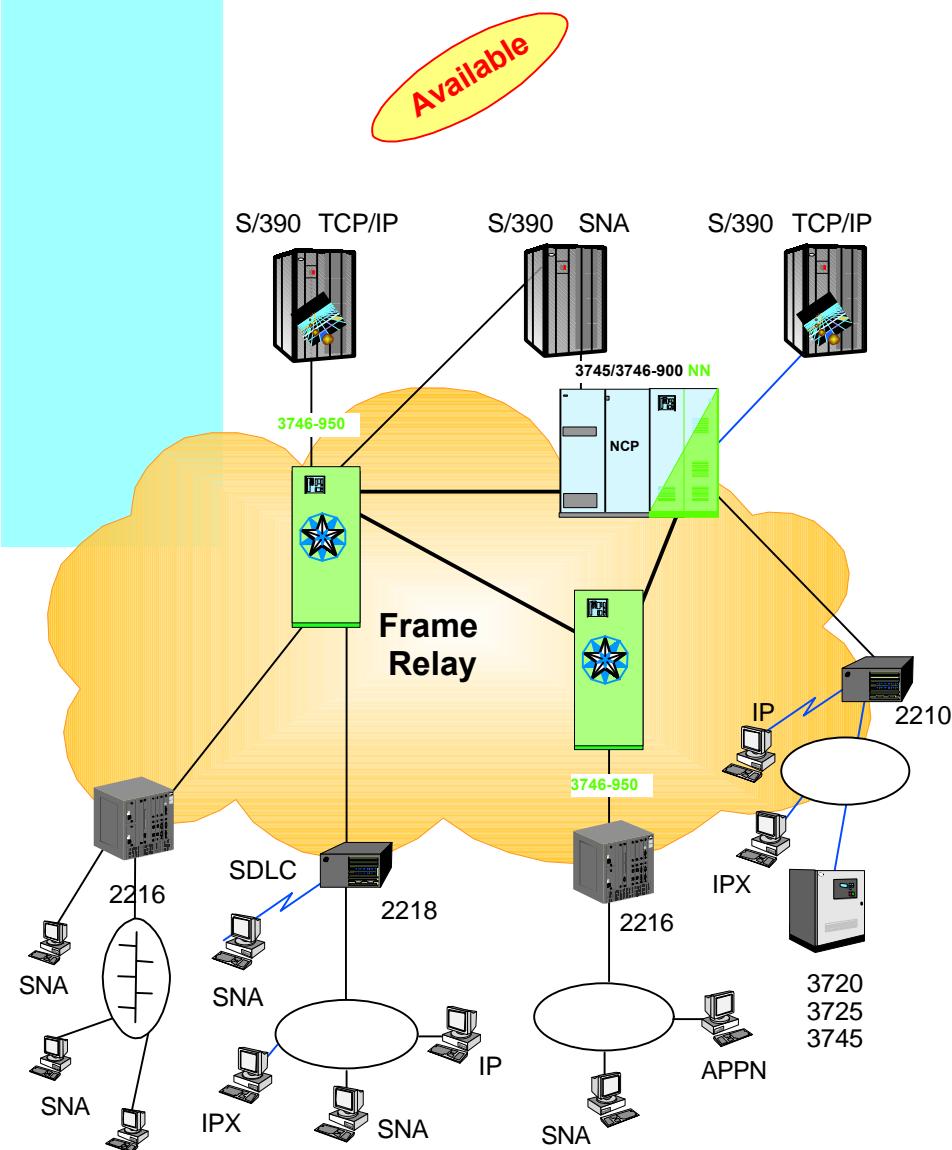
- **Frame Relay Terminating Equipment**
  - **Connectivity to public/private network**
  - **One single network infrastructure**
- **RFC 1490 compliant**
  - **SNA/DLUR, APPN, IP, HPR**
  - **Multiple downstream PUs per DLCI**
  - **Single or multiple protocols per DLCI**
  - **FR-BAN for 2210, 2218, 2216**
  - **FR-BNN for 2217, 3174, 2216**
  - **FR-BAN for remote 37xx (INN)**
- **FR Sharing**
  - **Port level (NCP, NN, IP)**
  - **DLCI level (NCP, NN, IP)**
- **First class bandwidth management**
  - **BRS (IP), Comrate, CIR+**

