

Top 10 Tips for z/OS Network Performance Monitoring with OMEGAMON

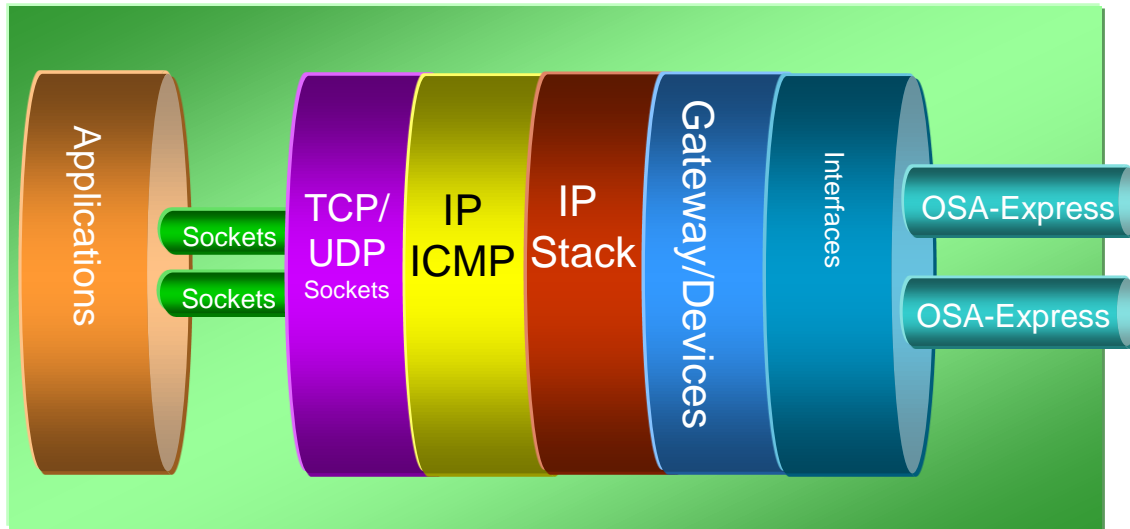
Ernie Gilman
IBM

August 10, 2011: 1:30 PM-2:30 PM
Session 9917

Agenda

- Overview of OMEGAMON for Mainframe Networks
- FP3 and z/OS 1.12
 1. OSA Express and Interface status and utilization
 2. Show all IP Stacks in one view
 3. TCP/IP Connection backlog and rejections
 4. High TCP/IP Connection Rates
 5. High TCP/IP Connection response times
 6. Zombie Connections
 7. Single Application Focused Network Monitor
 8. TN3270 Response time analysis
 9. FTP Logon and transfer failures
 10. EE and HPR performance issues

- This presentation will highlight best practices from customers who use OMEGAMON XE for Mainframe Network to monitor their z/OS Networking environment.
- Some of these best practices will include hundreds of new metrics that came in with OMEGAMON MFN FP3 and new interface details from IBM Communications Server for z/OS 1.12
- I created a custom Navigator view to highlight the best practices discusses in this presentation



- Solutions that Monitor IBM z/OS Network performance
- **IBM OMEGAMON XE for Mainframe Networks V4R2**
 - Performance monitoring
 - FP3 added hundreds of new metrics, see slide at the end for details
- **IBM NetView for z/OS V6R1**
 - TEP Feeds
 - DVIPA – Extensive monitoring
 - TCP/IP Connection awareness
 - Inactive Connections with termination code
 - Real Time Packet and OSA Traces with on the fly analysis

OMEGAMON XE for Mainframe Networks

NLDM API

TCP/IP NMI

VTAM API

SNMP

z/OS Communications Server

- **Collected using the TCP/IP NMI:**
 - Applications, Connections, TCP/IP Memory Statistics, IPsec
 - FTP Sessions and Transfers, TN3270 Server Sessions, Interfaces (z/OS 1.12)
 - **Collected using the VTAM API:**
 - ▶ VTAM Summary, CSM Buffer Pools
 - ▶ Enterprise Extender (EE), High Performance Routing (HPR)
 - **Collected using SNMP:**
 - ▶ Interfaces (z/OS 1.11 or before)
 - ▶ OSA
 - **Collected using the “Session Awareness and trace” API:**
 - ▶ SNA Session Awareness and Trace
-
- ✓ Move from SNMP and NETSTAT COMMANDS to the NMI API
 - ✓ Less overhead
 - ✓ Scalable

- **Common user interface**

- Manage z/OS system and distributed resources - single user interface.
- Displays real time and historical ,and alerts at the same time
- All customization and admin through the same interface
- Define thresholds and generate events

- **Out of the box Best Practices**

- Workspaces
- Situations - Problem Signatures and Expert Advice (ALERTS)

- **Create your own views and situations**

- To match responsibility and skill level

The screenshot displays the Tivoli Enterprise Portal (TEP) interface for monitoring a listener named WMQACHIN. The interface is divided into several panels:

- LISTENER for: WMQACHIN**: A summary table showing overall listener statistics.
- Active Connections for: WMQACHIN**: A table listing active connections with columns for Remote Port, ASID, Connection Start Time, Duration, State, Response Time, and Time Since Last Activity.
- INACTIVE CONNECTIONS for: WMQACHIN**: A table listing inactive connections with columns for System ID, Resource Name, Remote IP Address, Remote Port String, Termination Reason Code, Total Segments Retransmitted, and Byte Rate.
- Application Connection Topo...**: A diagram showing the network topology of the application connections.
- JOB OVERVIEW**: A table providing a high-level overview of the job's performance metrics.

LISTENER for: WMQACHIN

Application Name	Local Port	Active Connections	Accepted Connections	Connection Rate	Active Connections High Water Mark	Time Stamp for Active Connections High Water Mark	Idle Time Since Last Accept	Server Up Time	Connections in Backlog	Established Connections in Backlog	FRC/Connect in Back
WMQACHIN	1414	11	0	0	11	08/05/11 00:33:34	0.08	31.00	0	0	

Active Connections for: WMQACHIN

Remote Port	ASID	Connection Start Time	Connection Duration	Connection State	Response Time	Time Since Last Activity	Duplicate ACKs	Total Segments Retransmitted	Total Out of Order Segments
50331	0X0112	08/04/11 20:37:24	17530	ESTABLISHED	5.72	16,519.56	0	0	0
59953	0X0112	08/03/11 20:53:29	102965	ESTABLISHED	5.35	102,615.32	0	0	0
49405	0X0112	08/04/11 19:30:42	21532	ESTABLISHED	5.63	18,260.51	20	21	0

INACTIVE CONNECTIONS for: WMQACHIN

System ID	Resource Name	Remote IP Address	Remote Port String	Termination Reason Code	Total Segments Retransmitted	Byte Rate
/SA	WMQACHIN	9.76.159.5	52107	Excessive_Retrans	50	1237
/SA	WMQACHIN	9.39.66.103	39940	Client_Sent_Reset	0	0
/SA	WMQACHIN	9.76.133.99	49761	Excessive_Retrans	17	9800
/SA	WMQACHIN	9.39.66.103	34836	Client_Sent_Reset	0	0


JOB OVERVIEW

Job Name	CPU Percent	Step Name	Proc Step	Type	SvcClass	SvcClass Period	ASID	JESJOBID	TCB Percent	SRB Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Independent Enclave C
WMQACHIN	0.0	WMQACHIN	MQ70	STC	OPSDEF	1	0X0112	STC05805	0.0	0.0	0.0	0.0	0.0	0.0	

z/OS Job summary for: WMQACHIN

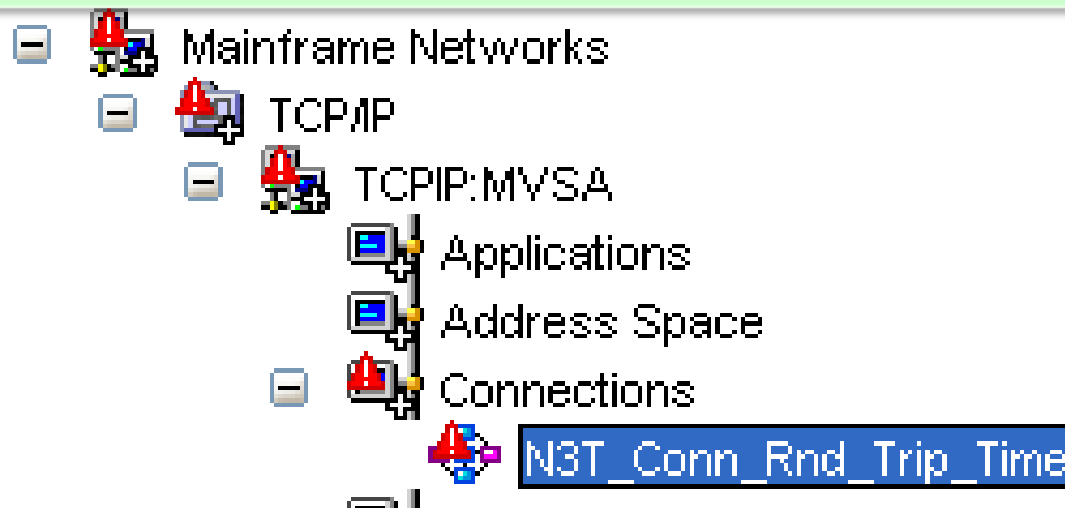
View Thresholds TIP

- Highlight metrics in a table you are viewing
- Will bring out hidden problems
- Help collate metrics to probable cause of problem

 Response Time	Origin Node	System ID
15.19	TCP/IP:MVSA	MVSA
5.67	TCP/IP:MVSA	MVSA
Response Time GE 5.00		

Situations

Notification, though the TEP or OMNIBUS or even an email



Situation Expert Advice

The screenshot displays the Situation Expert Advice interface. On the left is a tree view of network components. The main area is divided into three sections: Initial Situation Values, Current Situation Values, and Expert Advice. The 'Take Action' panel is also visible on the left.

