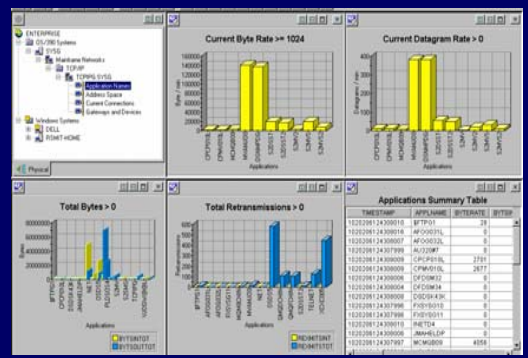
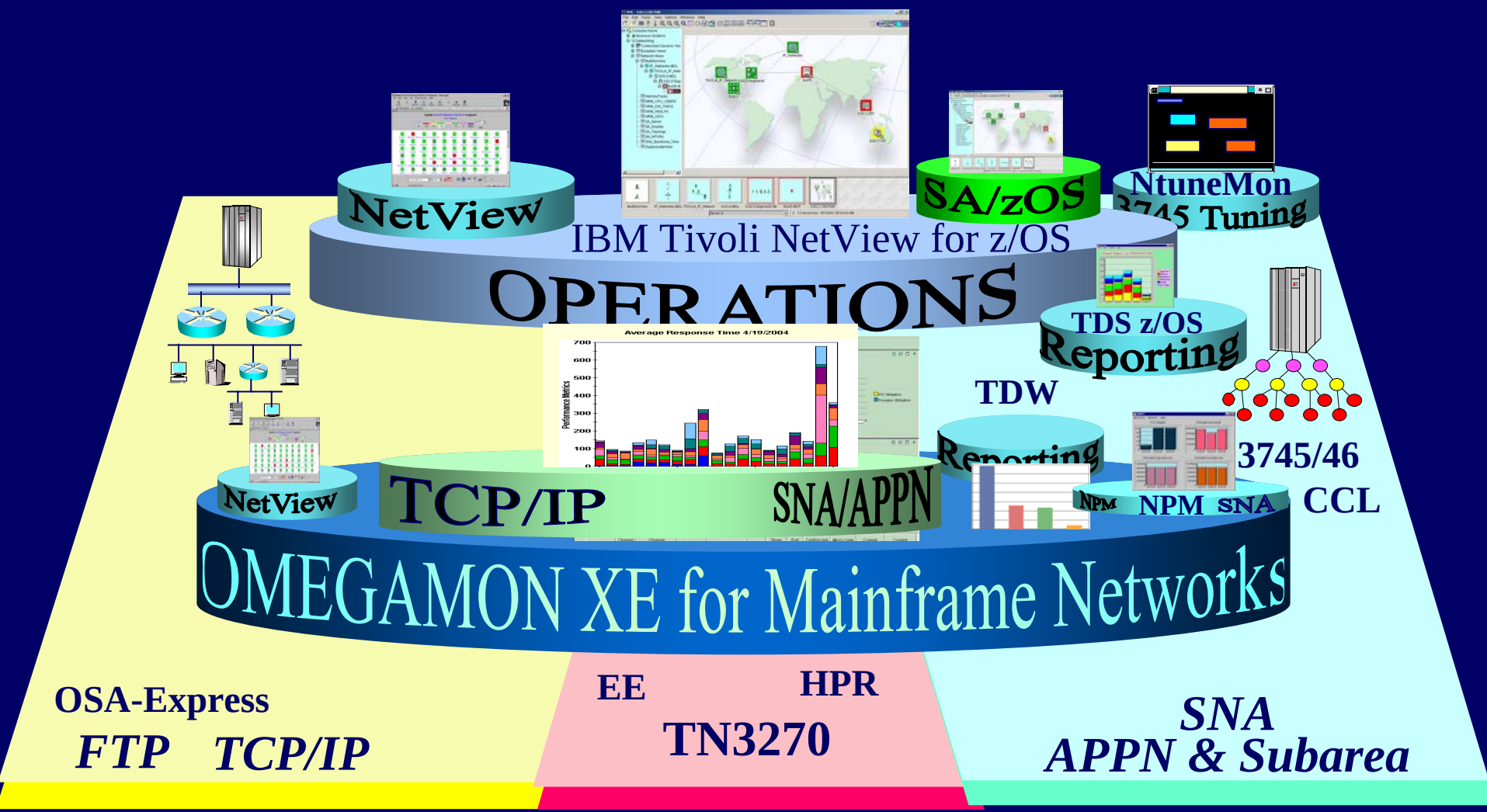
IBM zSeries Network Performance Management

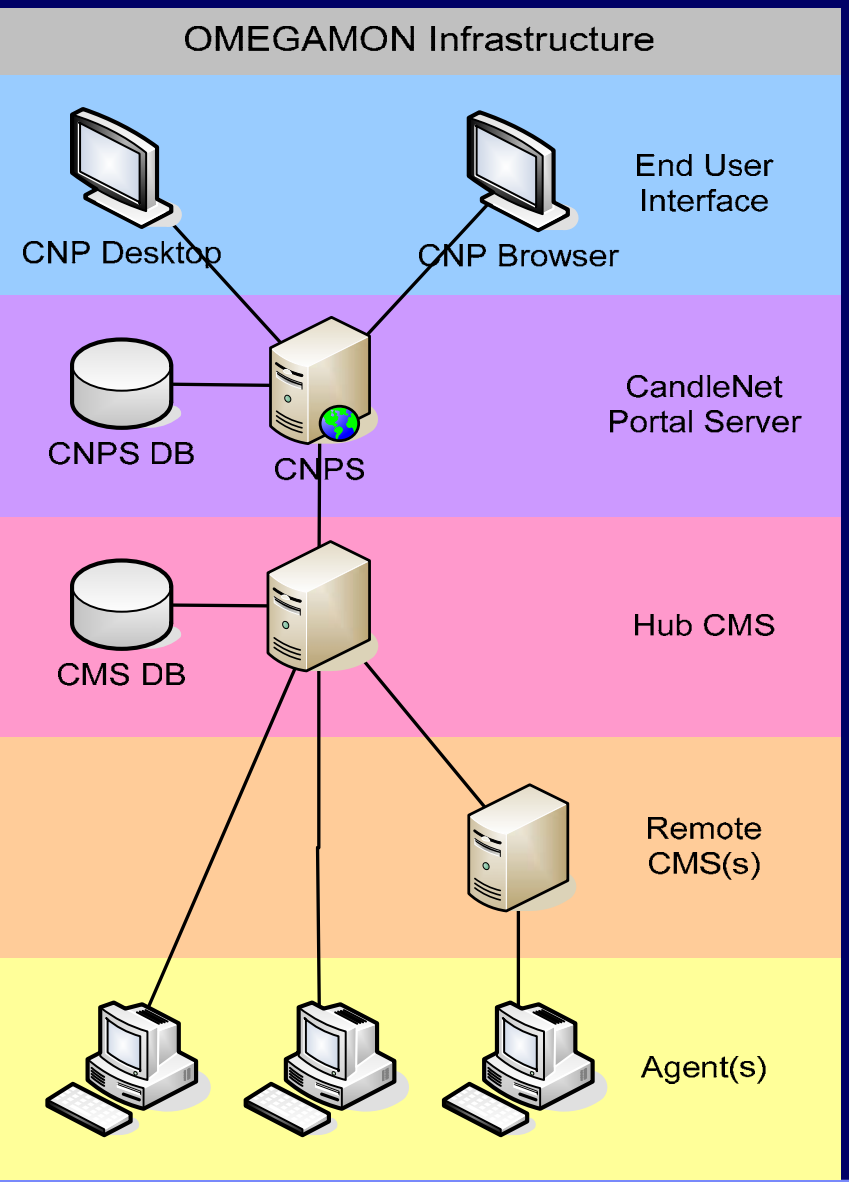


Tivoli z/OS Network Performance and Automation Management

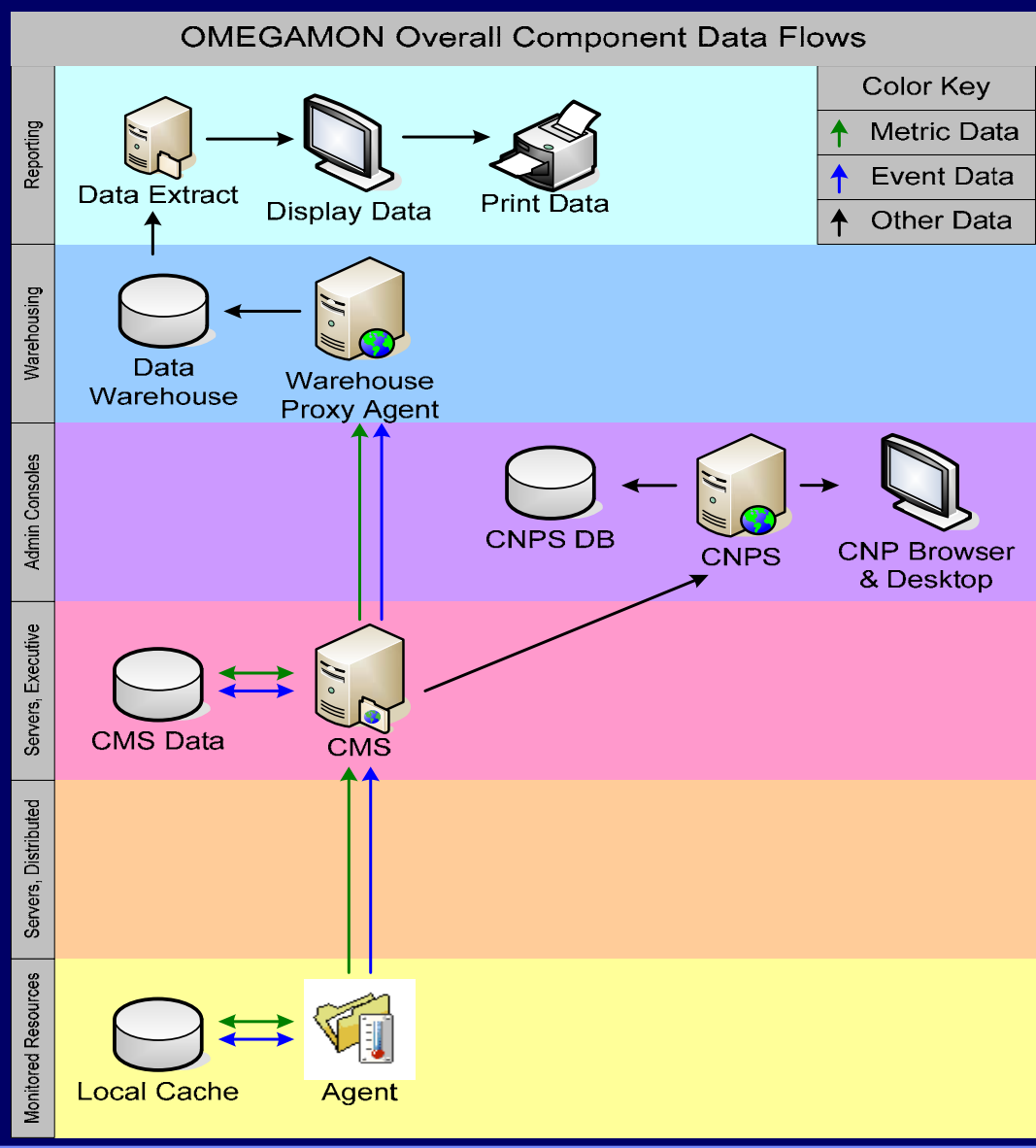


OMEGAMON - Environment

Logical Architecture



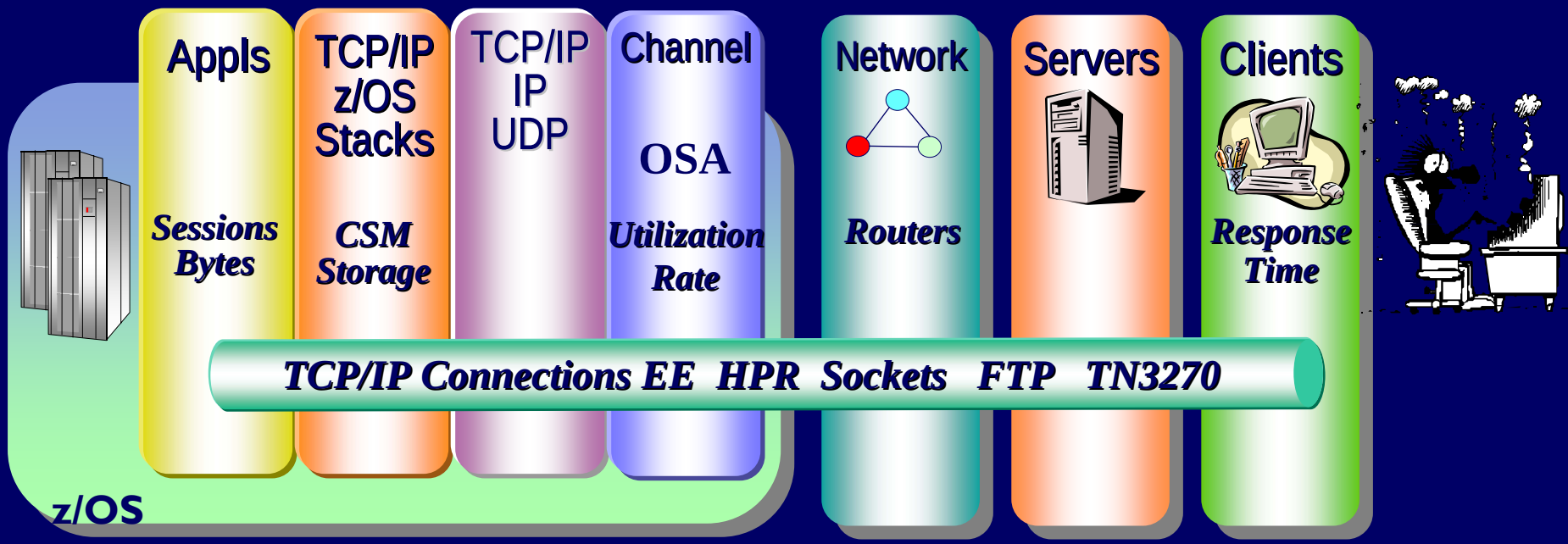
Data Flow



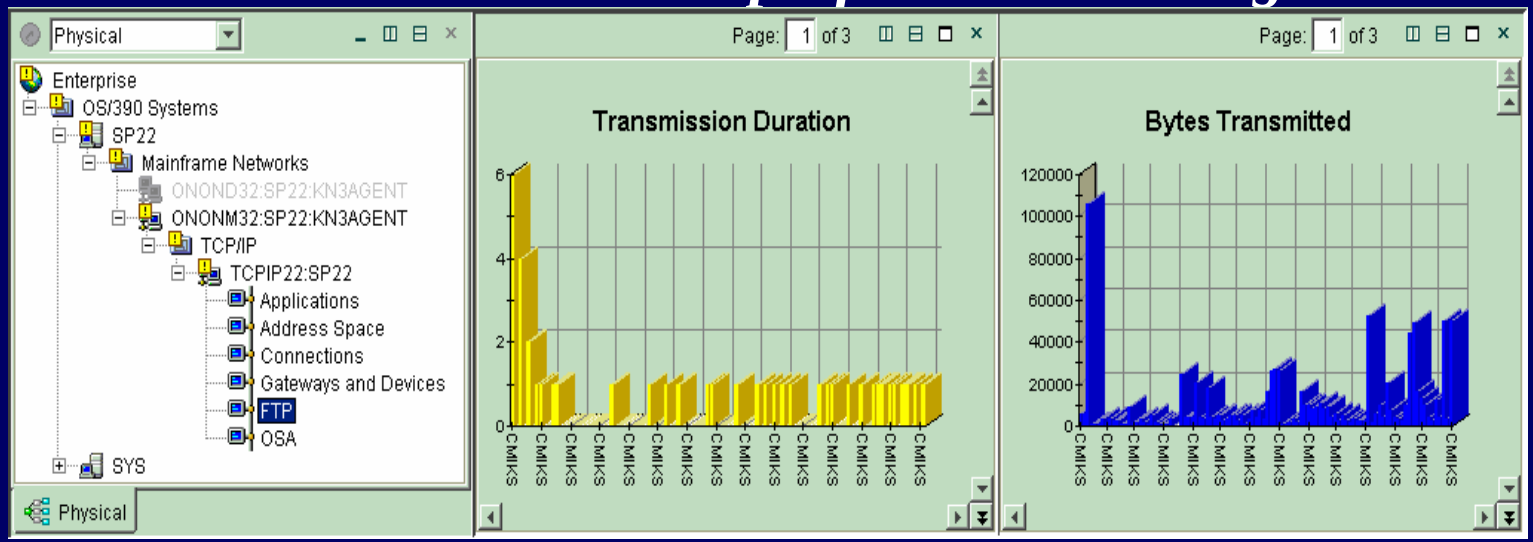
Common z/OS TCP/IP Problems

- IBM TCP/IP z/OS (Communications Server)
- FTP problems, failures, timeouts, hangs
- Unauthorized users doing large FTPs
- TCP/IP just slows down or hangs.
- Long problem resolution times for network problems
- Managing multiple z/OS IP stacks at once
- How to manage SNA over IP
  - (EE, HPR, TN3270)
- Channel problems – OSA Express
- TCP/IP tools do not understand the mainframe

IBM Network Performance Management

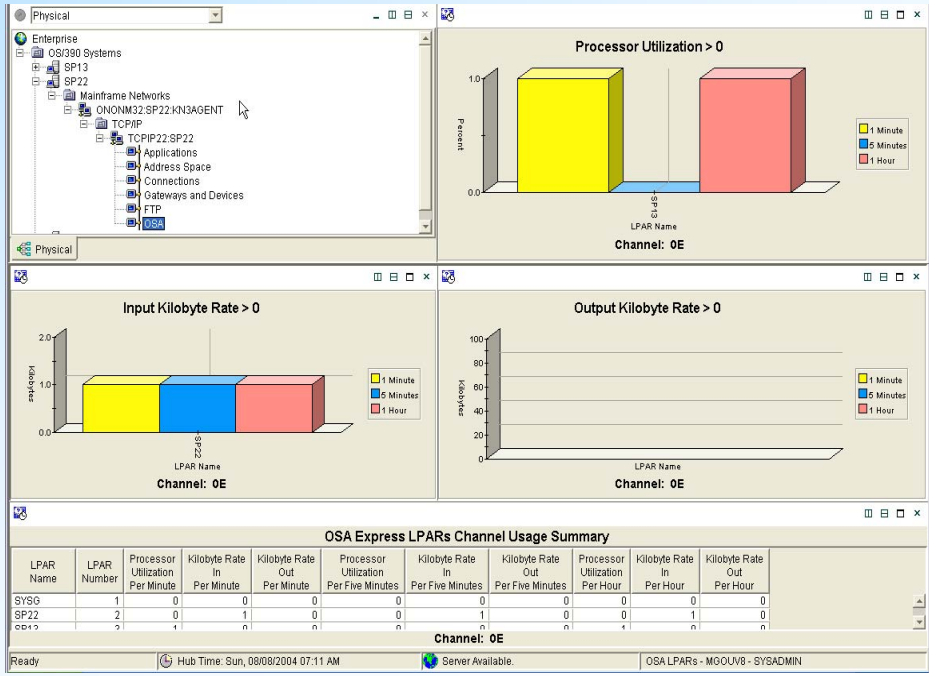


z/OS Oriented TCP/IP end to end performance management



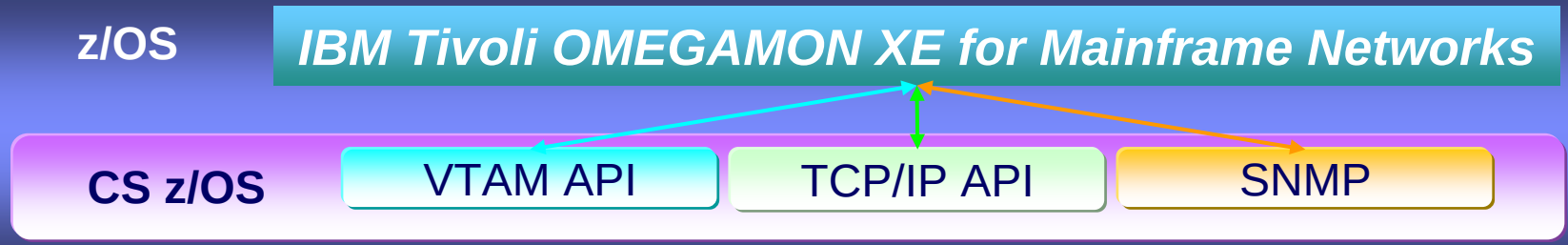
OMEGAMON XE for Mainframe Networks Highlights

- **Common user interface**
  - Candle Net Portal (CNP) and Tivoli Enterprise Portal (TEP)
  - Manage z/OS system resources from a single user interface.
  - Easy to use and Intuitive
  - Displays data in graphs, charts and table format
- **Easy to configure**
  - Define thresholds, Filters, Sort
  - Customize workspaces and reports
  - Generate Events
- **Out of the box**
  - Situations
  - Problem signatures and Expert Advice
- **Integrated**
  - OMEGAMON products
  - NetView for z/OS
  - TEC
  - ITM 6.1 (TEP)



