

# IBM 3746 Nways Multiprotocol Controllers Models 900 and 950

December 2, 1997  
(Revision 4)



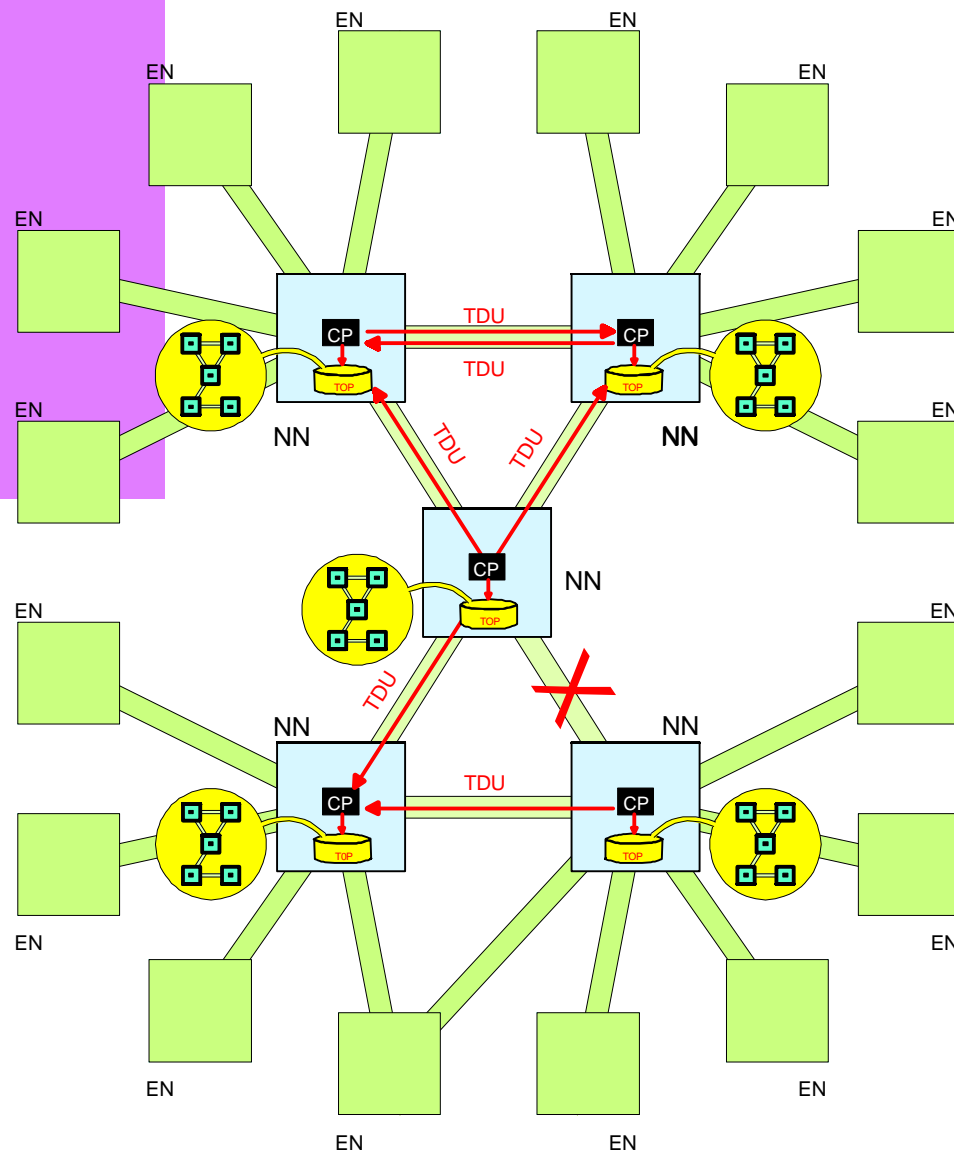
**SNA (DLUR)  
APPN (ISR)  
HPR (ANR, RTP, ARB,  
MLTG, SSE)**

# IBM 3746 - APPN / HPR Support



- SNA (DLUR) Available 10/95
- APPN (ISR) Available 01/96
- HPR (ANR) Available 09/96
- HPR (RTP, ARB) Available 12/96
- HPR (MLTG) Available 06/97
- HPR (SSE) 10/30/98

# APPN - Network Topology

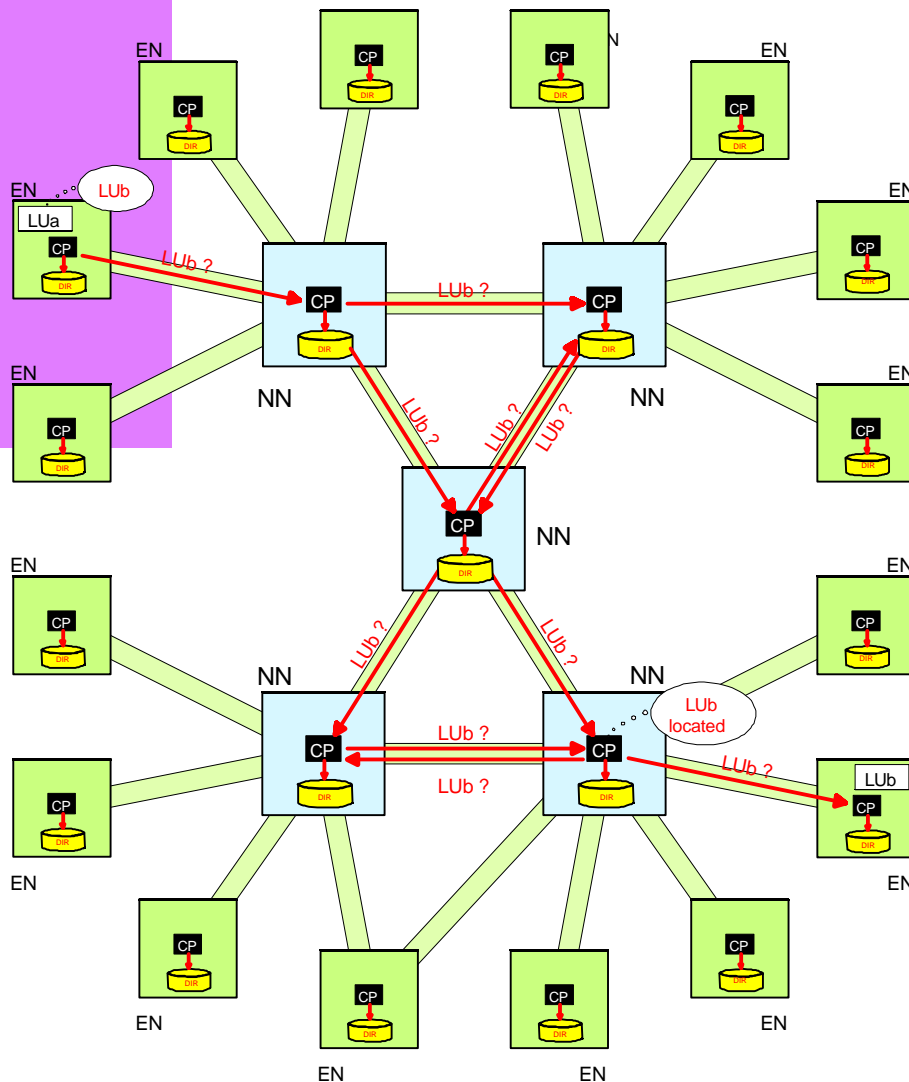


- Dynamic update of APPN network topology
  - NN topology is automatically updated at each network modification
  - The new topology is propagated among all Network Nodes
  - No routes predefined

TOP: Topology

TDU: Topology Database Update

# APPN - Node Directory

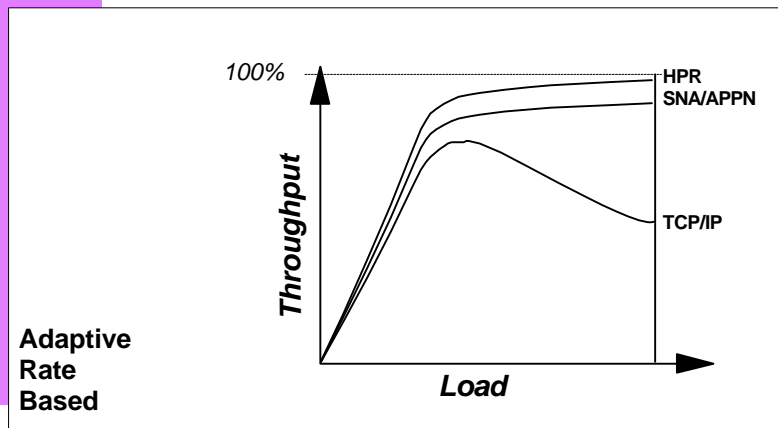


- Dynamic localisation of resources
- Research on several levels if necessary :

