# IBM 3746 Nways Multiprotocol Controllers Models 900 and 950

December 2, 1997
(Revision 4)
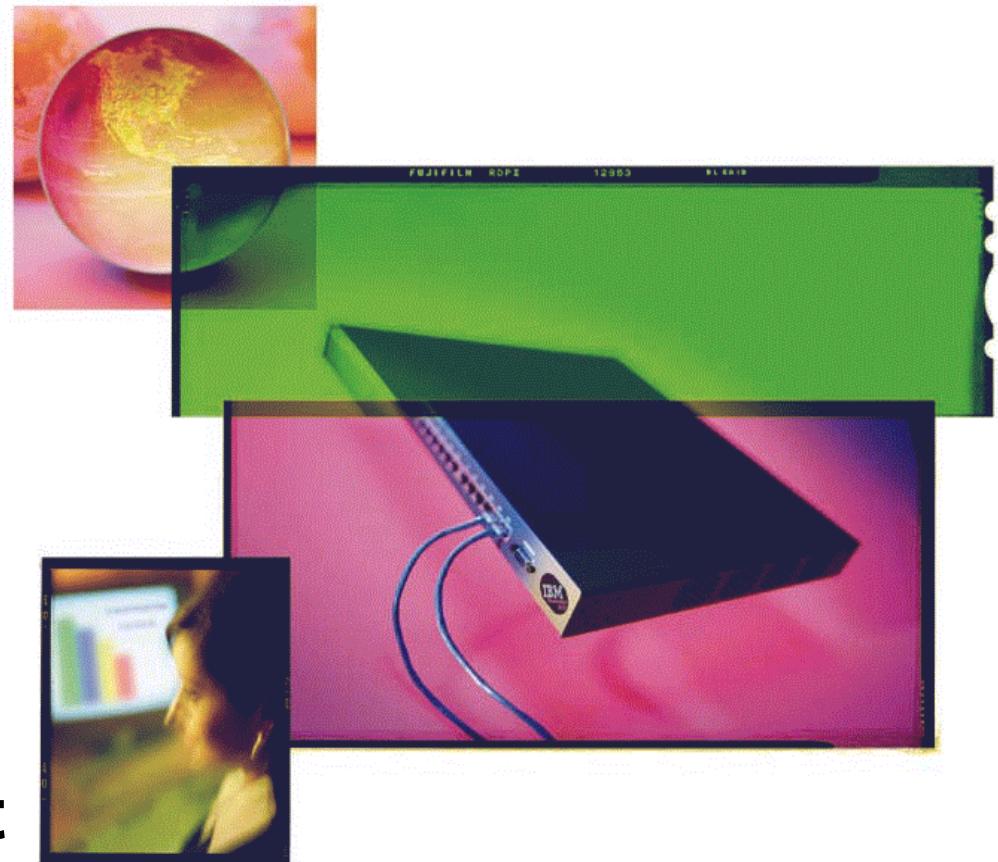
Network Management Support
SNA, APPN/HPR and IP

# IBM 3746 - Single Platform to access the Data Center

TCP/IP

RTP

RTP

SNA
APPN
HPR

IP

3746

2210

IP

2217

IP

SNA

2216
ANR

2218

CS/2
RTP

CS/2
RTP

3746
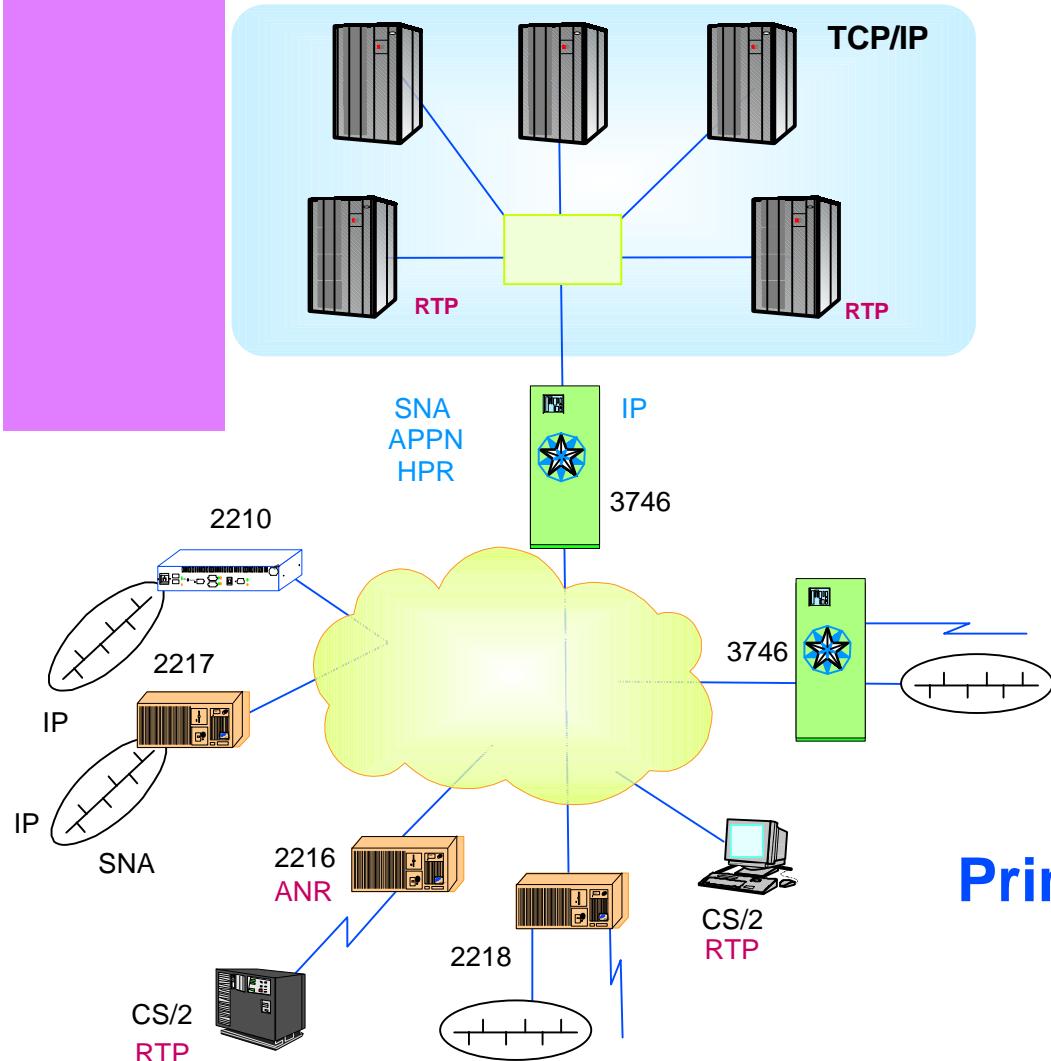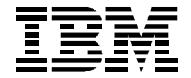
- **SNA+APPN + HPR + IP**
  - **Unique platform**
  - **Highly reliable**
  - **Sharing hardware**
  - **distributed routing**
  - **Native IP routing (No Encapsulation)**
  - **Best of breed SNA routing**
  - **Powerfull single configurator**
  - **Centralised Network Management**