Initial Situation Values										
Response Time	Application Name	Connection Type	Local Port	Foreign Socket	Connection Number	Connection State	Total Bytes Received	Total Bytes Sent	Total Bytes	Total Bytes
6.48	CICSAOR5	TCP_Connection	18085	9.65.243.124:3440	6745433	ESTABLISHED	884	759	1643	1643
16.16										

Current Situation Values										
Response Time	Application Name	Connection Type	Local Port	Foreign Socket	Connection Number	Connection State	Total Bytes Received	Total Bytes Sent	Total Bytes	Total Bytes
6.48	CICSAOR5	TCP_Connection	18085	9.65.243.124:3440	6745433	ESTABLISHED	884	759	1643	1643
16.16										

Expert Advice

N3T_Conn_Rnd_Trip_Time

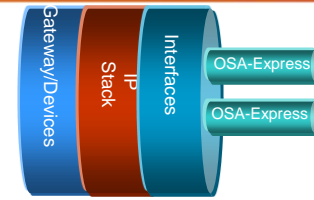
[Situation Description](#) **Connection round trip time**
[Suggested Actions](#)

The response time for the last TCP segment transmitted on the connection. It is the elapsed time, in tenths of a second, starting when the segment was sent and ending when the acknowledgment was received. Round trip time is not end-to-end response time since it does not account for application time. However in conjunction with the round trip variance, it is a good indication of the general health of the route.

- **Initial Situation Values:** Captures metrics at timed triggers
- **Current Situation Values:** Compare current metrics with initial metrics
- **Expert Advice:** Provides suggested actions
- **Take Action:** Issue commands from TEP
- **Reflex Automation:** Automatically issue commands
- **Event Forwarding:** Can forwards alerts to OMNIBUS



- Interface Status
 - (Enhancement with z/OS 1.12)
- Situation on OSA Interface Status.
- Alert of OSA Interface down.
- Check Microcode level
- Adjust MTU size to reduce fragmentation
- zEnterprise – Monitor new OSA types
- Put all OSA and interfaces on one workspace



Out of Box Expert Advice

Interfaces

- Device Inactive
- High bandwidth Utilization
- No traffic
- QDIO is Accelerating Bytes
- Max Staging queue depth
- DLC Read deferrals
- DLC Read Exhausted

Out of Box Expert Advice

OSA Express

- High BUS Utilization
- Channel utilization
- Missed packets
- Not Stored Frames

Tip#1 Put all OSA and Interfaces Cross LPAR View

OSA Express - XPBASE - Ernie Gilman *ADMIN MODE*

File Edit View Help

Navigator View: Networks (MFN)

Networks (MFN)

- *OMEGAMONXE_MAINFRAME_NTWK
 - MVSA
 - TCPIP:MVSA
 - Address Space
 - Applications
 - Connections
 - Gateways and Devices
 - FTP
 - Interfaces
 - IP Filters
 - IPSec Tunnels
 - OSA
 - TCP/IP Memory Statistics

Physical Networks (MFN)

OSA Interface Topology -- Interface Names and System IDs

Interface Statistics OSA only - all LPARS z/OS 1.12 only

System ID	Interface Name	Interface Type	Device or Datapath Status	Interface Status	IP Address Version	Total Bytes Received
MVSB	OSAFBC0L	OSA QDIO ethernet OSD	Active	Active	IPv4	183,920,915
MVSC	OSAFBC0L	OSA QDIO ethernet OSD	Active	Active	IPv4	99,633,994
MVSA	EZ6OSM01	OSA QDIO ethernet OSM	Active	Active	IPv6	9,051
MVSA	EZ6OSM02	OSA QDIO ethernet OSM	Active	Active	IPv6	8,316

System ID	Channel Number	Device Port N	Channel Number	Port Name
MVSA	01	IUTMP0	04	IUTXP004
MVSA	02	IUTMP0	06	IUTXP006
MVSA	04	IUTXP0	0B	OSAFBC0
MVSA	06	IUTXP0	0B	OSAFBC0

Hub Time: Tue, 07/26/2011 09:26 PM Server Available OSA Express - XPBASE - Ernie Gilman *ADMIN MODE*

Next, DLC Queuing Details



Tuning OSA Interfaces is now simpler with z/OS 1.12

The screenshot displays four monitoring windows:

- Bytes Received per Queue Workload Name:** A 3D bar chart showing approximately 10 billion bytes for the PRIMARY workload.
- Bytes Transmitted per Queue Priority:** A 3D bar chart showing transmission across four priorities, with priority 4 being the highest.
- QDIO Accelerator Bytes Received:** A 3D bar chart showing approximately 10 billion bytes.
- QDIO Accelerator Bytes Transmitted per Queue Priority:** A 3D bar chart showing transmission across four priorities, with priority 4 being the highest.

Below the graphs are two summary tables:

DLC Write Queue Statistics Summary Table

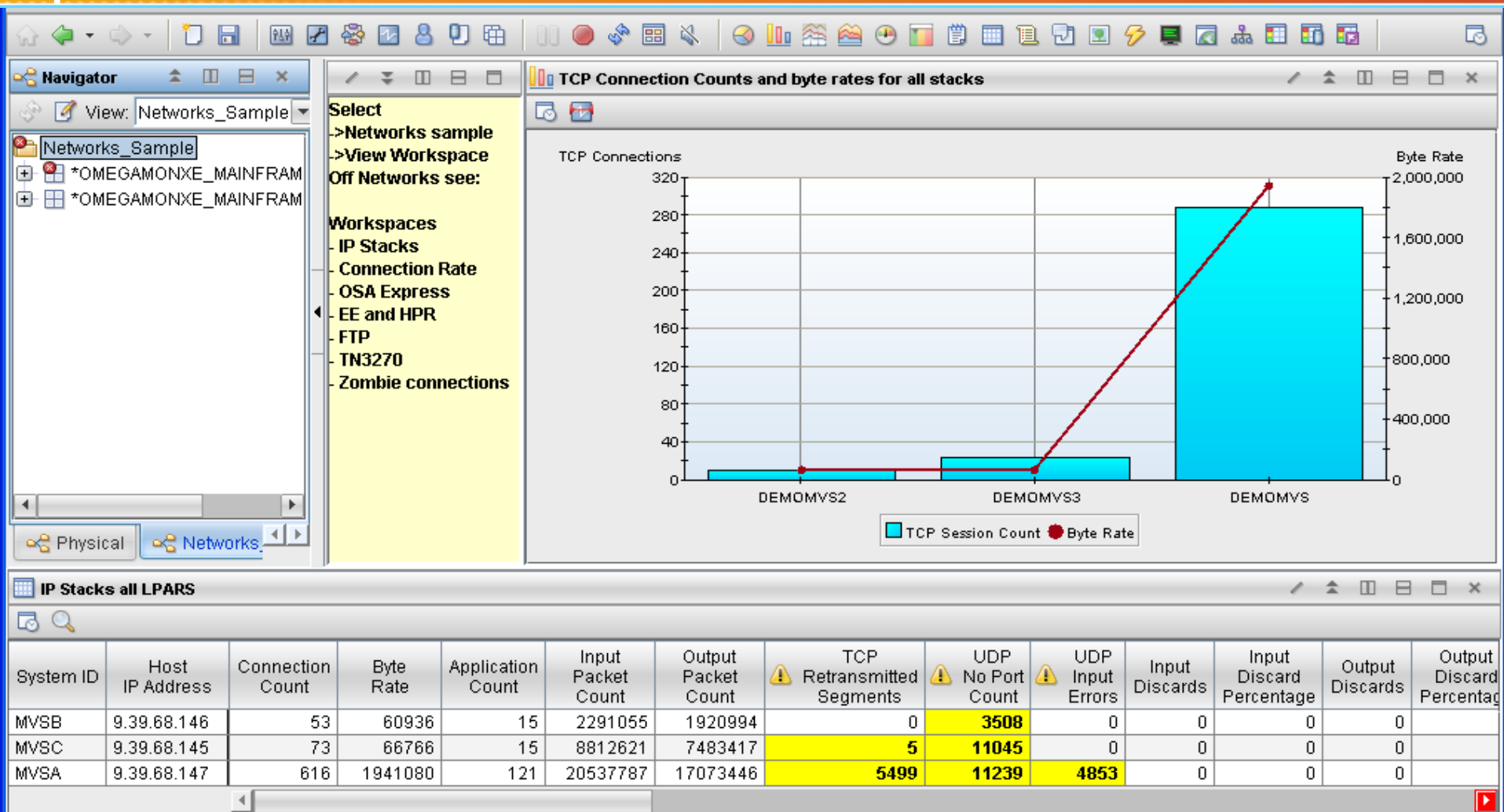
Interface Name	Interface Type	Interface Status	QDIO Accelerator	Frame Invalidation Support	Queue Priority	QDIO SIGA Count	Used SBALs	Average Staging Queue Depth	Maximum Staging Queue Depth
OSAFBC0L	OSA QDIO ethernet OSD	Active	No	Yes	1	40,527	40,623	0	0
OSAFBC0L	OSA QDIO ethernet OSD	Active	No	Yes	2	134,883	147,057	0	0
OSAFBC0L	OSA QDIO ethernet OSD	Active	No	Yes	3	56,538	58,903	0	0
OSAFBC0L	OSA QDIO ethernet OSD	Active	No	Yes	4	19,441,3...	21,311,224	0	0