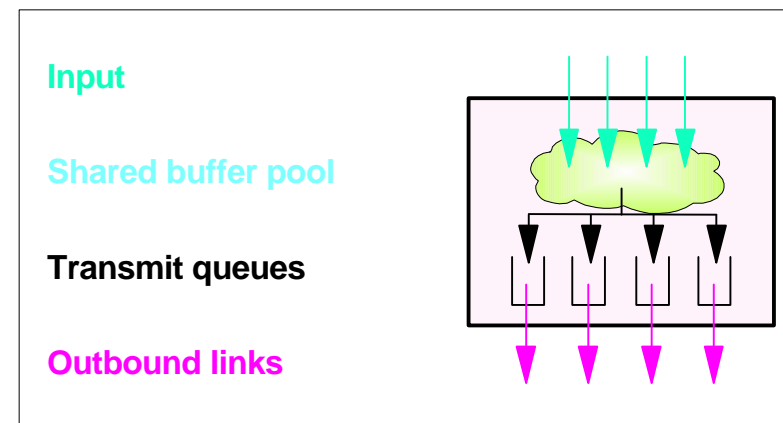
- Adjacent NN Server (Directory + Cache)
- Central Directory Server (CDS) (VTAM)
- Broadcast to all NN directions

**DIR:** Directory

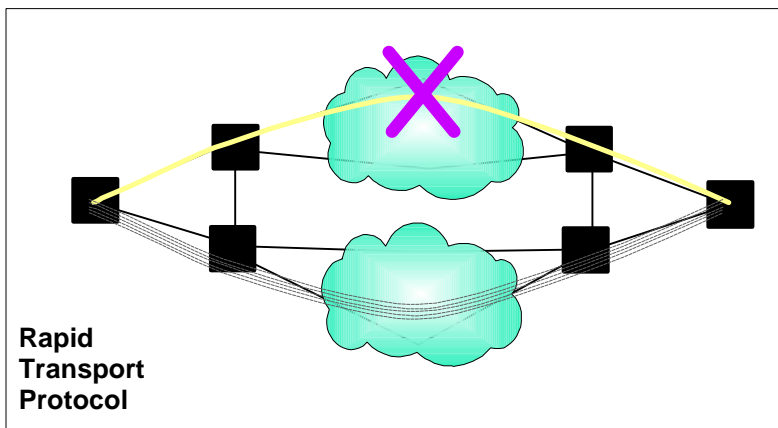
# IBM 3746 - High Performance Routing (HPR)