Prime Solution to Consolidate Networks

Cost Effective Solution

IBM 3746 - Network Management Overview

Focal point

Back-up

– NetView
  (SNATAM)
– NPM

LU 6.2 sessions

APPN / DLUR

**DCAF
CCM**

OS/2

3745

**3746
900 NN**

**3746
950
+
MAE**

I P

CCM

OS/2

**Telnet
User**

RISC

| NetView/AIX |
| :---: |
| Nways Enterprise Manager |
| SNMP |
| AIX |

Controller Configuration and Management

IBM
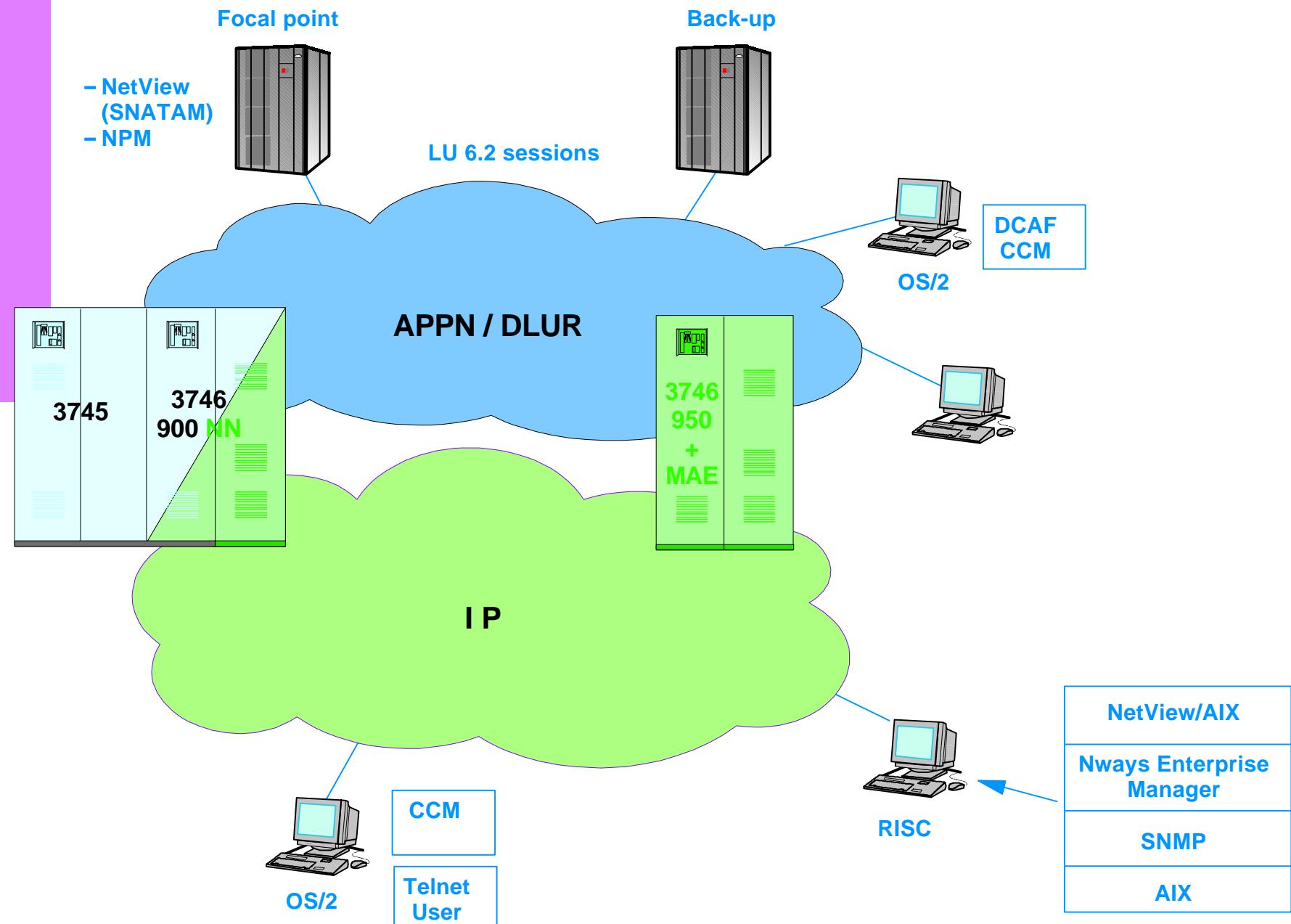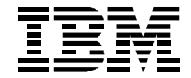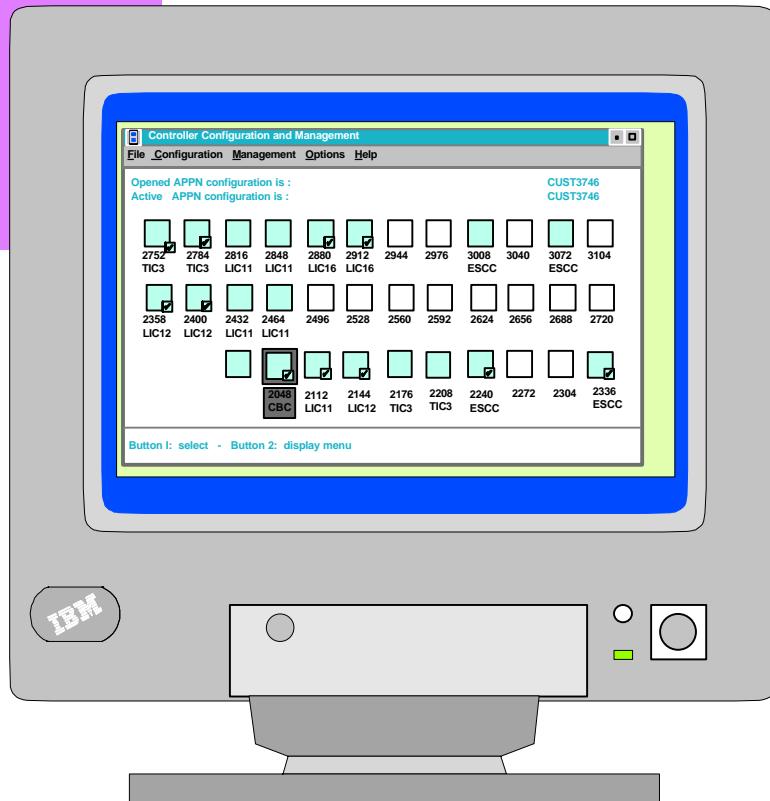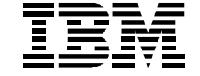
- **Single 3746 management tool**
  - **APPN / HPR / IP**