3. IBM 3746 - Frame Relay Frame Handler

Available

S/390 TCP/IP   S/390   SNA   S/390 TCP/IP

3745/3746-900

NCP

3746-950

Frame Relay

3746-950

IP

2210

IPX

SNA 2216

SDLC

2218

2216

SNA

SNA

IP

IPX

IPX Server

IPX SNA SNA SNA APPN

3720
3725
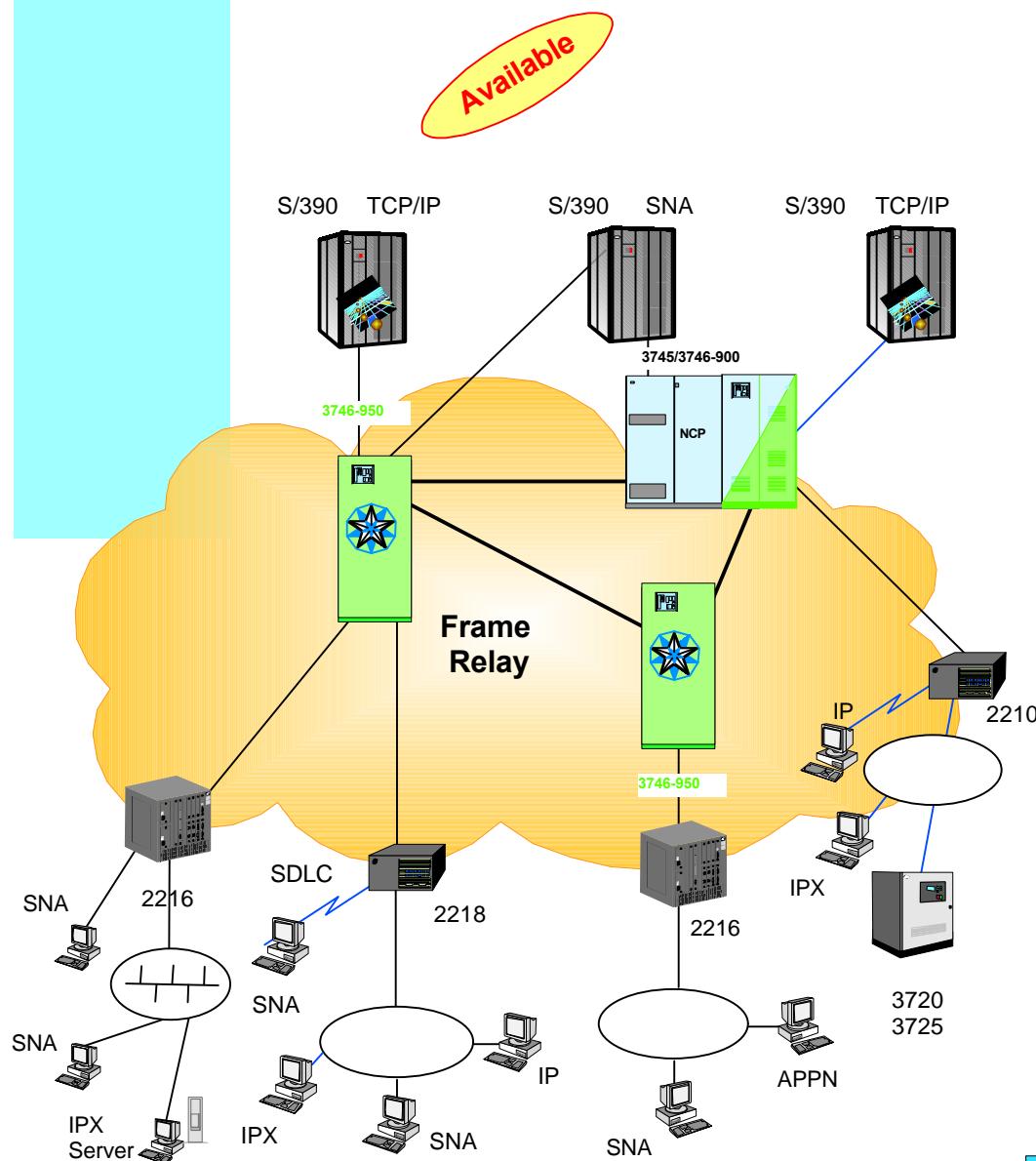
- **Build your own Frame Relay Switch Network**

- **Powerfull Bandwidth management (CIR+)**
  - **Committed Information Rate**
  - **Bandwidth Reservation System per DLCI (APPN, HPR and IP)**

- **Migrate your leased lines (SDLC, ..) infrastructure to Frame Relay protocol**

- **High performance switching rate**

- **Migration path to SVN**
  - **Switching in the backbone (protocol transparent)**
  - **Routing at the periphery**

Multiprotocol Path Switch

3. IBM 3746 - Frame Relay CIR+

BRS over a DLCI

CIR per DLCI

FR Line

APPN/DLUR — 40 %
HPR/DLUR — 40 %
IP — 20 %

DLCI1

Bc1 + Be1

APPN/DLUR — 50 %
HPR/DLUR — 50 %

DLCI2

Bc2 (Be2=0)