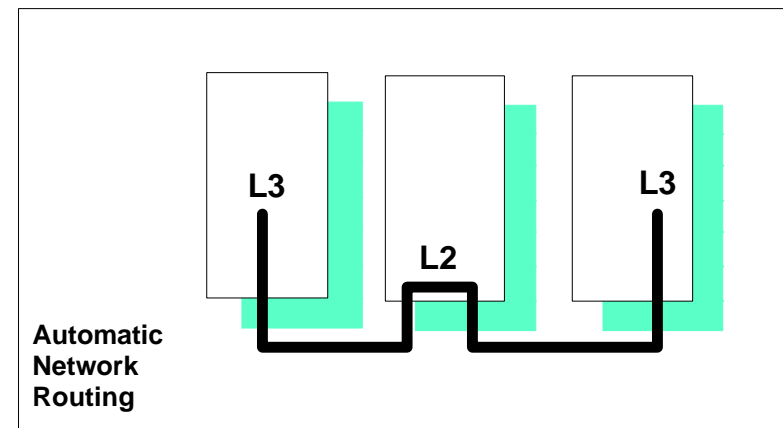
*Maximizes link utilization*



*Dynamic Fairness and Priority*

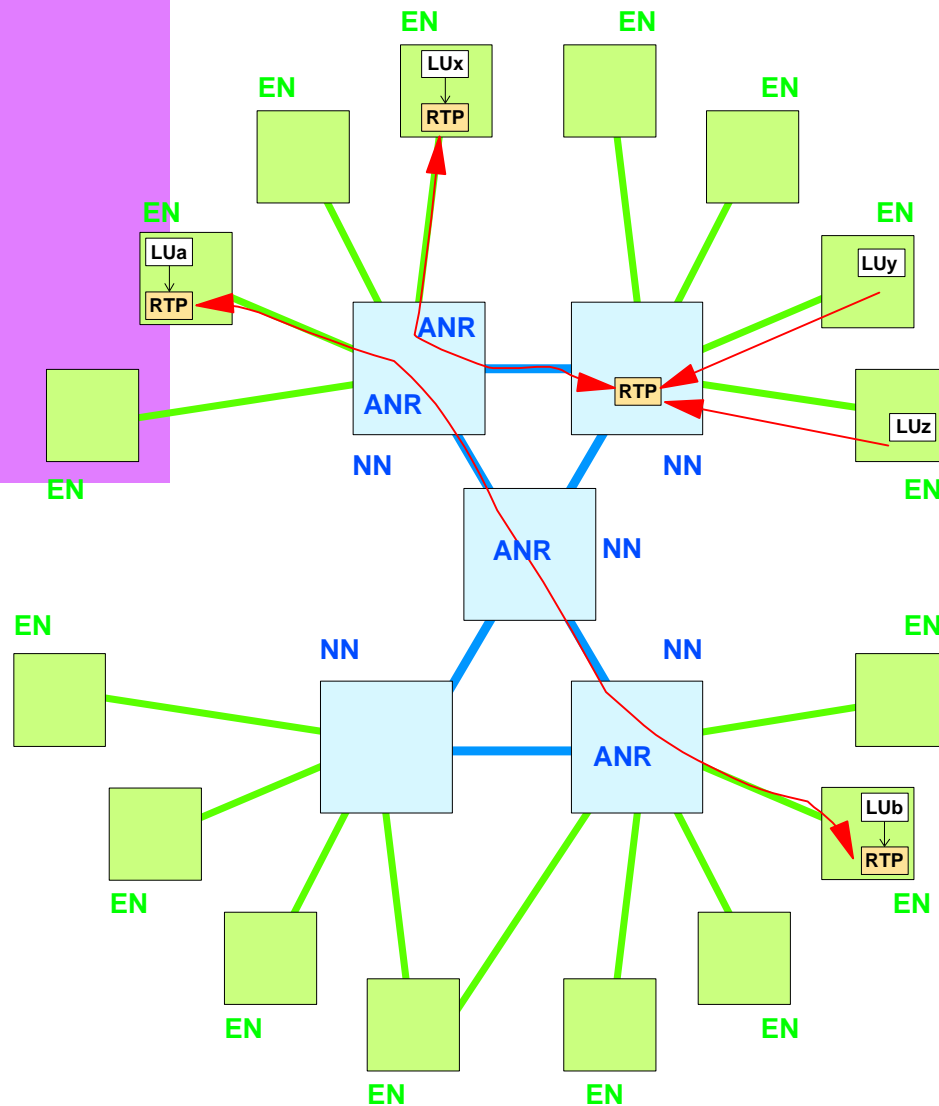


*Non-disruptive rerouting*



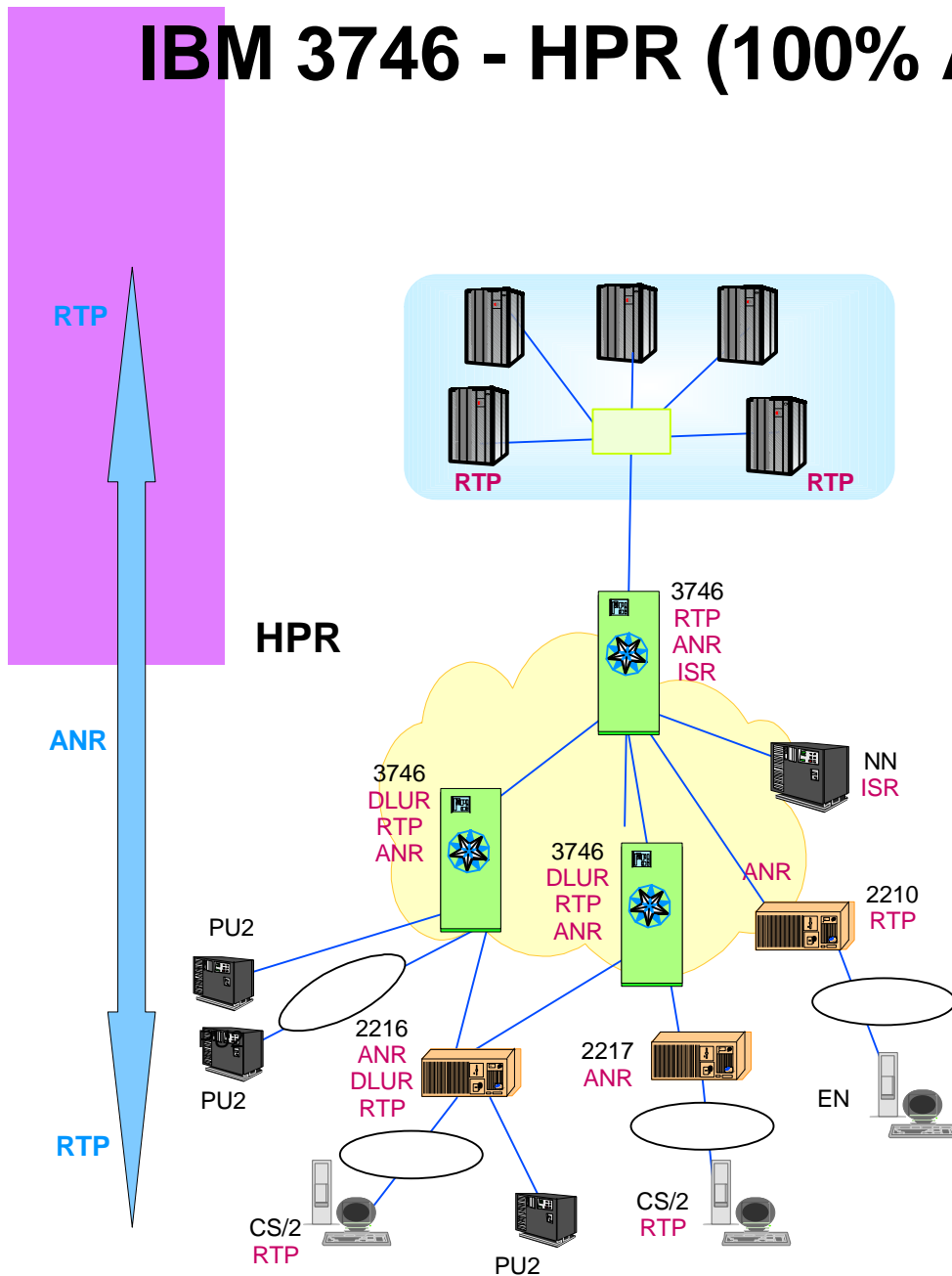
*Improves performance*

# IBM 3746 - High Performance Routing (HPR)



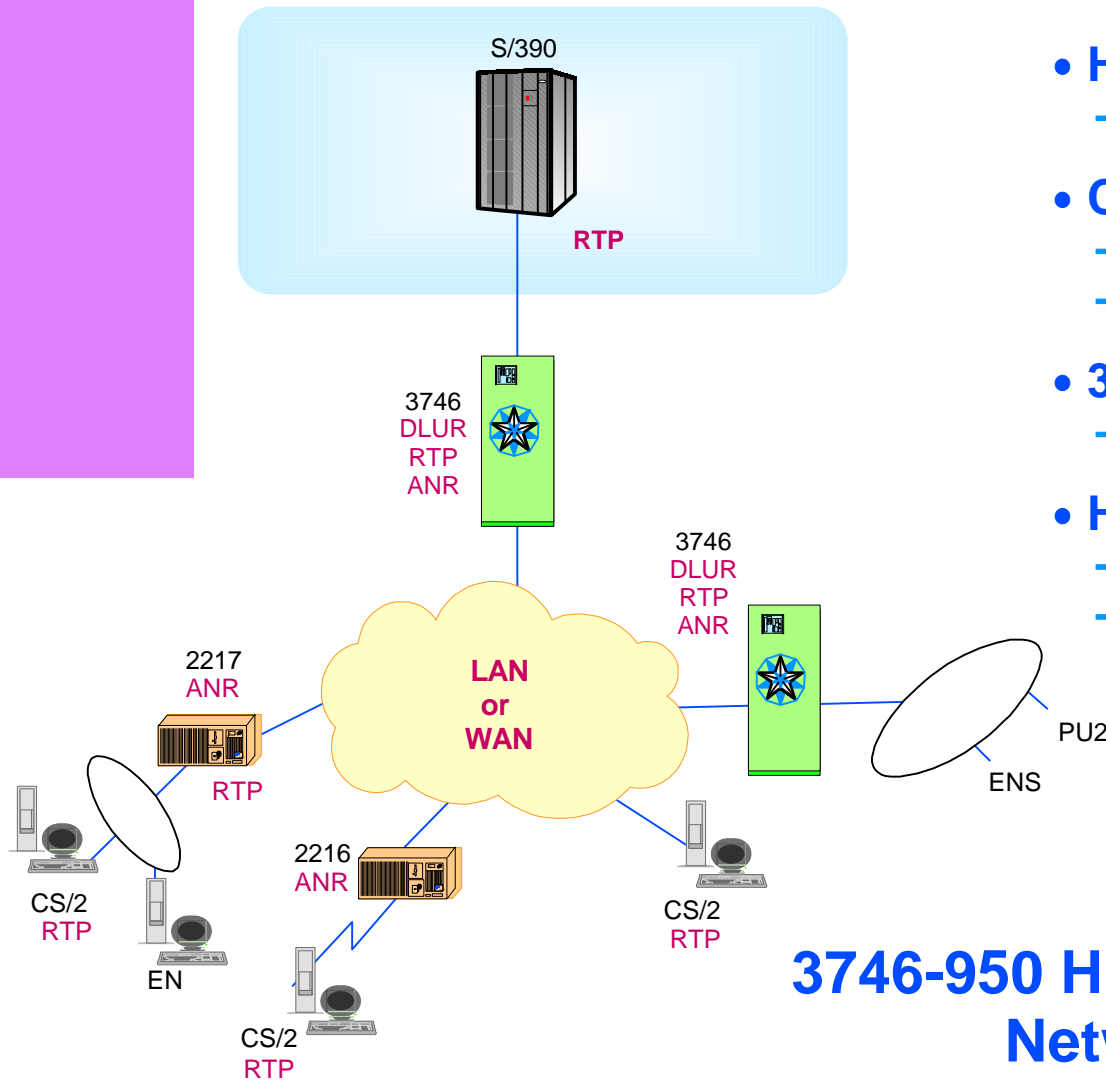
- 3746 NN (No NCP)
- Rapid Transport Protocol (RTP)
  - HPR pipe for :  
Adjacent PUs , nodes  
DLUR + APPN
  - End to end error recovery (packet retransmission)
- Automatic Network Routing (ANR)
  - Fast routing : x3 (vs APPN)
  - Unlimited number of ANR sessions
- Adaptive Rate Based (ARB)
  - Network congestion control (end to end)

# IBM 3746 - HPR (100% Availability Solution)



- **Network availability**
  - 24x7x365
  - HPR end to end non-disruptive session switching
  - Full APPN dynamics for routing
- **DLUR support for non\_APPN 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
- **APPN support (ISR) for non HPR nodes**
- **HPR-MLTG on SDLC, FR, TR/Ethernet**