- **Single configurator tool**
  - **Support of APPN/HPR (ANR/RTP)**
  - **Support of IP (ESCON, TR, RIP, OSPF, ARP, ...)**
  - **Support of Frame Relay (FRTE, BAN, BNN, FRFH)**
  - **Support of SNMP, NPM**
  - **ESCON (SNA/NCP, APPN/HPR, IP)**

- **On-line configuration changes**
  - **ESCON, LAN, WAN resources**
  - **Automatic deactivation/reactivation of impacted resources**

- **Miscellaneous**
  - **Copy function on configuration**
  - **SPAN of control of CCM operators**
  - **Search function enhanced**
  - **Validation vs Hardware Configuration**

Controller Configuration and Management
File Configuration Management Options Help

Opened APPN configuration is :   CUST3746
Active APPN configuration is :   CUST3746

2752 2784 2816 2848 2880 2912 2944 2976 3008 3040 3072 3104
TIC3 TIC3 LIC11 LIC11 LIC16 LIC16   ESCC   ESCC

2358 2400 2432 2464 2496 2528 2560 2592 2624 2656 2688 2720
LIC12 LIC12 LIC11 LIC11

2048 2112 2144 2176 2208 2240 2272 2304 2336
CBC   LIC11 LIC12 TIC3 TIC3 ESCC   ESCC

Button I: select - Button 2: display menu

IBM 3746 Nways Controllers Network Environment
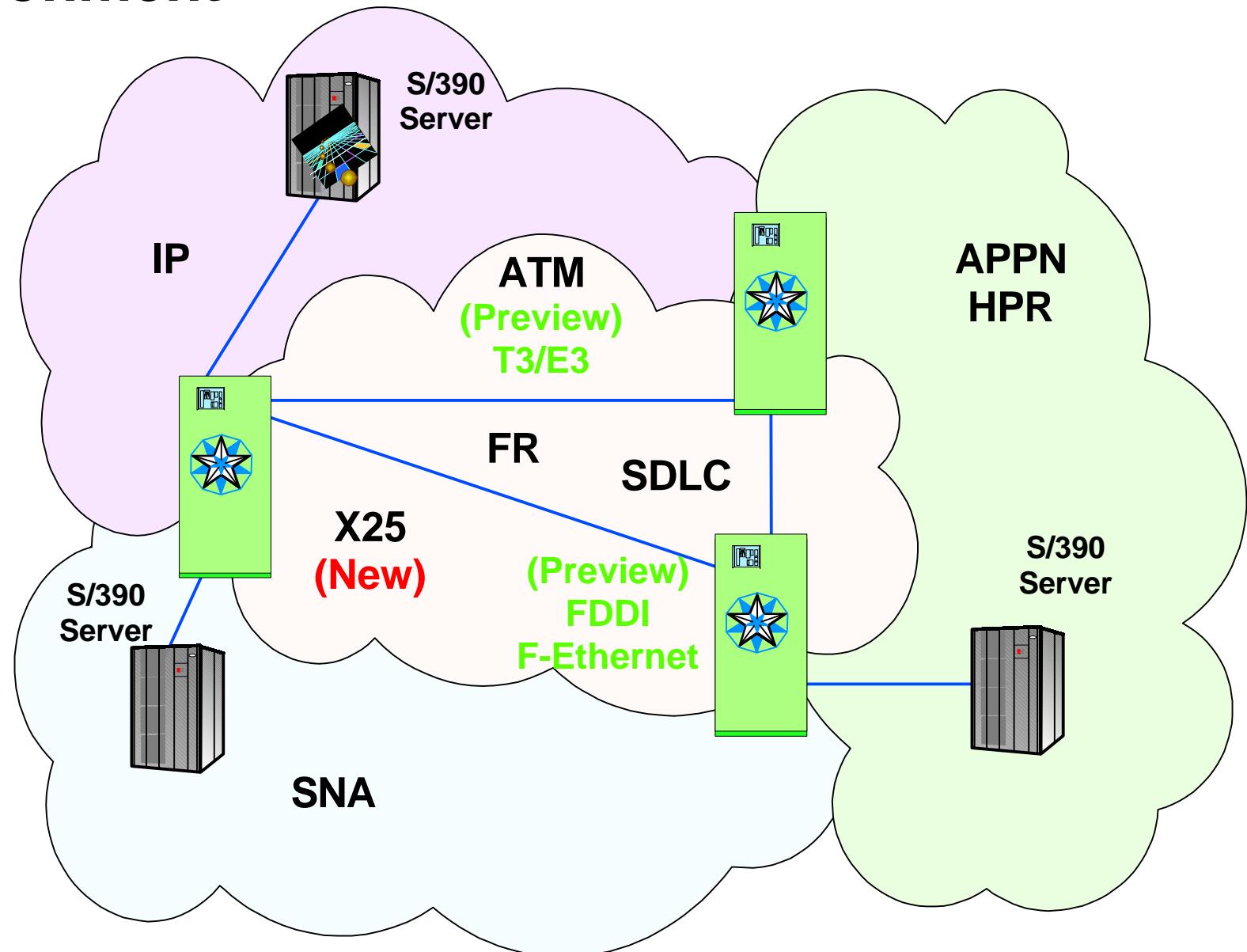
IP
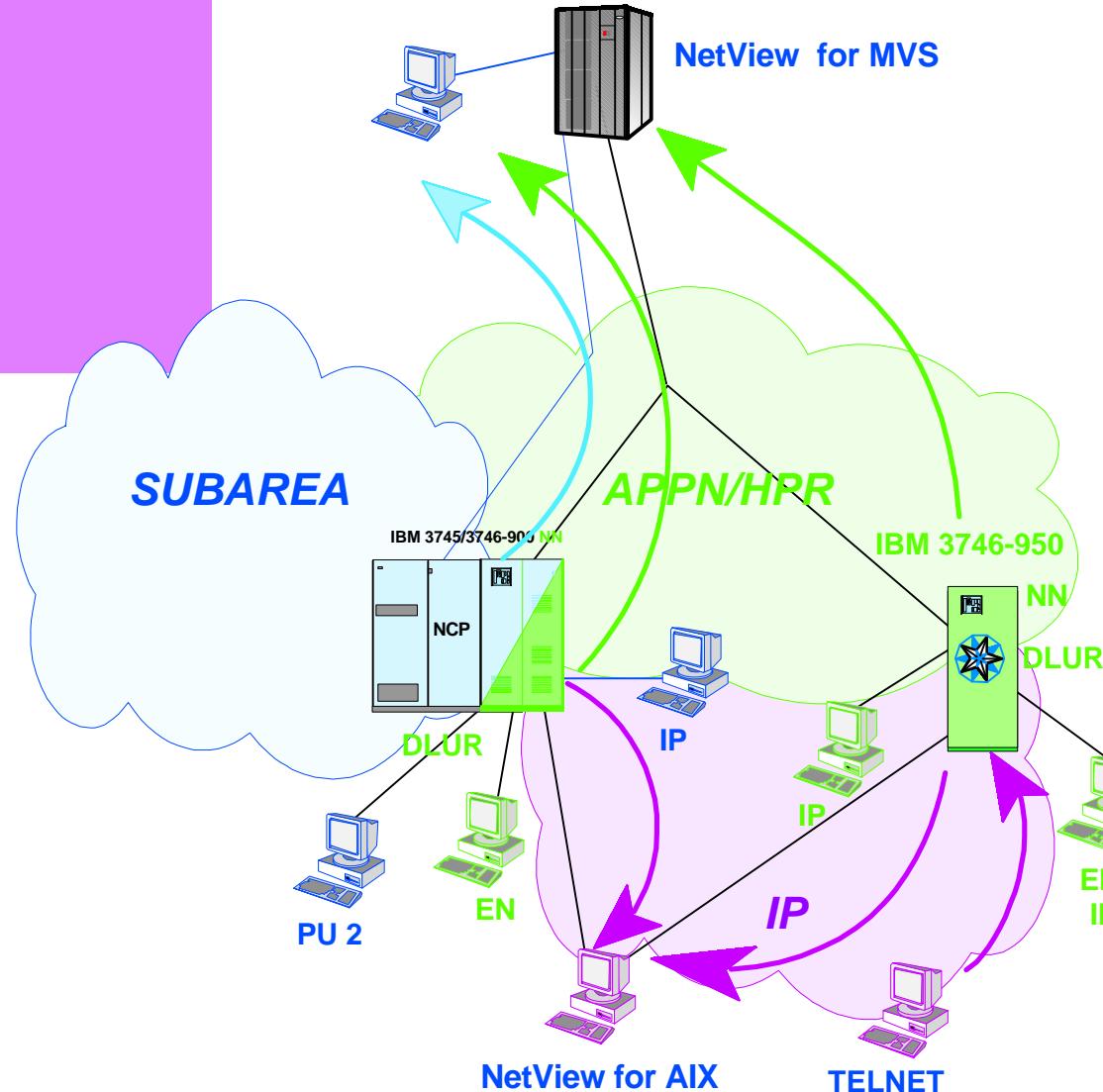
S/390 Server

ATM
(Preview)
T3/E3

APPN
HPR

FR

SDLC

X25
(New)

(Preview)
FDDI
F-Ethernet

S/390 Server

S/390 Server

SNA

S/390 Server

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**
  - **SNATAM for 3746-9x0 APPN/HPR resources**
    - **Activation/Deactivation**
    - **Display**