DLC Read Queue Statistics Summary Table

Interface Name	Interface Type	Interface Status	QDIO Accelerator	Frame Invalidation Support	Queue Workload Name	Queue ID	Real PCI Interrupts	Virtual PCI Interrupts	Total PCI Interrupts	Percent Real PCI Interrupts
OSAFBC0L	OSA QDIO ethernet OSD	Active	No	Yes	PRIMARY	1	33,948,258	357,540	34,305,798	

Next, Monitoring Multiple IP Stacks

Tip#2 Put all IP Stacks for all LPARs in one view



- Create Cross LPAR Stack view
- Number of Connections
- Errors
- Monitor DVIPA from NetView

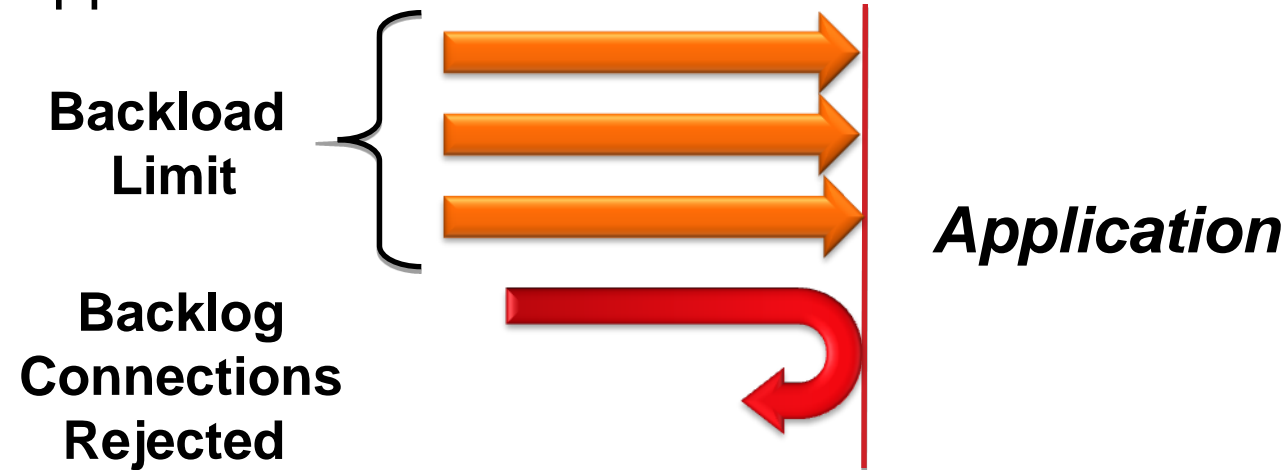
Out of Box Expert Advice

IP Stack

- Input Discards
- Output Discards

Next a Connection Backlogs

Application will not be aware that connections are being rejected

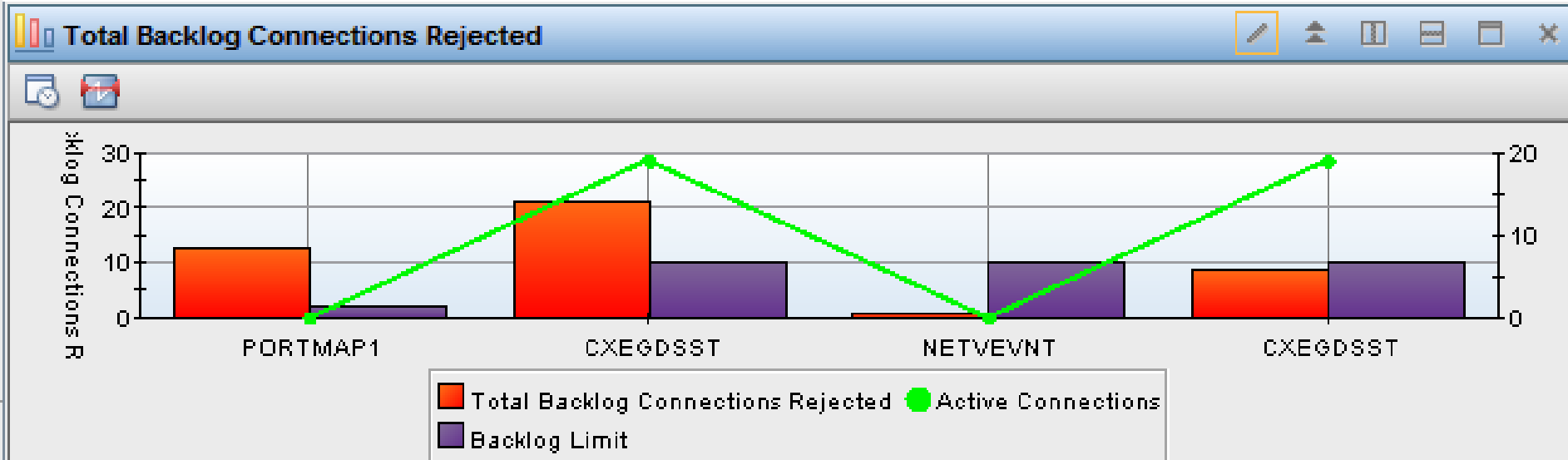


Out of Box Expert Advice

Application problems

- Backlog Connections Rejected
- Connections backlogged
- Not Accepting Connections
- Rejecting new connections

Tip#3 Monitor Connection Backlog Rejections



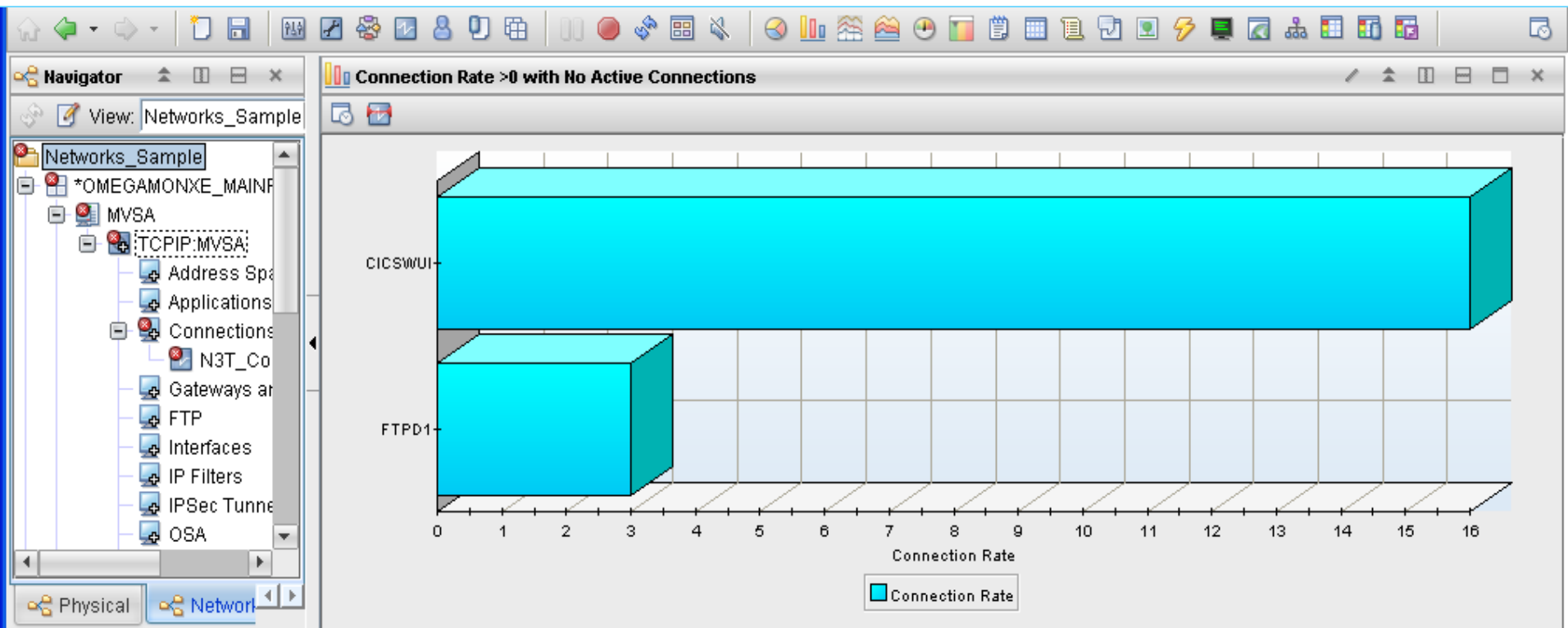
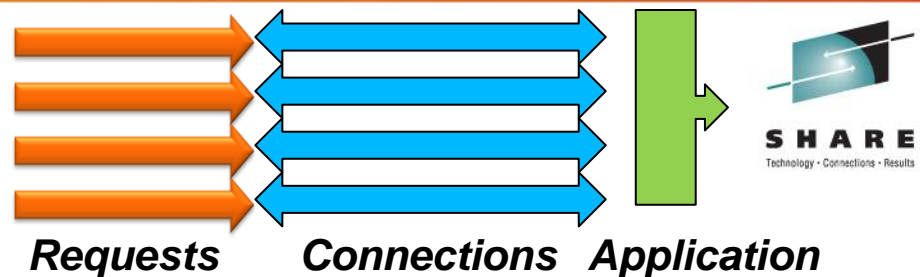
	System ID	Application Name	Local Port	Active Connections	Total Backlog Connections Rejected	Backlog Limit	Backlog Connections Rejected Time Stamp
	MVSA	CXEGDSST	1920	19	21	10	07/22/11 13:34:26
	MVSB	PORTMAP1	111	0	13	2	07/18/11 12:21:23
	MVSA	CXEGDSST	1920	19	9	10	07/22/11 13:34:21
	MVSA	NETVEVNT	3754	0	1	10	07/21/11 08:58:53

