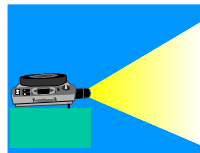


# Leadership in S/390 Server Access

## Part 3 - Excellence in SNA Networking

Raj Rajan  
Competitive Marketing Team  
(919) 486-2351  
(T/L 8-526-2351)  
RAJAN@RALVM6  
rajr@vnet.ibm.com  
Sep., 1997





# Content

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## ▶ IBM S/390 Server Access Leadership

- Part 1 : Considerations for S/390 Server Access
- Part 2 : Leadership in TCP/IP networking
- Part 3 : Excellence in SNA networking
- Part 4 : Testing Background
- Part 5 : WSC performance testing results
- Part 5 : Why Choose IBM for S/390 Server Access



## ***SNA is alive & well***

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- **Over 70% of worlds business information is SNA based, residing in IBM S/390 servers**
- **61% of all data networks run on SNA**
- **90% of Banking applications are still SNA**

*" Just because TCP/IP has won the hearts and minds of all mankind, curtesy of the internet phenomenon, that does not mean it does a better job than SNA of servicing transaction-based traffic. It doesn't.*

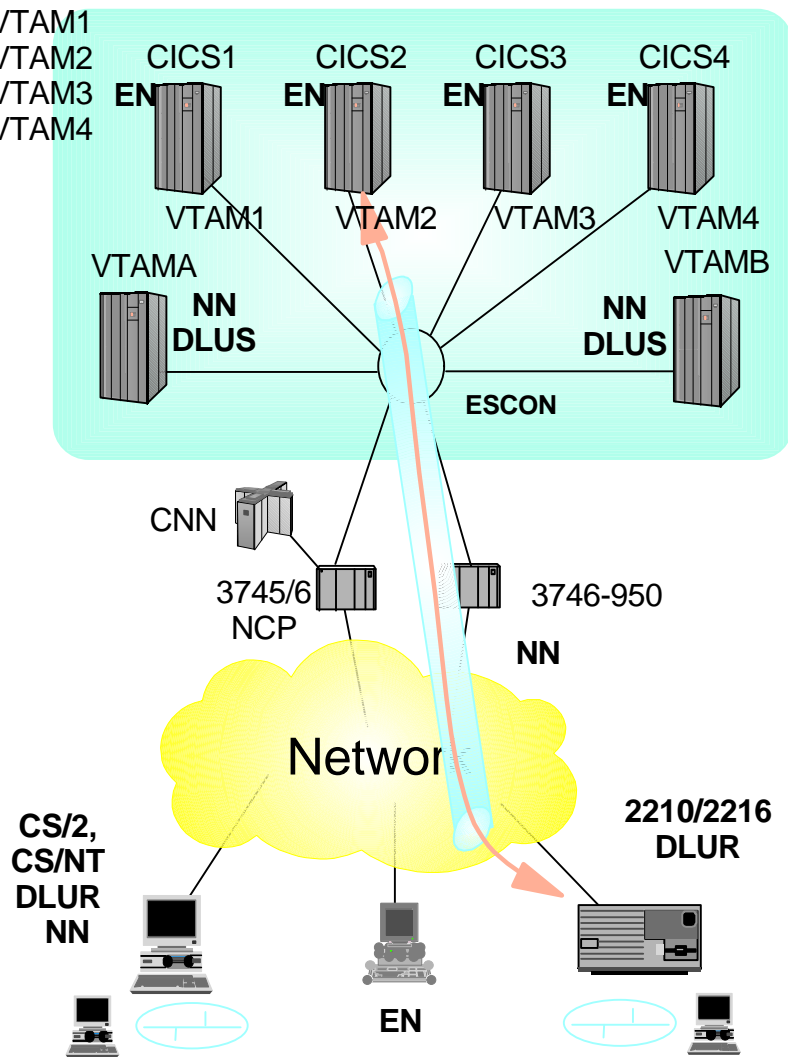
*In fact, many so called advanced features, such as class of service have been standard in SNA for years. "*

*Kevin Tolly, NetworkWorld Aug. 18, 1997*

# → Enterprise Class - Availability - SNA

## Directory

CICS  
 CICS1 - VTAM1  
 CICS2 - VTAM2  
 CICS3 - VTAM3  
 CICS4 - VTAM4



## ■ Application Recovery

- ▶ Multi-Node Persistent Sessions
  - 24x7 applications
- ▶ Generic Resource
  - Reliability
  - Minimize Appl. failure impact
- ▶ Automatic restart of system