HPR/DLUR — 80 %
IP — 20 %

DLCI3

Be3 (Bc3=0)
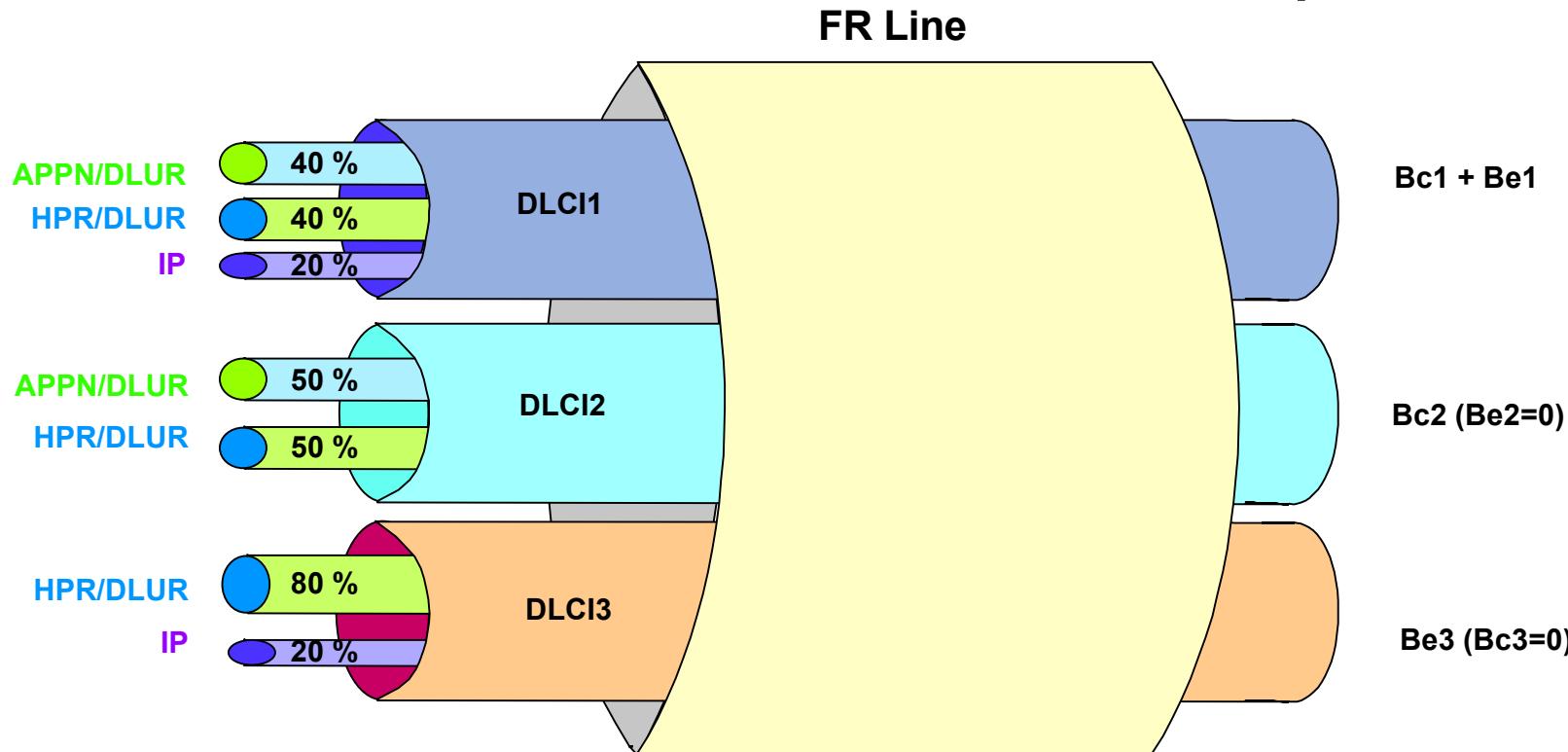
- For a DLCI : Bc + Be $\neq$ 0
- "Overbooking" allowed (Σ Bc > line speed)
- CIR = Bc / Tc (network committed bandwidth per DLCI)

Be: Burst Exceeded
Bc: Burst Comitted
CIR: Comitted Information rate
BRS: Bandwidth Reservation System

3. IBM 3746 - Network Management

IBM
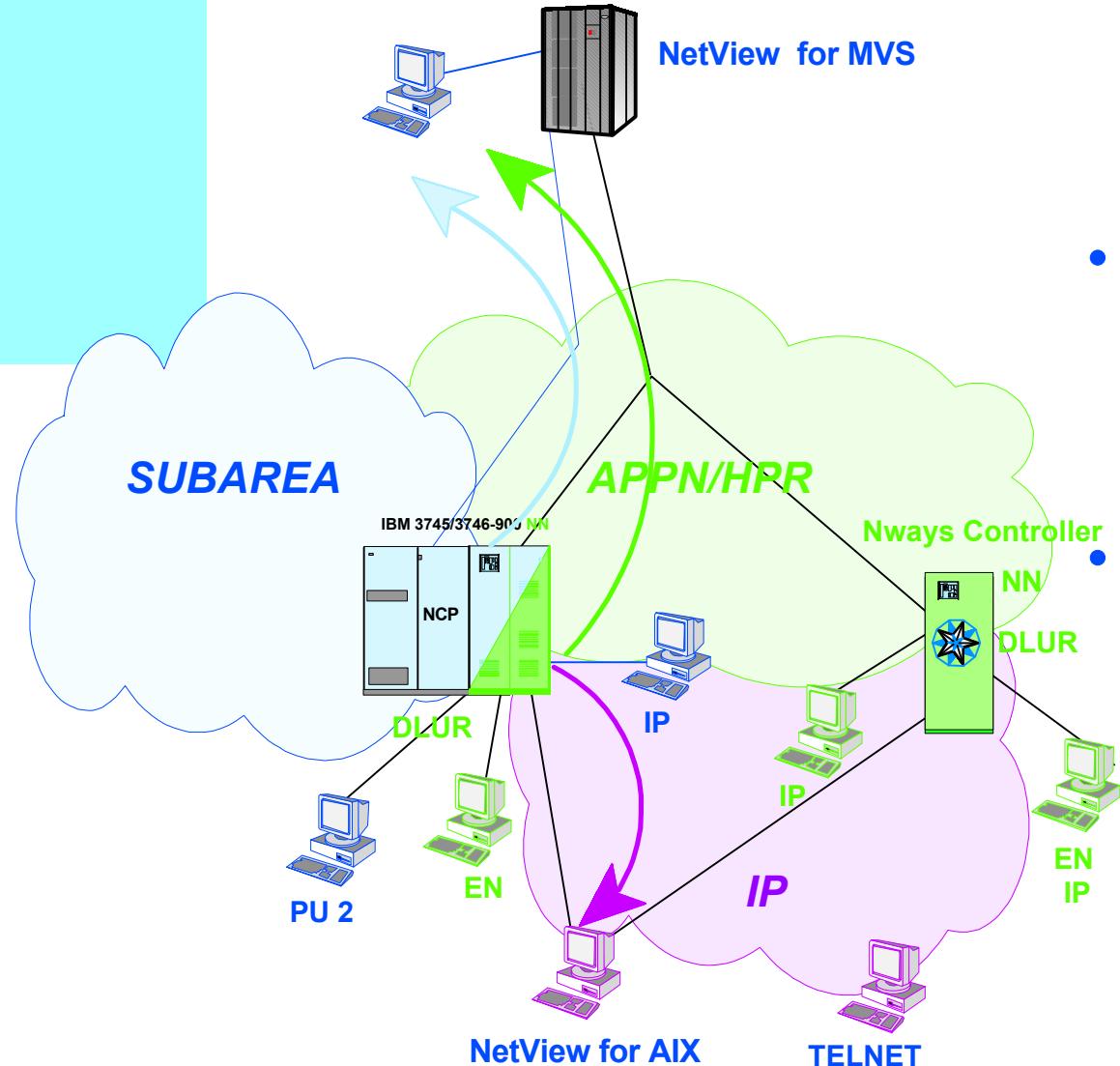
- **Netview for AIX**
  - Nways Enterprise Manager (SNA alert Manager)
  - Nways Campus Manager LAN version 2
  - Nways Campus Manager Suite version 2