- Application TCP Listeners workspace
- TCP Listeners workspace

Next a high connect / disconnect rate

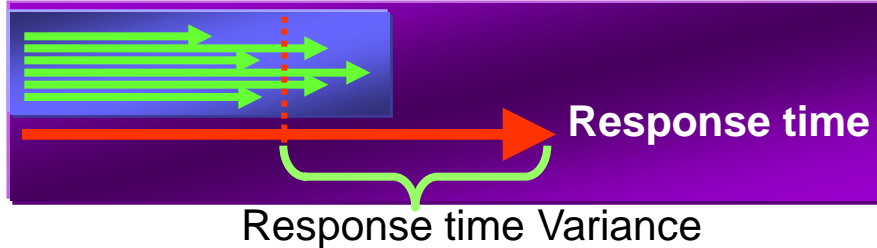
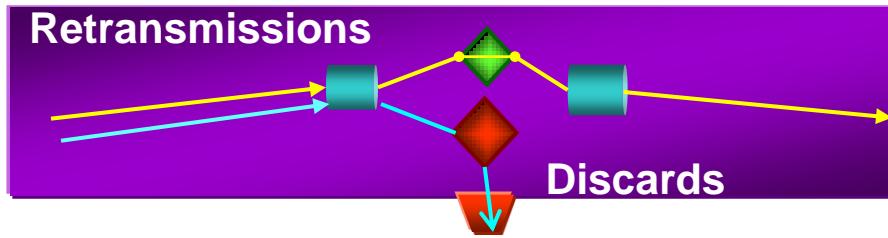
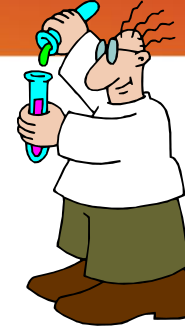
Tip#4 Monitor High Connection Rates

A high connection rate with very few active connections may indicate a poor design and can cause excess z/OS overhead.



TCP Listeners with Connection Rate > 0 with no active Connections

System ID	Application Name	Local Port	Connection Rate	Active Connections	Connections in Backlog	Total Backlog Connections Rejected	Collection Time	Accepted Connections	Active Connections High Water Mark	Time Stamp for Active Connections High Water Mark	Idle Time Since Last Accept
MVSA	FTPD1	21	3	0	0	0	08/04/11 10:25:34	3	2	08/03/11 20:40:34	0.01
MVSA	CICSWUI	3041	16	0	0	0	08/04/11 10:25:34	16	2	08/04/11 09:48:34	0.01

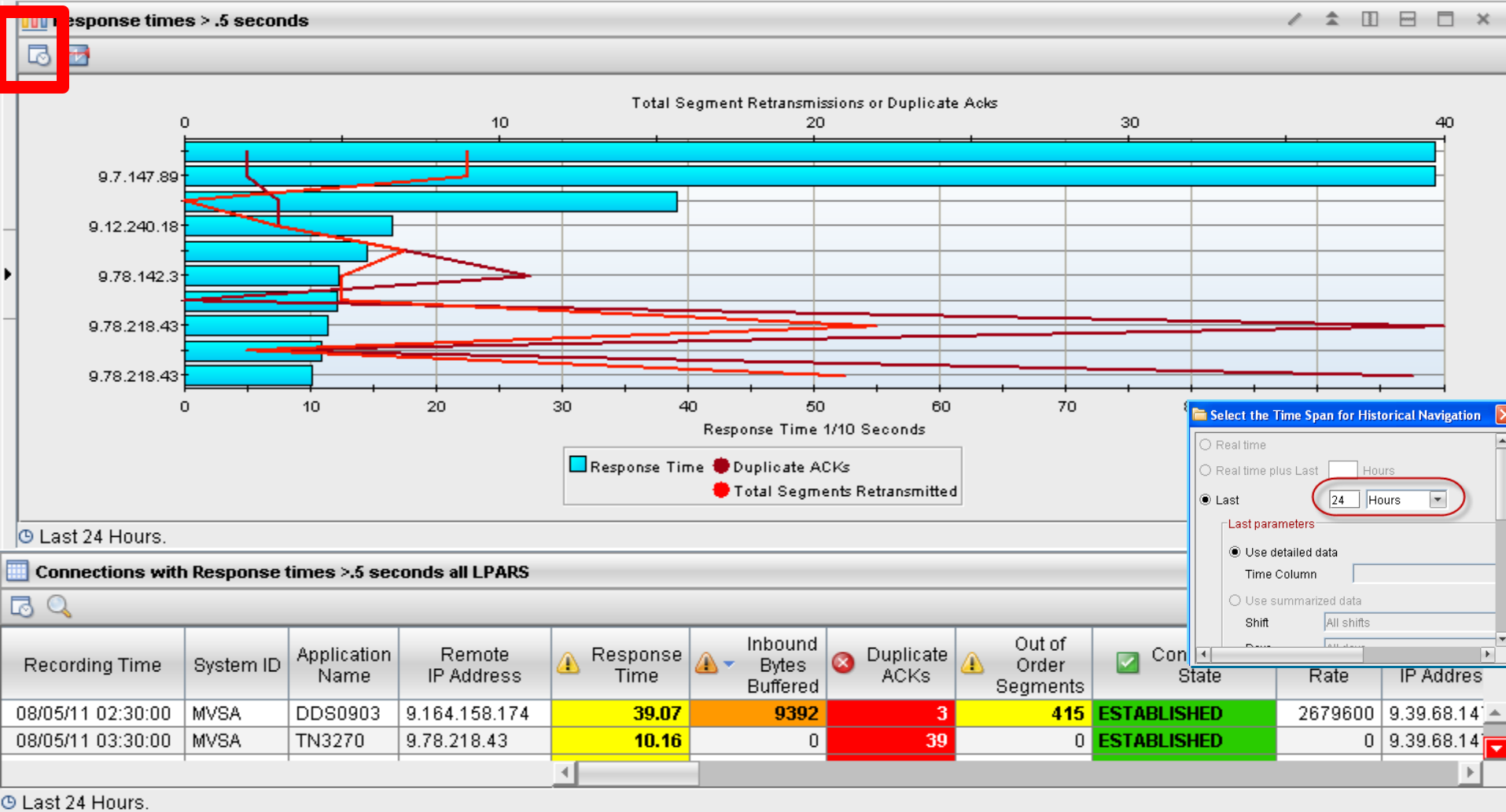


Out of Box Expert Advice Connections

- Retransmissions
- Discards
- Out of order segments
- Round trip time
- Round trip time variance

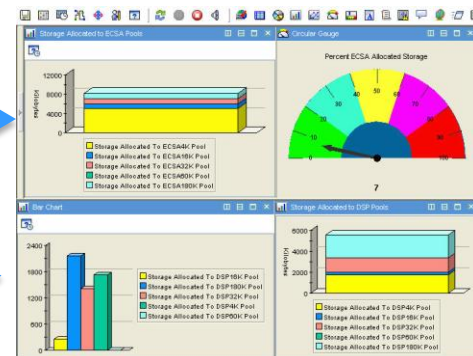
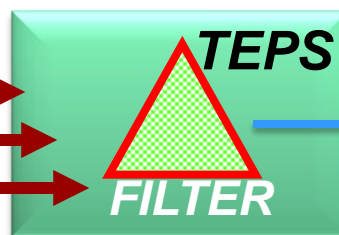
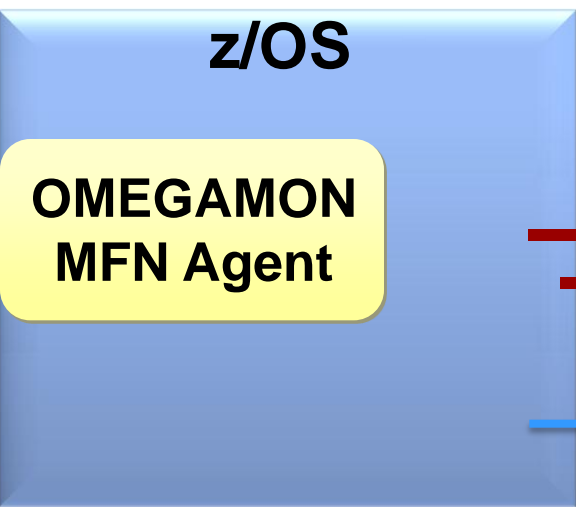
- Retransmissions, discards and out of order segments
- Window Size set to zero (local or remote)
 - Can indicate congestion
- **Inbound and outbound bytes buffered (new)**
 - *Can be used to avoid major outage!*
 - *Create situation off TCP Connections Workspace*