# IBM 3746 - HPR Solution

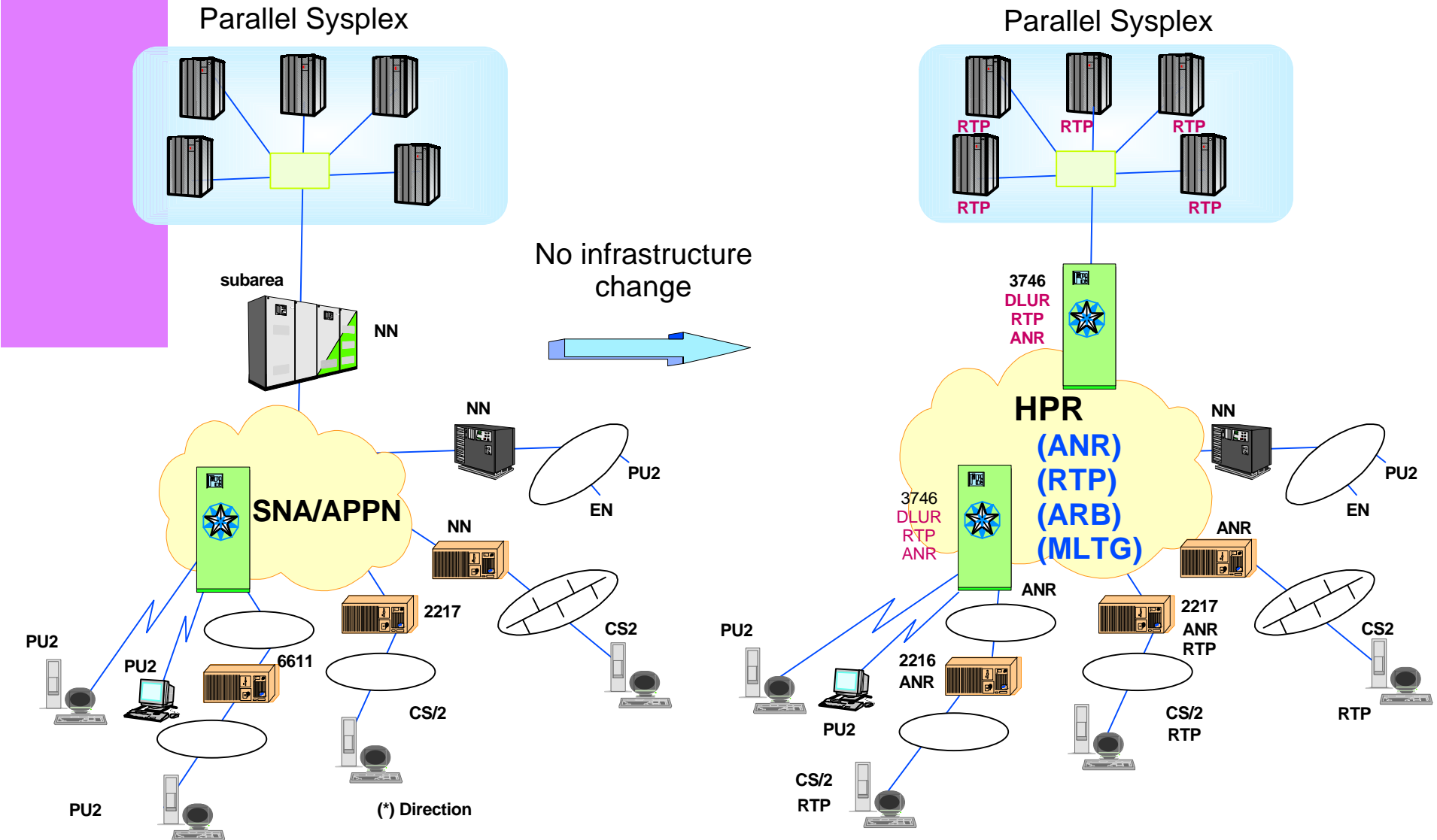


- **High availability**
  - non disruptive rerouting
- **Cost saving**
  - ANR offload 3746 adapters
  - Dynamic operations
- **3746 Hardware already enabled**
  - minimum changes required
- **High performance**
  - Traffic routing at level 2
  - Tremendous 3746 throughput improvement (x30)

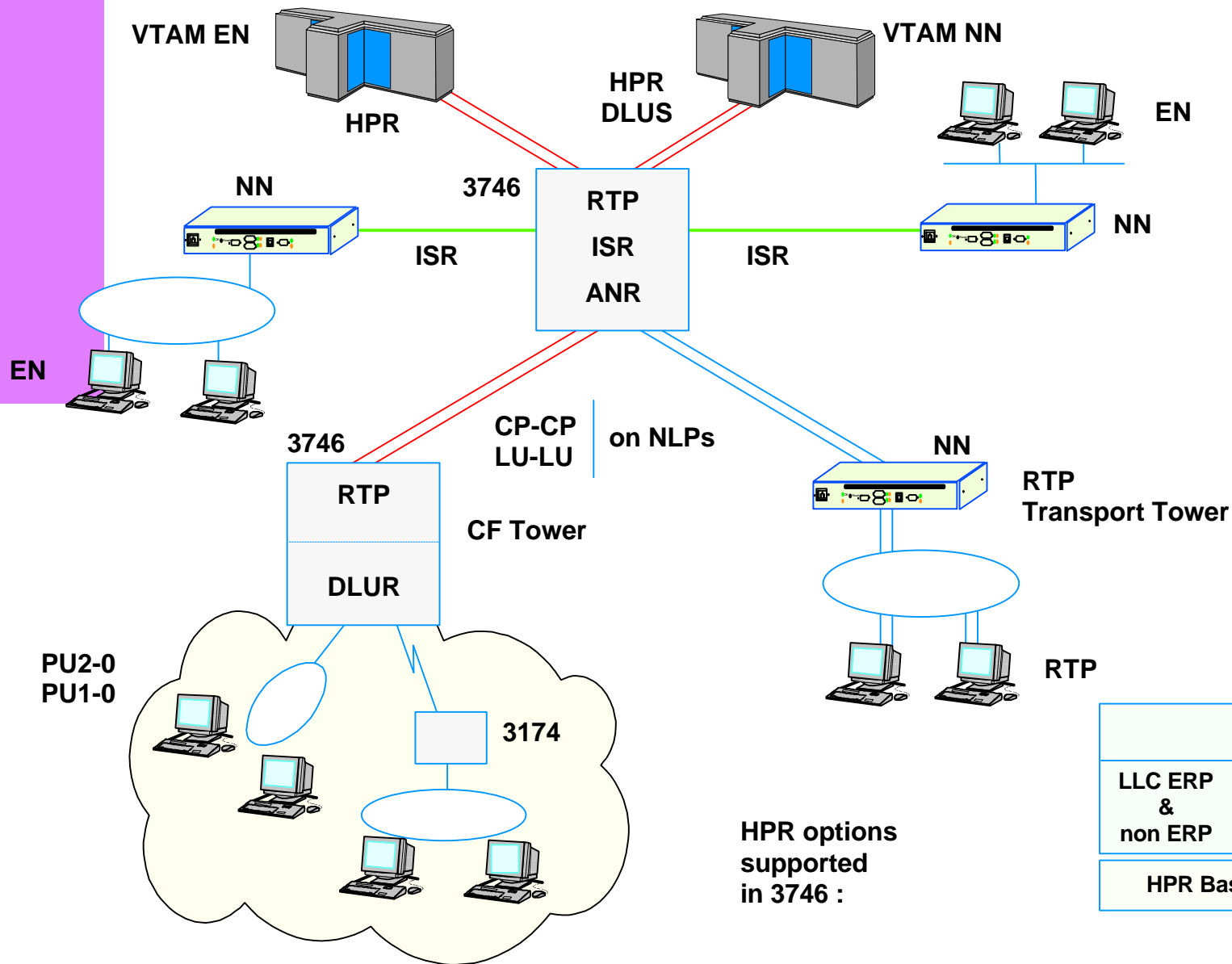
## 3746-950 HPR "The High Availability Networking Solution"