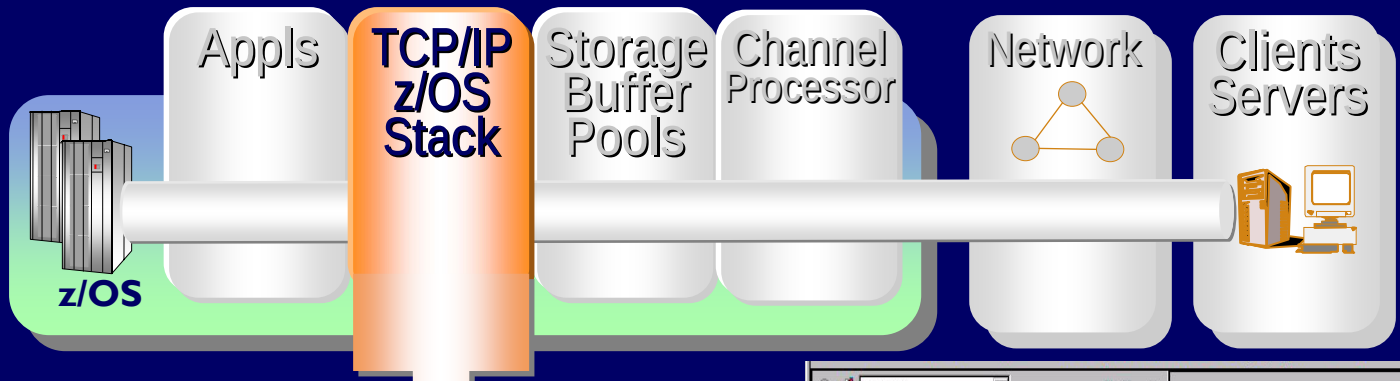
z/OS Network Performance Data Collection Points

- ✓Fast
- ✓Scalable
- ✓Reliable



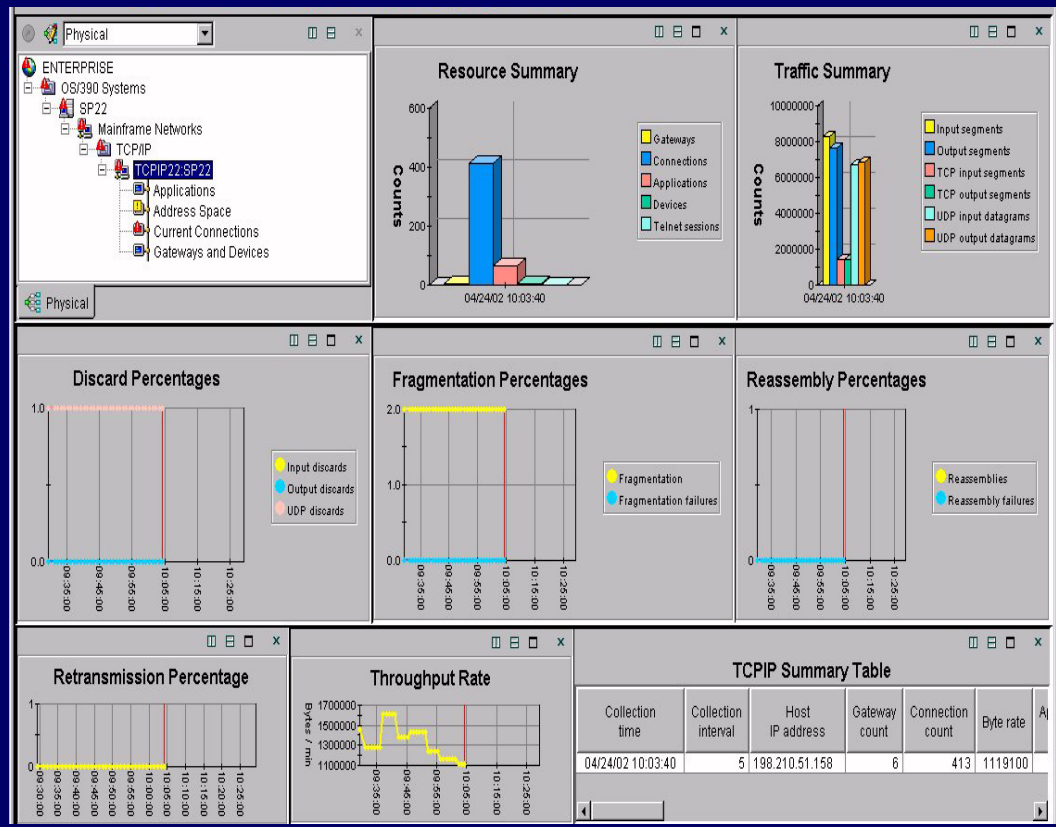
- **Collected using the z/OS Communications Server TCP/IP API:**
  - Applications
  - Connections including TCP Connections, TCP Listeners and UDP End Points
  - FTP Sessions and Transfers
  - TN3270 Server Sessions
  - TCP/IP Memory Statistics
- **Collected using the z/OS Communications Server VTAM API:**
  - VTAM Summary
  - CSM Buffer Pools
  - Enterprise Extender connections (EE)
  - High Performance Routing connections (HPR)
- **Collected using SNMP:**
  - TCP/IP Summary
  - TCP/IP Stack Layers
  - Gateways and Devices
  - Interfaces
  - OSA

z/OS TCP/IP Stack

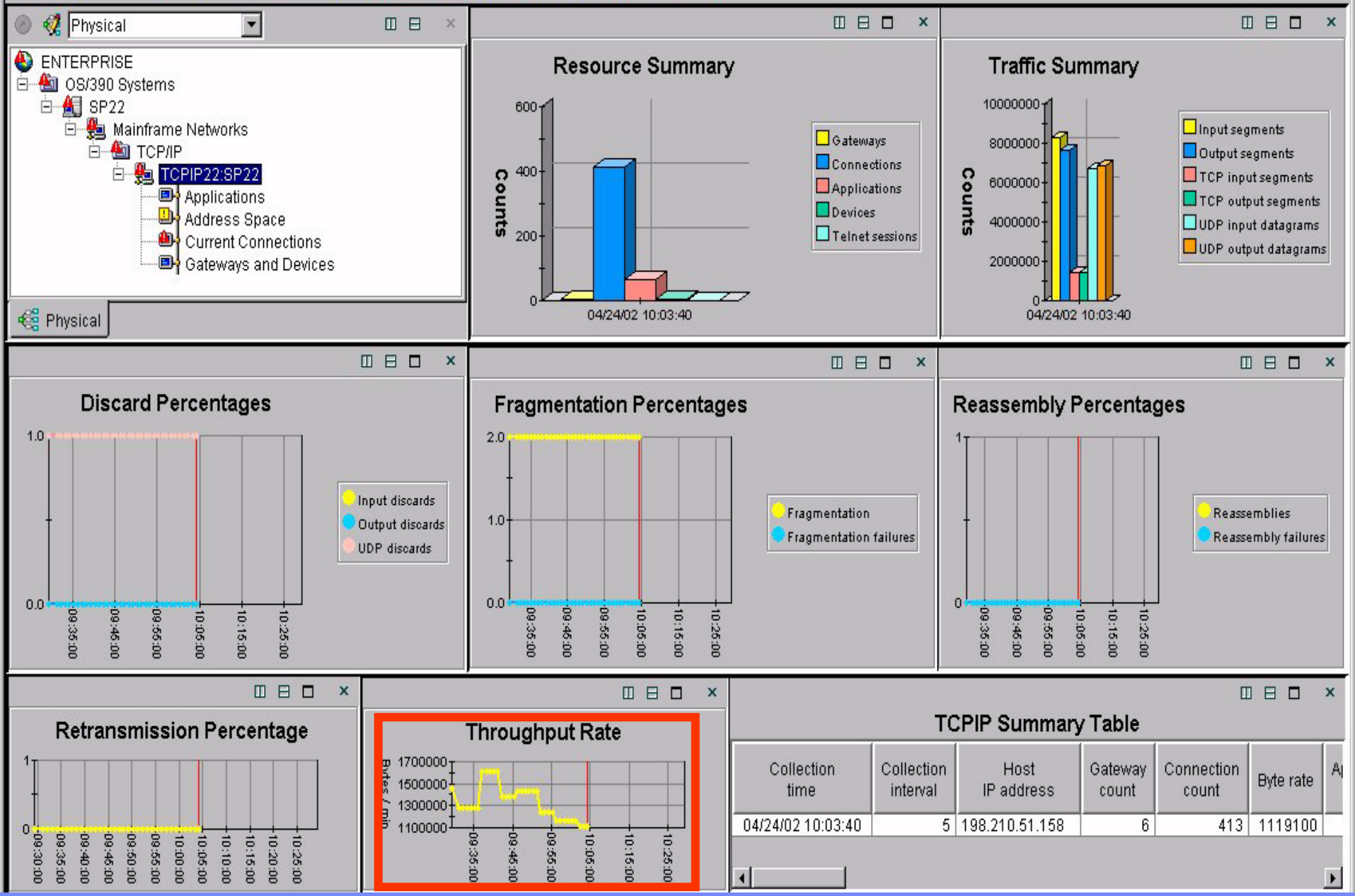


Why is my TCP/IP stack running so slow?

- **Statistics by Stack**
- **Receive and Transmit rates**
- **Segment Errors**
- **Out of order errors**



Detect Intermittent Problems



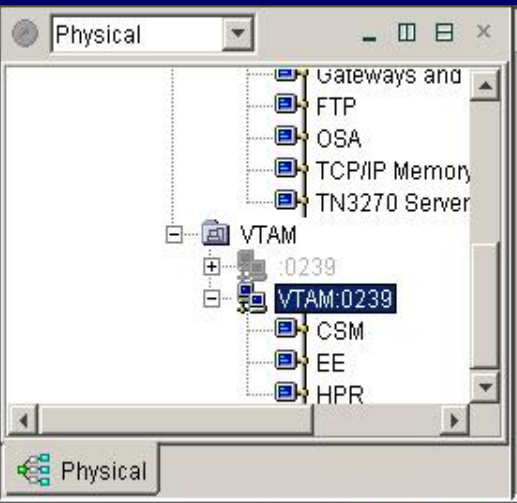
Historical Trend Data

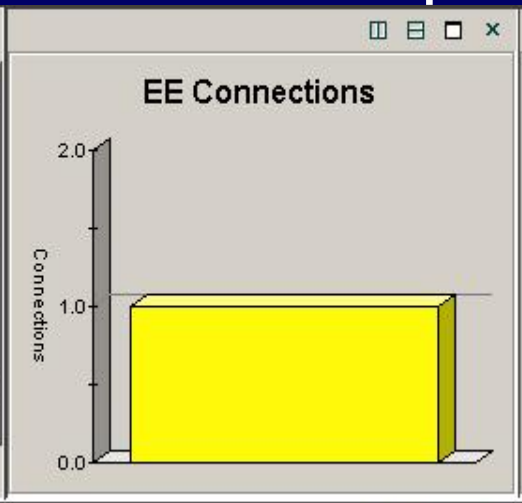
Erratic Response Time Highlighted

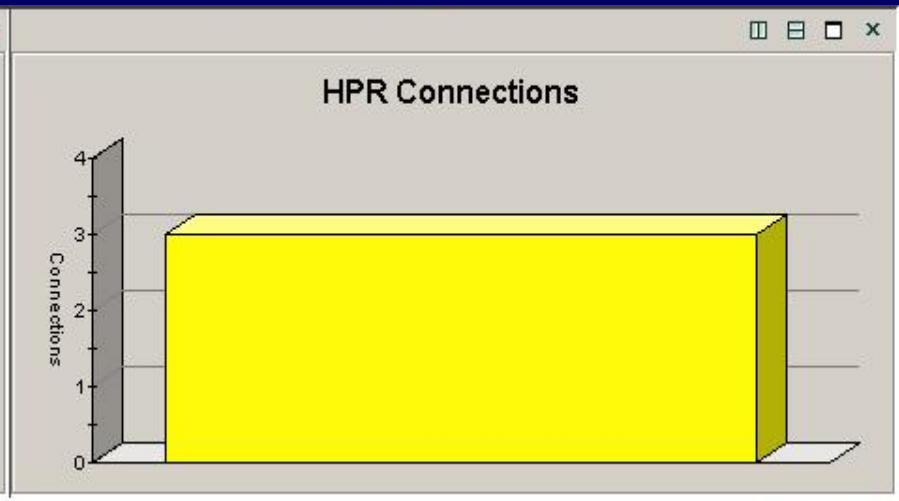
Connections Summary Table

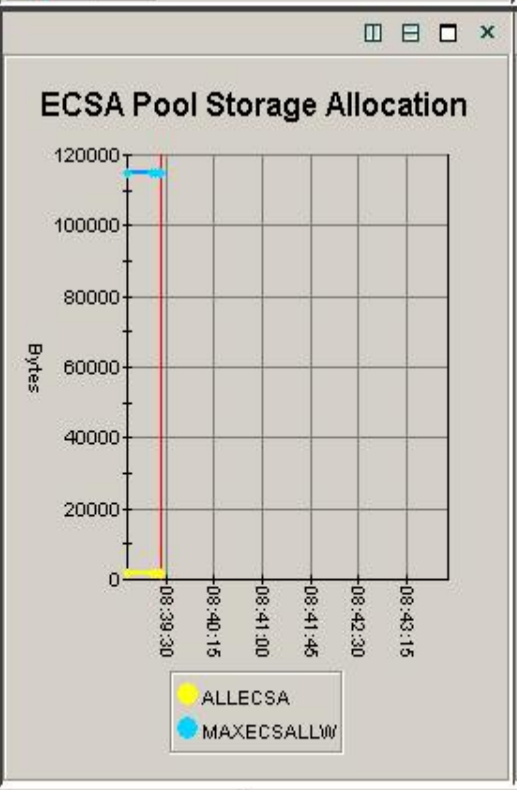
Application Name	Local Port	Foreign Socket	Byte Rate	Bytes In Last Sample	Bytes Out Last Sample	Datagram Rate	Datagrams In Last Sample	Datagrams Out Last Sample	Total Retransmits	Round Trip Time	R \
VFCTH@@L	21326	198.210.51.158..2500	2414	9784	2288	0	0	0	0	1.10	
PLDSOS6	26060	*..*	125	416	208	1	2	2	0	0.00	
PLDSOS6	6199	*..*	10	24	24	1	2	2	0	0.00	
PLDSOS6	6200	*..*	62	104	208	0	1	1	0	0.00	
PLDSOS6	6203	*..*	62	104	208	0	1	1	0	0.00	
VFCTH@@L	21326	198.210.51.146..1030	306	1330	200	0	0	0	1	0.17	
EDMQ030	7381	*..*	216	540	540	18	45	45	0	0.00	
EDMQ030	7386	*..*	9160	41752	4048	18	45	45	0	0.00	
EDMQ040	7396	*..*	2210	888	10164	4	10	10	0	0.00	
EDMQ040	7399	*..*	2726	1152	12476	5	13	13	0	0.00	
EDMQ040	7428	*..*	2210	888	10164	4	10	10	0	0.00	
EDMQ030	7576	*..*	41	96	108	0	1	1	0	0.00	
VCCTW@@L	1044	198.210.51.174..21323	101356	31860	474922	0	0	0	183	0.24	
CSC2SP22	1153	*..*	29	72	72	2	6	6	0	0.00	
CSC2SP22	1169	*..*	266	720	612	2	6	6	0	0.00	
CSC2SP22	1173	*..*	136	188	490	1	2	2	0	0.00	
PLDSOS6	9621	*..*	341	0	1704	4	0	18	0	0.00	
PLDSOS6	9622	*..*	341	0	1704	4	0	18	0	0.00	
PLDSOS6	9788	*..*	341	0	1704	4	0	18	0	0.00	
PLDSOS6	9789	*..*	341	0	1704	4	0	18	0	0.00	
CSC2SP22	9975	*..*	190	184	764	1	2	2	0	0.00	
VAN3@@@L	10082	*..*	28800	130297	13703	79	198	198	0	0.00	
MCMQB07	10123	*..*	9571	836	47020	12	9	49	0	0.00	
BBOWEB40	3555	198.210.51.158..47275	298	308	1184	0	0	0	0	2.13	
MCMQB07	47275	198.210.51.158..3555	298	1184	308	0	0	0	0	2.44	
VFN3H@@L	1196	*..*	28843	130301	13914	79	198	198	0	0.00	
CSC2SP22	1200	*..*	190	184	764	1	2	2	0	0.00	
VFONH@@L	1203	*..*	144308	651995	69544	396	990	990	0	0.00	

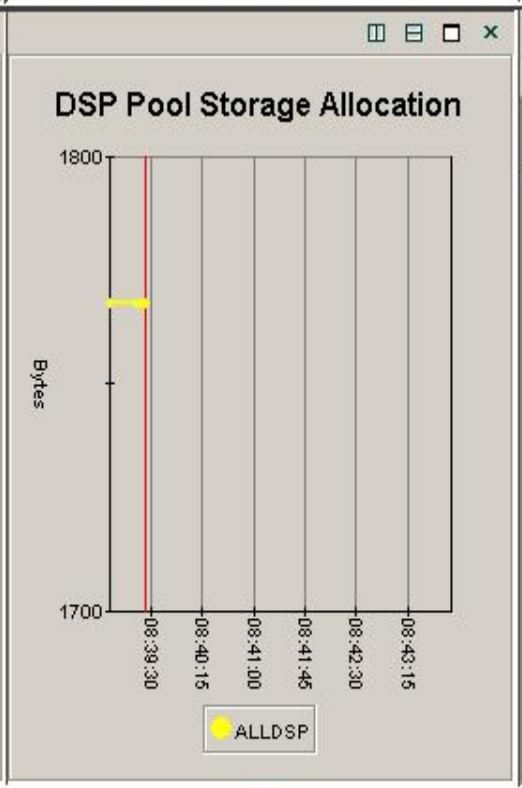
New VTAM Workspace







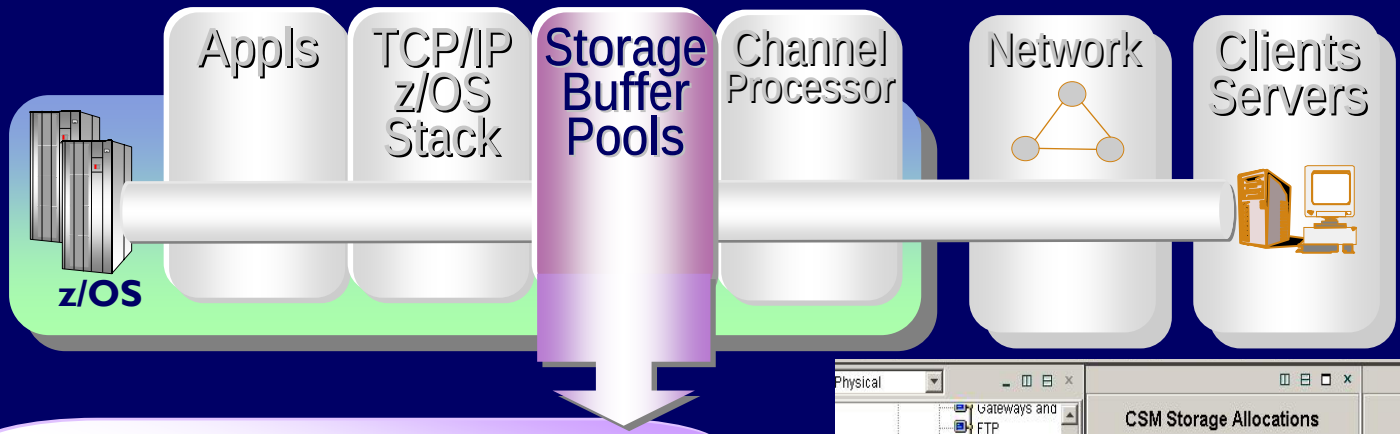




Table

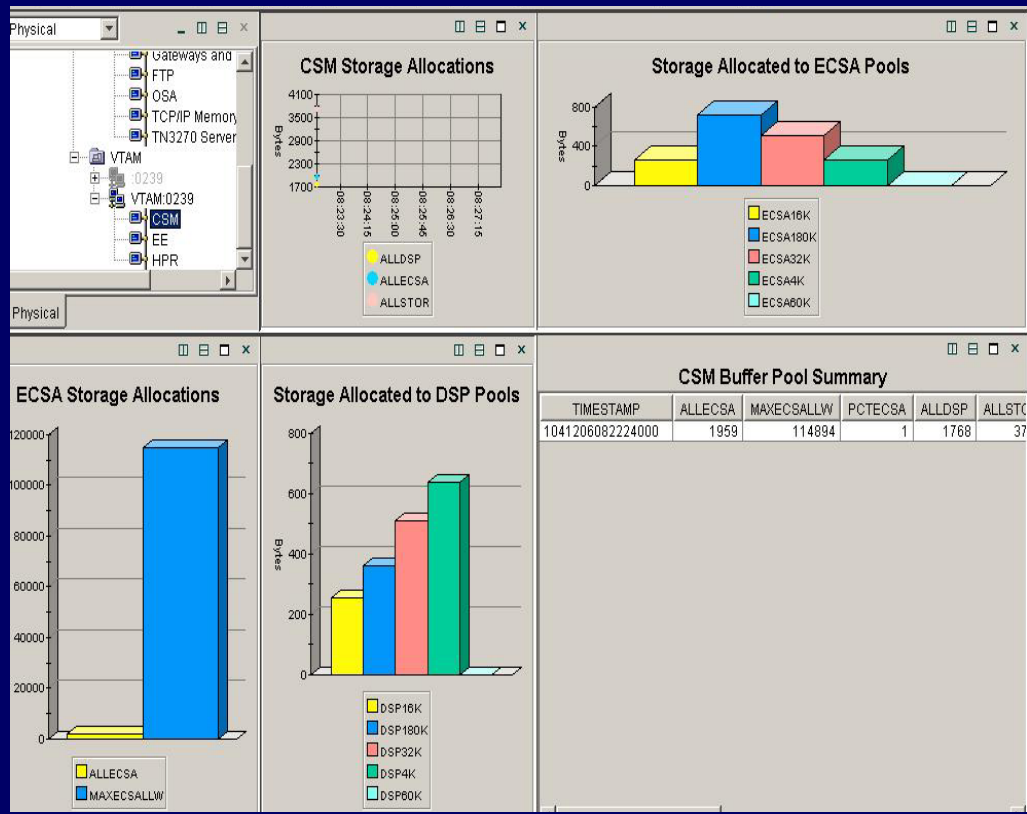
TIMESTAMP	EECONNCNT	HPRCONNCNT	ALLECSA	MAXECSALL
1041206083824000	1	3	1959	1148