Tip#5 Correlate Response Times with Errors



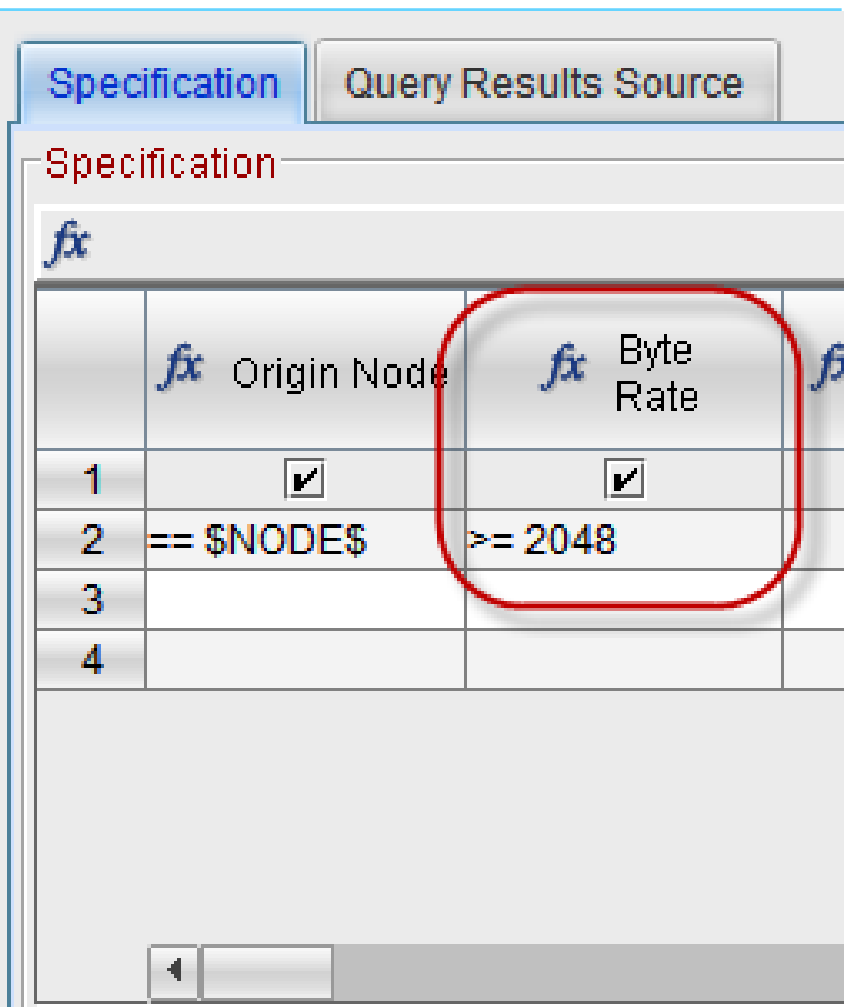
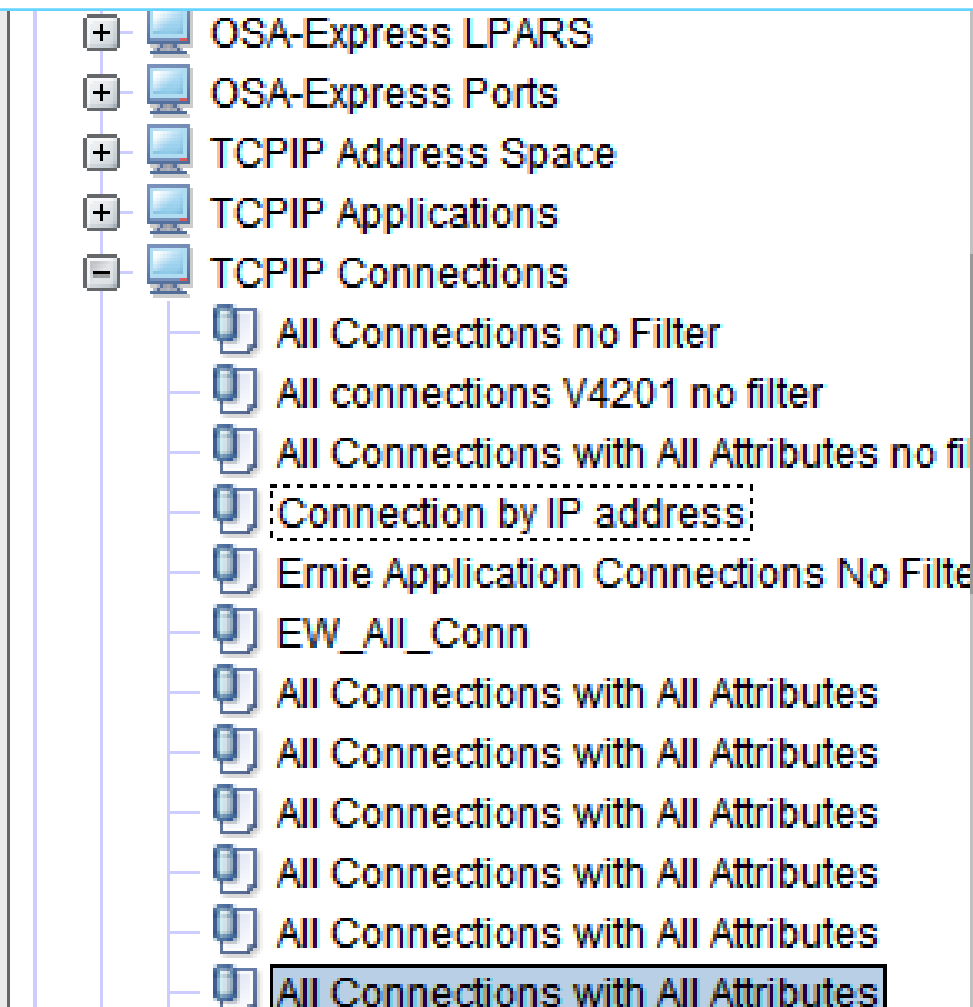
- View all connections with high response times across all LPARS
- Turn on history to see when problems are occurring
- See if poor response time correlates with any errors.
- Notice Inbound Bytes Buffered

Next : Why filters can be so dramatic



- Filter can be at TEPS Server or z/OS Agent
- Filtered Query is dynamically pushed to z/OS Agents
- Performance gain is dramatic and immediate

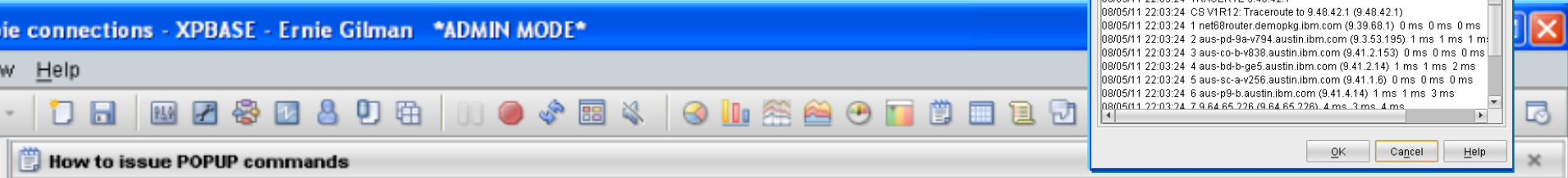
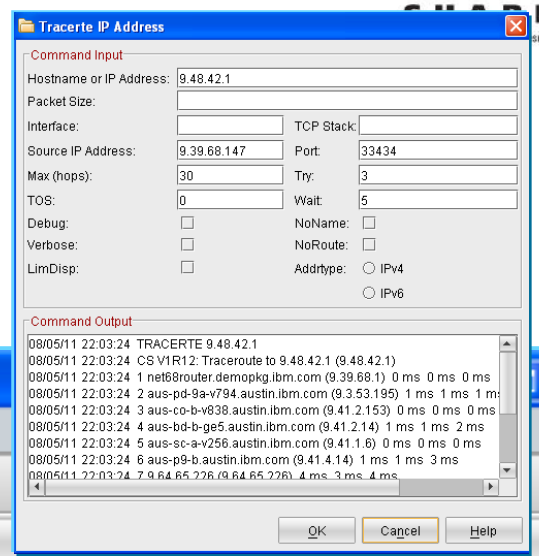
- OMEGAMON for MFN default filters can hide problems
- It is simple is to override these filters.