- **Netview for MVS**
  - APPNTAM for 3746-9x0 APPN/HPR resources
    - Activation/Inactivation
    - Display
    - Topology

- **Network Performance Monitor (NPM)**
  - for all 3746-9x0 APPN/HPR resources

NetView for MVS

SUBAREA

APPN/HPR

IBM 3745/3746-900 NN

NCP

DLUR

Nways Controller

NN

DLUR

IP

IP

IP

PU 2

EN

EN
IP

NetView for AIX

TELNET

3. IBM 3746 - Extend 3746-9x0 Connectivity with New Multiaccess Enclosure

Available

Multiaccess Enclosure

The Path to the High Speeds

- **7 new PCI adapter slots**
- **IBM Power PC engine**
- **ATM 155 Mbps adapter (SMF/MMF)**
  - **Classical IP**
  - **LAN emulation (client)**
- **PRI-ISDN adapters**
- **More T1/E1/Ethernet/TR ports**
- **New ESCON adapter**
  - **IP, APPN, SNA Passthru**
  - **MPC+ for APPN (VTAM V4R4)**
  - **High Throughput, Host CPU cycle savings**
- **Network Protocols**
  - **APPN/HPR**
  - **IP, IPX**
- **Peripheral SNA**
  - **DLUR, DLSw**
- **Dual APPN/HPR Control point and IP router**

3. IBM 3746 - Performance Ratio (SNA/APPN/HPR)

IBM

	SNA APPN (CNN)		SNA (DLUR) APPN	HPR (ANR)	
	VTAM **S/390**	**VTAM** **S/390**	**VTAM** **S/390**	**VTAM** **S/390**	**VTAM** **S/390**

	ESCON	ESCON	ESCON	ESCON

| 3745
-210
NCP | 3745
-21A
NCP | 3746
-900 | 3745
(NCP) | 3746
-9x0
NNP | 3745
(NCP) | 3746
-9x0
NNP | 3745
-xxA
(NCP) | 3746
-9x0
NNP |