    - **Topology (Network + 3746 local topology)**

- **Network Performance**
  - **NPM**
    - **all 3746-9x0 SNA/APPN/HPR resources**
  - **NEM (MIBs)**
    - **all 3746-9x0 IP resources**
  - **all adapters (processors + storage utilization)**

- **Telnet**

Diagram labels: NetView for MVS, SUBAREA, APPN/HPR, IBM 3745/3746-900 NN, NCP, IBM 3746-950, NN, DLUR, DLUR, IP, IP, EN, PU 2, IP, EN IP, NetView for AIX, TELNET

IBM 3746 - Network Management System

- **3746 SNA/DLUR, APPN/HPR Network Management**
  - **NetView for MVS Support**
  - **APPN topology manager (SNATAM)**
    - Topology display from NetView for MVS
    - Operation (resource activation, deactivation, display)
    - Command automation
  - **Netview Performance Monitor (NPM)**
    - Performance counters and configuration reported for DLUR/APPN/HPR resources
    - Performance counters and configuration reported for SNA resources

- **3746 IP Network Management**
  - **NetView for AIX**
    - Nways Enterprise Manager (SNA Alert Manager)
    - Nways Campus Manager LAN version 2
    - Nways Campus Manager suite version 2
  - **SNMP**
    - 3746 Hardware Alerts (all resources)
    - Layer 3 Alerts (IP Routing)
    - IP Network Topology
    - Performance Counters (MIBs display)
    - Use of Standard MIBs (Token Ring, PPP, FR) and ESCON (IBM)
  - **Telnet support for local/remote IP resources operations with password**
    - same set of commands as IBM 2210 and IBM 2216 (GWCON)