# IBM 3746 - Evolving to the HPR Backbone



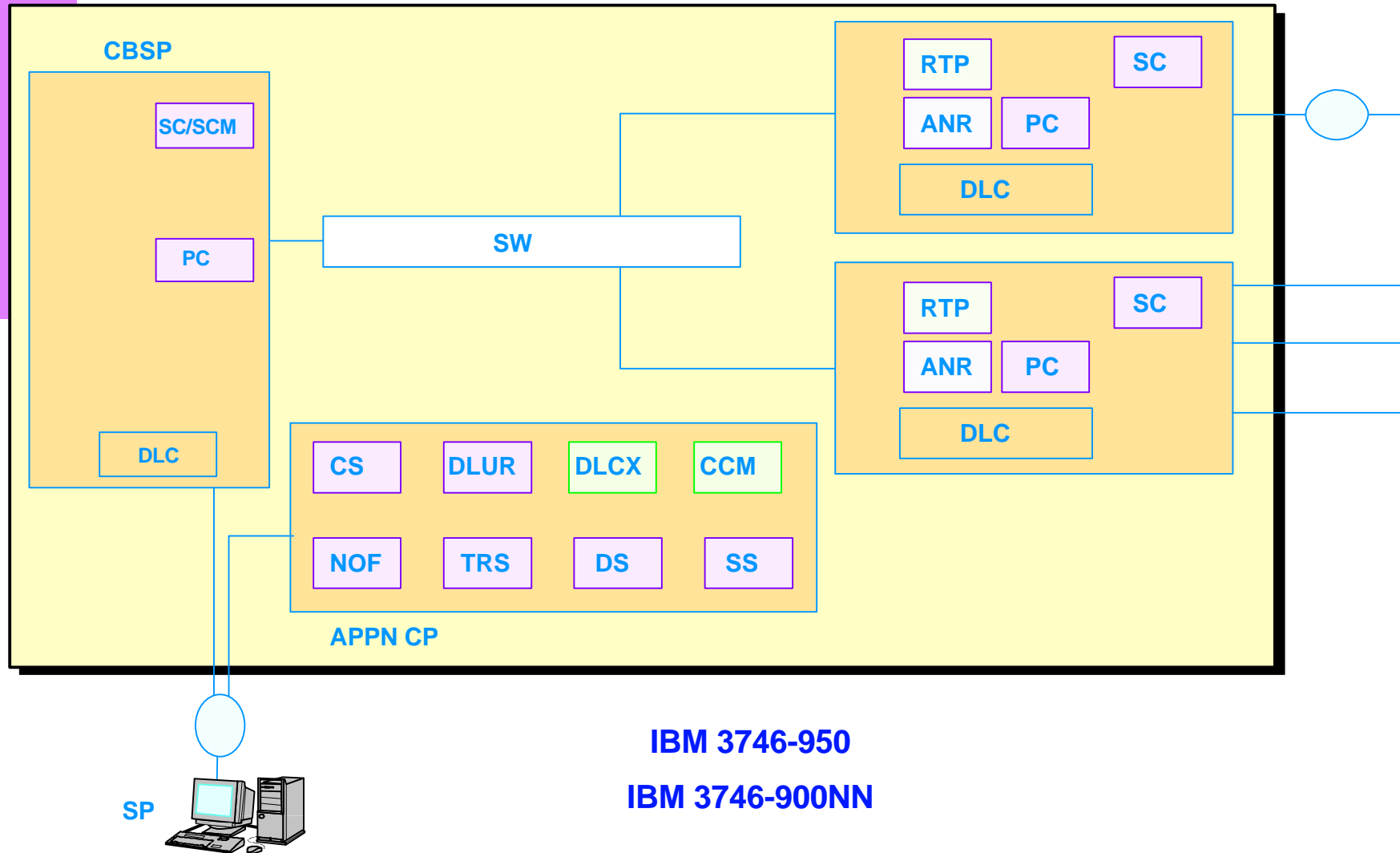
# IBM 3746 - HPR (ISR, RTP, ANR) Functions



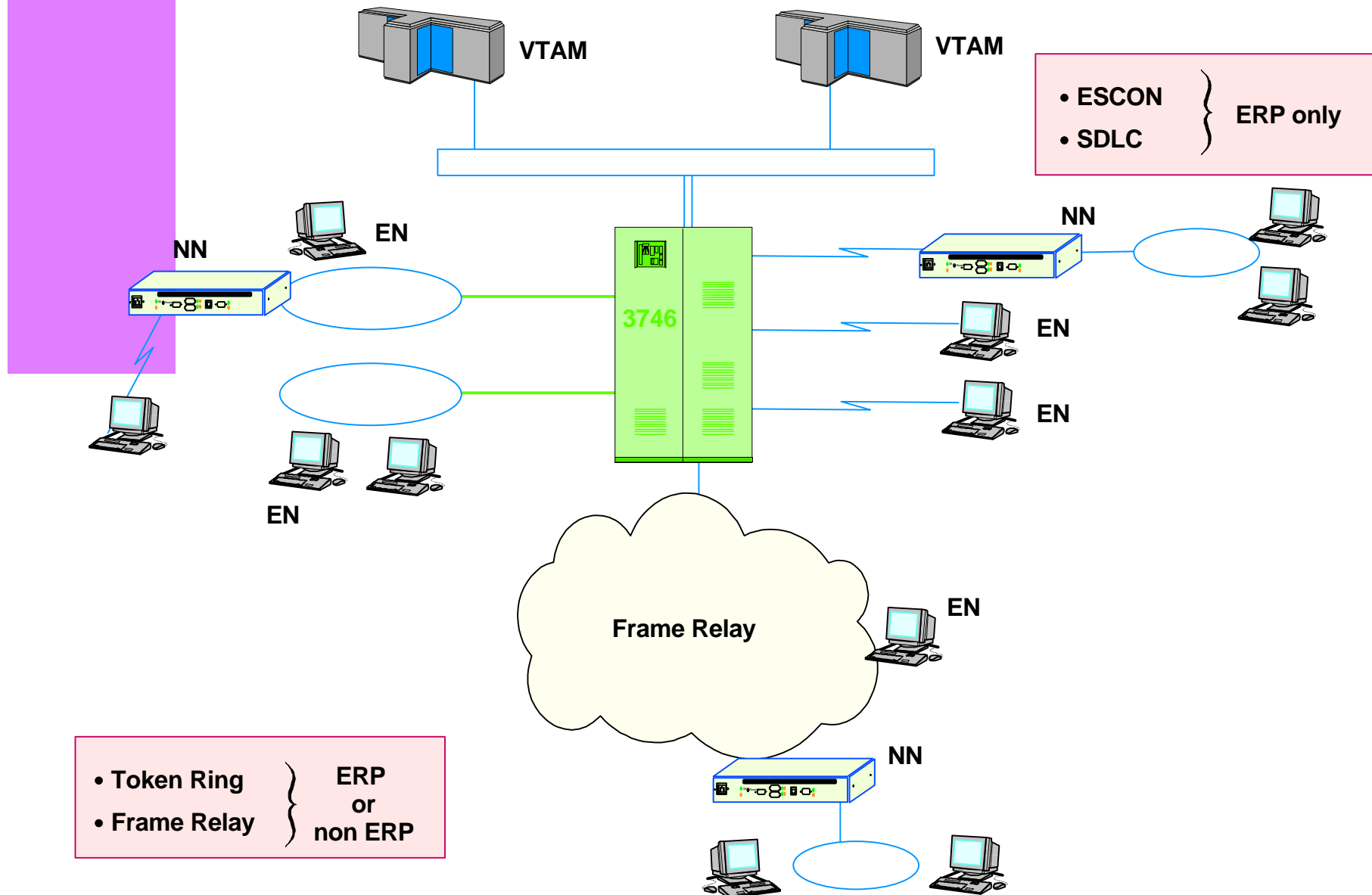
HPR options supported in 3746 :

	CF Tower
LLC ERP & non ERP	Transport
HPR Base (ANR)	