Storage and Buffer Pools

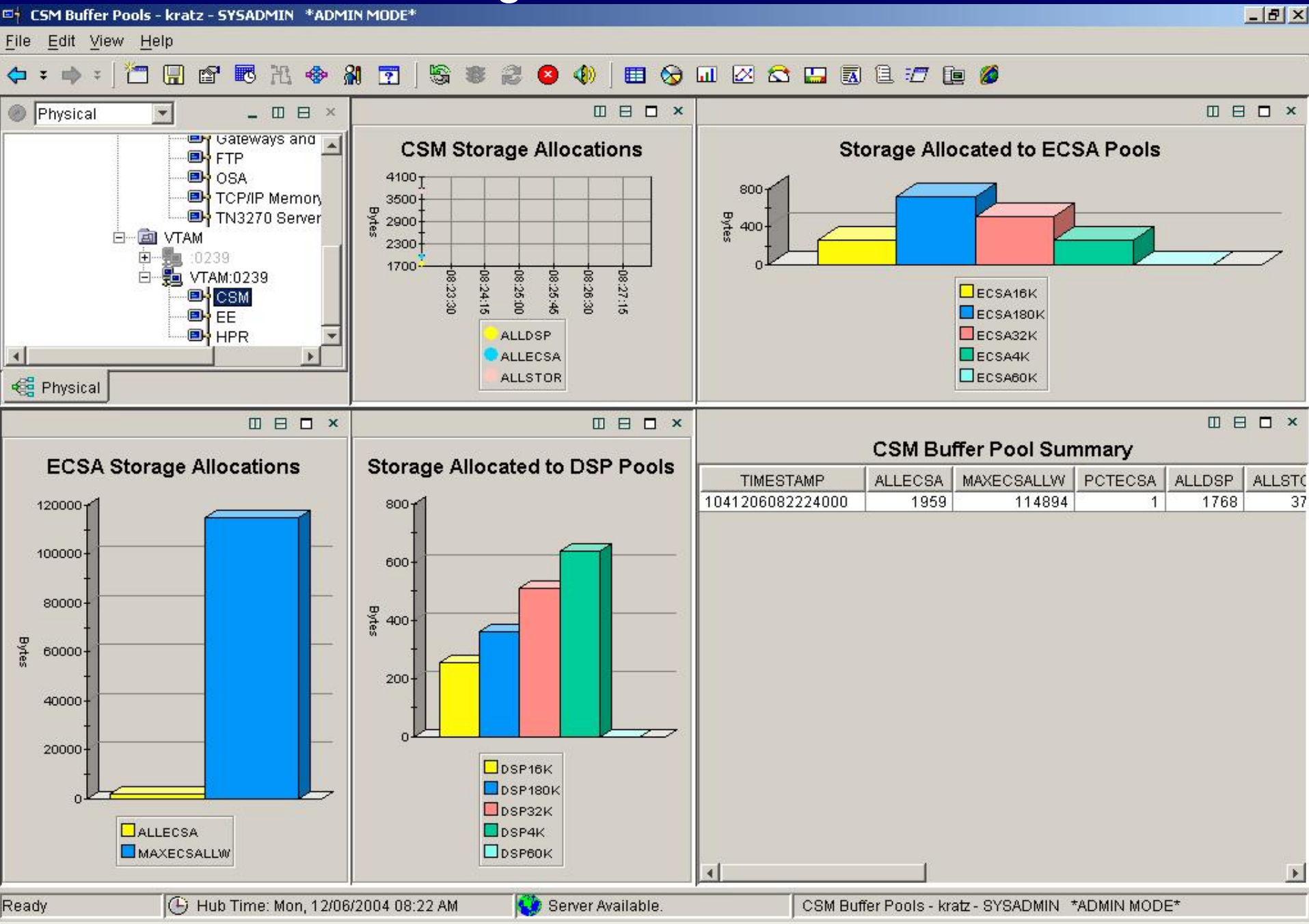


Is TCP/IP data backing up into my z/OS?

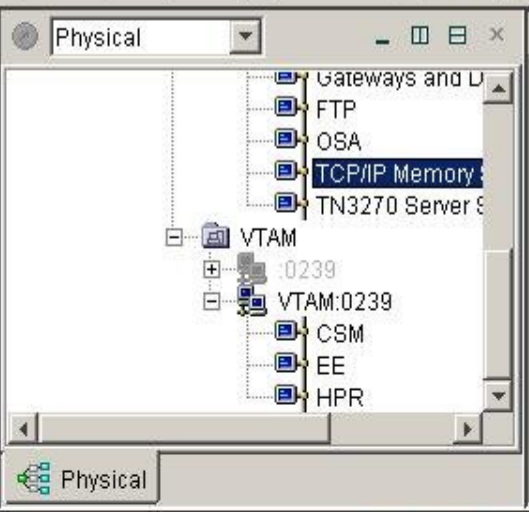
- CSM
- DSP
- ECSA
- VTAM Buffers

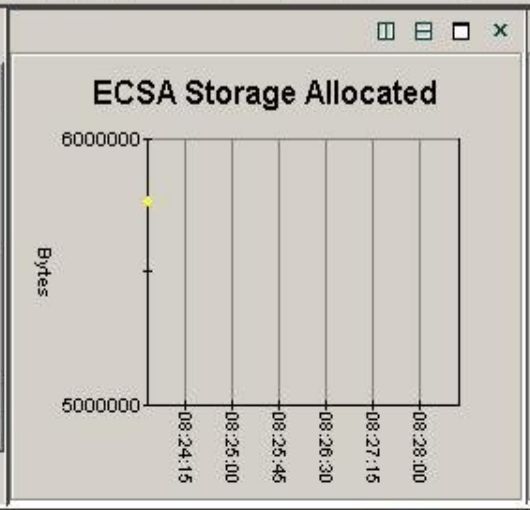


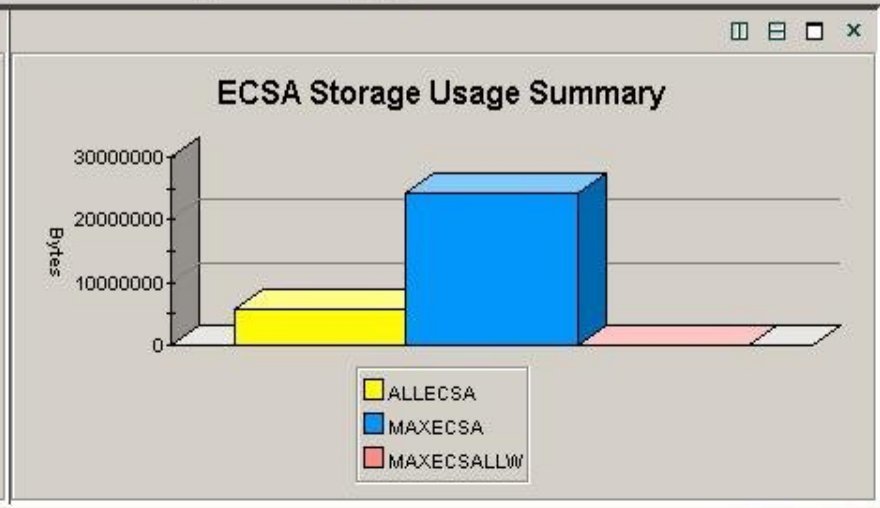
VTAM Storage

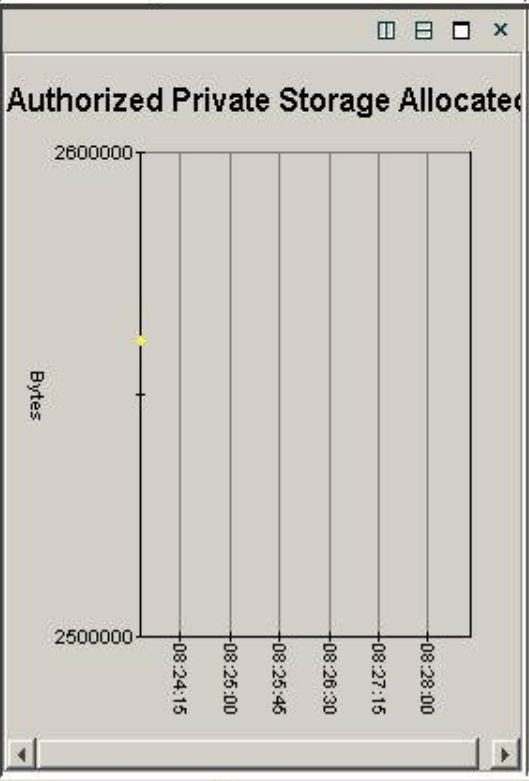


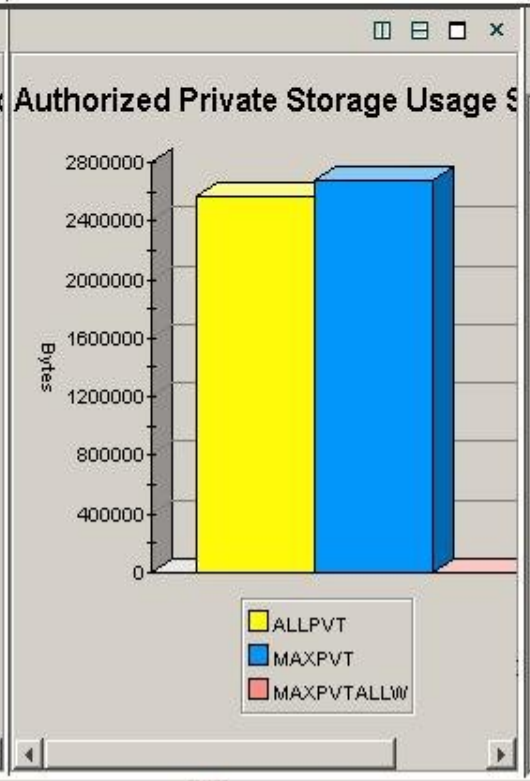
TCP/IP Memory

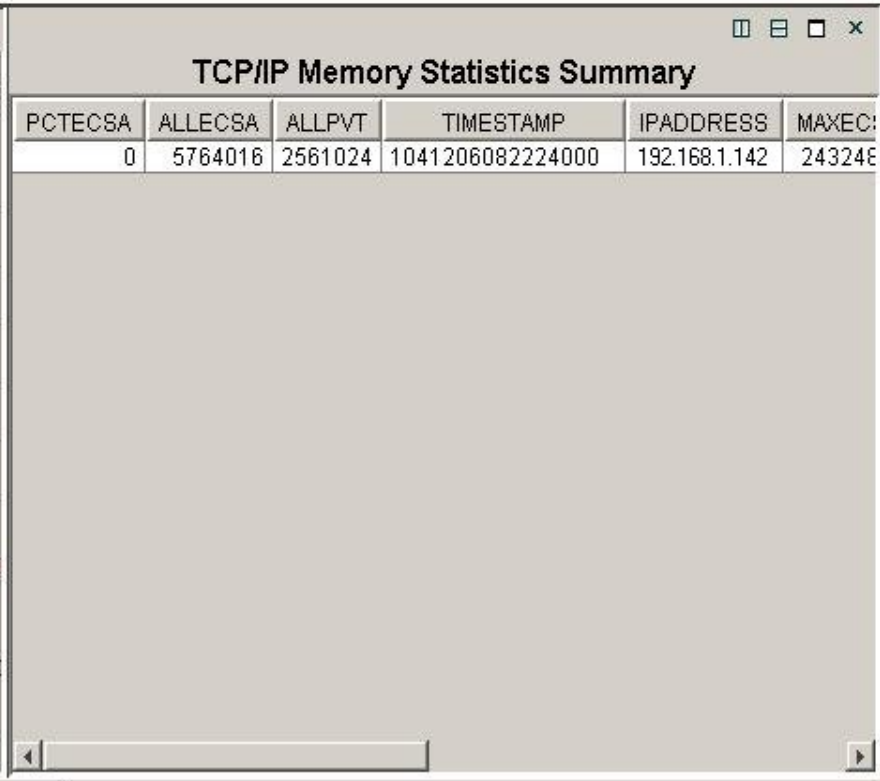






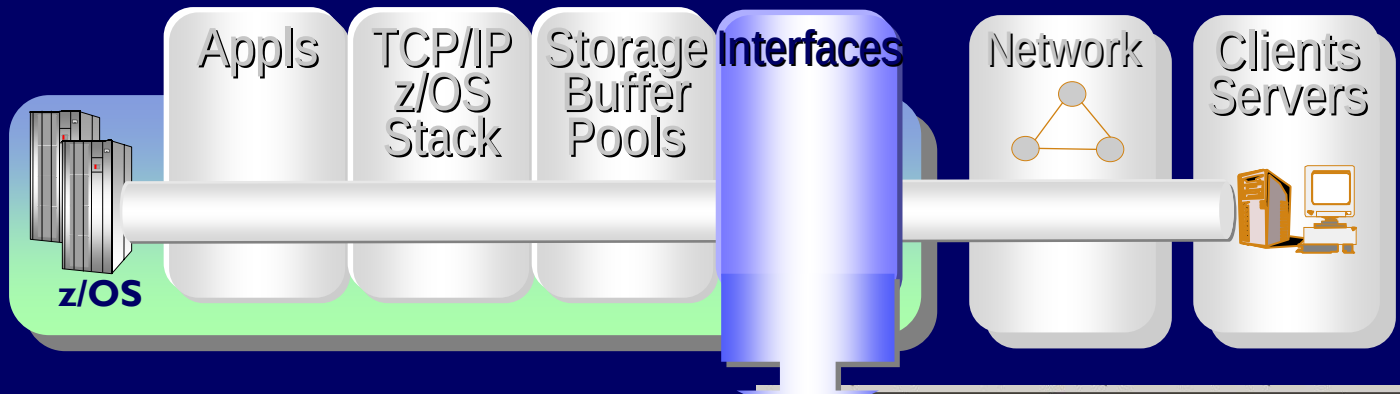






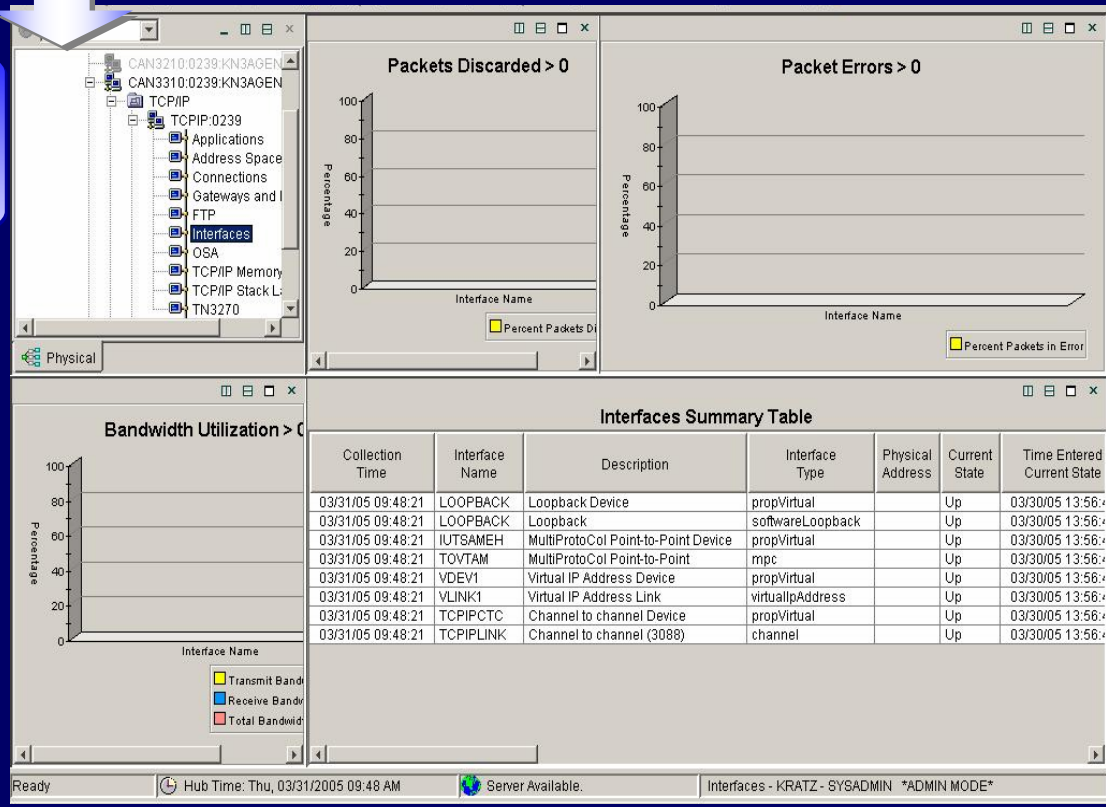
PCTECSA	ALLECSA	ALLPVT	TIMESTAMP	IPADDRESS	MAXEC
0	5764016	2561024	1041206082224000	192.168.1.142	243248

zSeries Interfaces

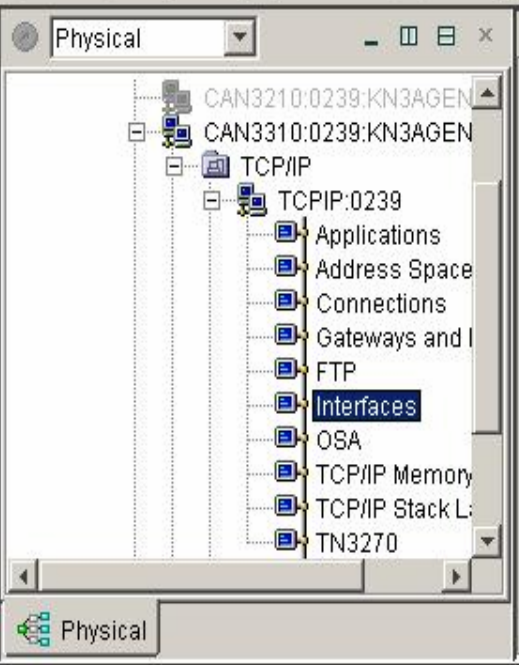


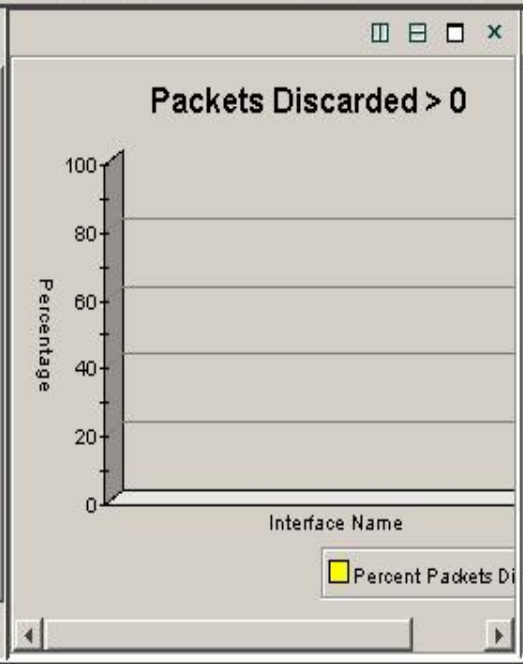
What is the performance of my channels?