Tip#6 Create custom query for zombie connections



- Connection that do not get dropped
- Connections could start to backlog
- Connections with no traffic for a long time.
- Filter out addresses like Loopback
- Also create situation on Bytes buffered



Right Click anywhere on a connection and select: DROP PING TRACETE NSLOOKUP or EXPORT

TCP connections with no activity for >10 Mins - all LPARS

System ID	Application Name	Remote IP Address	Remote Port	Local IP Address	Local Port	ASID	Byte Rate	Time Since Last Activity	Connection State	Inbound Bytes Buffered	Hex Connection Number
MVSA	BBOS002S	9.39.68.147	9558	9.39.68.147	13452	0X019F	0	11,884.23	CLOSE_WAIT	23	0X00061D5C
MVSA	BBOS002S	9.39.68.147	9558	9.39.68.147	183						
MVSA	BBOS002S	9.39.68.147	9558	9.39.68.147	183						
MVSA	IBMSMV31	9.65.252.47	2546	9.39.68.147	99						
MVSA	CXEGI2	9.39.68.147			139						
MVSA	1072	9.39.68.147			424						
MVSA	ADM9F07C	9.39.68.147			120						
MVSA	ADM9E110	9.39.68.147			422						

Drop Connection

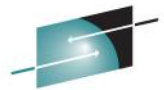
Ping IP Address

Tracerte IP Address

NSLookup IP Address

Byte Rate	Time Since Last Activity	Connection State	Inbound Bytes Buffered
0	11,884.23	CLOSE_WAIT	23
0	700.34	CLOSE_WAIT	23
0	700.34	CLOSE_WAIT	23
0	17,322.36	ESTABLISHED	0

Next: Filter for zombies



Specification

Query Results Source

Specification

fx

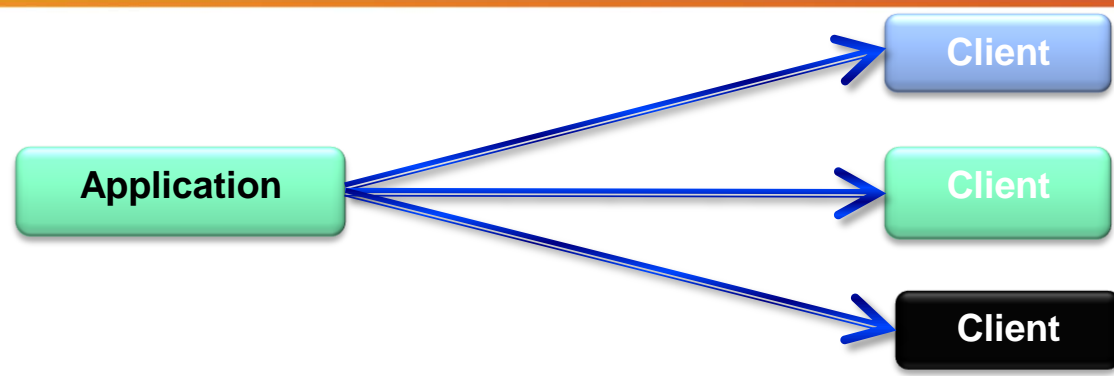


	<i>fx</i> Origin Node	<i>fx</i> Time Since Last Activity	<i>fx</i> Remote IP Address	<i>fx</i> Remote IP Address	<i>fx</i> By Ra
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	== \$NODE\$	> 600.00	= '127.0.0.1'	!= '::1'	
3					

Connections with no activity for > 10 Mins (600 seconds)
Filter out addresses such as loopback
Filter will automatically be pushed out to the MFN Agents



- Examples:**
- Connect:Direct
 - MQ
 - CICS
 - WebSphere



Address Space

- CPU
- Storage
- Priority

Application Listener

- Connection Rejections
- Backlog limit
- Number of Connections
- Connection Rate

TCP/IP Connections

- Response times
- Buffers queued
- Connection hangs
- Congestion
 - Reset windows
 - Retries,
 - Out of order

- Listener and connection feeds from OMEGAMON MFN
- Inactive connections feeds from NetView for Termination reasons
- Address Space feeds from OMEGAMON on z/OS

Next: Create filtered view on application

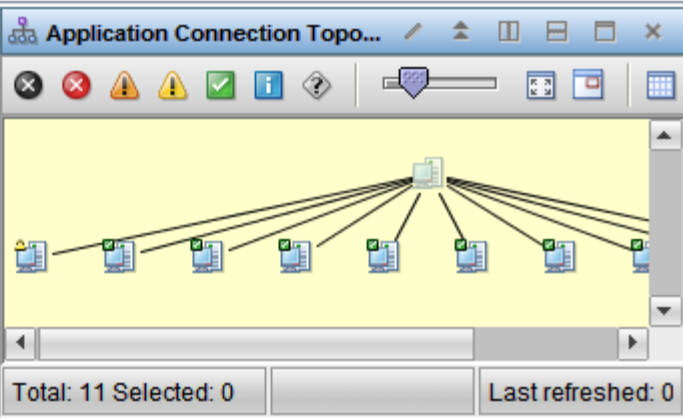
Here is one filtered on MQ



Application Name	Local Port	Active Connections	Accepted Connections	Connection Rate	Active Connections High Water Mark	Time Stamp for Active Connections High Water Mark	Idle Time Since Last Accept	Server Up Time	Connections in Backlog	Established Connections in Backlog	FRC/ Connect in Back
WMQACHIN	1414	11	0	0	11	08/05/11 00:33:34	0.08	31.00	0	0	

Remote Port	ASID	Connection Start Time	Connection Duration	Connection State	Response Time	Time Since Last Activity	Duplicate ACKs	Total Segments Retransmitted	Total Out of Order Segments
50331	0X0112	08/04/11 20:37:24	17530	ESTABLISHED	5.72	16,519.56	0	0	0
59953	0X0112	08/03/11 20:53:29	102965	ESTABLISHED	5.35	102,615.32	0	0	0
49405	0X0112	08/04/11 19:30:42	21532	ESTABLISHED	5.63	18,260.51	20	21	0

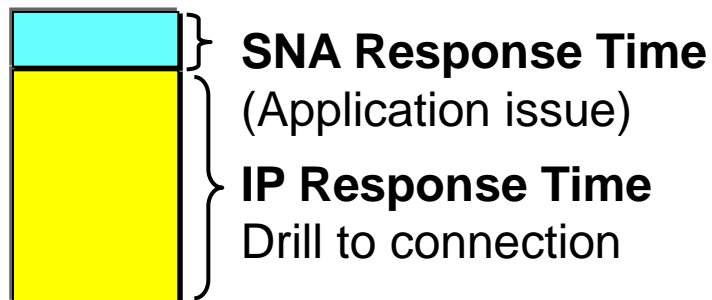
System ID	Resource Name	Remote IP Address	Remote Port String	Termination Reason Code	Total Segments Retransmitted	Byte Rate
/SA	WMQACHIN	9.76.159.5	52107	Excessive_Retrans	50	1237
/SA	WMQACHIN	9.39.66.103	39940	Client_Sent_Reset	0	0
/SA	WMQACHIN	9.76.133.99	49761	Excessive_Retrans	17	9800
/SA	WMQACHIN	9.39.66.103	34836	Client_Sent_Reset	0	0



Job Name	CPU Percent	Step Name	Proc Step	Type	SvcClass	SvcClass Period	ASID	JESJOBID	TCB Percent	SRB Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Independ Enclave C
WMQACHIN	0.0	WMQACHIN	MQ70	STC	OPSDEF	1	0X0112	SIC05805	0.0	0.0	0.0	0.0	0.0	0.0	