## ■ Network Recovery

- ▶ HPR in the Network
  - HPR network with RTP end-point at workstation or remote gateway
  - Non disruptive session switching end-to-end
- ▶ MLTG aggregates bandwidth

## SNA Support in Common Code Services

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- **Leading , industrial strength, World-Class SNA support**
- **High Performance Routing (HPR) and APPN**
  - APPN Version 2 Network node
  - Edge/Intermediate Node (RTP/ANR)
  - Includes ISR-HPR Gateway, ISR-ISR Routing
  - HPR Link Support types: LAN, Frame Relay, PPP, V.25bis, ISDN and ATM LANE
  - ISR Link Support types: Same as HPR plus SDLC and X.25
  - Dependent LU Requester (DLUR) for dependent SNA Subarea devices (LAN, Frame Relay, X.25, SDLC, ISDN and ATM LANE)
- **Data Link Switching ( DLSw V2 )**
  - AIW Version 1 (RFC 1795)
  - SDLC to LLC conversion
  - NetBIOS Tower
  - AIW DLSw MIB
  - Frame Relay, PPP, X.25,V.25bis and ISDN, LAN and ATM
- **SDLC Primary, Multipoint Secondary and PU 4/5 INN**
- **Frame Relay Boundary Access Node (BAN)**
  - Direct Frame Relay connection to 3745/46 and AS/400

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# Cisco's SNA Selling Strategy

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## ▶ 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 Cisco has failed to sell DLSw+/RSRB
- Lu 6.2 application development shops
- Customers with VTAM 4.1 & 4.2

## ▶ Cisco will say that they

- Supports APPN, DLUR, HPR and APPN over the channel
- Use IBM code
- Are investing in Staff & Skill to be in "the business"
- Supports bandwidth reservation for other protocols, in addition to IBM COS for SNA networks

## 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 well without border node ..etc ( Resource hog !!)
  
- ▶ APPN is a IBM proprietary protocol



## Enhancements to SNA from IBM

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- ▶ **Branch Extender**

- Allows SNA networks to scale up to 1000 nodes

- ▶ **Enterprise Extender (HPR over IP)**

- Allows Customers to preserve their SNA priority levels over TCP/IP (Internet) network

- ▶ **ATM Support**

- Mapping of ATM Quality of Service (QOS) to SNA Class of Service (COS)

- ▶ **APPN Border Node Support**

- Enables APPN networks to support capability similar to SNI

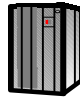


# Enterprise Extender

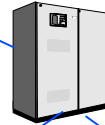
## S/390 Application Server

- TCP/IP applications
- SNA Applications

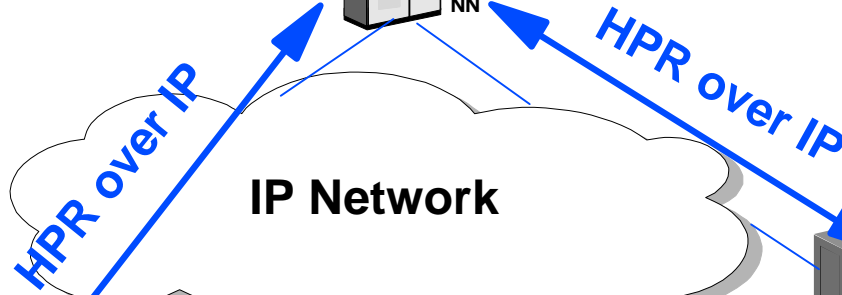
VTAM



3746-950



Enterprise Extender NN



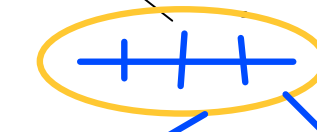
IP Network

Enterprise Extender



NN

Enterprise Extender NN



Application Client



Application Client

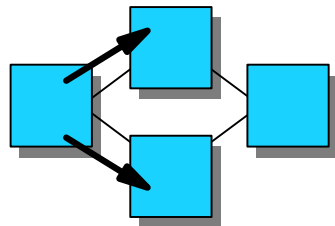
- Allows distributed TN3270 implementation
- Uses UDP to transport HPR traffic
- IP network is represented as a single HPR ANR hop
- Enables SNA priorities to be maintained over IP network