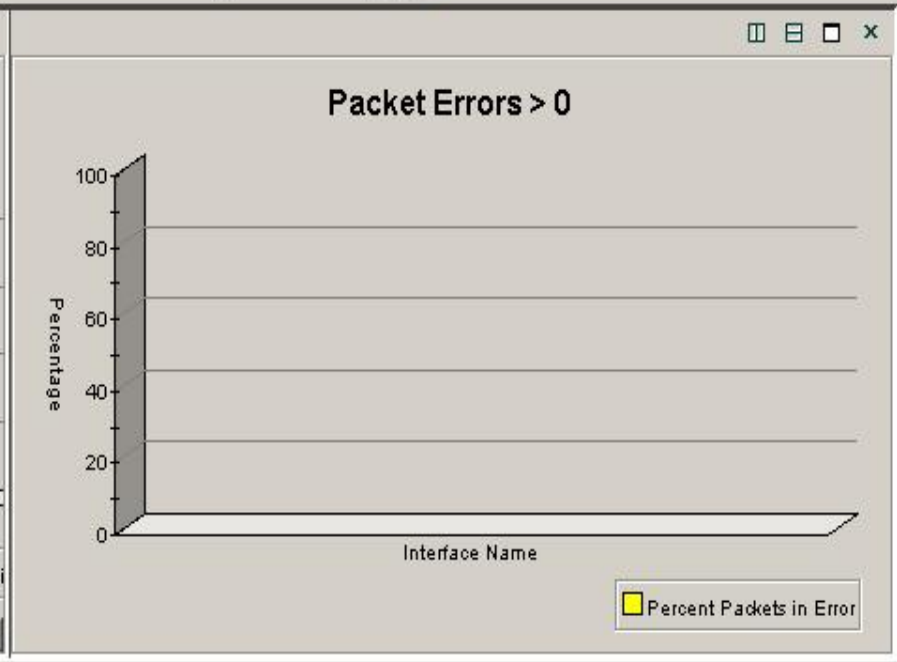
- Current Status
- MTU
- Transmission Rates
- Bandwidth utilization
- Error Rates

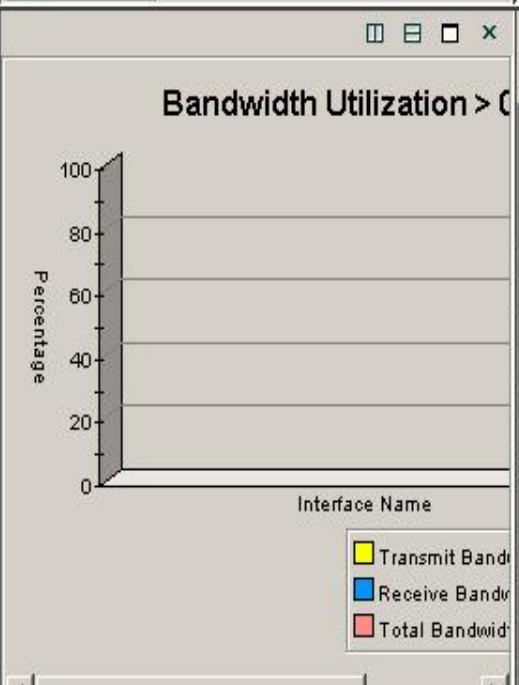


Interfaces





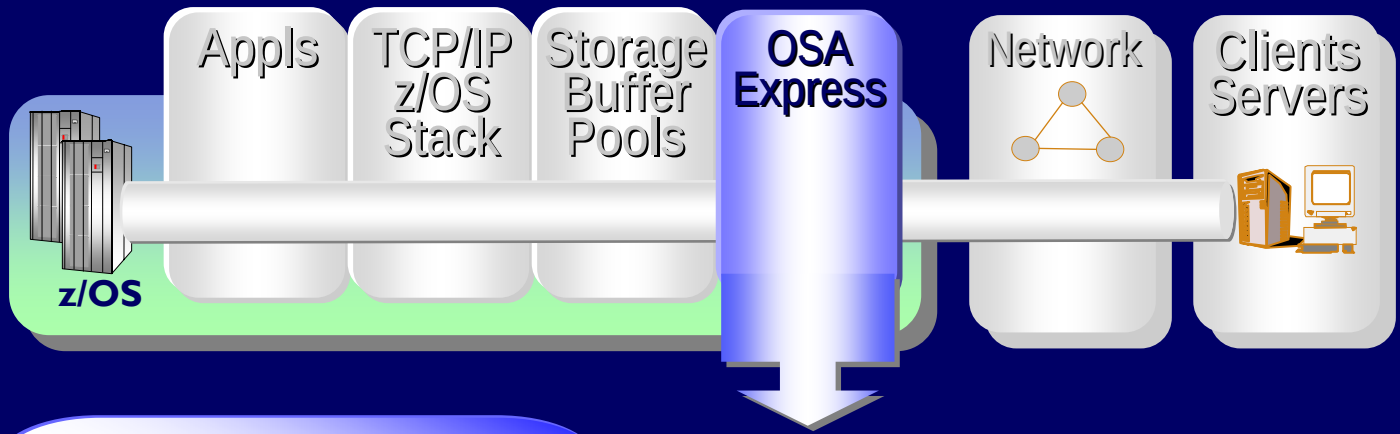




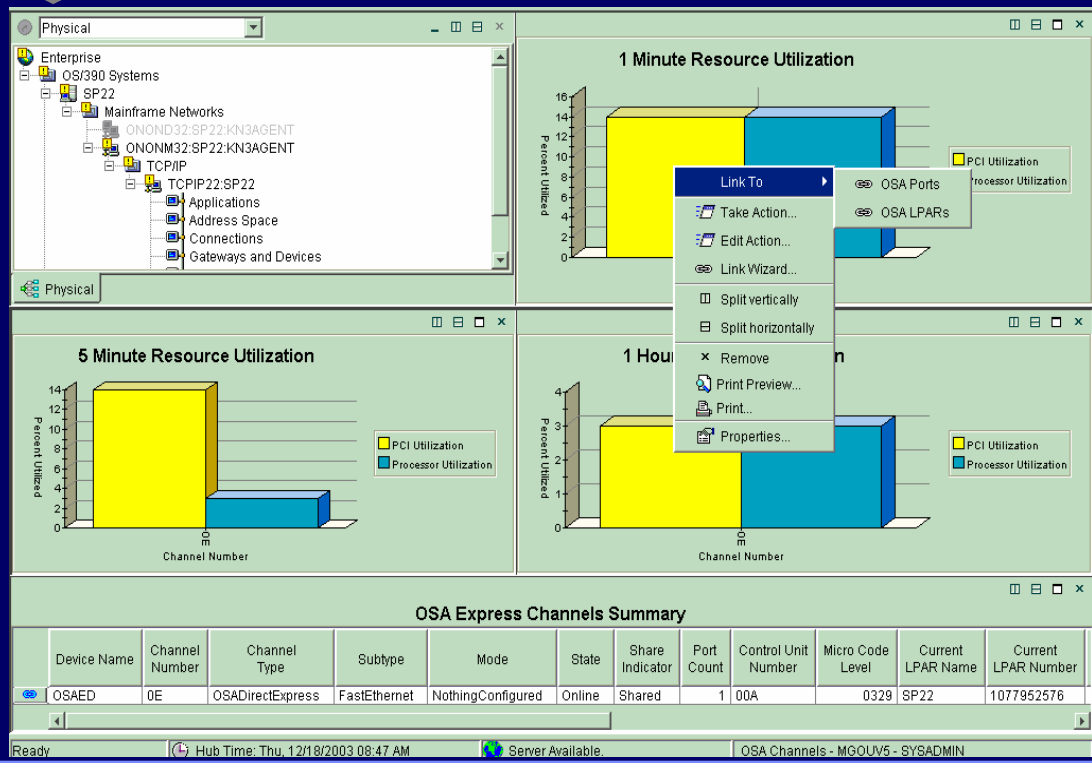
Interfaces Summary Table

Collection Time	Interface Name	Description	Interface Type	Physical Address	Current State	Time Entered Current State
03/31/05 09:48:21	LOOPBACK	Loopback Device	propVirtual		Up	03/30/05 13:56:
03/31/05 09:48:21	LOOPBACK	Loopback	softwareLoopback		Up	03/30/05 13:56:
03/31/05 09:48:21	IUTSAMEH	MultiProtoCol Point-to-Point Device	propVirtual		Up	03/30/05 13:56:
03/31/05 09:48:21	TOVTAM	MultiProtoCol Point-to-Point	mpc		Up	03/30/05 13:56:
03/31/05 09:48:21	VDEV1	Virtual IP Address Device	propVirtual		Up	03/30/05 13:56:
03/31/05 09:48:21	VLINK1	Virtual IP Address Link	virtualIpAddress		Up	03/30/05 13:56:
03/31/05 09:48:21	TCPIPCTC	Channel to channel Device	propVirtual		Up	03/30/05 13:56:
03/31/05 09:48:21	TCPIPLINK	Channel to channel (3088)	channel		Up	03/30/05 13:56:

OSA Express Adapter

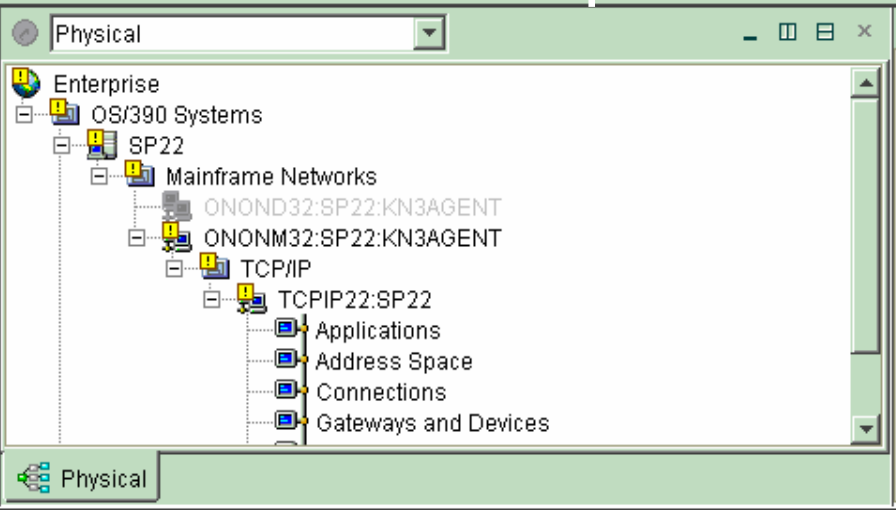


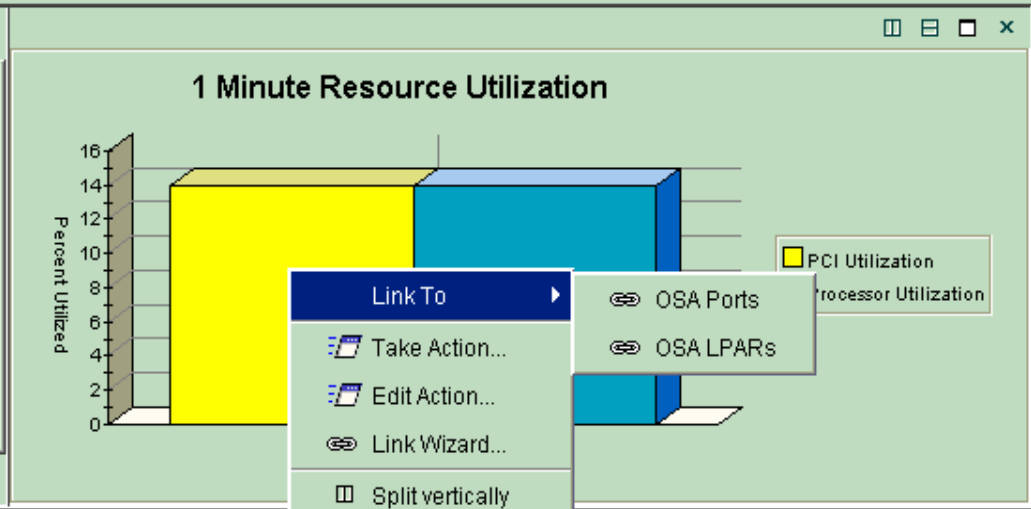
What is my OSA Express adapter utilization

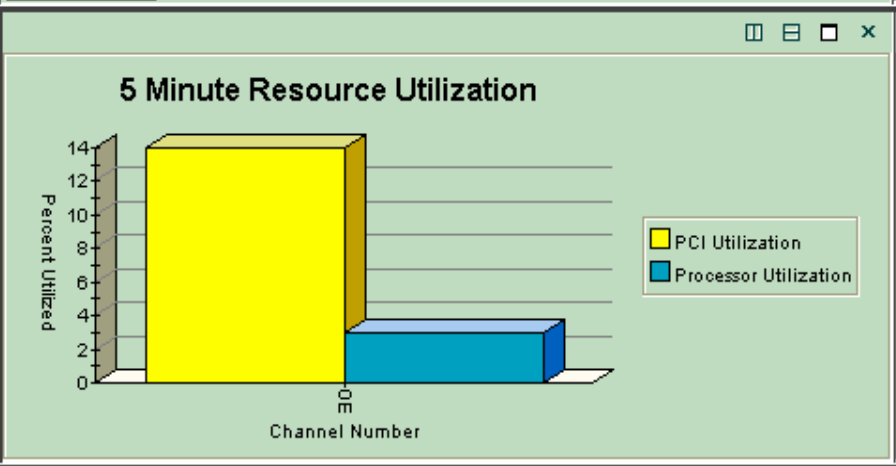


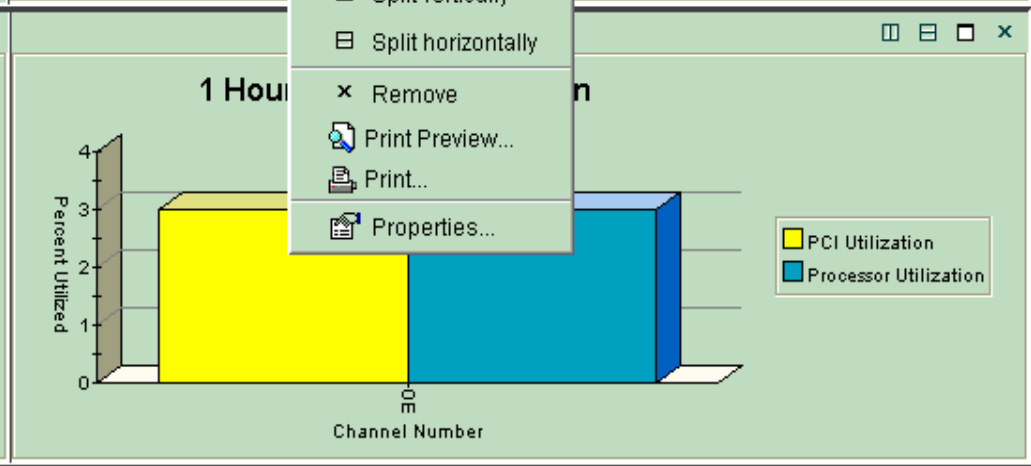
- Utilization
- Transmission Rates
- Mac address
- Channel ID
- Port Name
- Adapter capacity

OSA Express Performance







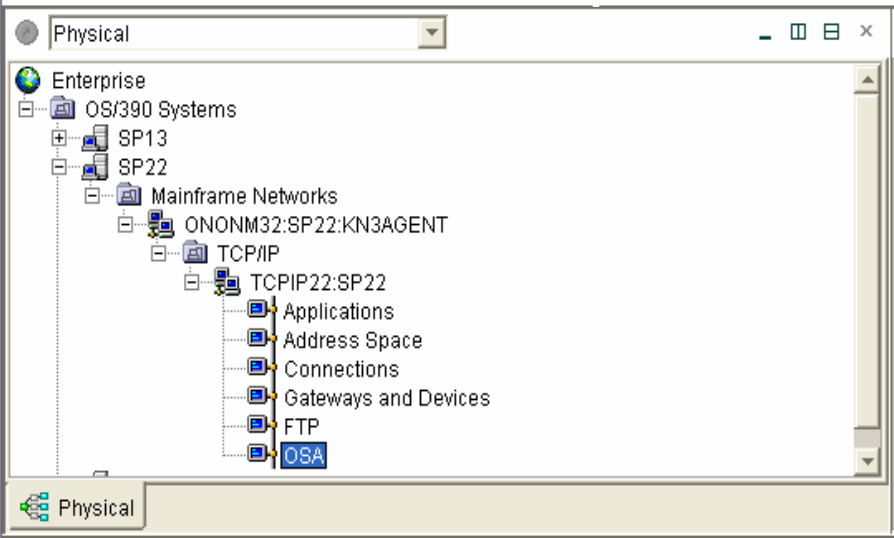


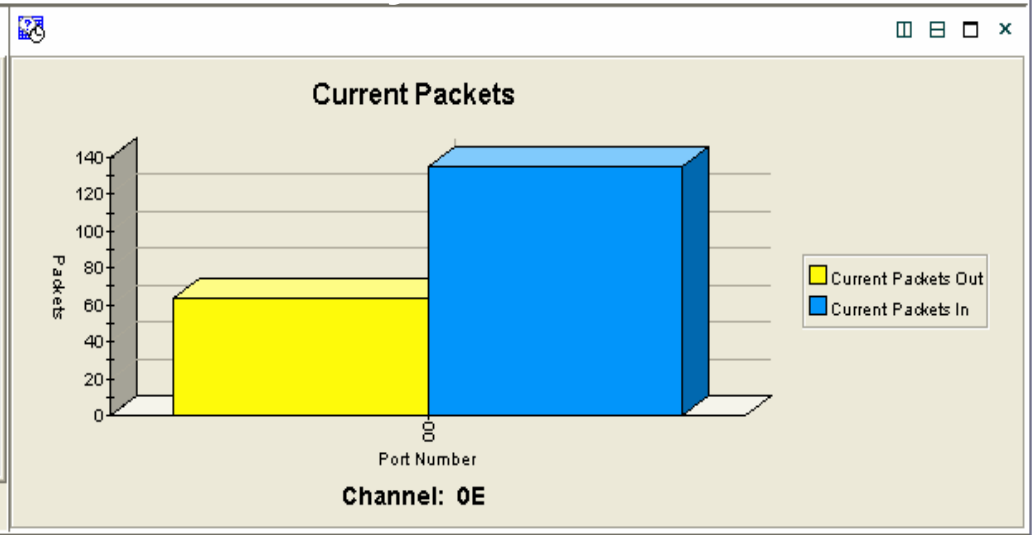
OSA Express Channels Summary

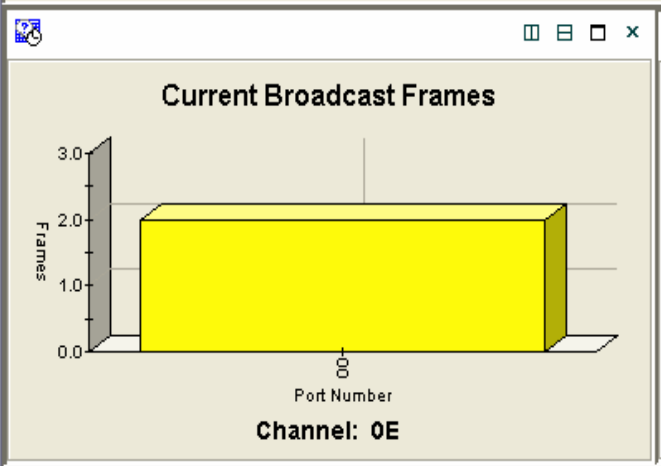
	Device Name	Channel Number	Channel Type	Subtype	Mode	State	Share Indicator	Port Count	Control Unit Number	Micro Code Level	Current LPAR Name	Current LPAR Number
	OSAED	0E	OSADirectExpress	FastEthernet	NothingConfigured	Online	Shared	1	00A	0329	SP22	1077952576

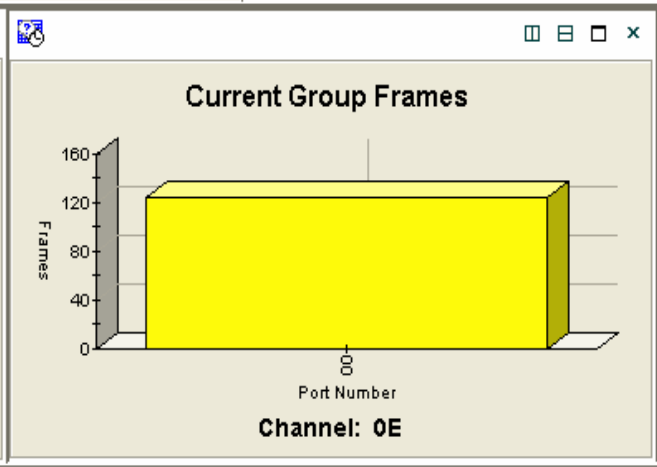
Ready | Hub Time: Thu, 12/18/2003 08:47 AM | Server Available. | OSA Channels - MGOUV5 - SYSADMIN

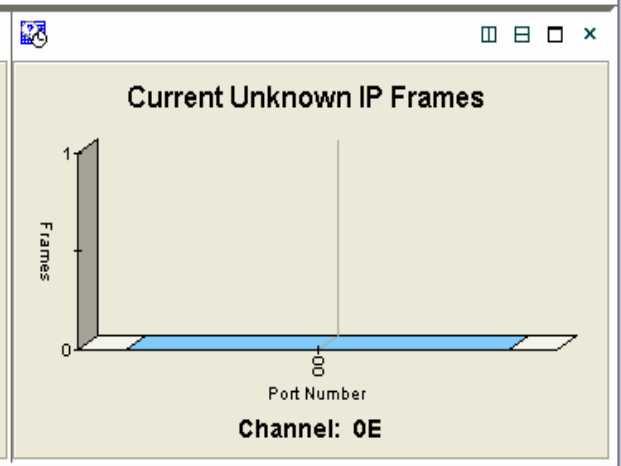
OSA-Express Ports Summary









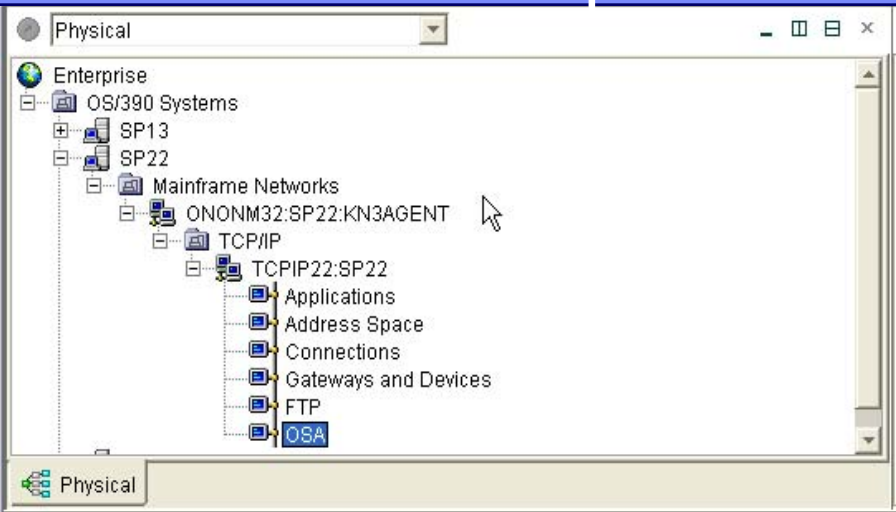


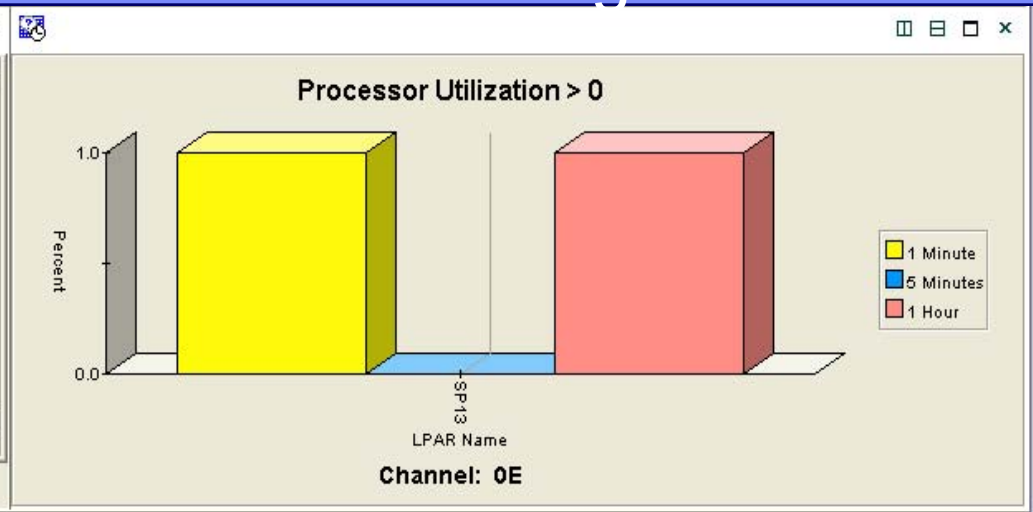
OSA Express Ports Summary

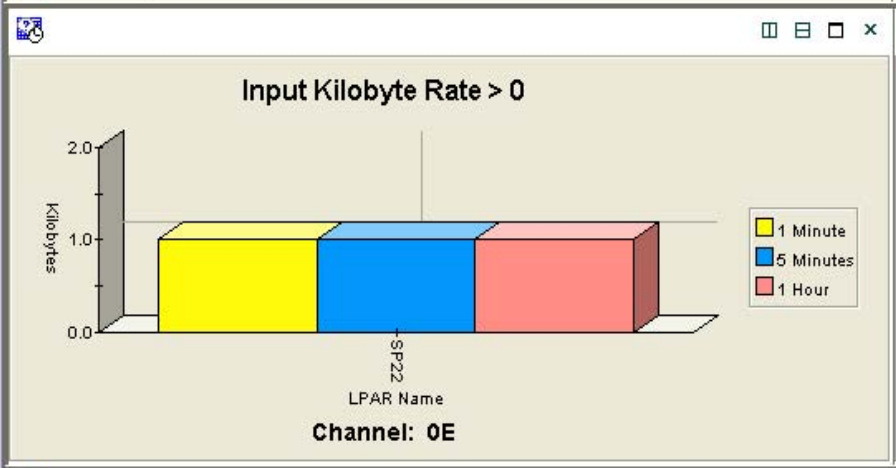
Port Name	Port Number	Link Name	Port Type	Hardware State	Disabled Status	Service Mode	Configuration Name	Configuration Speed	Active Speed	Active MA Address
OSAED	00	OSAEL	fastEthernet	Enabled	n/a	NotInServiceMode	IBM Default ConfigurationFile Feth	AutoNegotiate	OneHundredMbHalfDuplex	000629DC4