IBM 374x - Management Options (Summary)
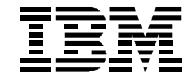
Networking Architecture	Management Data Available	Management Software	Transport
Subarea SNA	3746 Alerts NCP Alerts NPM Data	NetView/MVS NetView/MVS NPM	SSCP-PU
Subare SNA APPN/HPR (CNN)	3746 Alerts NCP Alerts NPM Data	NetView/MVS NetView/MVS NPM	LU6.2
DLUR,APPN/HPR (NNP)	3746 Alerts NNP Alerts NPM Data	NetView/MVS NetView/MVS SNATAM, NPM	LU6.2
IP (NNP)	IP Traps IP Topology	NetView/AIX NetView/AIX, MSM NEM	SNMP
DLUR, APP/HPR (MAE)	3746 Alerts NNP Alerts MAE Alerts	NetView/MVS NetView/AIX	LU6.2 SNMP
IP (MAE)	IP Traps MAE Traps IP Topology APPN Topology	NetView/AIX NetVieW/AIX, MSM NetView/AIX, MSM NEM, SNATAM	SNMP

IBM 3746 - NPM Implementation

3745

3746-9x0

NCP

NPA LU

NCP
Keywords

NNP
(APPN,
HPR)

NPA LU

IP

CCM
Keywords

Data
Collection

DLCs

Data
Collection

DLCs
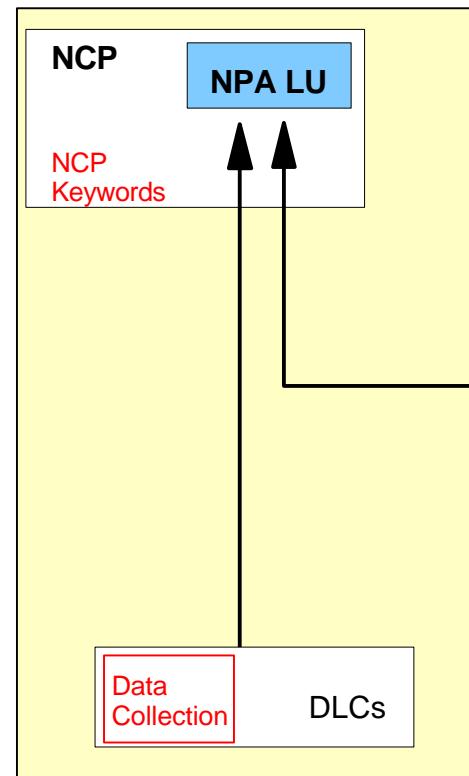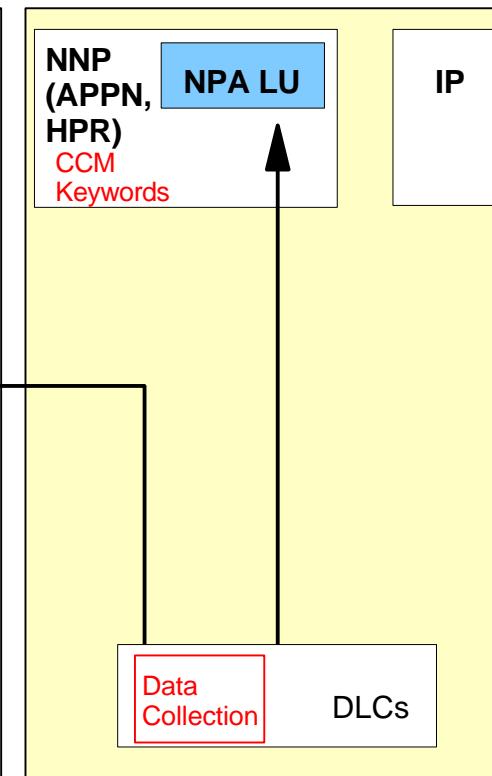
NPA LU : LU type 0

NPA : Network Performance Application

DLC: CDLC, TR 802.5, SDLC, FR, X.25, ISDN

IBM 3746 - APPN/HPR Performance Monitoring Activities

NetView/MVS

NPM

VTAM V4R2

NPM

(minimum)

Subarea Network

APPN Network

3745

3746-9x0

BCCA/CADS

ESCP

NPA LU : LU type 0

- uses DLUR/DLUS
- define in VTAM Switched Major Node

NCP

NPA LU

SWITCH

NNP

CBSP2

NPA LU

TIC2

TIC3 (2080)