z/OS Job summary for: WMQACHIN

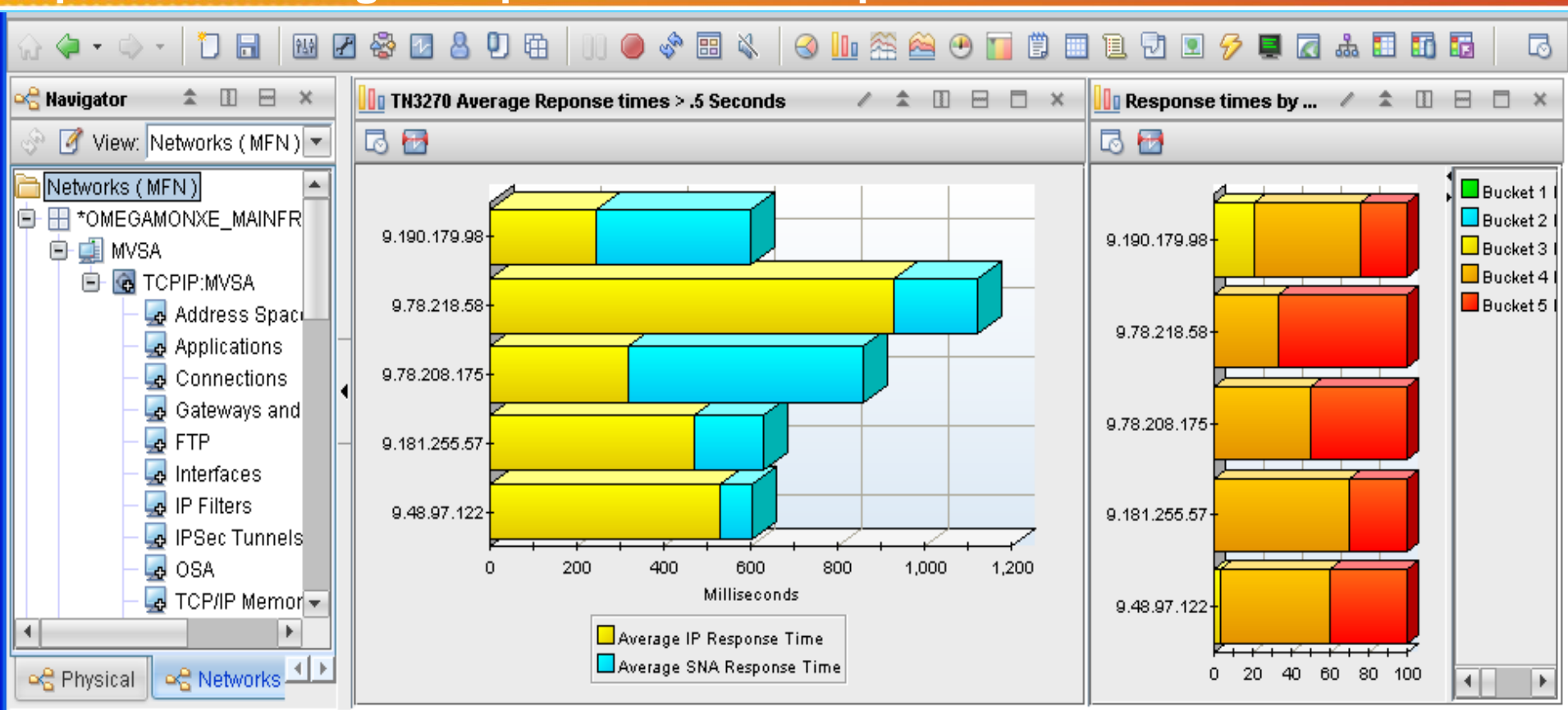
- **TN3270 Response time**
 - SNA time is application
 - IP time is the network
 - Drill down to TCP connection to see errors
 - Response time distribution by buckets
 - Sliding window buckets set in Comm Server
- **TN3270 Server status from NetView**



Out of Box Expert Advice **TN3270 Response times**

- Average IP response times
- Average SNA response times
- Average total response times
- High number of long responses

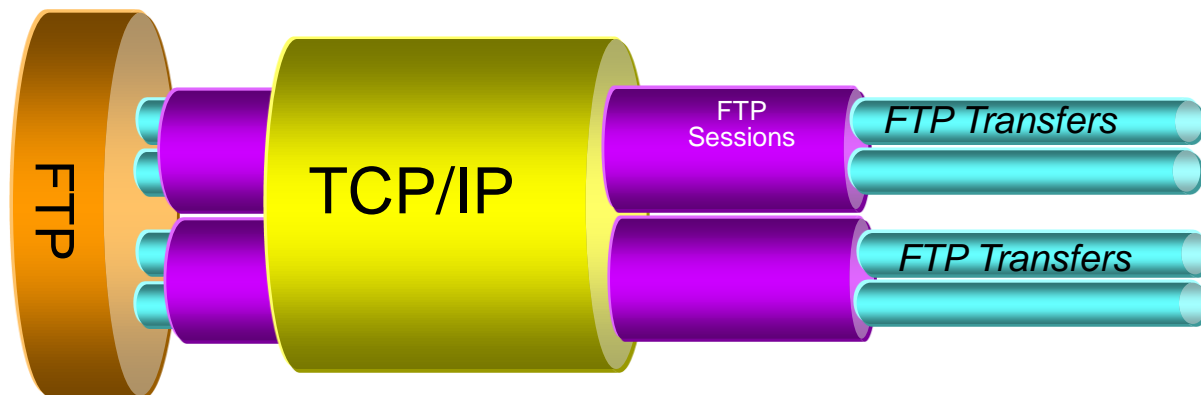
Tip#8 TN3270 High Response Time Exception View



TN3270 SESSIONS with response time > .5 seconds

System ID	SNA Application Name	Remote IP Address	Session End	Average Total Response Time	Average IP Response Time	Average SNA Response Time	Average Transaction Count	Response Time Collection Time	Total Transactions Detected
MVSA	ISZSMGR	9.78.218...	✓	1123	931	192	2	07/26/11 21:25:16	9
MVSA	DDCTSO...	9.78.208...	✓	861	320	541	0	07/26/11 21:25:33	6
MVSA	DDCTSO...	9.181.25...	✓	630	471	159	0	07/26/11 21:25:29	10

Next: FTPs

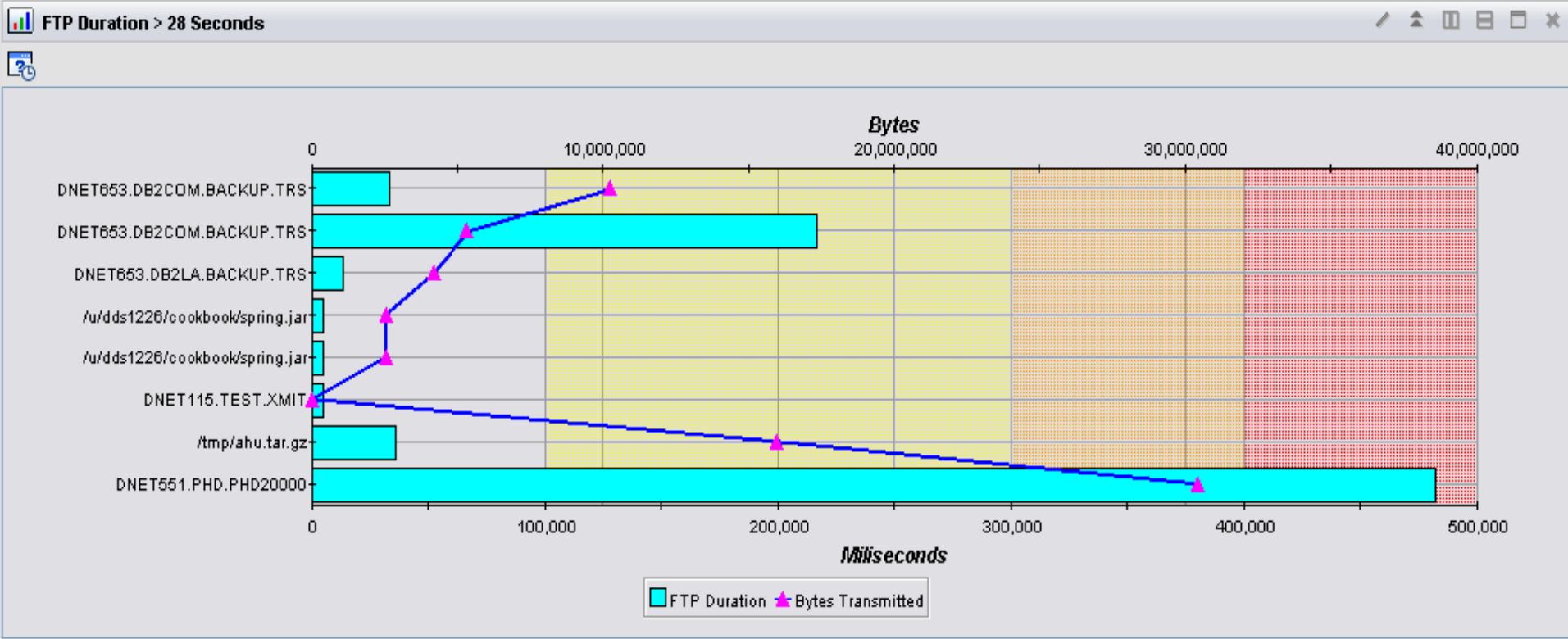


- FTP Session logon failure reason codes
- FTP Transfers, How long it took
- Drill down to connection for performance issues

User ID on Server	Session Start	Session End	Login Failure Reason Description
MS519	02/17/08 09:07:03	02/17/08 09:07:03	Password_not_valid
MS519	02/17/08 09:07:52		

User ID on Server	Last Reply to Client	Transmission Duration	Bytes Transmitted	Command	Last Reply to Client Description	Dataset Name
MS519	250	1140	1965120	RETRIEVE	Requested_file...	MS519.ELVIS...
MS519	250	490	429056	RETRIEVE	Requested_file...	MS519.ELVIS...
MS519	250	1140	1965120	RETRIEVE	Requested_file...	MS519.ELVIS...
MS519	250	500	429056	RETRIEVE	Requested_file...	MS519.ELVIS...
MS519	250	1160	1965120	RETRIEVE	Requested_file...	MS519.ELVIS...