Multiaccess Enclosure

LAN · LAN · LAN · LAN · LAN
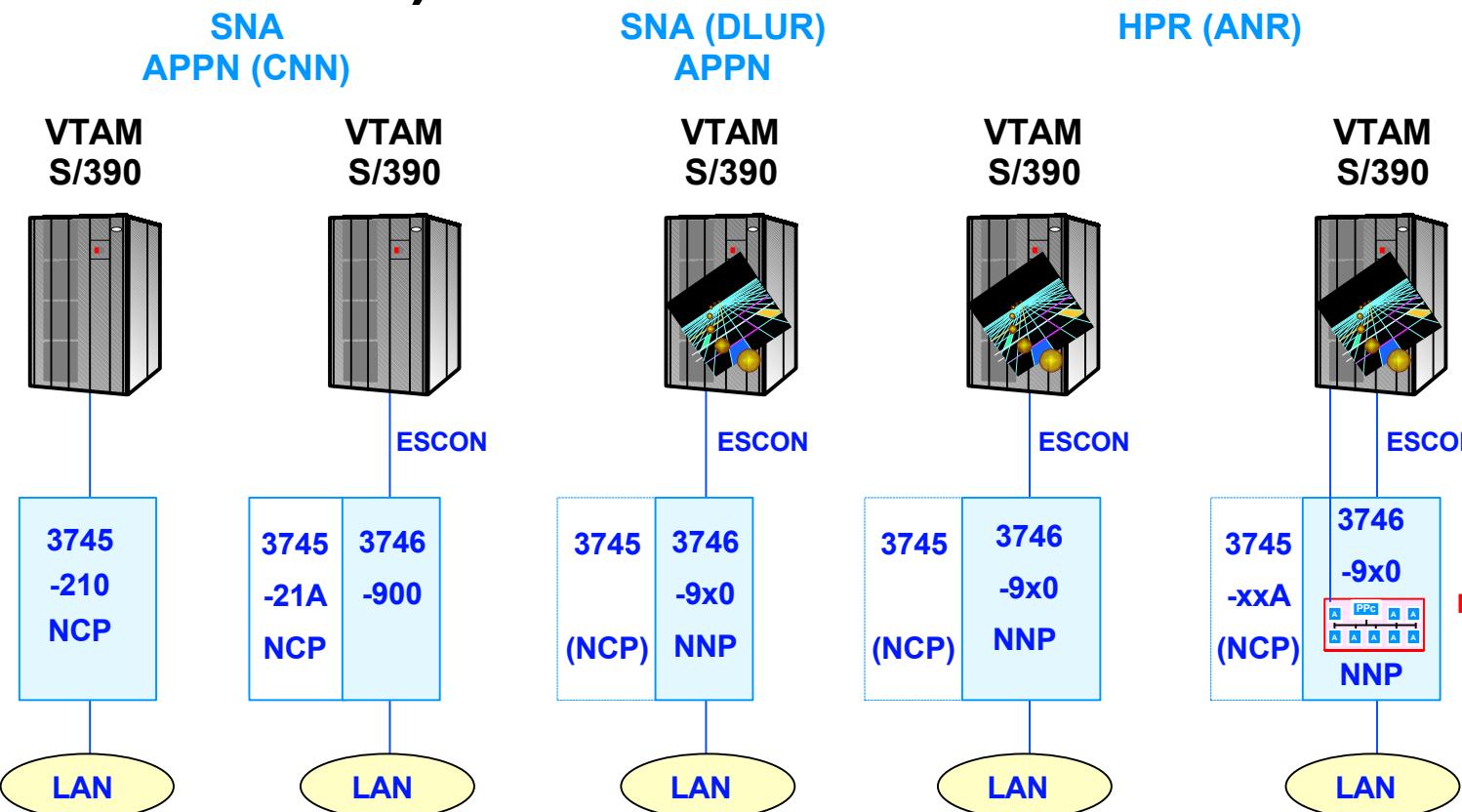
	SNA/APPN(CNN)		SNA(DLUR)/APPN	HPR(ANR)	
Transaction Rate (1)	1	2.5	7.5	14 (3)	20 (3)
File Transfer Throughput (2)	1	2.5	15	40 (3)	60 (3)

(1) Short messages: 128Bytes ...
(2) Large data blocks : 8000 Bytes
(3) estimate

3. IBM 3746 - Performance Ratio (TCP/IP)

IBM

	TCP/IP S/390	TCP/IP S/390	TCP/IP S/390	TCP/IP S/390

ESCON · ESCON · ESCON

3745 -210 NCP (IP)	3745 -xxA NCP · 3746 -900 NNP, IP	3746 -950 NNP, IP	3745 -xxA NCP · 3746 -9x0 / **Multiaccess Enclosure** / NNP, IP

LAN · LAN · LAN · LAN
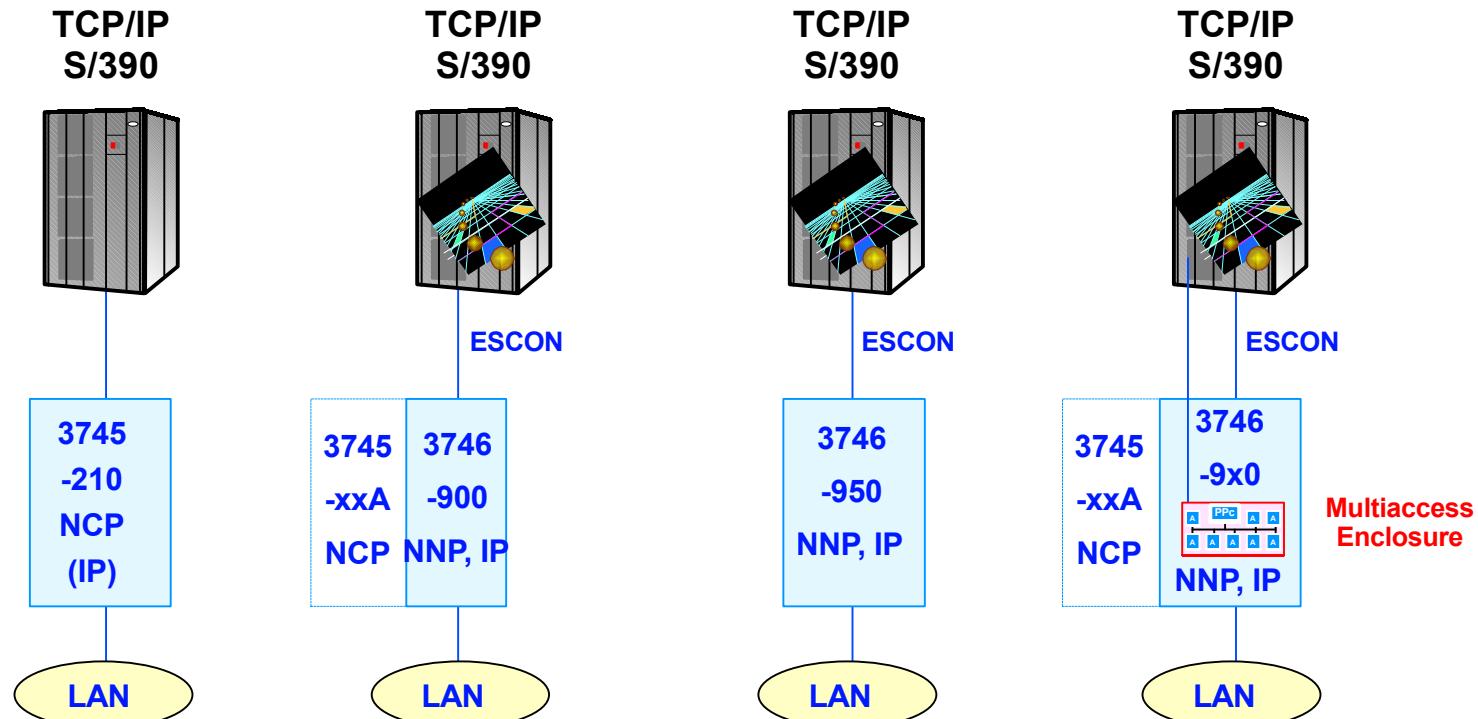
Transaction Rate (Telnet) (1)	1	15	15	30
Data Throughput (FTP) (2)	1	30	30	50