SP

Service LAN

———— **APPNPath via DLUR/DLUS**

- · - · - · **Subarea Path**
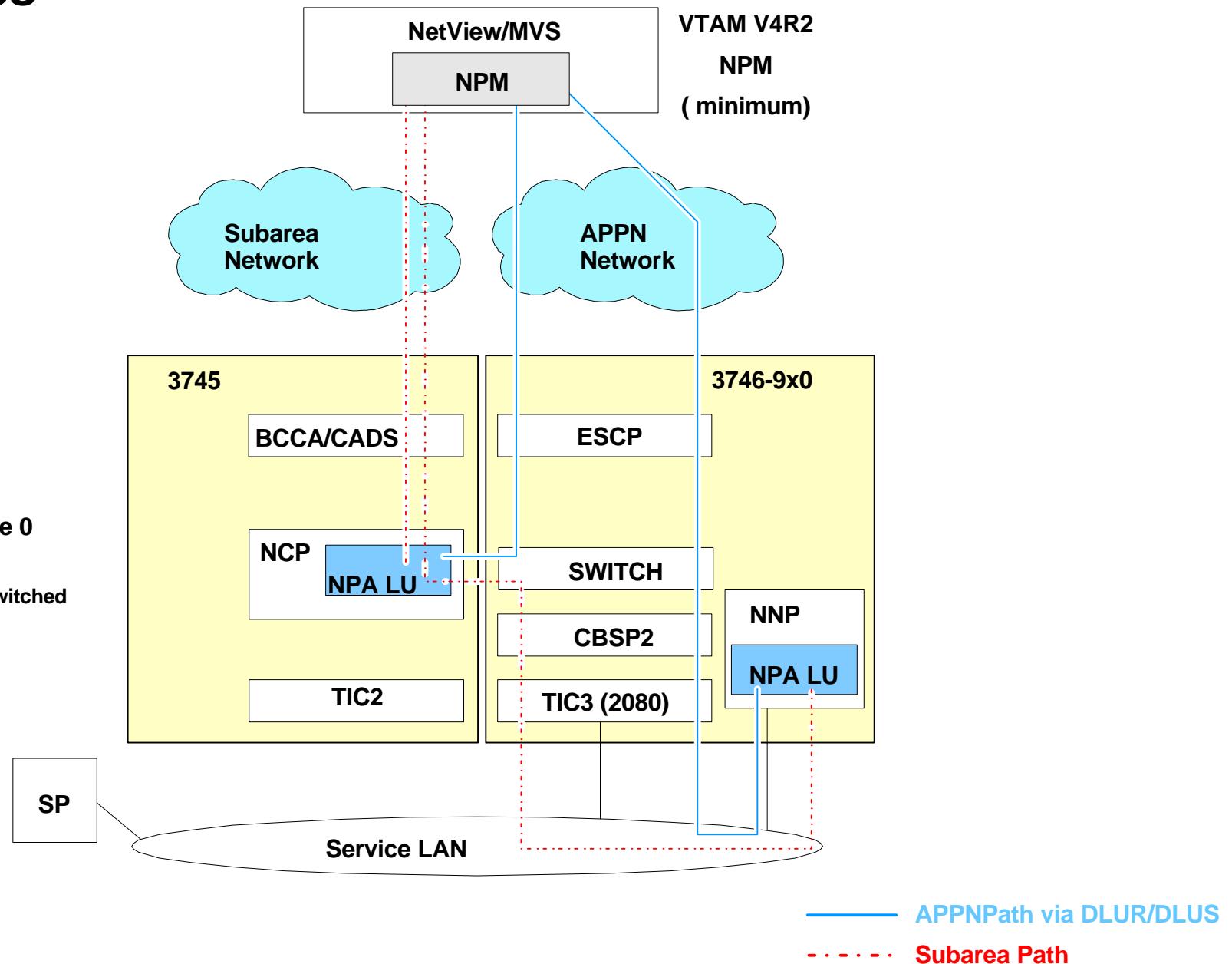
IBM 3746 - Managing IP Resources with SNMP IBM

NetView/AIX

Nways Enterprise Manager

(SNMP Manager)

IP Network

IP datagrams

(SNMP Agent)

3746 950 + MAE
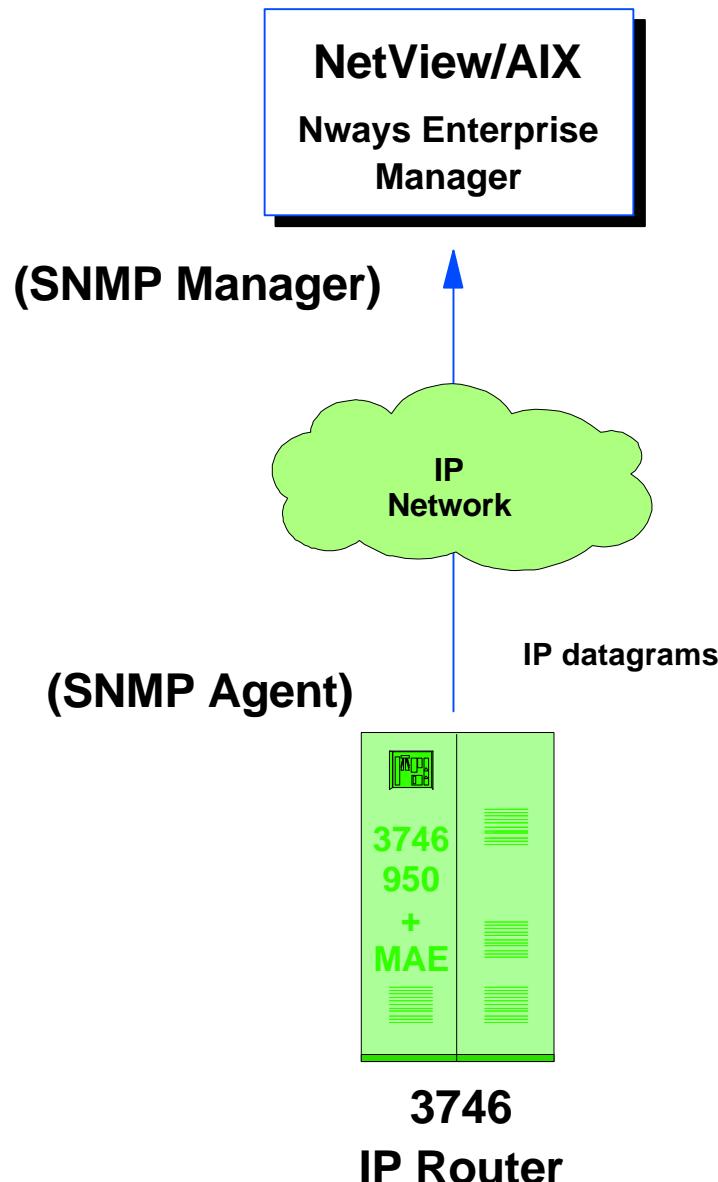
3746 IP Router

- **IP Resources controlled by the 3746 IP Router (FC #5033)**
  - **SNMP Agent**
- **Netview for AIX**
  - **SNMP Manager**
  - **Nways Enterprise Manager (SNA alert Manager)**
    - **Alert and Fault management information**
    - **MIB information**

IBM 3746 - MIB Support

IBM

- **Management Information Base (MIB)**
  - **Standard objects**
  - **MIB 2**   (standard MIB, RFC 1213)
  - **OSPF MIB**   (standard MIB, RFC 1253)
  - **Token Ring 802.5 MIB**   (standard MIB, RFC 1231)
  - **Frame Realy MIB**   (standard MIB, RFC 1315)
  - **PPP MIB**   (standard MIB, RFC 1471)
  - **ESCON MIB**   (IBM)
  - **X.25 MIB**   (standard MIB, RFC 1381, RFC 1382)