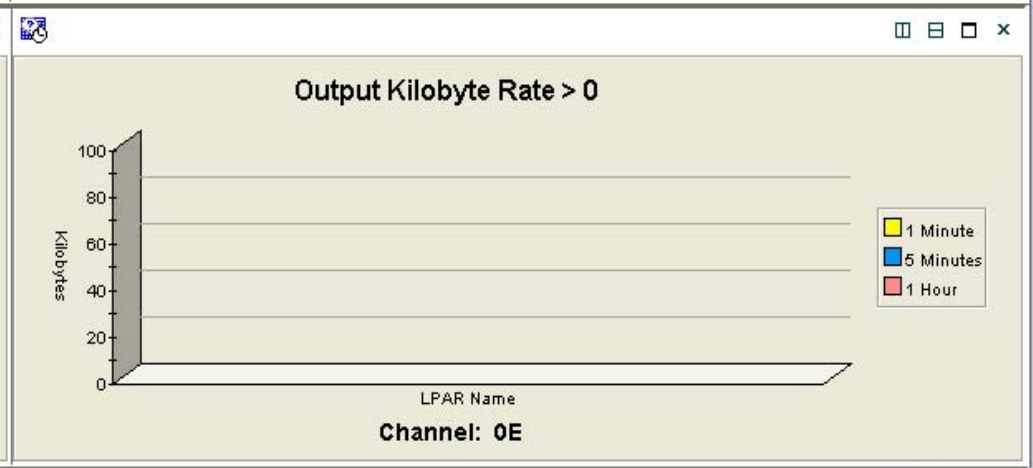
Channel: 0E

OSA Express LPARs Channel Usage







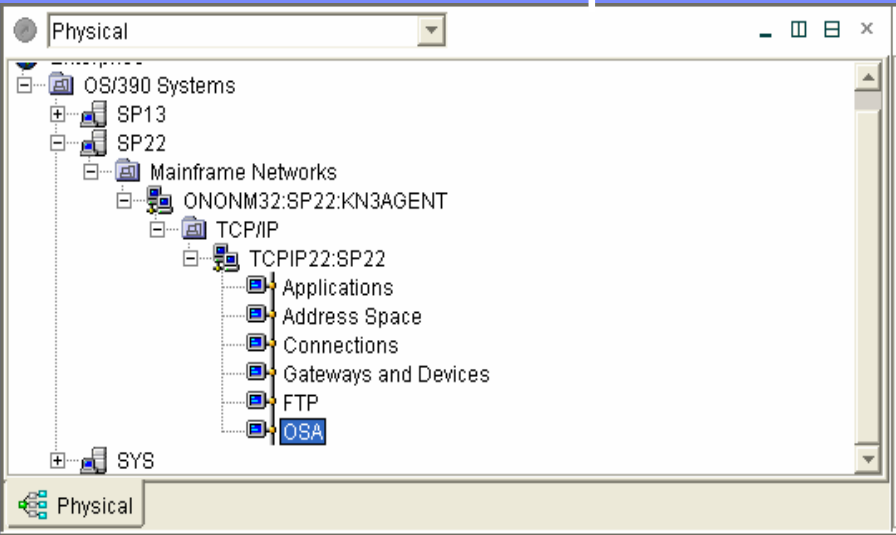


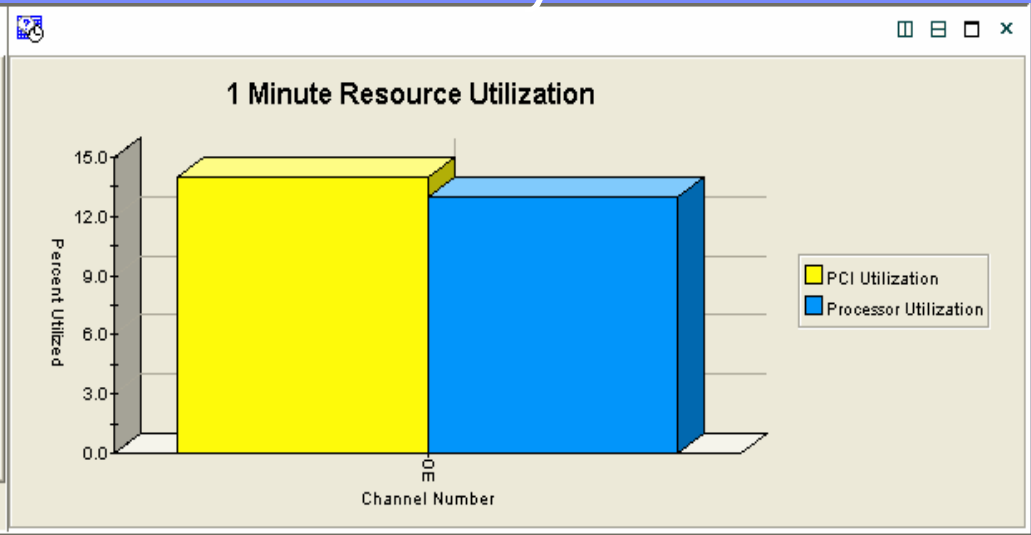
OSA Express LPARs Channel Usage Summary

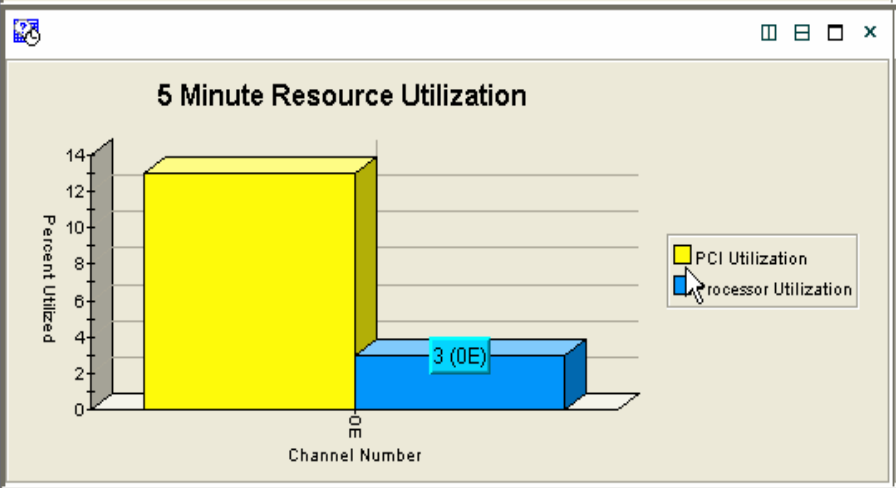
LPAR Name	LPAR Number	Processor Utilization Per Minute	Kilobyte Rate In Per Minute	Kilobyte Rate Out Per Minute	Processor Utilization Per Five Minutes	Kilobyte Rate In Per Five Minutes	Kilobyte Rate Out Per Five Minutes	Processor Utilization Per Hour	Kilobyte Rate In Per Hour	Kilobyte Rate Out Per Hour
SYSG	1	0	0	0	0	0	0	0	0	0
SP22	2	0	1	0	0	1	0	0	1	0
SP13	3	1	0	0	0	0	0	1	0	0

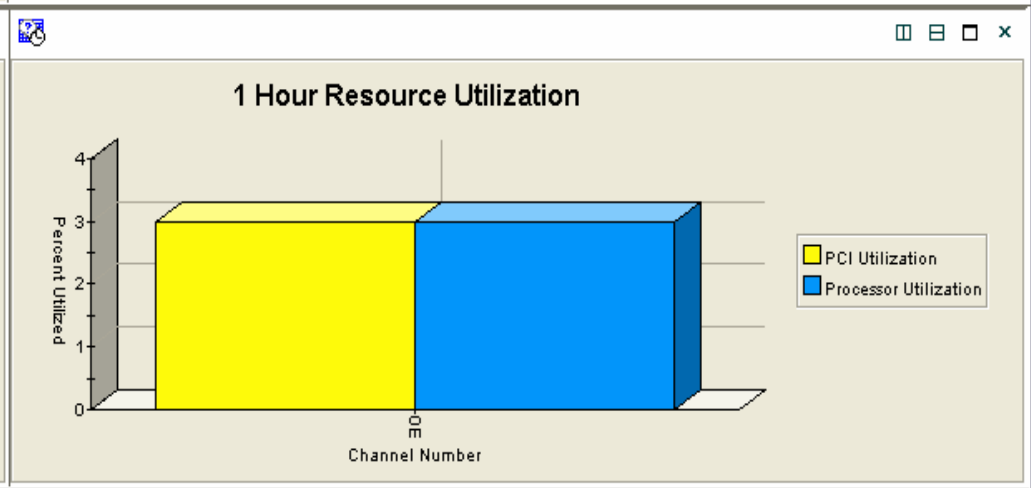
Channel: 0E

OSA Express Channels Summary





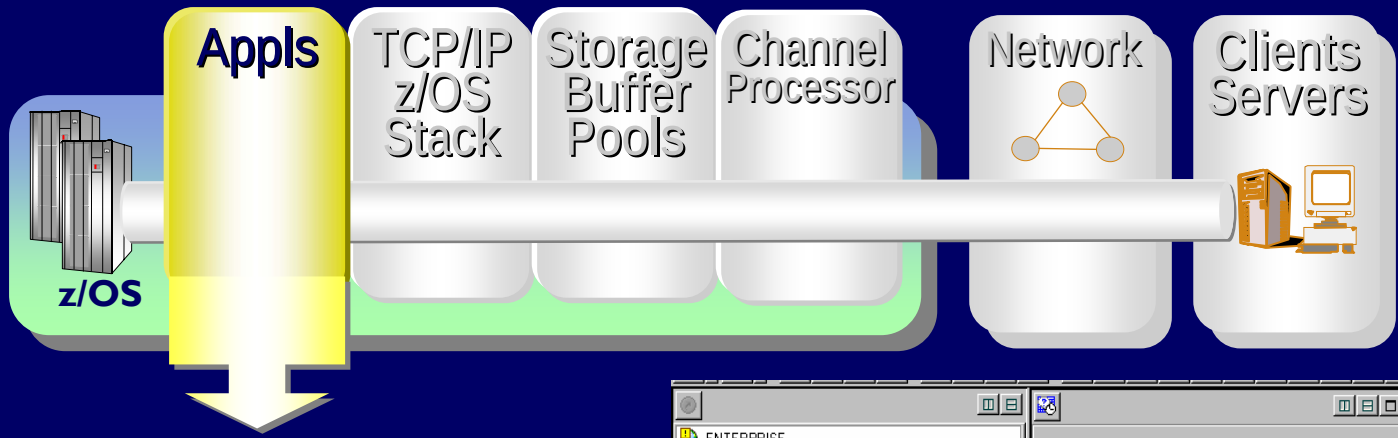




OSA Express Channels Summary

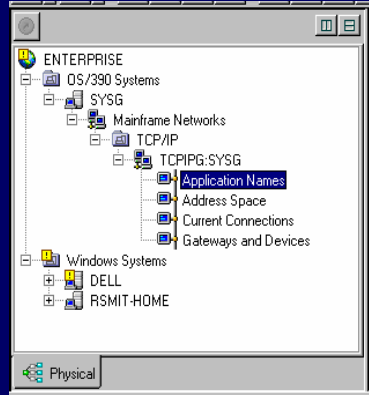
Device Name	Channel Number	Channel Type	Subtype	Mode	State	Share Indicator	Port Count	Control Unit Number	Micro Code Level	Current LPAR Name	Current LPAR Number	Managing LPAR Name	Mana LPAR N
OSAED	0E	OSADirectExpress	FastEthernet	NothingConfigured	Online	Shared	1	00A	0356	SP22	1077952576	SYSG	1

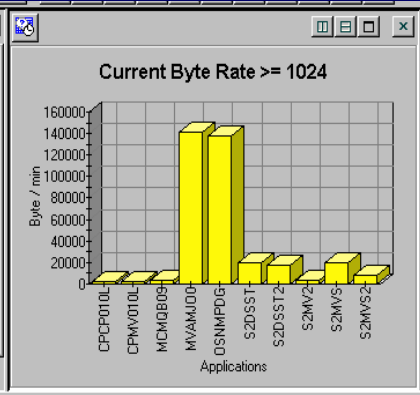
Applications

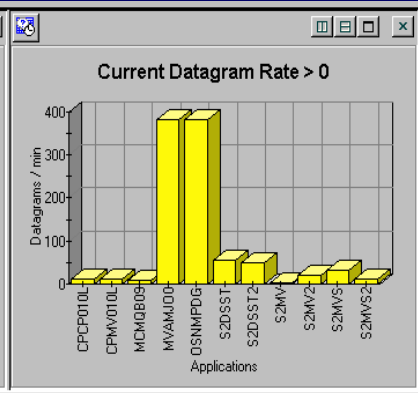


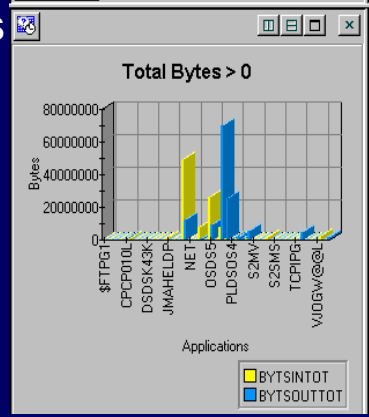
What is wrong with my applications?

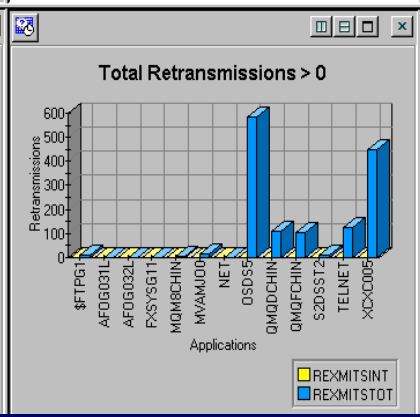
- Connections
  - State, Rate, Backlog, Rejections
- Last activity time
- Window Sizes
- Response Times
- Retransmissions
- Transmit / Receive Rates
- Out of order segments