Correlate FTP duration with bytes transmitted



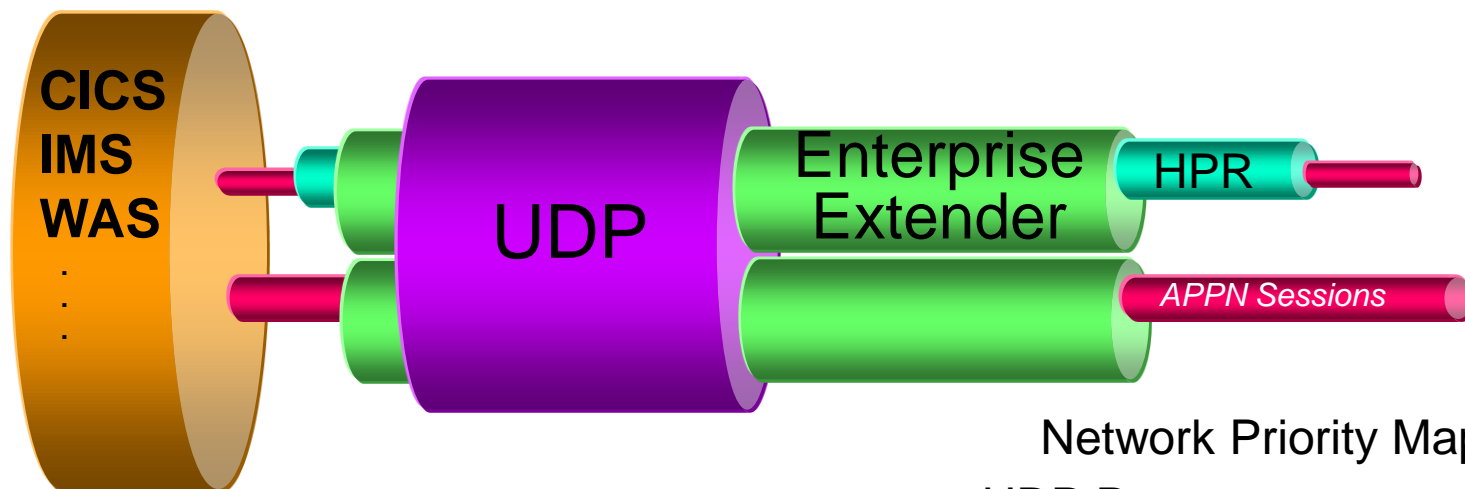
Out of Box Expert Advice

FTP Session Errors:

- Network or socket errors
- Error reply from server
- Invalid sequence from client
- Resource shortage (storage...)

FTP Transfer Errors

- File, system or network errors



Expert Advice

HPR

- Low initial throughput rate
- Path Switches
- ARB Mode Red, Persistent*

EE

- High retransmissions
- Out of Sequence buffers

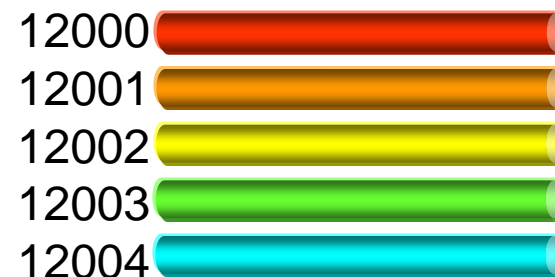
UDP

- High Discard Rates
- Long Queues exceeding Queue Limit*

*Simple to create

Network Priority Mappings

UDP Ports



SNA	Path Switch Timeout
LL2	(LIVTIME 10 Seconds)
Network	1 Minute
High	TP(2) 2 Minutes
Medium	TP(1) 3 Minutes
Low	TP(0) 8 Minutes

Tip#10 Show EE and HPR on one View for all LPARs

HPR all LPARS

Recording Time	System ID	Remote CP Name	Sessions	ARB Mode	Local RTP Name
08/05/11 21:00:00	MVSA	USIBMNR.NDCMVSB	11	Yellow	CNRC
08/05/11 18:00:00	MVSA	USIBMNR.NDCMVSB	11	Yellow	CNRC
08/05/11 19:00:00	MVSA	USIBMNR.NDCMVSB	11	Red	CNRC
08/05/11 18:00:00	MVSA	USIBMNR.NDCMVSC	6	Red	CNRC
08/05/11 20:00:00	MVSA	USIBMNR.NDCMVSB	11	Red	CNRC
08/05/11 19:00:00	MVSA	USIBMNR.NDCMVSC	2	Green	CNRC
08/05/11 19:00:00	MVSA	USIBMNR.NDCMVSB	1	Green	CNRC
08/05/11 19:00:00	MVSA	USIBMNR.NDCMVSB	1	Green	CNRC
08/05/11 20:00:00	MVSA	USIBMNR.NDCMVSC	6	Green	CNRC

Last 4 Hours.

HPR Topology

Total: 4 Selected: 0 Last refreshed: 08/06/11

Enterprise Extender all LPARS

Origin Node	System ID	PU Name	Local IP Address	Remote IP Address	RTP Pipes	Sessions	Packets Retransmitted	Percent of Packets Retransmitted	Packet Retransmission Rate	Transmit Byte Rate	Receive Byte Rate	Bytes Sent	Bytes Received
VTAM:MVSA	MVSA	EX000012	9.39.68.12	9.65.189.66	1	2	0	0	0	33	33	33	33

Out of Box Expert Advice VTAM and TCP Address Space

- CSA%, ECSA %, CPU % , Paging Rate, and Buffer Pool shortage

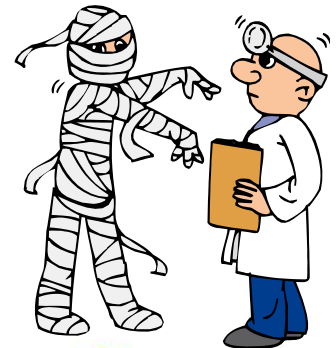
TCPIP Address Space all LPARS											
System ID	Host IP Address	zOS Release	CPU Percentage	Paging Rate	CSA Usage Below 16MB	CSA Percent Below 16MB	Total CSA Usage	Total CSA Percentage	Connection Count	Byte Rate	Application Count
MVSB	9.39.68.146	zOS_1.12	0	0	136	0	26032	0	53	67999	15
MVSC	9.39.68.145	zOS_1.12	0	0	136	0	26032	0	73	118353	15
MVSA	9.39.68.147	zOS_1.12	0	0	136	0	34392	0	587	1299346	121

TCPIP Memory Statistics all LPARS										
System ID	IP Address	ECSA Storage In Use	ECSA Storage Free	Percent ECSA Storage In Use	Authorized Private Storage In Use	Authorized Private Storage Free	Percent Authorized Private Storage In Use	64bit Common Storage In Use	64bit Common Storage Free	
MVSB	9.39.68.146	3,071,680	0	100	8,917,608	9,456	100	151,120	897,...	
MVSC	9.39.68.145	3,070,848	0	100	9,040,392	9,808	100	157,504	891,...	
MVSA	9.39.68.147	6,361,080	61,608	99	11,197,544	24,208	100	333,568	715,...	

VTAM Address Space all LPARS												
System ID	CPU Percentage	Paging Rate	CSA Below	CSA Percent	CSA Percentage	DASD SIO Per Sec	NCP SIO Per Sec	CTC SIO Per Sec	Local SNA SIO Per Sec	Local Non-SNA SIO Per Sec	Other SIO Per Sec	SIO Rate Pct of System
MVSC	0				9228	2	0	0	0	0	0	0
MVSA	0	0	84541	2	10213686	3	0	0	0	0	0	0

CSM Storage Statistics all LPARS											
System ID	Percent ECSA In Use Storage	Percent ECSA Allocated Storage	Storage In Use Across ECSA Pools	Storage Free Across ECSA Pools	Storage Allocated Across ECSA Pools	Maximum ECSA Storage Allowed	Storage In Use Across DSP Pools	Storage Free Across DSP Pools	Storage Allocated Across DSP Pools	Storage In Use Across Pools	
MVSC	0	2	248	1800	2383	122880	5208	1616	6824	5456	
MVSA	1	3	812	2340	4160	122880	23008	5648	28656	23820	

1. OSA Express and Interface status and utilization
2. Show all IP Stacks in one view
3. TCP/IP Connection backlog and rejections
4. High TCP/IP Connection Rates
5. High TCP/IP Connection response times
6. Zombie Connections
7. Single Application Focused Network Monitor
8. TN3270 Response time analysis
9. FTP Logon and transfer failures
10. EE and HPR performance issues





- **OMEGAMON Recommended Maintenance:**
- <https://www-304.ibm.com/support/docview.wss?uid=swg21290883>
 - **OMEGAMON XE for MFN V4R2 Fix pack 3** [4.2.0.3-TIV-KN3-IF0001](#)
 - **Matching PTFs** UA58835, UA59029, UA59138 , UA59709
 - **IBM Tivoli Monitoring V6.2.2**
 - **Fix Pack** [6.2.2-TIV-ITM-FP0005](#)
 - **Matching PTFs** UA60941, UA60942 ,UA60943, UA60944

Pulse 2011 Session 1254: Solving Application and Network issues using IBM's OMEGAMON Mainframe Networks *by James T Sherpey II*

Top 10 Tips for z/OS Network Performance Monitoring with OMEGAMON

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IBM

Session **9917**