# Extending SNA Priority over IP networks

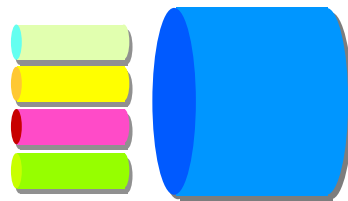
## HPR Class of Service

### 1. Choose a circuit

HPR permits multiple paths of different characteristics to operate concurrently



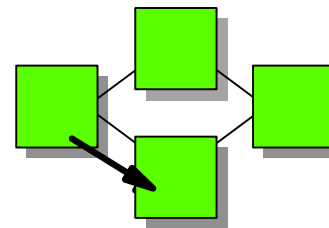
### 2. Choose a queue on the circuit



## Enterprise Extender SNA Priority Queuing

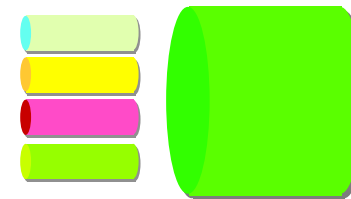
### 1. IP is the only circuit

IP operates on one route at a time



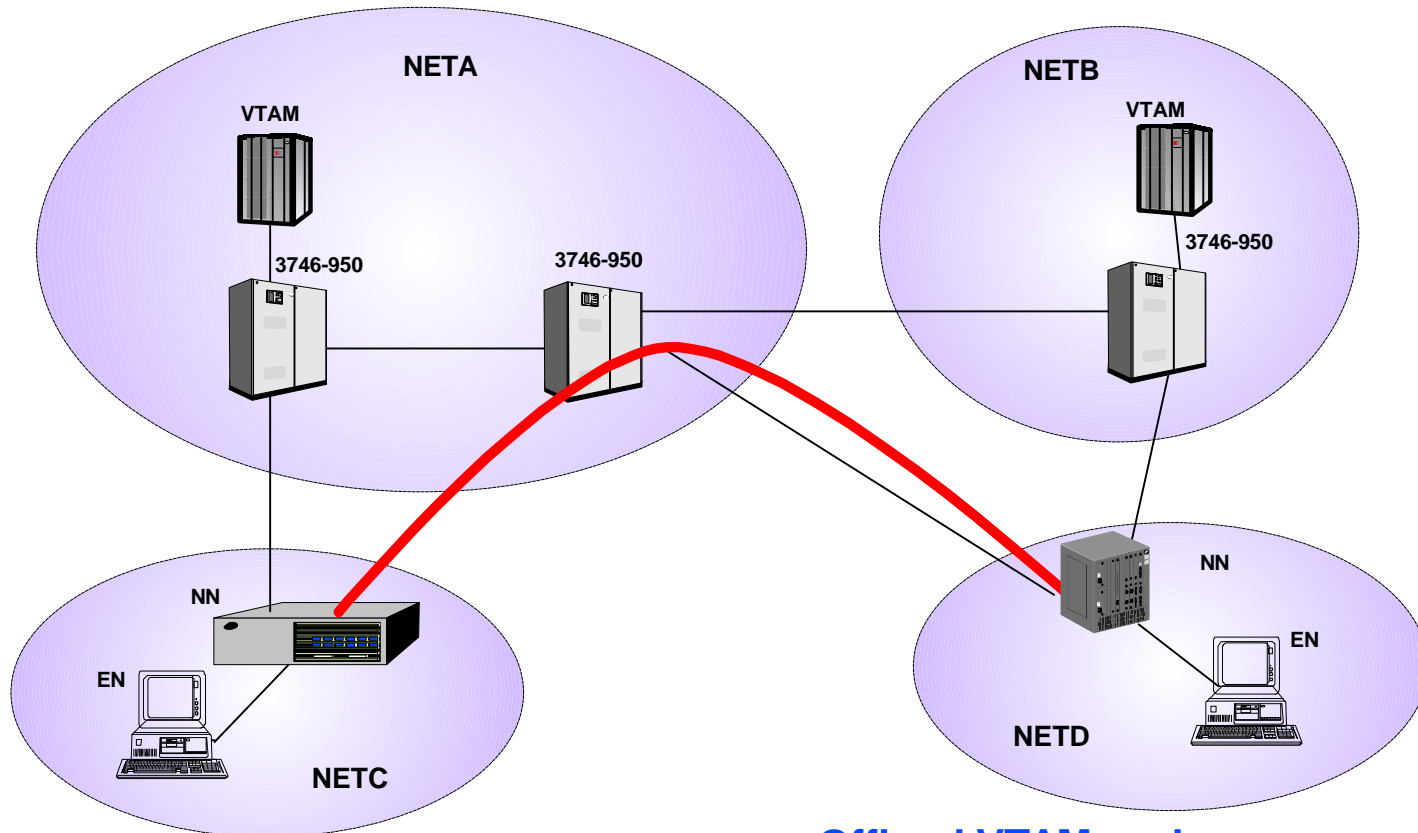
### 2. Choose a queue on the circuit

Maps SNA priority to four selected UDP port numbers



# Extended Border Node

**EBN**

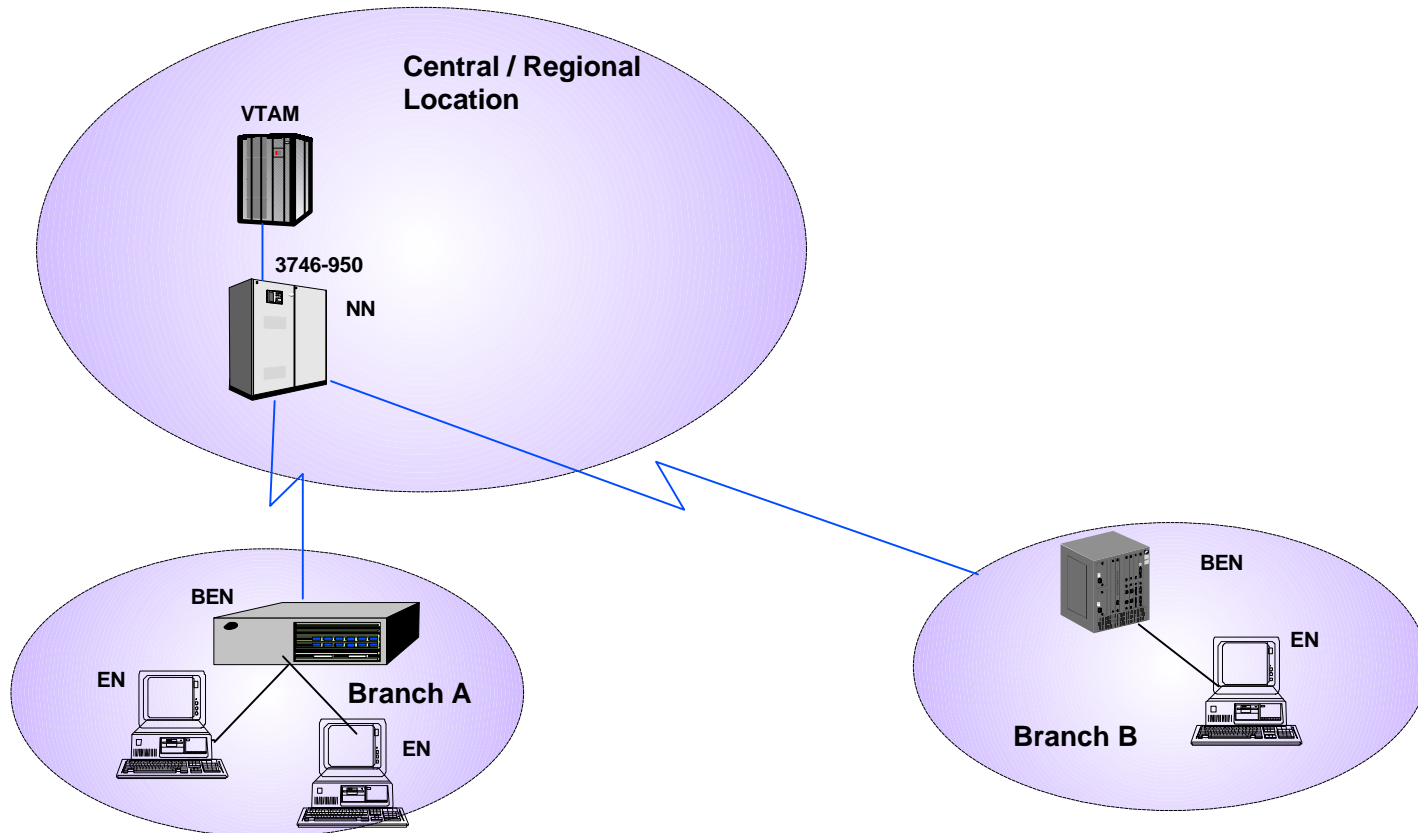


- Link different APPN domains
- Allow SNA environment migration
- Allow multiple SNA domains migration

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

– SNI

## IBM 3746 - Branch Extender Node ( BEN )



- Enables APPN Networks to scale in Branch network topologies
- Allow SNA environment migration

# Infrastructures for Network Growth

## Enhanced End User Service for Enterprise Customers

Enterprise Extender for IP / SNA  
Backbone choices

Network Dispatcher for balancing  
Internet / Intranet servers

Smooth path to ATM

Branch Extender for APPN Network  
Scalability

Data Link Switching

HPR

TN3270e Server