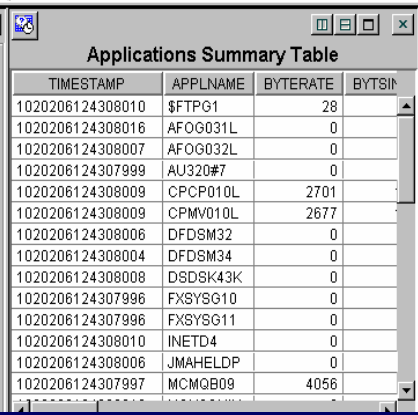




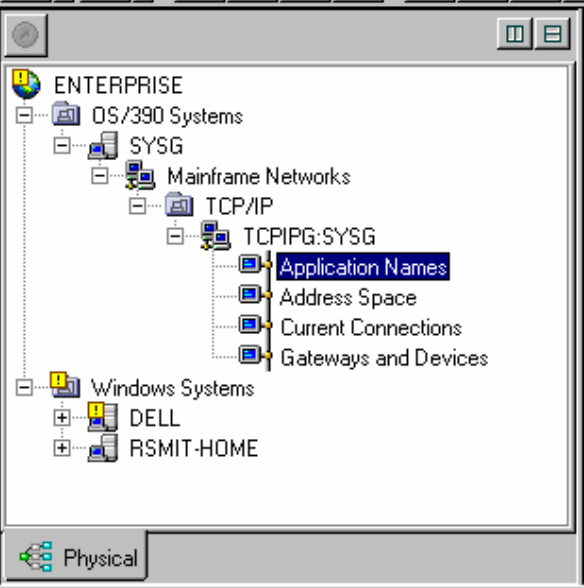


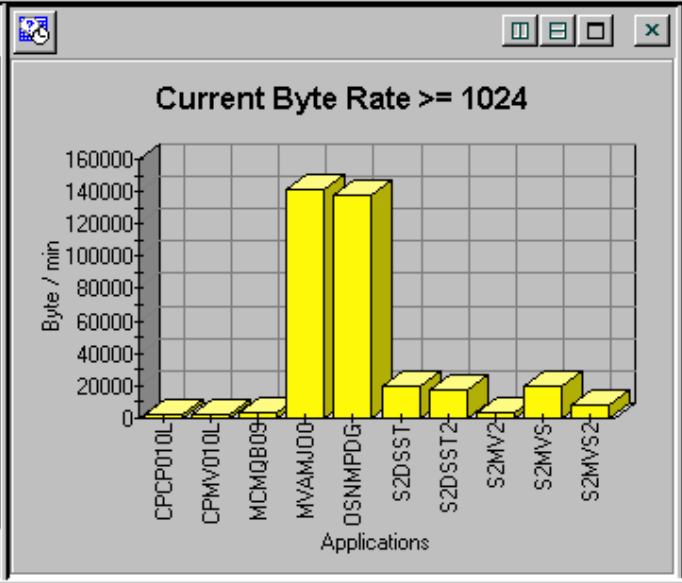


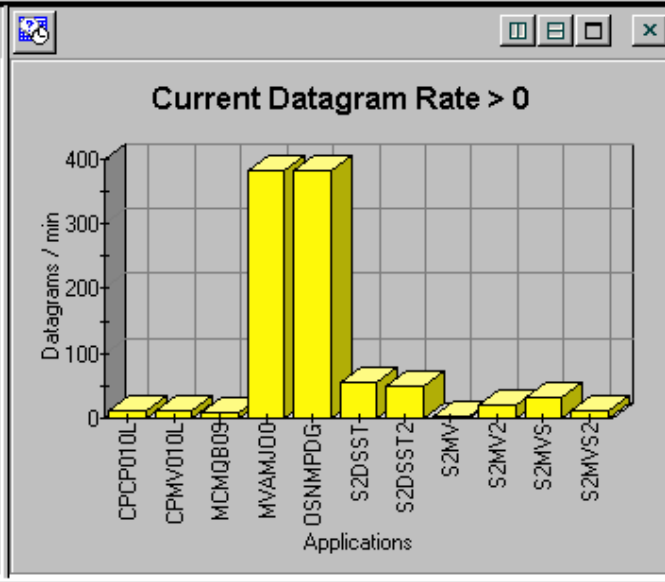


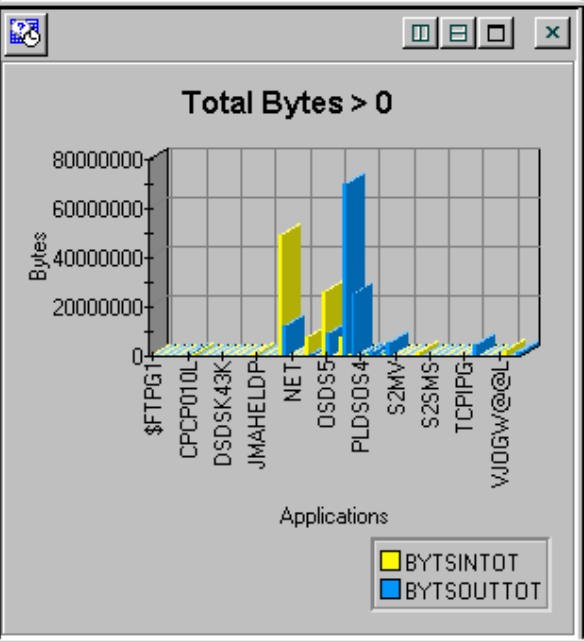


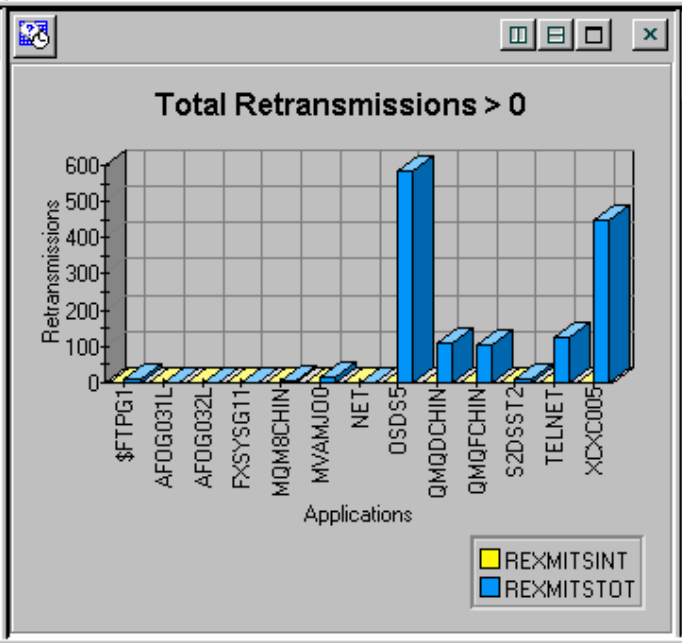
Applications TCP/IP Performance









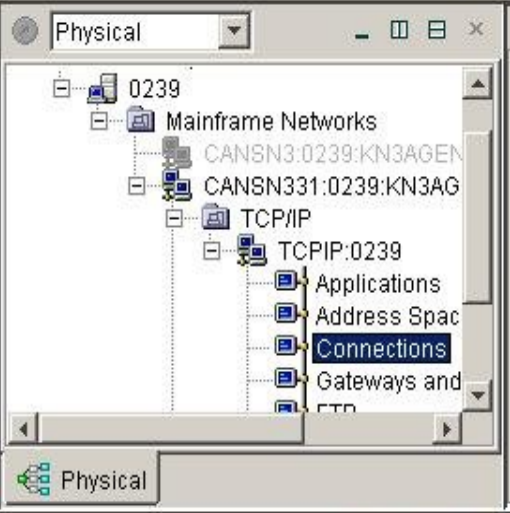


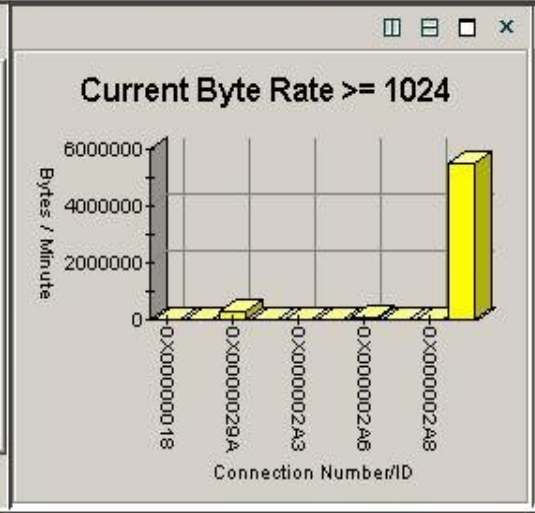
Applications Summary Table

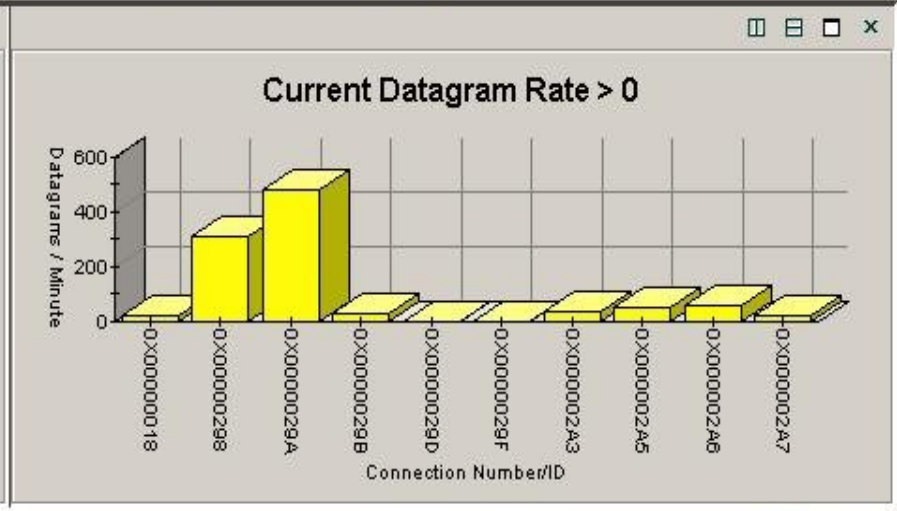
TIMESTAMP	APPLNAME	BYTERATE	BYTSIN
1020206124308010	$FTPG1	28	
1020206124308016	AFOG031L	0	
1020206124308007	AFOG032L	0	
1020206124307999	AU320#7	0	
1020206124308009	CPCP010L	2701	
1020206124308009	CPMV010L	2677	
1020206124308006	DFDSM32	0	
1020206124308004	DFDSM34	0	
1020206124308008	DSDSK43K	0	
1020206124307996	FXSYSG10	0	
1020206124307996	FXSYSG11	0	
1020206124308010	INETD4	0	
1020206124308006	JMAHELDP	0	
1020206124307997	MCMQB09	4056	

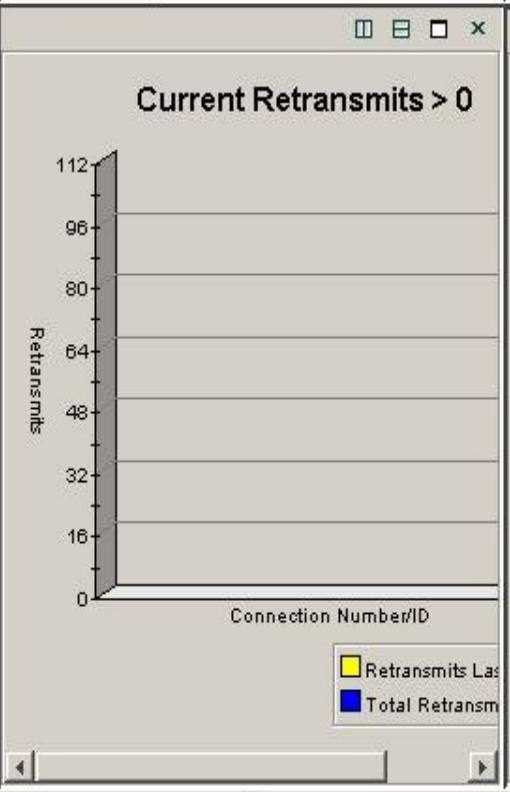
Ready | Server Available. | Applications - dell:14000 - SYSADMIN

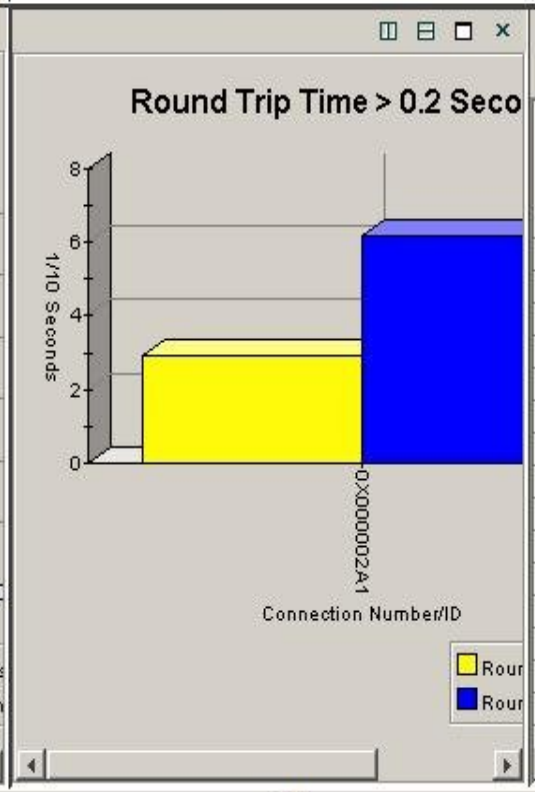
TCP/IP Connections







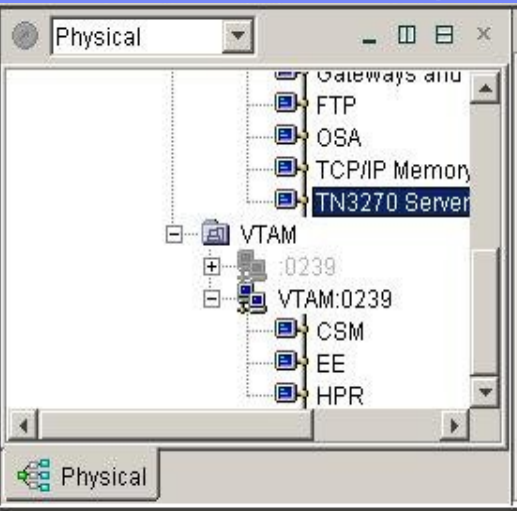


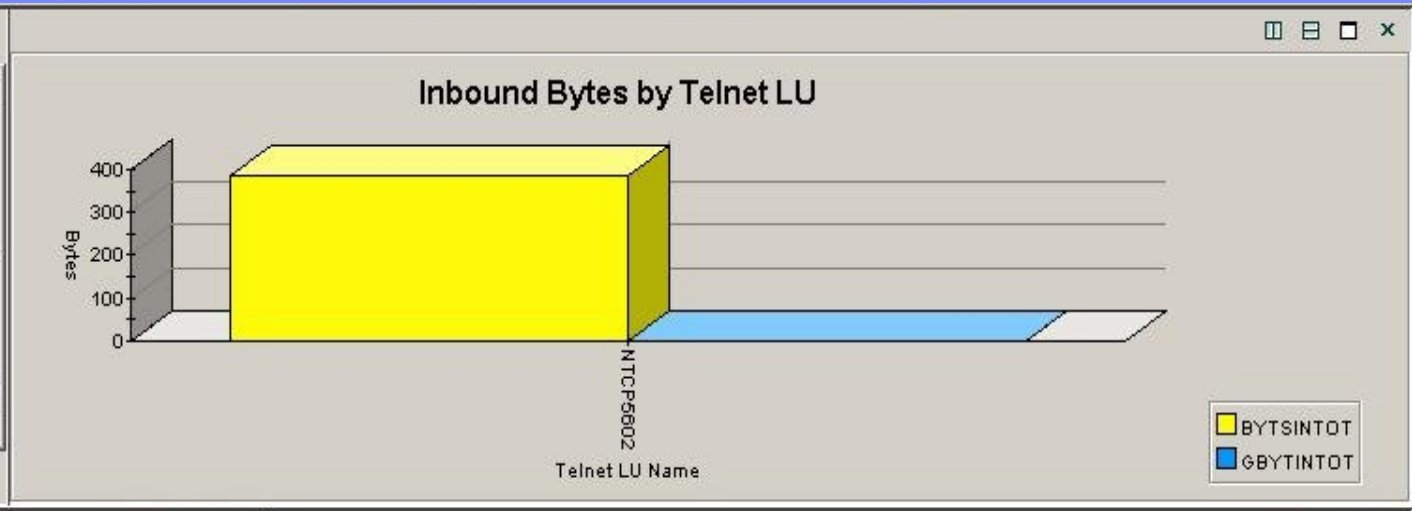


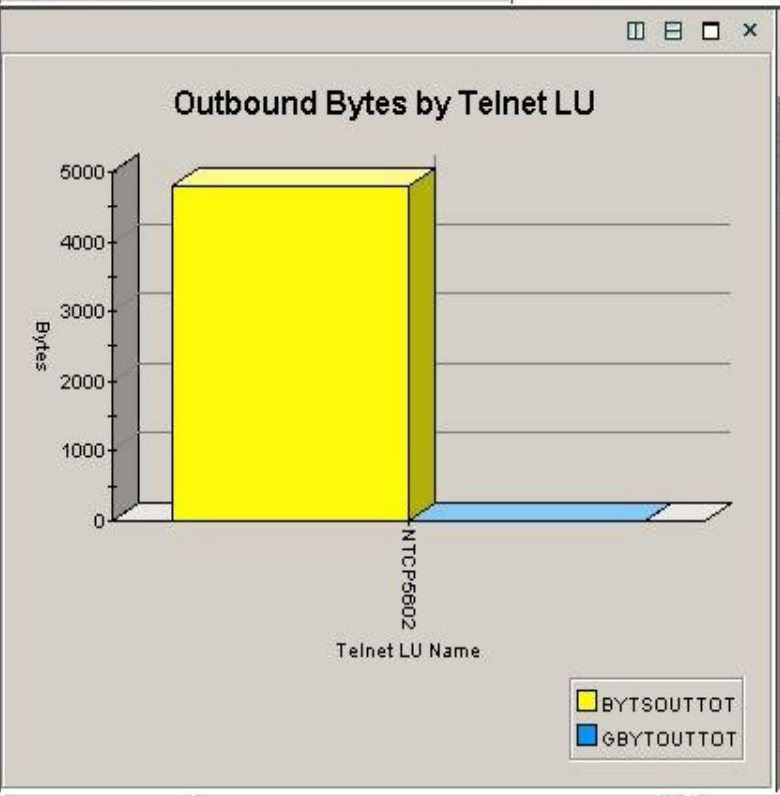
Connections Summary Table

Collection Time	Application Name	UDP Flag	Local Port	Foreign Soc
12/07/04 11:12:37	VTAM	UDP_Endpoint	12000	
12/07/04 11:12:37	VTAM	UDP_Endpoint	12001	
12/07/04 11:12:37	VTAM	UDP_Endpoint	12002	
12/07/04 11:12:37	VTAM	UDP_Endpoint	12003	
12/07/04 11:12:37	VTAM	UDP_Endpoint	12004	
12/07/04 11:12:37	TCPIP	TCP_Listener	1024	
12/07/04 11:12:37	TCPIP	TCP_Connection	1025	127.0.0.1:102
12/07/04 11:12:37	TCPIP	TCP_Connection	1024	127.0.0.1:102
12/07/04 11:12:37	TCPIP	TCP_Listener	23	
12/07/04 11:12:37	OSNMPD	UDP_Endpoint	161	192.168.1.149:1
12/07/04 11:12:37	OSNMPD	TCP_Listener	1026	
12/07/04 11:12:37	RXSERVE	TCP_Listener	512	
12/07/04 11:12:37	RXSERVE	TCP_Listener	514	
12/07/04 11:12:37	FTPD1	TCP_Listener	21	
12/07/04 11:12:37	SNMPQE	UDP_Endpoint	1027	
12/07/04 11:12:37	SNMPQE	UDP_Endpoint	162	192.168.1.149:1
12/07/04 11:12:37	SNMPQE	TCP_Listener	1027	

TN3270



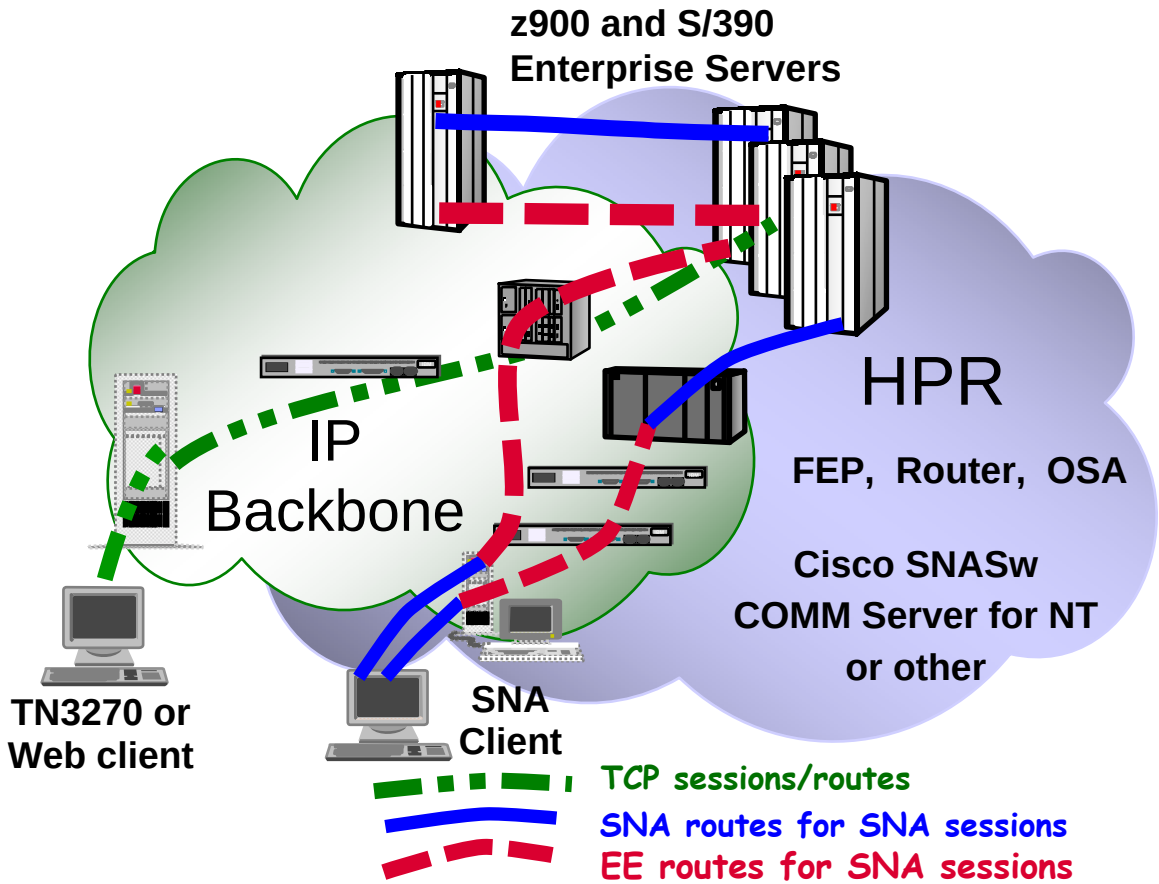




TN3270 Server Session Summary

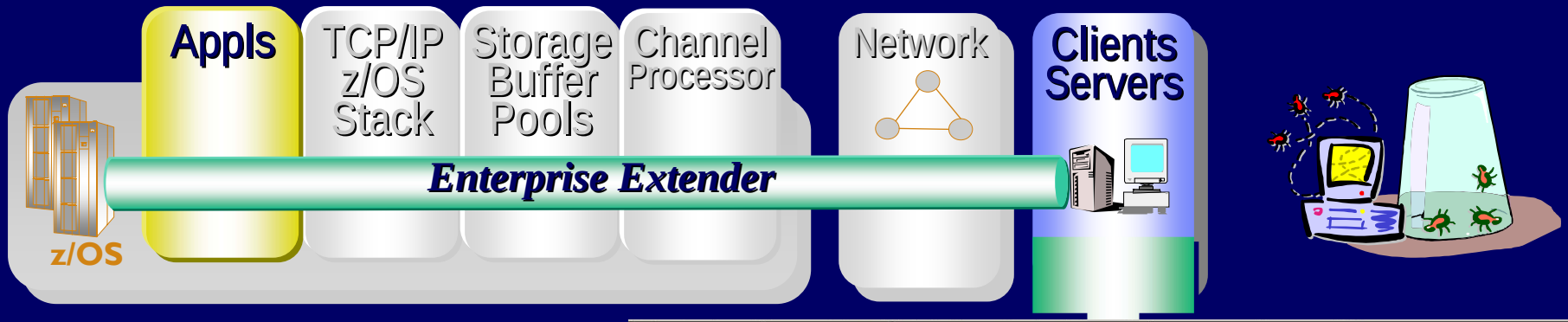
TIMESTAMP	LUNAME	SNALUNAME	REMOTEIP	LOCALIP	REMPORT	LOCALPO
1041206082436000	NTCP5602	NT56TSO2	192.168.0.121	192.168.1.149	0	
1041206082501000	NTCP5602	NT56TSO2	192.168.0.121	192.168.1.149	1112	

What is Enterprise Extender



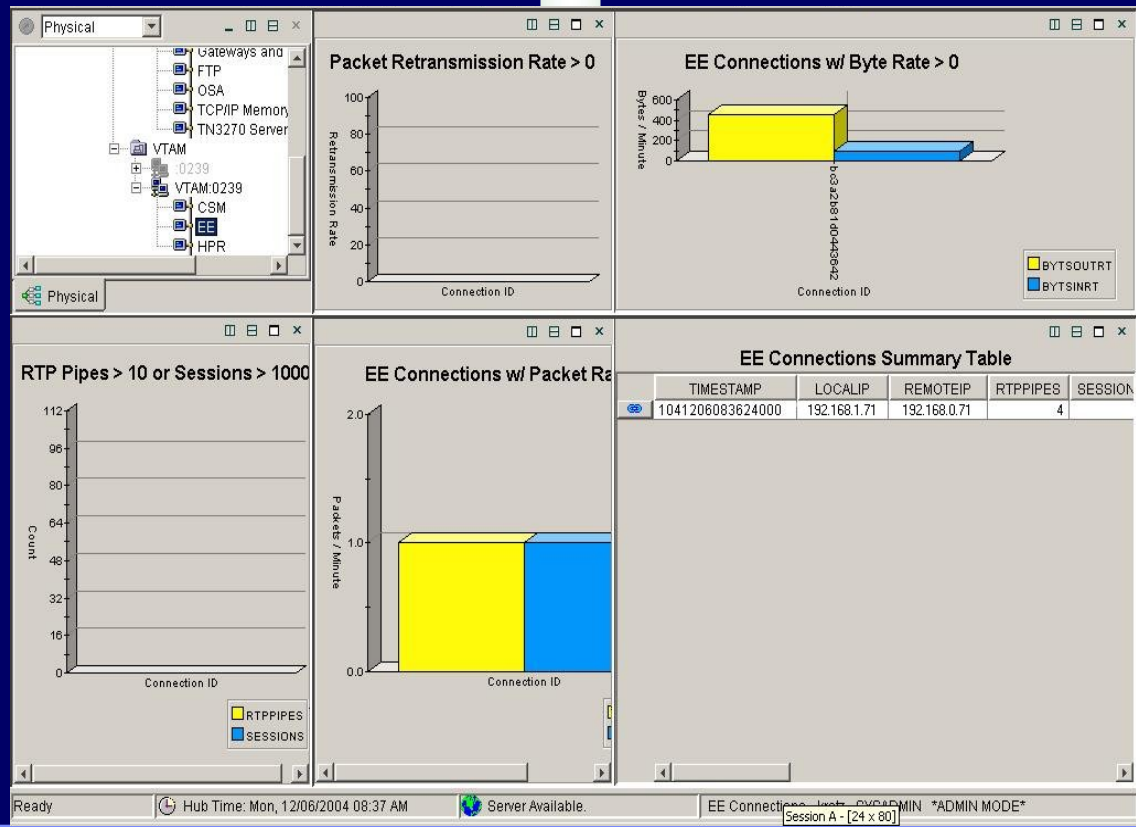
- **Allows use of IP network for SNA sessions**
  - Preserves SNA application and endpoint investment
  - Allows convergence on single IP transport network for both IP and SNA
- **Conceptually, IP network looks like APPN/HPR TG in session route**