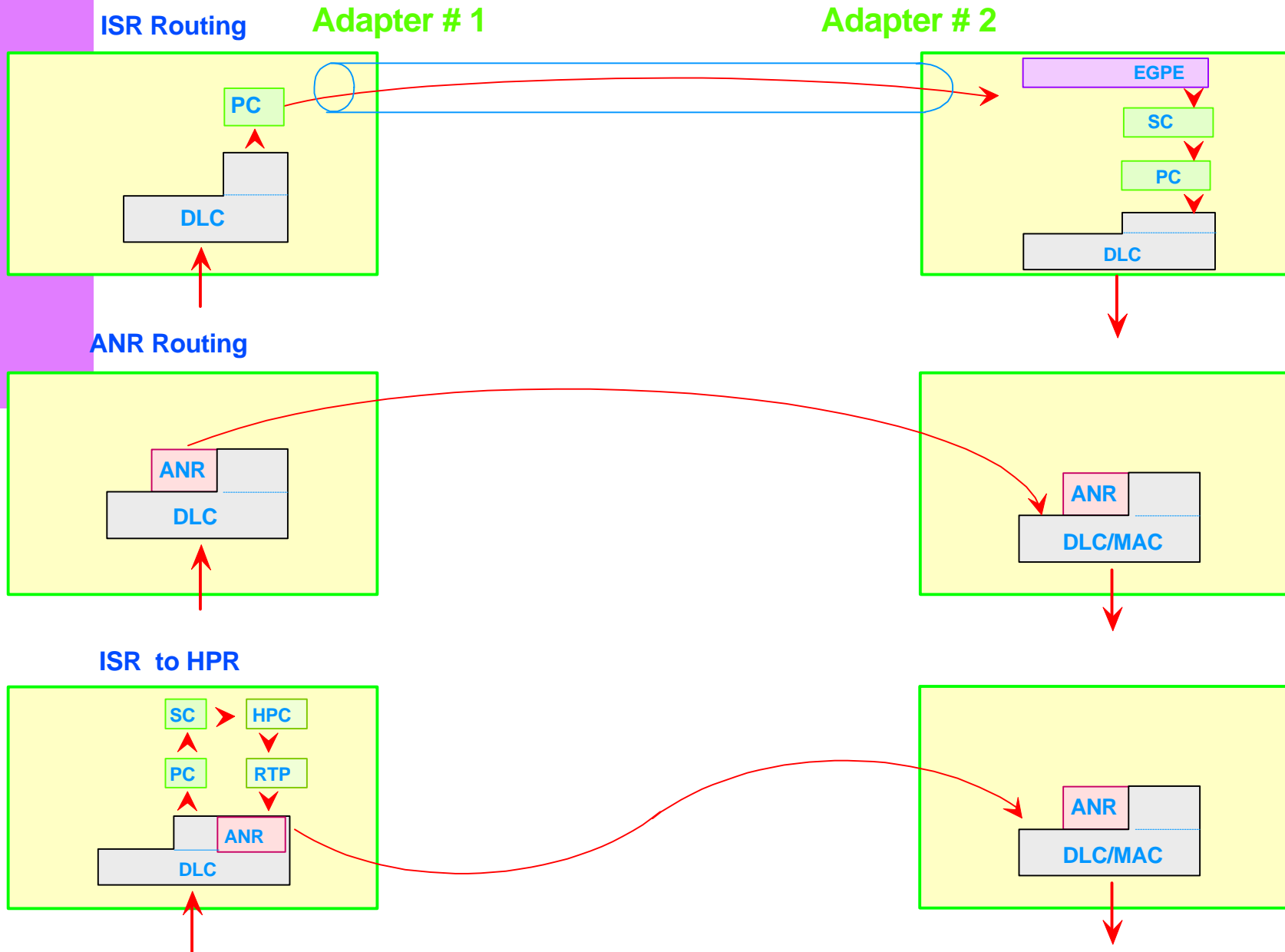
# IBM 3746 - APPN/HPR Components



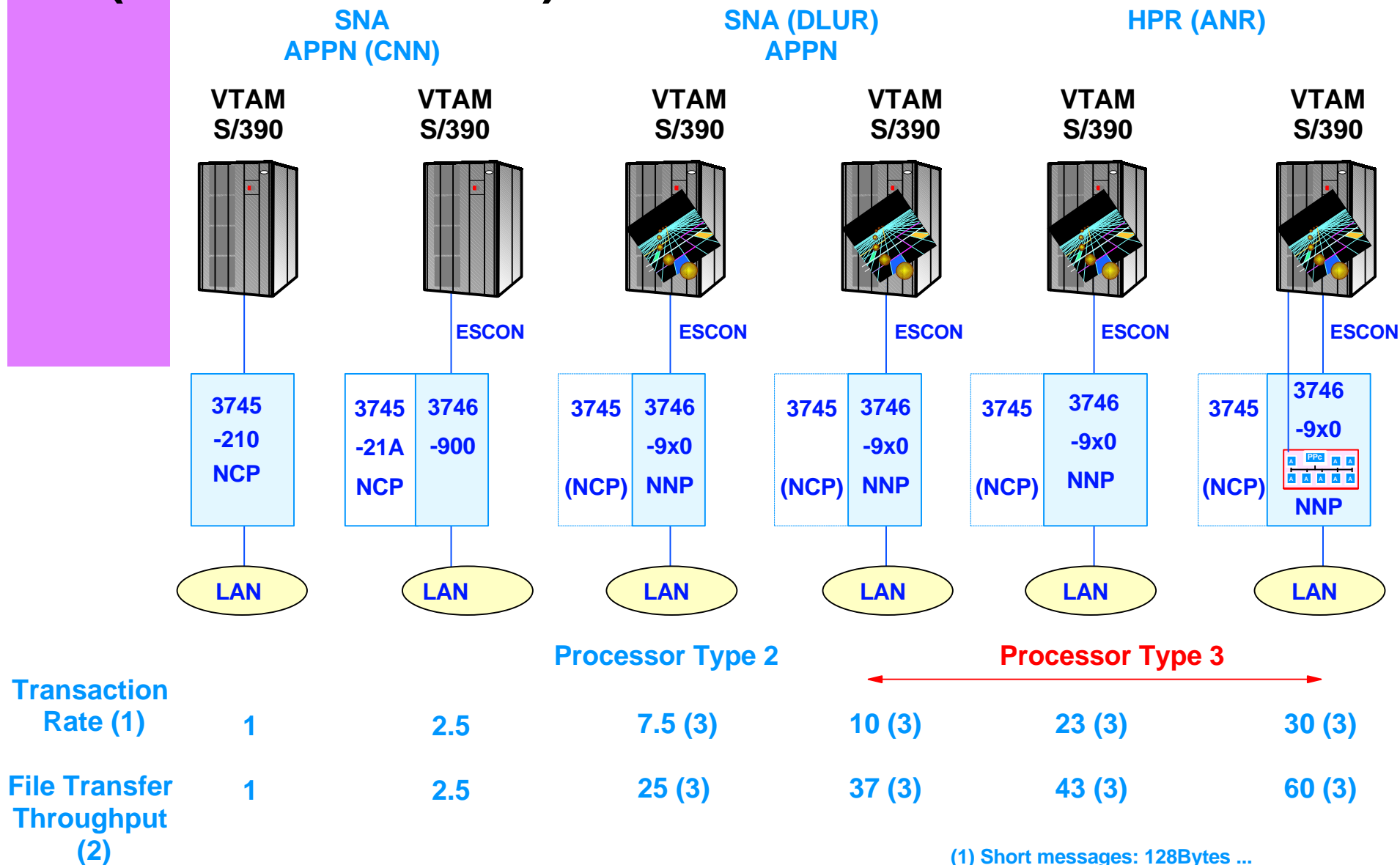
# IBM 3746 - HPR (LLC ERP) Options



# IBM 3746 - HPR Routing Mechanism



# IBM 3746 - Performance Ratio (SNA/APPN/HPR)

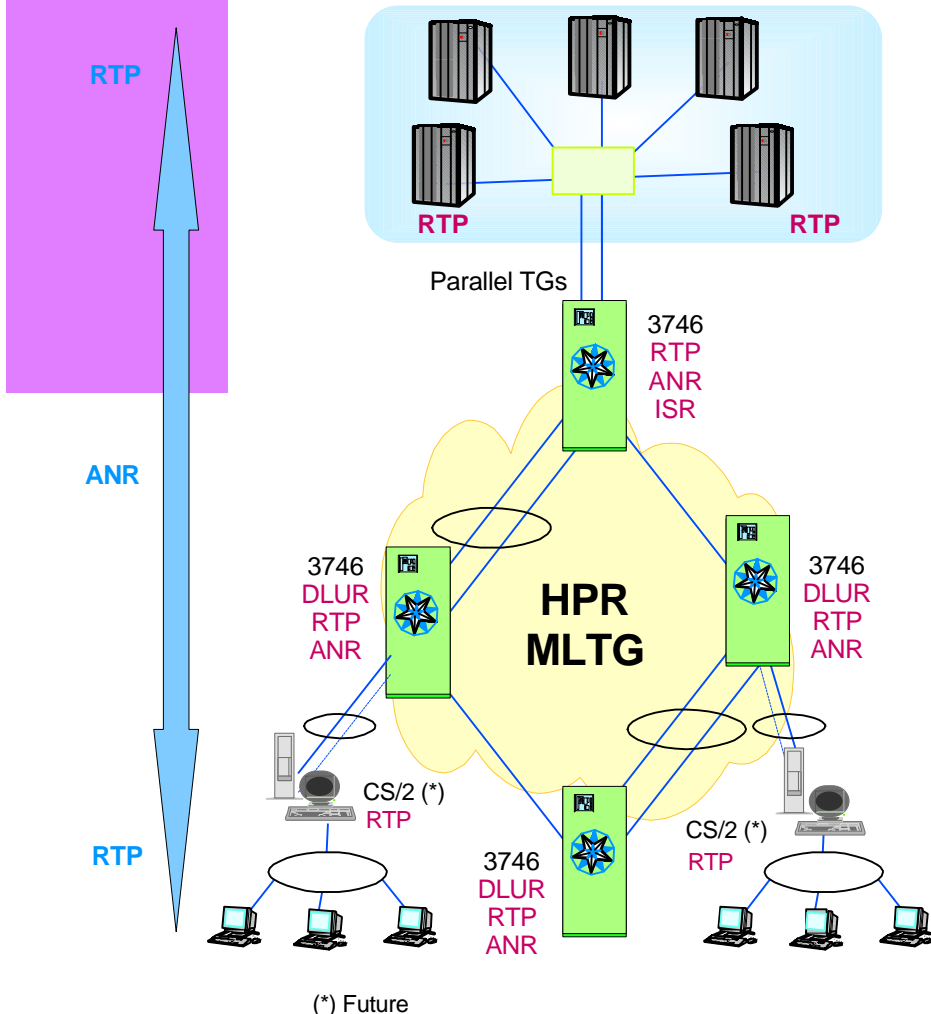


(1) Short messages: 128Bytes ...  
 (2) Large data blocks : 8000 Bytes  
 (3) estimate (16 processors)