- **SNMP V1 Agent support in the 3746**
  - **SNMP "GET", "GET_NEXT", TRAP" commands are supported**
  - **The SNMP "SET" command is not supported**
  - **Configuration via CCM**
    - **configuration via TELNET interface is not supported**

IBM 3746 - IP SNMP Path to NetView for AIX

NetView/AIX

NEM

TCP/IP MVS

IP Network

- **SNMP Agent (Ag)**
  - resides in the NNP

- **SNMP Relay (Ry)**
  - resides in the CBSP2

3746-9x0

PROCESSOR

SWITCH

CBSP2

SNMP Ry

NNP

SNMP Ag

TIC3

SP

Service LAN

—— **IP SNMP Path**

IBM 3746 - SNMP Flows

CBSP2

SNMP Relay

TCP   UDP

IP

SWITCH

(7)
(6)

**Adapter
ESCP, TRP, CLP**

MIBs

IP

DLC

(8)
(2)

MIBs

**Management
Information
Base**

Service Ring

NNP

IP

TCP

SUB
Agents

SNMP Agent

**Adapter
ESCP, TRP, CLP**

MIBs

IP

DLC

(1)   (8)

IP Network

(8)

(1)

**Netview/Aix
NEM**

SNMP Manager

(1) SNMP Mgr: Get request
(2) Dest IP add belongs to 3746
(3) SNMP port number: Relay Appli
(4) TCP Connection with NNP
(5) SNMP Agent
(6) Local requests for counters
(7) SNMP response to Relay
(8) SNMP response to Manager

IBM 3746 - SNMP Distributed Agents

DPI (V2)
Distributed Programming Interface (RFC 1592)

NNP

SNMP Agent

DPI

| IP Sub Agent | OSPF Sub Agent | PPP Sub Agent | FR Sub Agent | TR Sub Agent | Escon Sub Agent | RFCTRAP Alerts Envelopper |

(3)

Service Ring

(2)

Netview/Aix NEM

SNMP Manager

3746-9x0

| IP Code | OSPF Code | PPP Code | FR Code | TR Code | Escon Code | Alerts / Alarms |

(4)

SNMP Relay

(1)

IP Network

3746 IP Router

IBM 3746 - RFCs Support
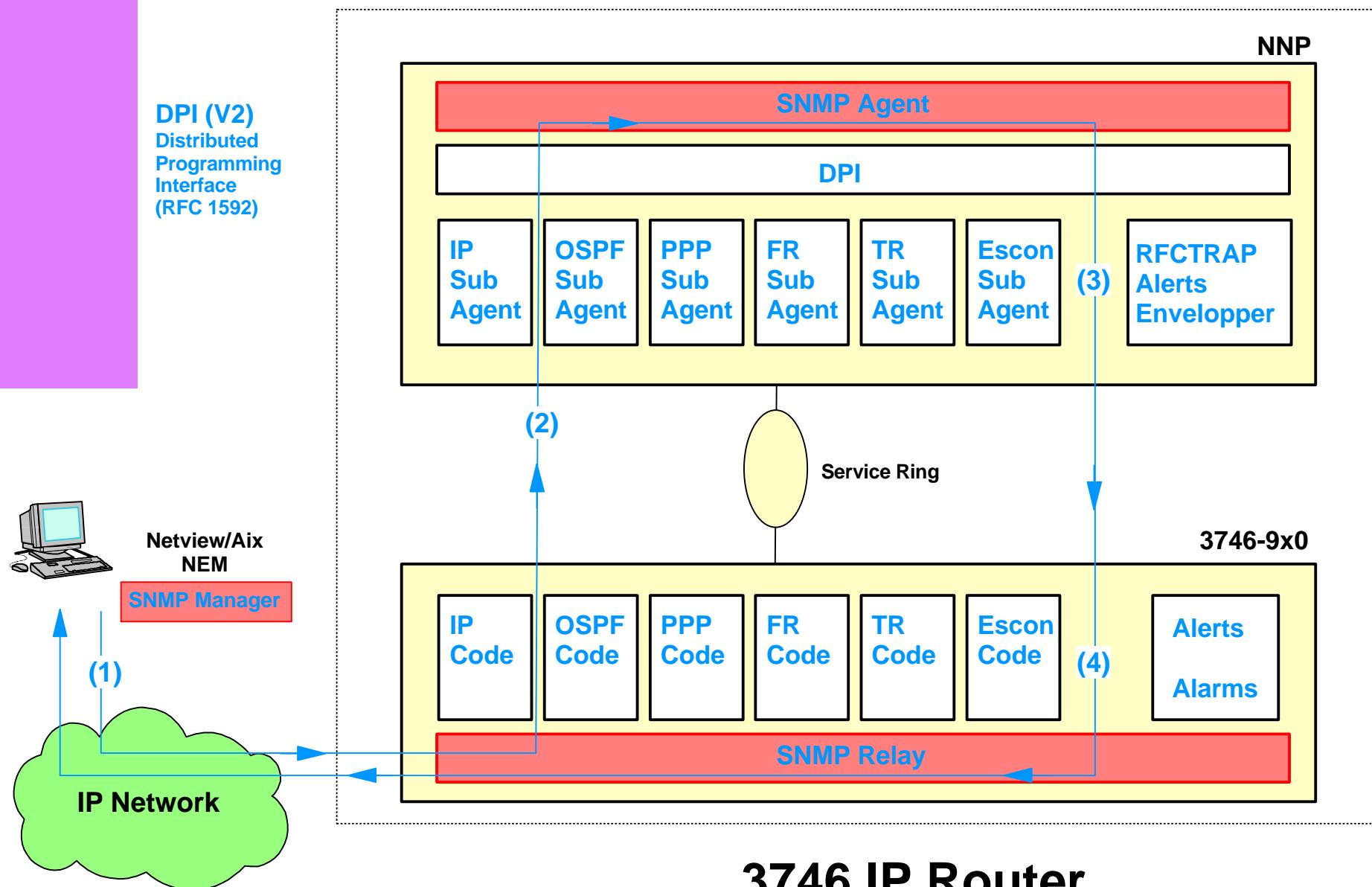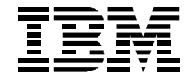
- **The 3746 IP Router supports the following RFCs :**
  - RFC 768   : UDP
  - RFC 791   : IP
  - RFC 792   : ICMP
  - RFC 793   : TCP
  - RFC 826-1042 : ARP
  - RFC 919- 922 : Broadcast including:
  - RFC 925   : ARP Subnet Routing:
  - RFC 950   : Subnetting
  - RFC 951-1542 : BOOTP Relay Agents
  - RFC 1009   : Internet Gateways
  - RFC 1027   : Proxy ARP(Subnet Routing)
  - RFC 1058   : RIP V1
  - RFC 1112   : IP Multicast
  - RFC 1122   : Requirements for Internet Hosts -- Communication Layers
  - RFC 1144   : TCP/IP header compression
  - RFC 1155   : Structure of Management Information
  - RFC 1157, 1441-1450, 1452   : SNMP v2
  - RFC 1191   : Path MTU discovery
  - RFC 1213   : MIB-II for TCP/IP-based Internet
  - RFC 1231   : Token Ring MIB
  - RFC 1253   : OSPF V2 MIB
  - RFC 1315   : Frame Relay MIB
  - RFC 1331-1332 : PPP
  - RFC 1471   : PPP IP MIB support
  - RFC 1490   : Frame Relay
  - RFC 1583-1584 : OSPF V2 & Multicast Extensions to OSPF
  - RFC 1592   : DPI
  - RFC 1654   : BGP V4
  - RFC 1716   : Towards Requirements for IP Routers