Enterprise Extender Analysis

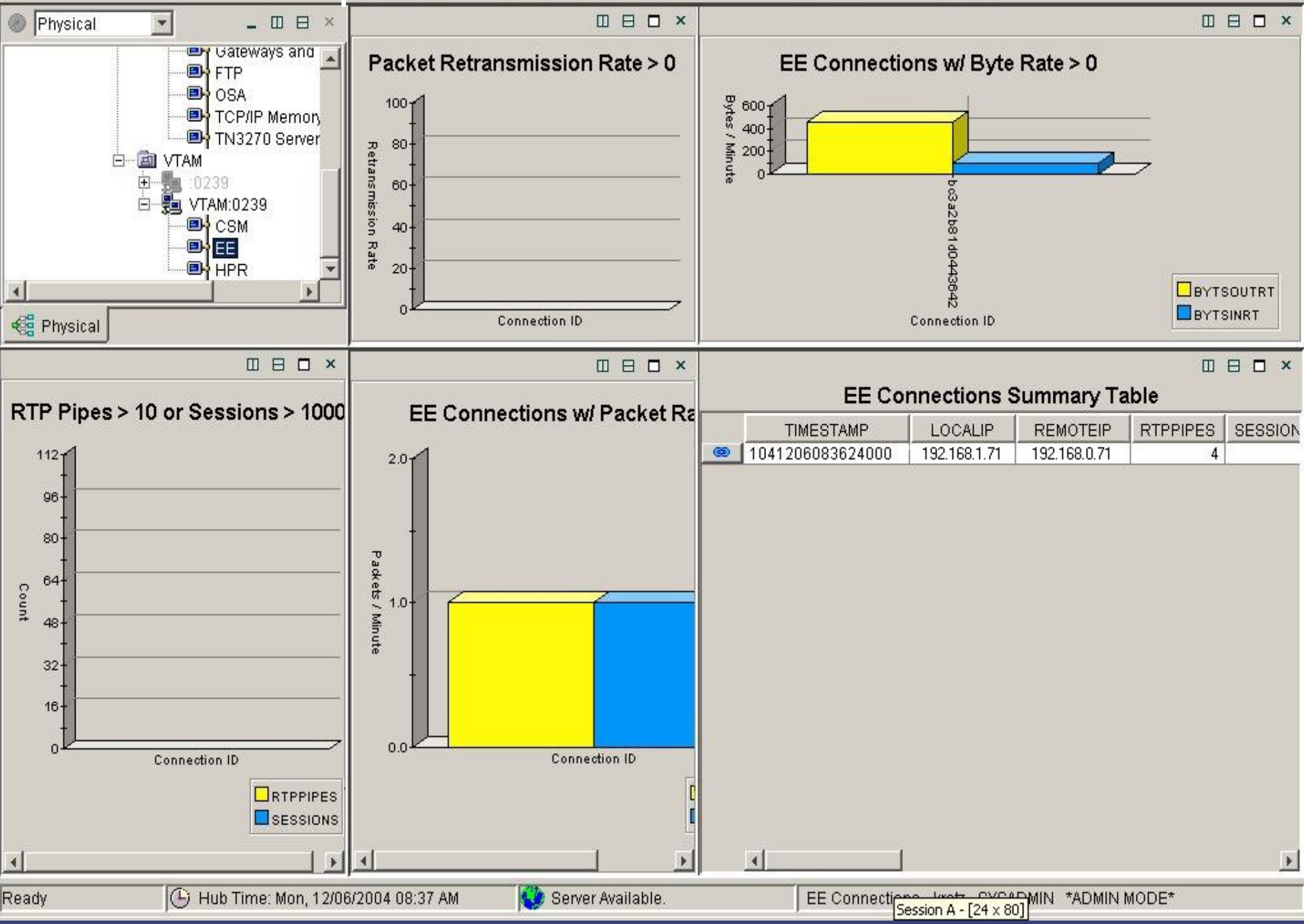


How is my EE performing?

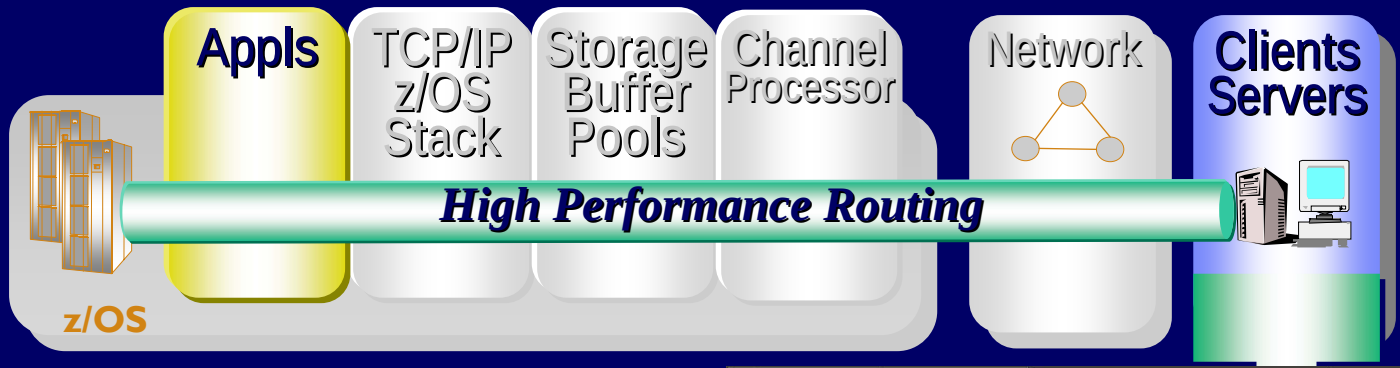
- **EE Analysis**
  - **Throughput Rates**
  - **Retransmission Rates**
  - **RTP Pipes**
  - **Sessions**
  - **Drill down to Port Details**
  - **Type of Service (TOS)**



Enterprise Extender

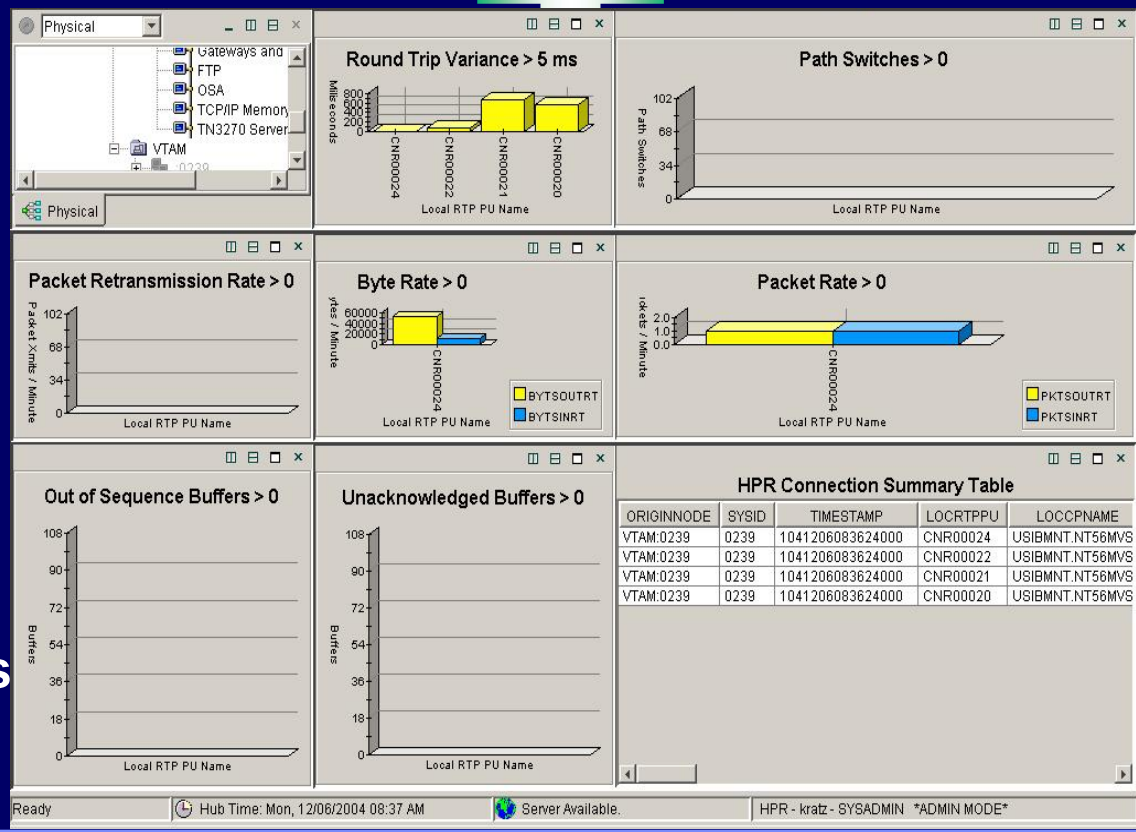


High Performance Routing (HPR) Analysis

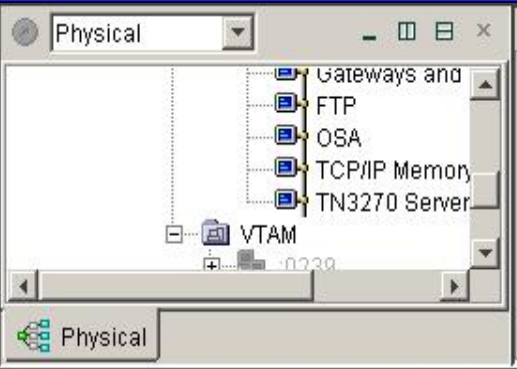


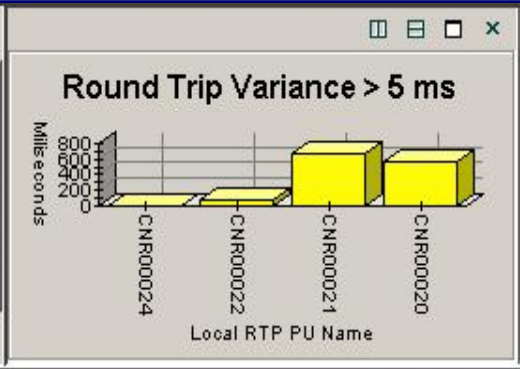
Is my HPR Congested?

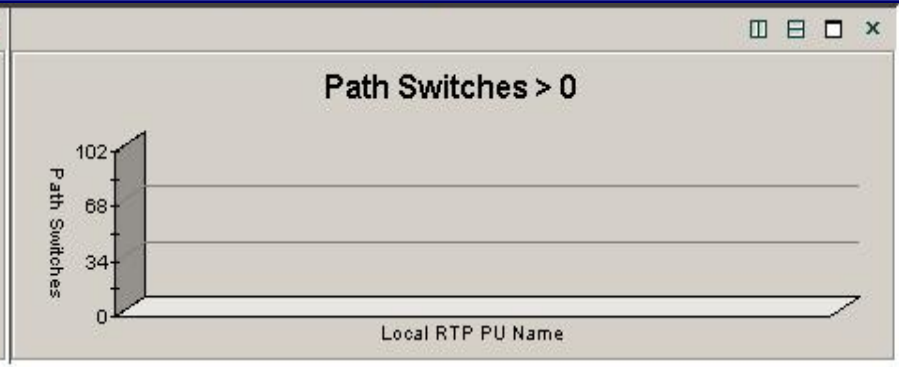
- **HPR Analysis**
  - **Throughput Rates**
  - **Retransmission Rates**
  - **RTP Pipe congestion**
  - **Round trip time**
  - **Sessions, CPnames**
  - **Drill down to link Details**
  - **Class of Service**

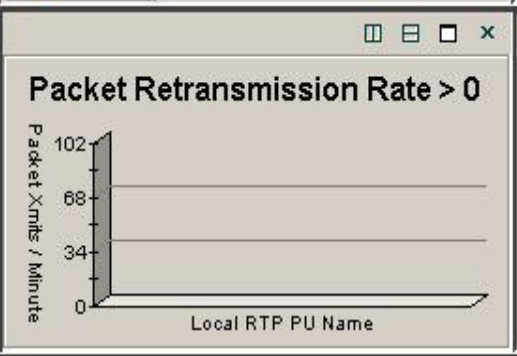


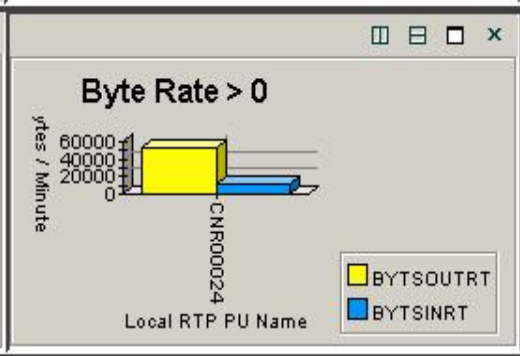
HPR Performance

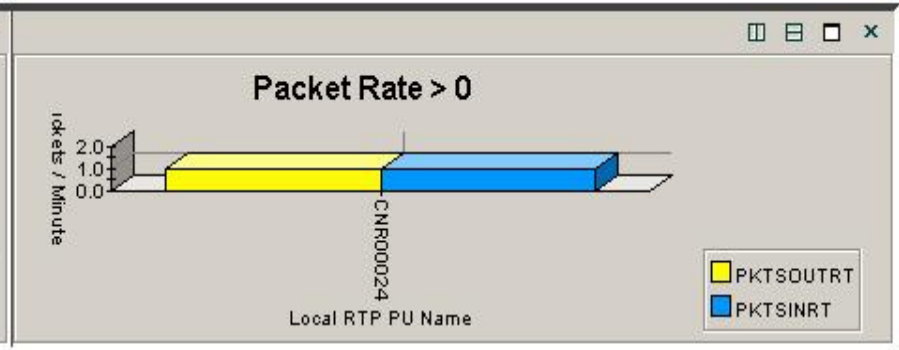


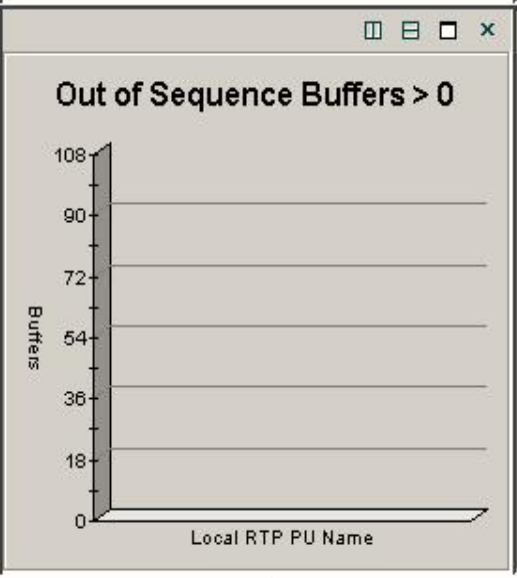


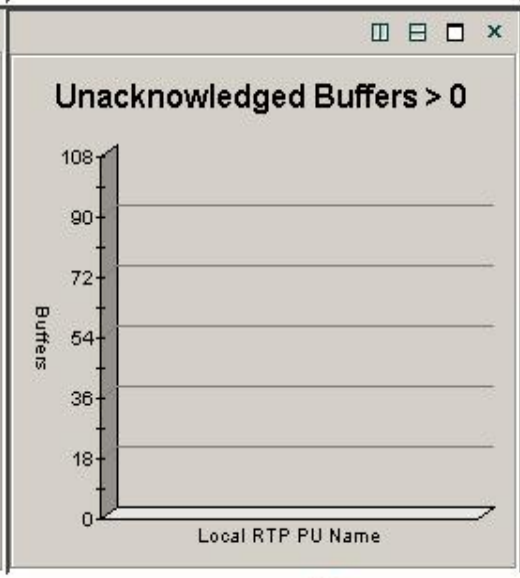








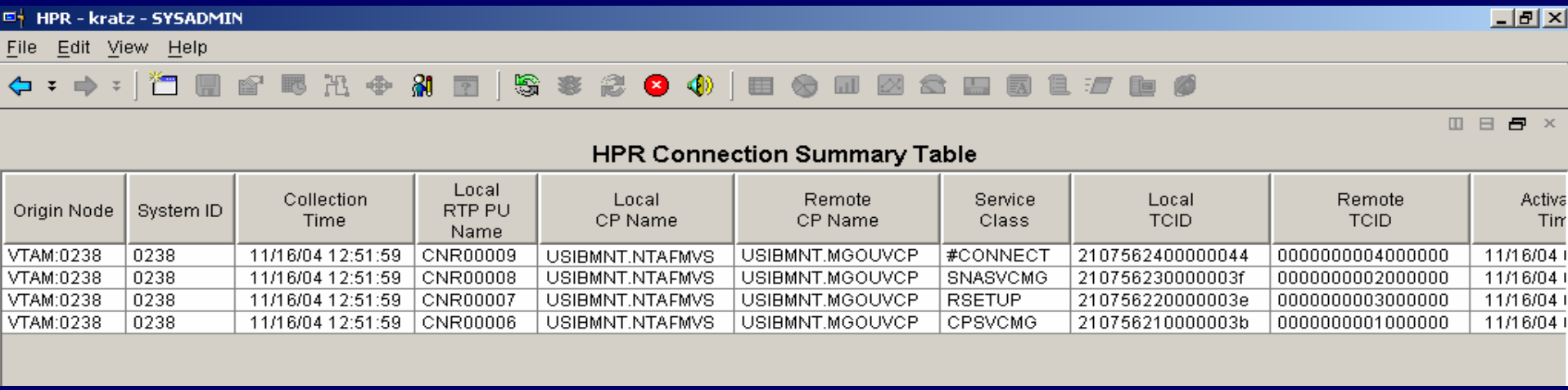




HPR Connection Summary Table

ORIGINNODE	SYSID	TIMESTAMP	LOCRTPPU	LOCCPNAME
VTAM:0239	0239	1041206083624000	CNR00024	USIBMNT.NT56MVS
VTAM:0239	0239	1041206083624000	CNR00022	USIBMNT.NT56MVS
VTAM:0239	0239	1041206083624000	CNR00021	USIBMNT.NT56MVS
VTAM:0239	0239	1041206083624000	CNR00020	USIBMNT.NT56MVS

HPR Connections

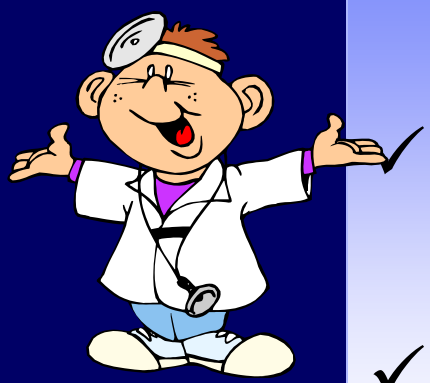


HPR Connection Summary Table

Origin Node	System ID	Collection Time	Local RTP PU Name	Local CP Name	Remote CP Name	Service Class	Local TCID	Remote TCID	Activa Tim
VTAM:0238	0238	11/16/04 12:51:59	CNR00009	USIBMNT.NTAFMVS	USIBMNT.MGOUVCP	#CONNECT	2107562400000044	0000000004000000	11/16/04
VTAM:0238	0238	11/16/04 12:51:59	CNR00008	USIBMNT.NTAFMVS	USIBMNT.MGOUVCP	SNASVCMG	210756230000003f	0000000002000000	11/16/04
VTAM:0238	0238	11/16/04 12:51:59	CNR00007	USIBMNT.NTAFMVS	USIBMNT.MGOUVCP	RSETUP	210756220000003e	0000000003000000	11/16/04
VTAM:0238	0238	11/16/04 12:51:59	CNR00006	USIBMNT.NTAFMVS	USIBMNT.MGOUVCP	CPSVCMG	210756210000003b	0000000001000000	11/16/04

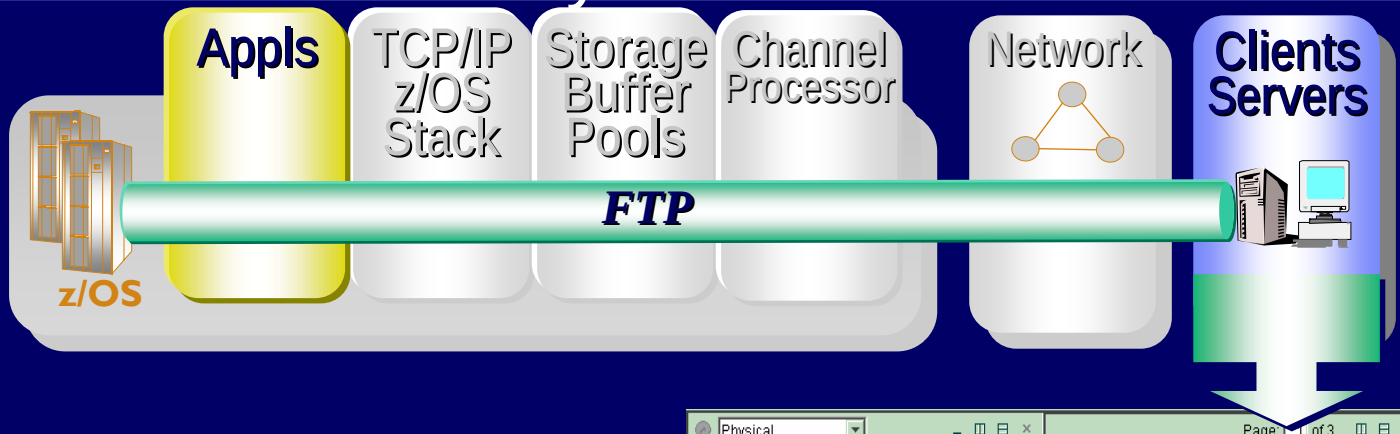
z/OS FTP Challenge

- **Simplicity has led to overuse and abuse**
- **FTP has become mission critical**
- **Difficult to analyze**
  - **“one-way”, no response required**
- **Long problem isolation times**