# IBM 3746 - HPR MultiLink Transmission Group

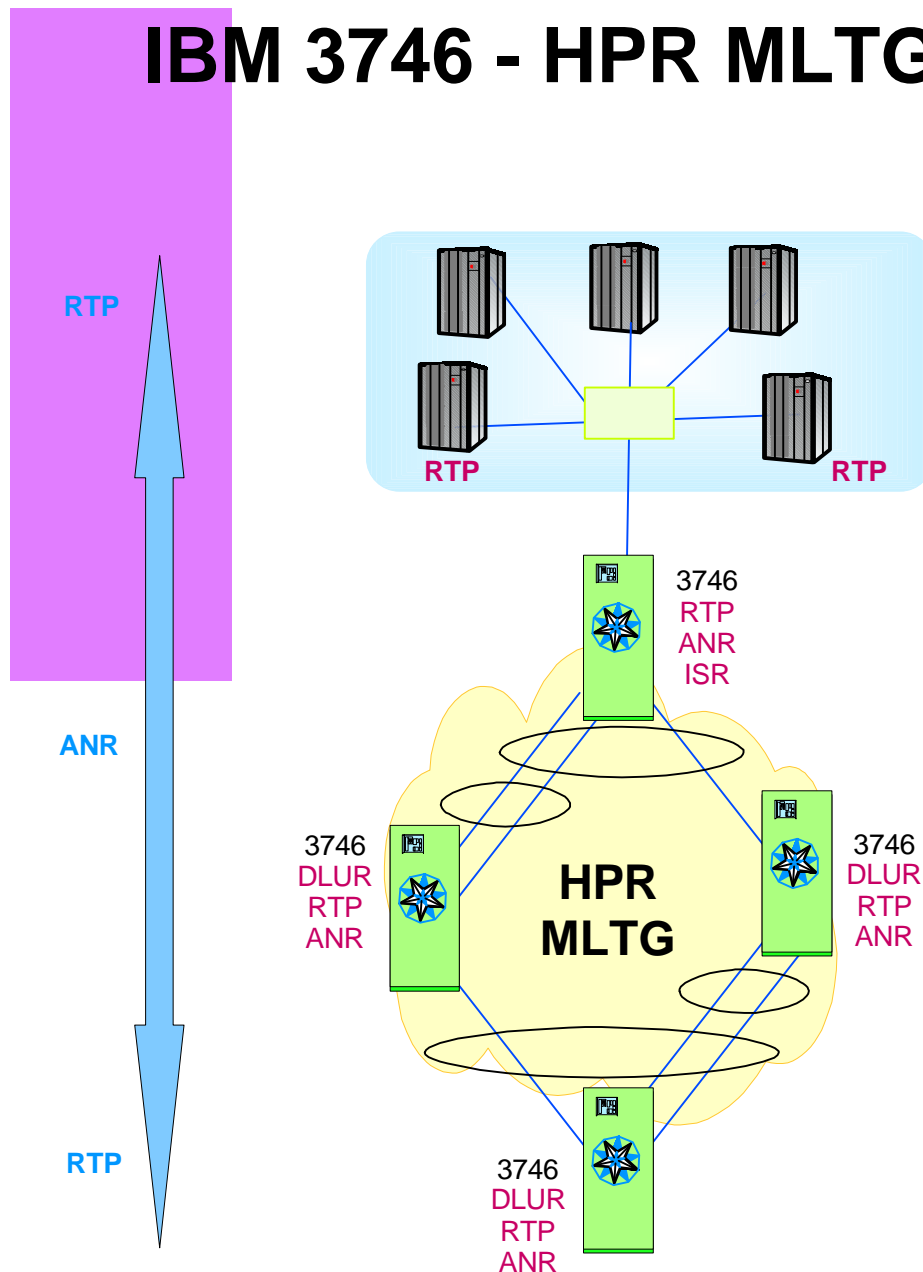


Available



- Higher Bandwidth
  - packets distributed over multiple links
- Increased Bandwidth per session
  - Multiple physical links = 1 Single logical link
- Additional Bandwidth 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