(1) packets: IN=100 Bytes, OUT=1000 Bytes
(2) packets: 4000 Bytes

4. IBM 3746 - Network Computing Solution

IBM

Previewed Sept 9, 97

IP HPR

S/390 // SYSPLEX

MPC+ **3746-950**

F-Ethernet (100 Mbps)

ATM Campus

TR

FDDI

2216

HSSI T3/E3

PRI-ISDN

3745 3746-900

SDLC

FR/X25 ATM HSSI

ISDN

3745 3725

3174

3174

SNA

SNA

SNA

SDLC

2210

SNA

IPX

HPR

ATM Campus

2216

2210

SDLC

SNA

IP

HPR

F-Ethernet

HSSI T3/E3

3746-950

ATM Campus

F-Ethernet

• **High Speed Host Access**

• **High Speed local LANs**

• **High Speed WANs**

• **High Speed remote LANs**

Small Branches concentration

Small to Medium Branches concentration

Medium to High Branches concentration

4. IBM 3746 - Multiacces Enclosure Value add TN3270e Server

IBM

Parallel Sysplex

3270 applications

VTAM

Preview

SNA APPN/HPR

Lu-Lu sessions

ESCD

3746

MAE

- **IP access to SNA applications**
- **APPN/HPR benefits**

TCP/IP

IP

IP
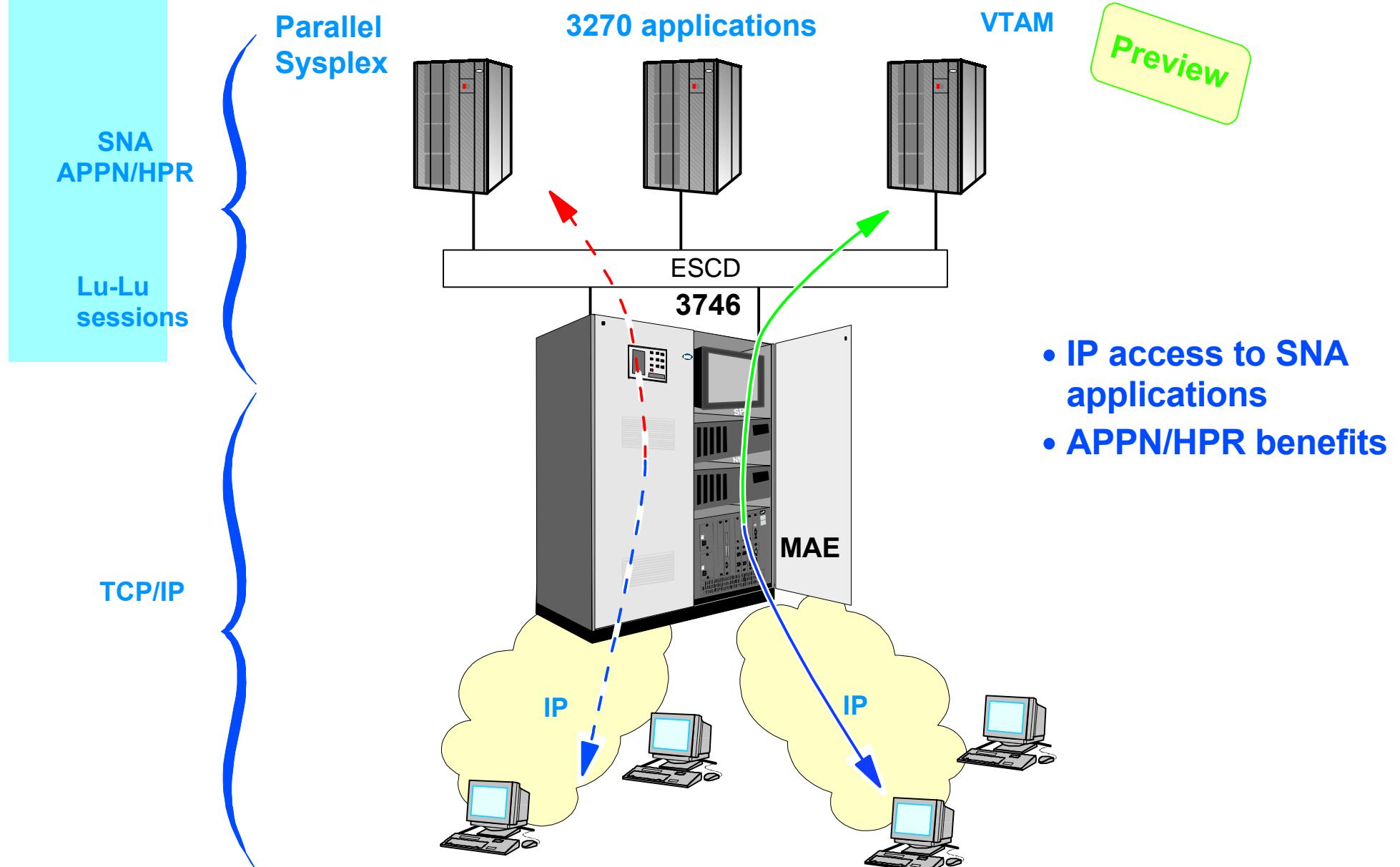
4. IBM 3746 - Value add Function - Enterprise Extender