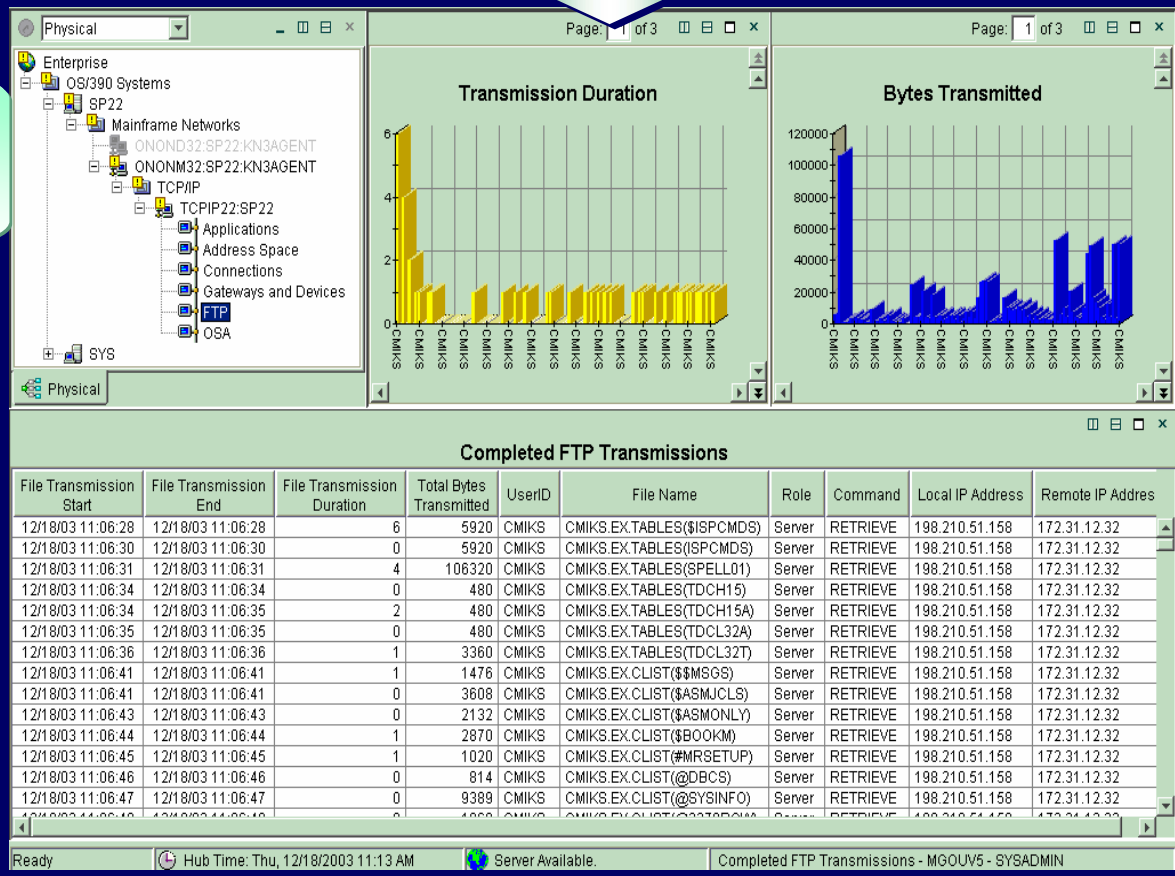
- ✓ **Need real time detection and analysis**
  - **Hangs, errors**
  - **Requires FTP and SMF exits**
- ✓ **Real time alerts**
  - **FTP hangs**
  - **Excessive FTP usage**
- ✓ **Historical detailed analysis**
  - **By datasets, applications, times**
  - **By most sessions, bytes, failures**

FTP Analysis



Who is doing large FTPs during 1st shift?

- **FTP Analysis**
  - **Datasets names**
  - **By Bytes**
  - **By failures**
  - **Last command**
  - **Login Failure reason**
  - **Transmission Mode**
  - **By Application**



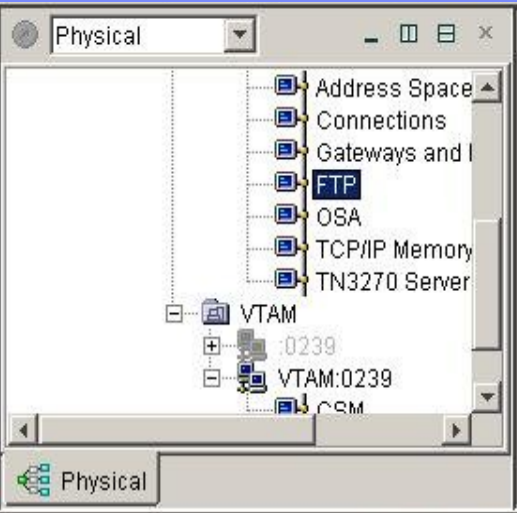
Managing FTPs

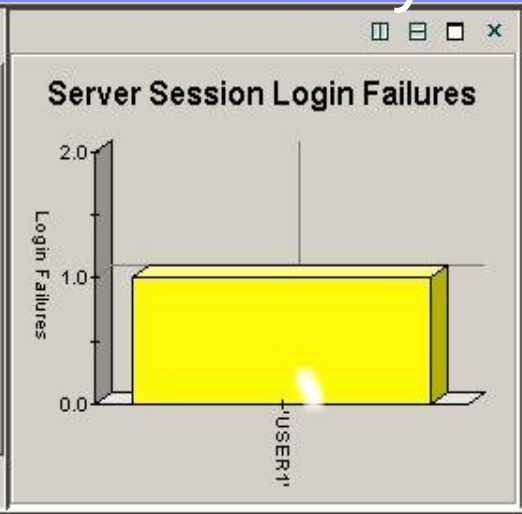
Why is my FTP performance so bad?

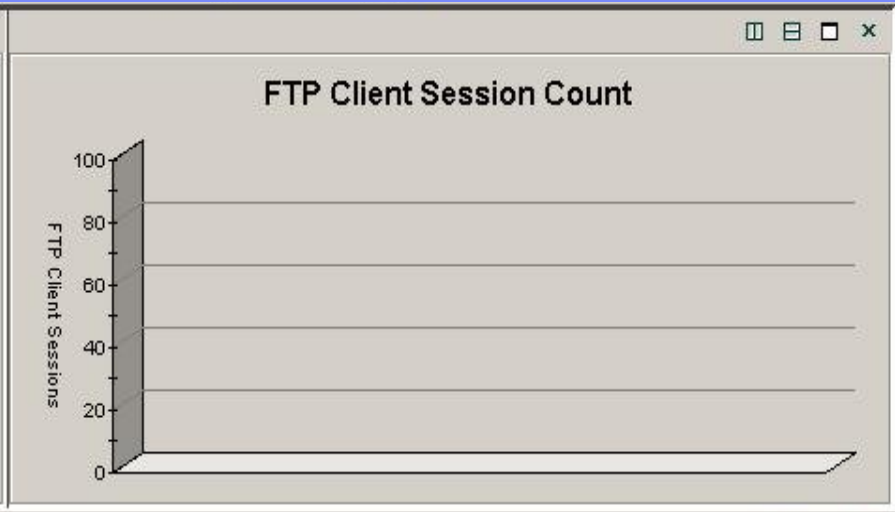
My Retransmissions are high!

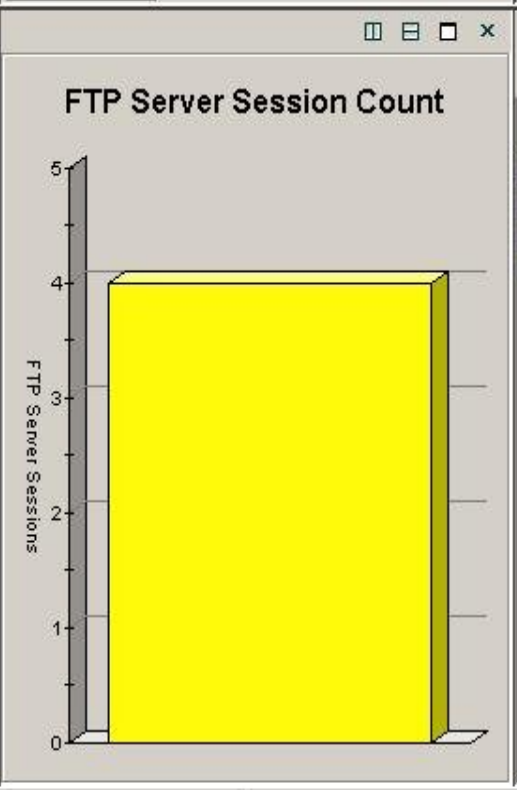
Total Retransmits	Round Trip Time	Round Trip Variance	Telnet Appl Name	Telnet LU Name	Idle Time	Connection Number
63	16.16	11.82		TCP00041	14545	35221
18	8.44	2.45			91492	6087
16	7.09	3.19			91483	6083
0	3.26	1.12	CICSACB2	TCP00012	2203	42053

Current FTP Analysis







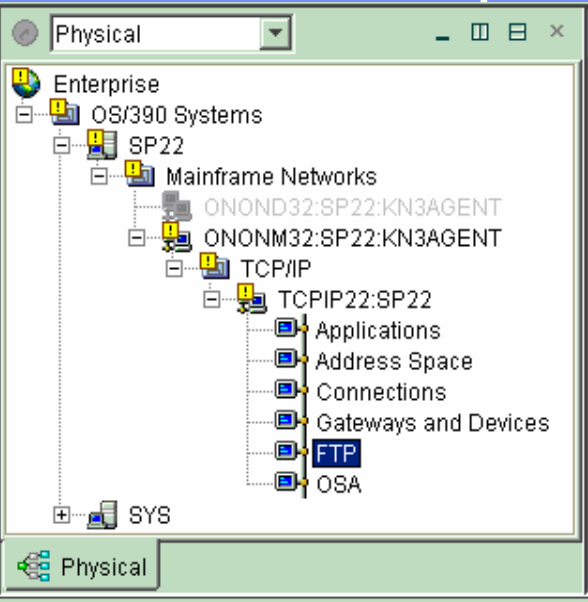


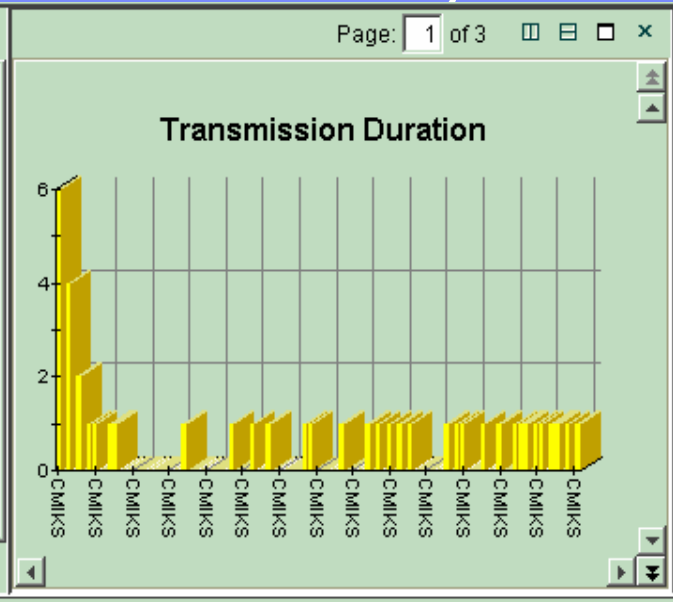
FTP Session Summary Table

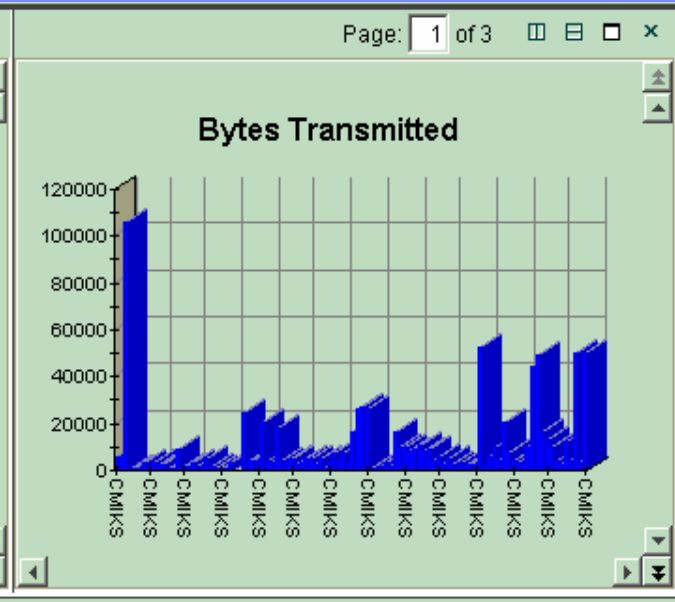
	TIMESTAMP	APPLNAME	FTPTYPE	REMOTEIP	REMPORT	LOCALIP	LOCALPORT	SRVUSERID	C
	1041206083008000	'FTPD1'	1	192.168.1.121	1116	192.168.0.188	21	'USER1'	N
	1041206082906000	'FTPD1'	1	192.168.1.121	1113	192.168.0.188	21	'USER1'	N
	1041206082906000	'FTPD1'	1	192.168.1.121	1113	192.168.0.188	21	'USER1'	N
	1041206083029000	'FTPD1'	1	192.168.1.121	1118	192.168.0.188	21	'USER1'	N

Ready | Hub Time: Mon, 12/06/2004 08:31 AM | Server Available. | FTP Sessiona - kratz - SYSADMIN *ADMIN MODE*

Completed FTP Analysis







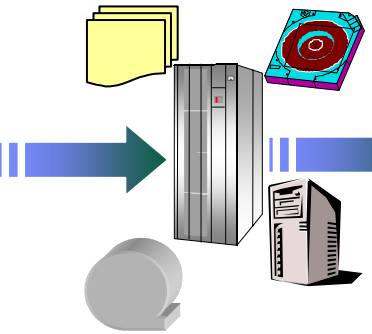
Completed FTP Transmissions

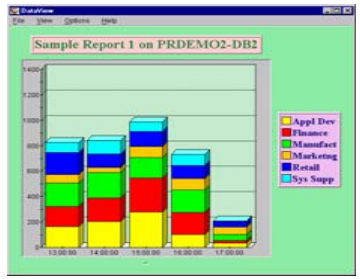
File Transmission Start	File Transmission End	File Transmission Duration	Total Bytes Transmitted	UserID	File Name	Role	Command	Local IP Address	Remote IP Addres
12/18/03 11:06:28	12/18/03 11:06:28	6	5920	CMIKS	CMIKS.EX.TABLES($ISPCMDS)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:30	12/18/03 11:06:30	0	5920	CMIKS	CMIKS.EX.TABLES(ISPCMDS)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:31	12/18/03 11:06:31	4	106320	CMIKS	CMIKS.EX.TABLES(SPELL01)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:34	12/18/03 11:06:34	0	480	CMIKS	CMIKS.EX.TABLES(TDCH15)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:34	12/18/03 11:06:35	2	480	CMIKS	CMIKS.EX.TABLES(TDCH15A)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:35	12/18/03 11:06:35	0	480	CMIKS	CMIKS.EX.TABLES(TDCL32A)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:36	12/18/03 11:06:36	1	3360	CMIKS	CMIKS.EX.TABLES(TDCL32T)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:41	12/18/03 11:06:41	1	1476	CMIKS	CMIKS.EX.CLIST($$MSGS)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:41	12/18/03 11:06:41	0	3608	CMIKS	CMIKS.EX.CLIST($ASMJCLS)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:43	12/18/03 11:06:43	0	2132	CMIKS	CMIKS.EX.CLIST($ASMONLY)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:44	12/18/03 11:06:44	1	2870	CMIKS	CMIKS.EX.CLIST($BOOKM)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:45	12/18/03 11:06:45	1	1020	CMIKS	CMIKS.EX.CLIST(#MRSETUP)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:46	12/18/03 11:06:46	0	814	CMIKS	CMIKS.EX.CLIST(@DBCS)	Server	RETRIEVE	198.210.51.158	172.31.12.32
12/18/03 11:06:47	12/18/03 11:06:47	0	9389	CMIKS	CMIKS.EX.CLIST(@SYSINFO)	Server	RETRIEVE	198.210.51.158	172.31.12.32

Ready | Hub Time: Thu, 12/18/2003 11:13 AM | Server Available. | Completed FTP Transmissions - MGOUV5 - SYSADMIN

IBM zSeries TCP/IP Historical Reporting

IBM Tivoli Decision Support for z/OS





SMF, Logs
RMF, ...

Central Repository

Trend Analysis
Accounting
Capacity Planning
Service Levels

- **TCP/IP General statistics**
  - Availability
  - Session failures
  - SNMP routers
  - TCP/IP API INIT calls for sockets
  - TCP/IP API TERM calls for sockets
- **TELNET**
  - TELNET CLIENT calls
  - TELNET SERVER INIT calls
  - TELNET SERVER TERM calls
- **File transfer**
  - FTP CLIENT calls
  - FTP SERVER - append
  - FTP SERVER - delete
  - FTP SERVER - log failed
  - FTP SERVER - rename
  - FTP SERVER - retrieve
  - FTP SERVER - store
- **OSA-Express**

. . .

TCP/IP Performance Report Examples

TCP/IP Statistices Report

Date	TCPIP Procname	Received Datagrams	Forward Datagrams	Delivered Datagrams	Sent Datagrams	Reassembled Datagrams	Fragms Gen'd
2000-09-08	TCPIP	2733	0	2785	2696	0	0
2000-09-09	TCPIP	893378	0	906493	763674	0	0

Cisco Router CPU Usage

DATE	HOUR	IP ADDRESS	CPU BUSY PFRC MAX	CPU BUSY PFRC MIN	CPU BUSY PFRC AVG	CPU BUSY AVG 1EXP	CPU BUSY AVG 5EXP
2005-04-28	15.00.00	69.100.110.254	22	21	2,150E+01	2.430E+1	2.300E+01

Performance Reporters: NWOCIS04

Cisco Memory Pool Usage

DATE	HOUR	IP ADDRESS	TYPE	MAX MEMORY POOL USED/1024	MIN MEMORY POOL USED/1024	AVG MEMORY POOL USED/1024	MAX MEMORY POOL FREE/1024	MIN MEMORY POOL FREE/1024	AVG MEMORY POOL FREE/1024	MAX MEMORY POOL LARGEST FREE/1024	MIN MEMORY POOL LARGEST FREE/1024	AVG MEMORY POOL LARGEST FREE/1024
2005 04 28	15.00.00	69.100.110.254	1	1.8034.00	1.4342.00	1.6460.00	1.6460.00	1.4560.00	1.4660.00	1.4460.00	1.4460.00	1.4460.00
2005 04 28	15.00.00	69.100.110.254	1	1.6034.00	1.6342.00	1.6460.00	4.6460.00	4.4560.00	4.4660.00	2.4460.00	2.4460.00	2.4460.00

Performance Reporters: NWOCTSO1

Thank You

OMEGAMON XE Platform Prerequisites

- **Candle Management Server**
  - z/OS, Windows (2000, XP Pro, 2003 Server), AIX, HP, Solaris
- **CandleNet Portal Server**
  - Recommended hardware –
    - Intel P4 server capable of running Windows 2003, XP Pro or 2003 Server and DB2 UDB 8.1
  - Windows 2000, XP Pro, 2003 Server
  - DB2 8.1 (recommended) **OR** Microsoft SQL Server version 7.0 or 2000 **OR** MSDE
  - Java 1.3.1_04 or higher
- **CandleNet Portal**
  - Recommended hardware –
    - Intel system capable of running Windows XP Pro or Windows 2000
  - Windows XP Professional Edition w/SP 1 (or higher) or Windows 2000 w/SP 3 (or higher)
    - **CNP Desktop Client**
      - requires Sun Java v1.3.1_04 thru v.1.4.2_07
        - (excluding the 1.4.0 and 1.4.1 versions)
    - **CNP Browser** Client requires Internet Explorer 6 (or higher)
      - with Java Plug-in (same Java release levels as above)
- **Warehouse Proxy and Candle Data Warehouse**
  - Recommended hardware –
    - Intel P4 server capable of running Windows 2003, XP Pro or 2003 Server and Microsoft SQL Server version 7.0 or 2000
  - Windows 2000, XP Pro, 2003 Server
  - Microsoft SQL Server version 7.0 or Microsoft SQL Server 2000 (with fix pack 3)

- OMEGAMON XE for Mainframe Networks IRA
  - z/OS 1.4 (or higher).
  - maintenance on z/OS 1.4 and z/OS 1.5.
- OSA-Express adapters
  - Either OSA/SF or SNMP direct
    - Must be configured and running in order to collect OSA statistics.
  - The OSA-Express support has been modified to support the latest version of the OSA-Express MIB. To support this MIB, the Licensed Internal Code (LIC) levels of the OSA-Express adapters must meet the following criteria:
  - OSA module on a z900 or z800 system
    - LIC version of 3.33 or higher installed
  - OSA module on a z990 processor
    - all LIC levels are supported.

Required maintenance on z/OS 1.4:

APAR Number	Description
OA04394	(VTAM) EE/HPR/CSM data collection
PQ77244	(TCP/IP) TCP/IP stack enable network management interface APIs
PQ77633	FTP client server records have invalid return code (see UQ80465)
PQ77837	(TCP/IP) FTP enable network management interface APIs
PQ77838	(TCP/IP) Config, Netstat, SNMP
PQ77840	TCP/IP) IPCS enable network management interface APIs
PQ79583	(TCP/IP) CPU missing from TCP/IP trace
PQ78753	(TCP/IP) Correct FTP port & IP field information in SMF records
PQ74292	SNMP getnext request error
PQ81716	Telnet error in the date field for logon and logoff times
PQ83920	Shareport not distributing connections evenly
PQ84072	NETSTAT socket option displays incorrect information
PQ92481	SNA collection exception CEE0374C Condition=CEE3204S
II13699	Informational APAR on CD/390 API new function

Required maintenance on z/OS 1.5:

APAR Number	Description
PQ78753	Correct FTP port and IP field information in SMF records
PQ81716	Telnet error in the date field for logon and logoff times