# IBM 3746 - HPR MLTG Benefits

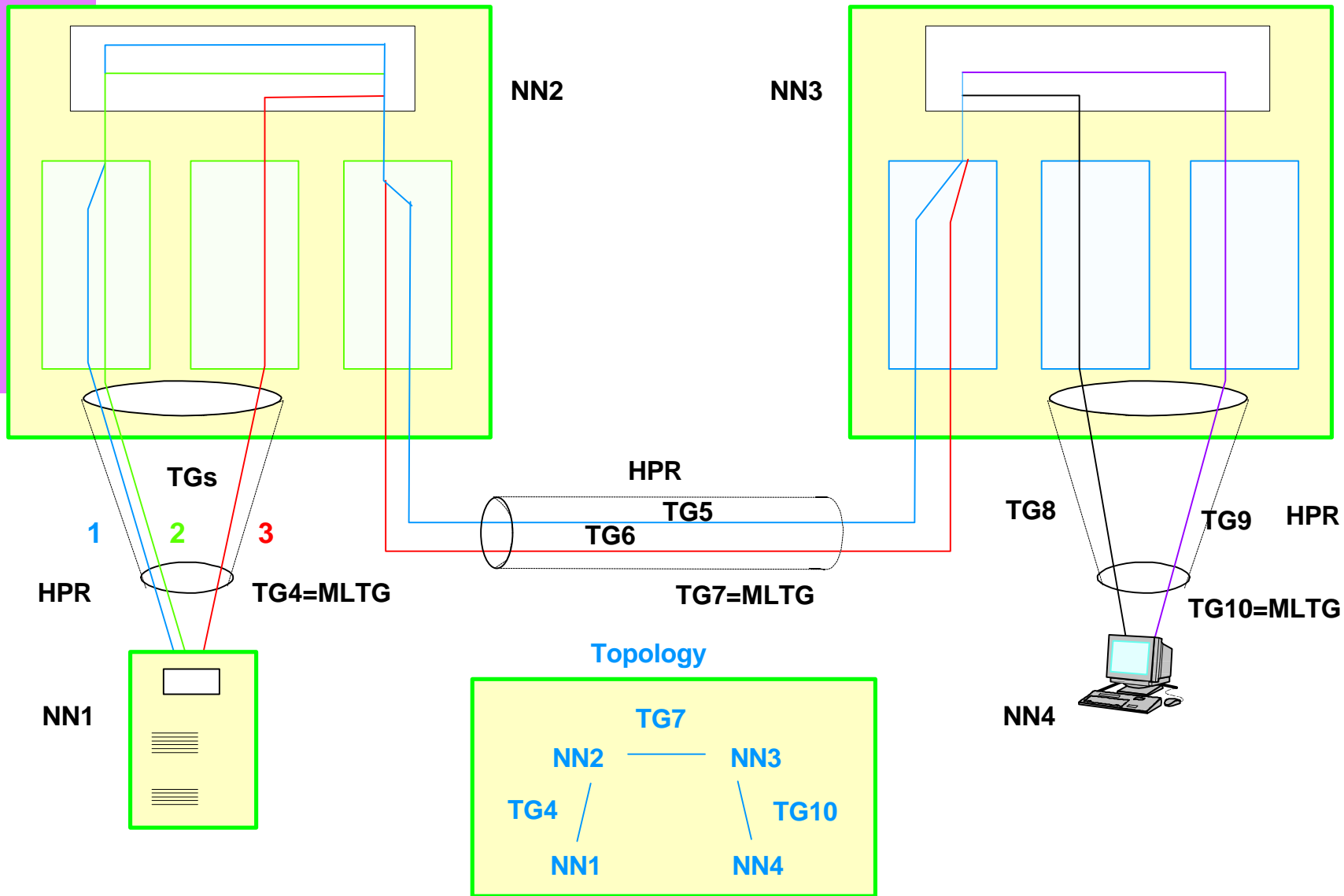


Available

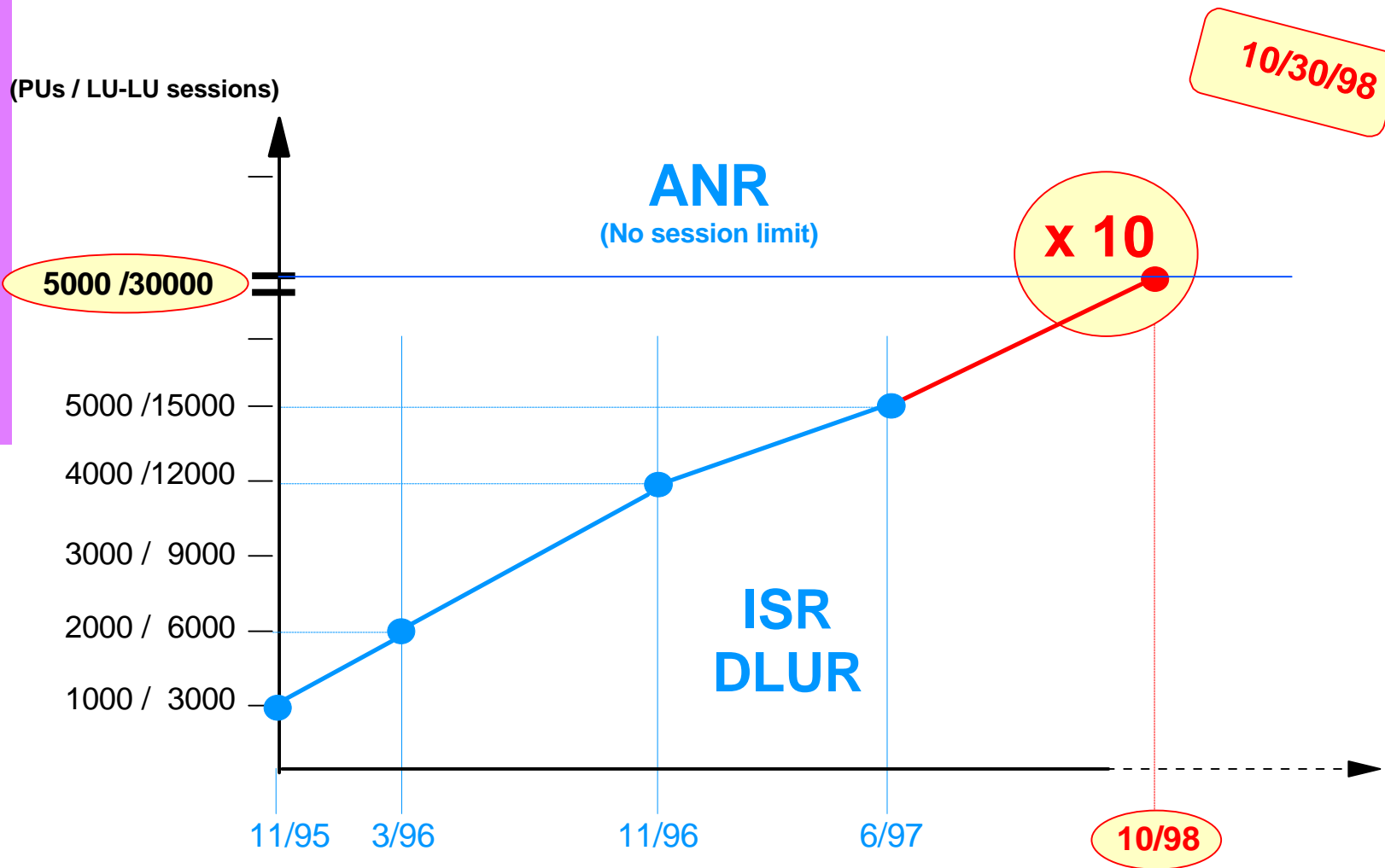
- MLTG on SDLC, FR, X.25, TR/Ethernet
- Special label in Route Setup for MLTG
- MLTG Topology
- Dynamic adding/deleting TGs inside the MLTG
- Data resequencing by RTP end point (use of MLTG indicator)
- TDU when individual TG add/delete to change MLTG characteristics
- Weighting mechanism between TGs in MLTG



# IBM 3746 - HPR MLTG Support



# IBM 3746 - Connectivity Increase



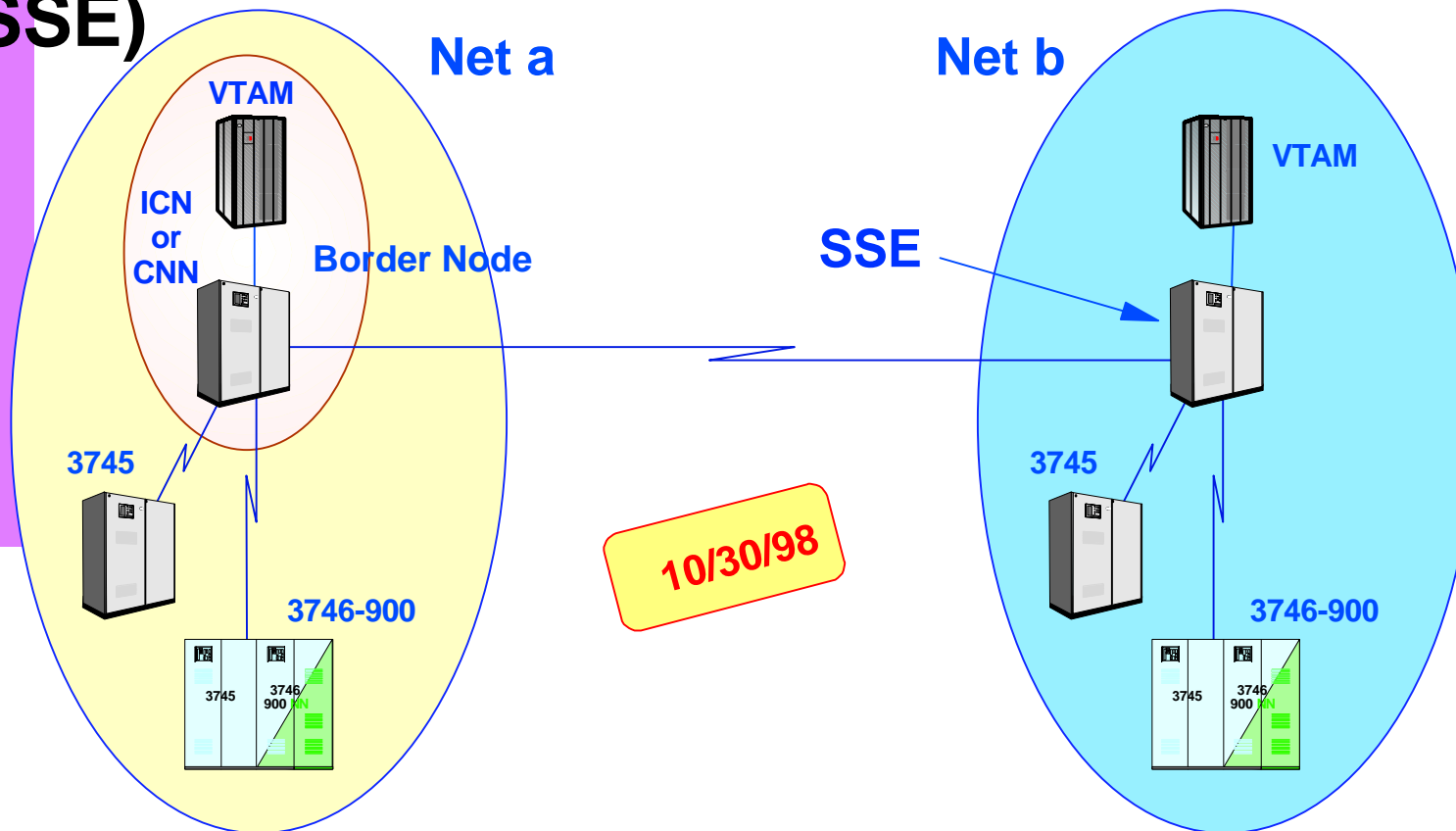
- **Connectivity increase**

- 30000 LU-LU sessions (APPN/ISR, DLUR)
- 240 lines (3746 NN and IP)

- **Prerequisite (for 30000 sessions)**

- Network Node Processor Type 2
- CBSP3

# IBM 3746 - Session Services Extended (SSE)



**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