Preview

VTAM

SNA/HPR

RTP end point

Parallel Sysplex

3746

IP

MAE

HPR over IP

IP

HPR over IP

2210

2216

RTP end point

APPN

HPR

EN

EN

TN3270E

IP

Telnet Connections

SNA

EN

- **Unique IBM function**
- **Benefits of APPN/HPR over IP Network**
  - **Non disruptive session rerouting in case of failure**
 - **High performance congestion control mechanism**
  - **C.O.S. : SNA/APPN class of services**
- **When workstations still SNA capable**
- **Allow distributed TN3270e**

4. IBM 3746 - Extended Border Node

Preview

EBN

NETA

VTAM

3746-9x0

3746-9x0

NETB

VTAM

3746-9x0

NN

EN

NETC

NN

EN

NETD
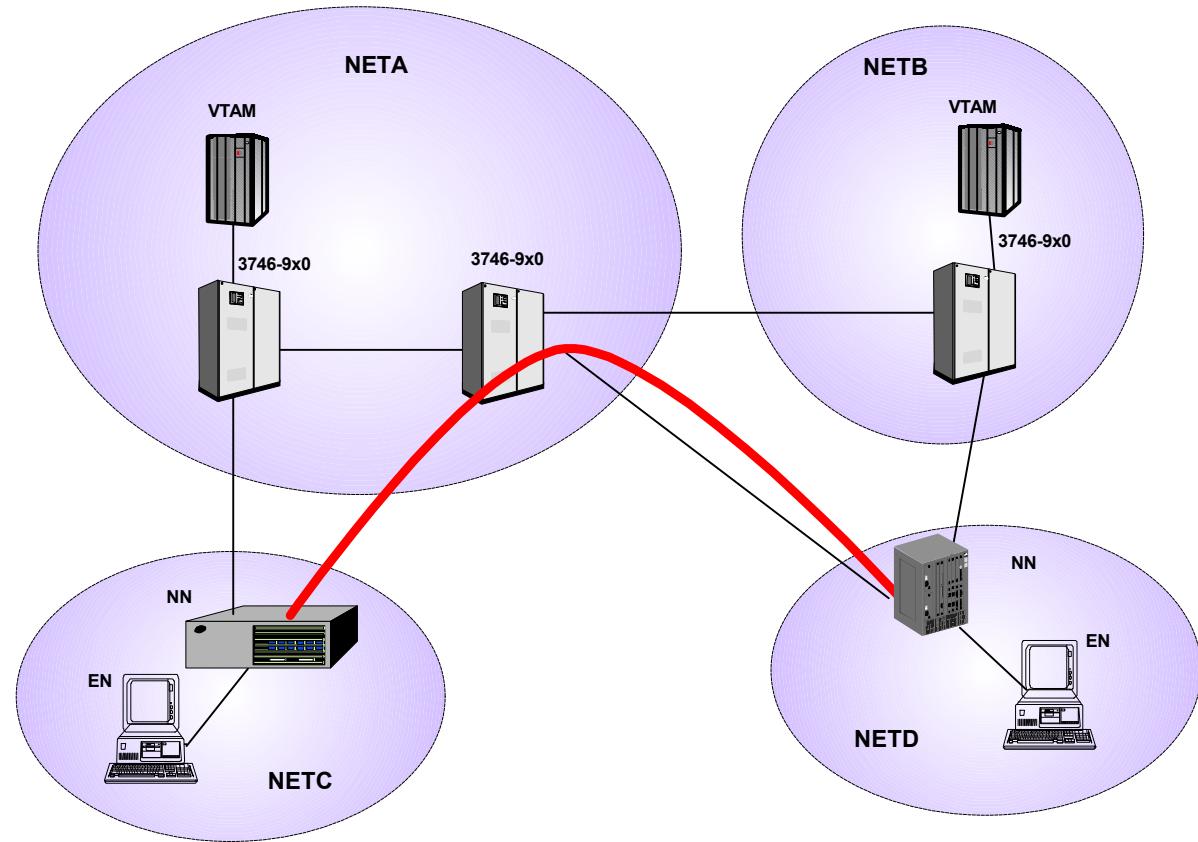
- **Link different APPN domains**

- **Allow SNA environment migration**

- **Allow multiple SNA domains migration**
  - **SNI**

- **Offload VTAM cycles**
  - **EBN offloaded from VTAM**

- **Tremendous APPN scalability improvement**

5. Positioning Summary 3745/3746 and 2216

Network Size

Protocols

3745/ 3746-900