IBM 3746 - CCM IP Management
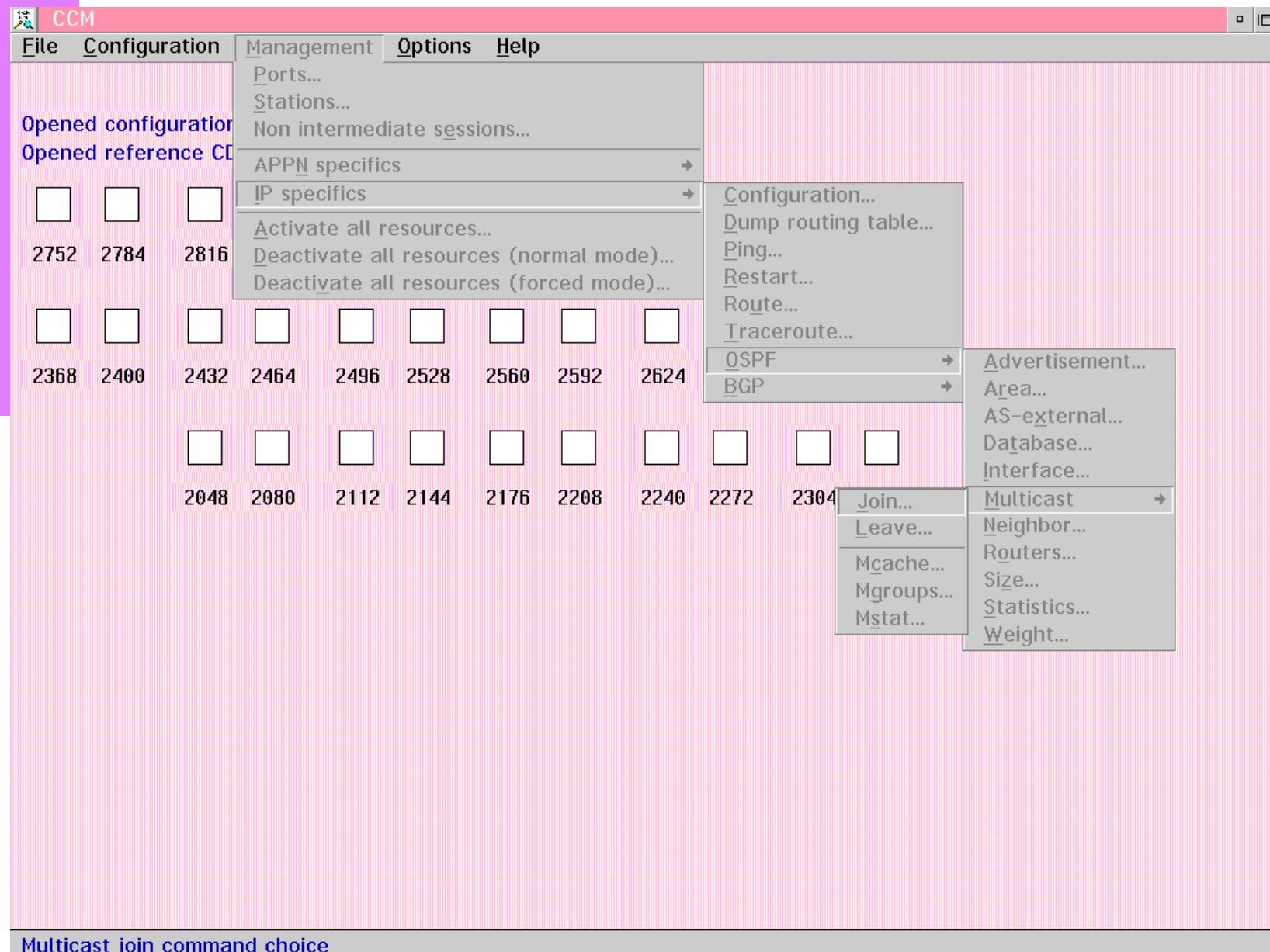
IBM 3746 - CCM APPN/HPR Management

CCM

File   Configuration   Management   Options   Help

Ports...
Stations...
Opened configuration   Non intermediate sessions...
Opened reference CD

APPN specifics   →   Topology...
IP specifics   →   Network node...
                                              Directory...
Activate all resources...   Connection networks...
Deactivate all resources (normal mode)...   HPR connections...
Deactivate all resources (forced mode)...

2752   2784   2816

2368   2400   2432   2464   2496   2528   2560   2592   2624   2656   2688   2720

2048   2080   2112   2144   2176   2208   2240   2272   2304   2336

Display topology choice