Subarea SNA

NCP controlled resources

Parallel Channel

3746-950

Network Node Processor

APPN/HPR, IP Routing

Multiaccess Enclosure

DLSw, SNA Passthru

APPN/HPR, IP Routing

ESCON Channel

ESCON Channel

2216

DLSw, SNA Passthru

APPN/HPR IP Routing

Other protocols .. WAN to Campus

ESCON Channel
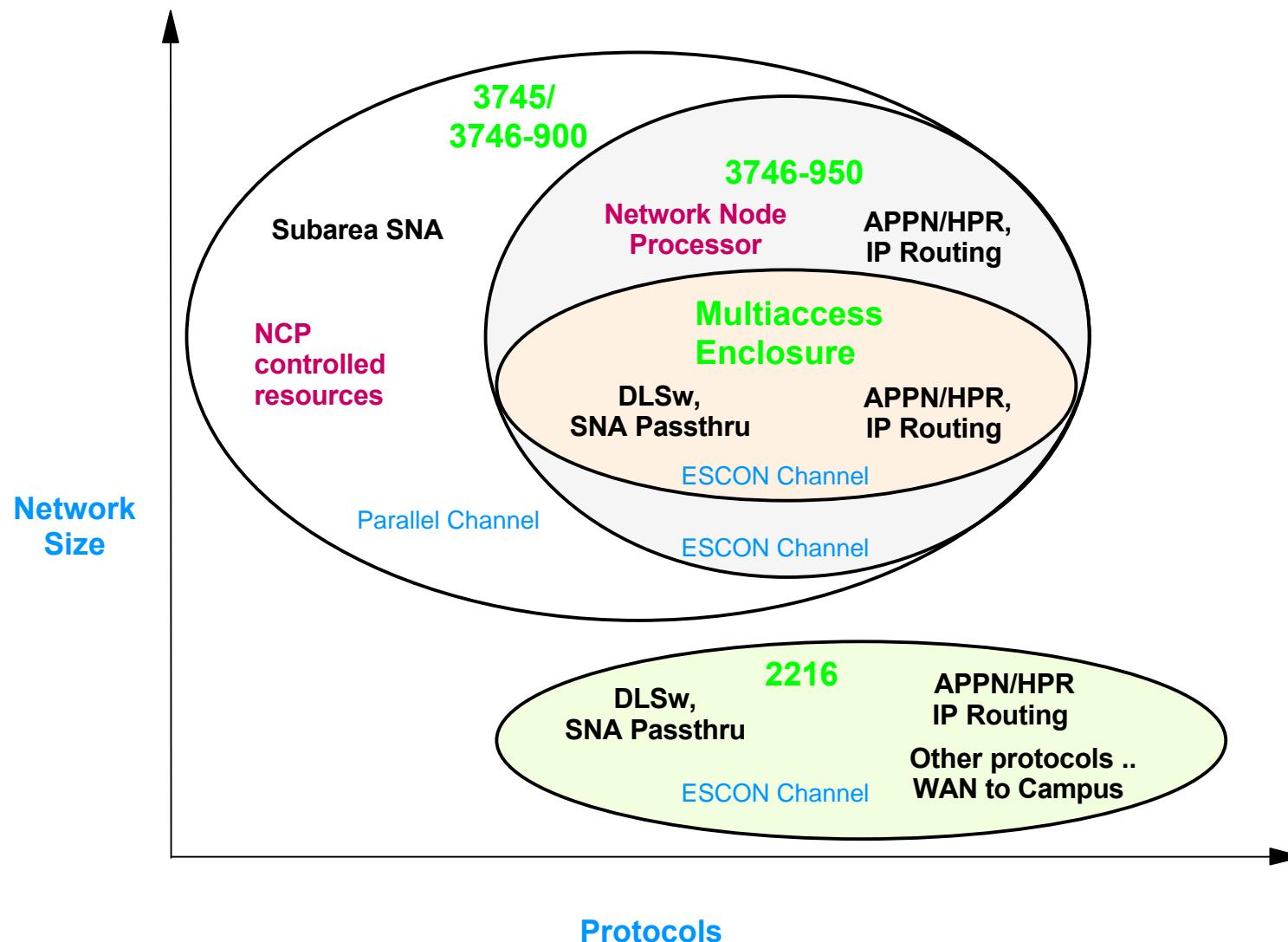
5. IBM 3746 - Field Evolution

NNP controlled traffic

3746-950
NNP SWITCH — SNA + HPR + IP

3745
NCP — 3746-900
NNP SWITCH — SNA + HPR + IP

3745
NCP — 3746-900
NNP SWITCH — SNA + HPR + IP

3746-950
NNP SWITCH — SNA + HPR + IP

SERVER APPLICATIONS

NCP controlled traffic

3745
NCP — 3746-900
SWITCH — SNA + HPR

3745
NCP / NPSI — 3746-900
SWITCH — SNA

3745
NCP / NPSI — SNA

IP   DLSW   HPR
APPN
SNA   DLUR

✓ FDDI (*)
✓ ATM LANe, Classical IP, native HPR
✓ HSSI (T3/E3) (*)
✓ F-Ethernet (100 Mbps) (*)
✓ PRI-ISDN (Worldwide)
✓ ESCON (MPC+)

✓ TN3270 (*)
✓ Net dispatcher

Accelerate your Move To Network Computing

(*) Preview