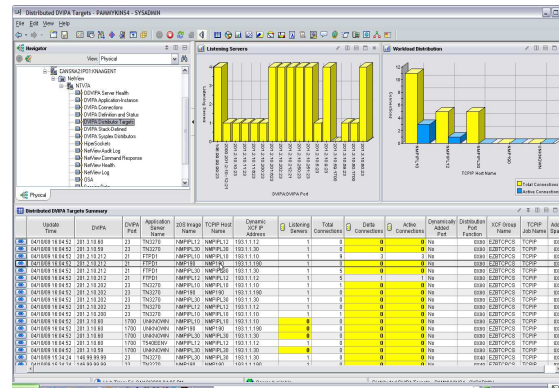




Addressing Networking Challenges with IBM NetView™ for z/OS™ V5.4

October, 2009



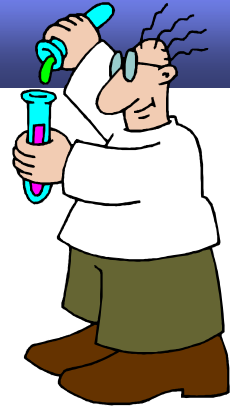
Ernie Gilman

IBM Sr. Consulting IT Specialist
egilman@us.ibm.com

Larry Green

Architect, NetView for z/OS
greenl@us.ibm.com

Presentation focus



This presentation will focus on how to address networking challenges with the recently announced IBM NetView for z/OS V5.4

The focus will highlight new Network Management features but will cover a few previously available network management capabilities.

What's New?

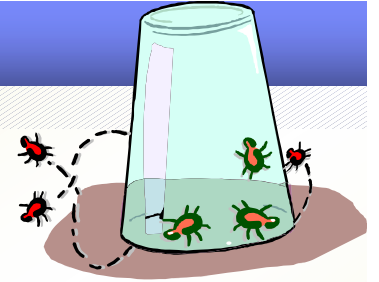
- **IBM NetView for z/OS V5.4**
 - ▶ Prereqs z/OS 1.9
 - ▶ Generally available October 2, 2009

- **Sysplex management Enhancements**
 - Expanded discovery and management of sysplexes
- **IP management**
 - REAL-Time TCP/IP and OSA Traces.
 - Inactive IP connections now include the reason the connection was terminated.
 - Dynamic Virtual IP Address (DVIPA) monitoring has been enhanced
 - IP Subnet and z/OS discovery through IBM Tivoli Network Manager.
 - NetView Management Console support for IPv6 communications.
- **Expanded Tivoli Enterprise Portal (TEP) support**
 - New and expanded data and workspaces: OSA, HiperSockets, Telnet servers, DVIPA
- **Core NetView**
 - Long password phrase support.
 - Service oriented architecture through a Web services gateway.
 - Enhanced Command Revision
 - SMF type 30 record automation support. (job & job-step termination)
 - The KEEP stage in the PIPE has been enhanced to allow access globally from any regular task.



AGENDA

▪ Addressing Networking Challenges with IBM NetView for z/OS V5.4

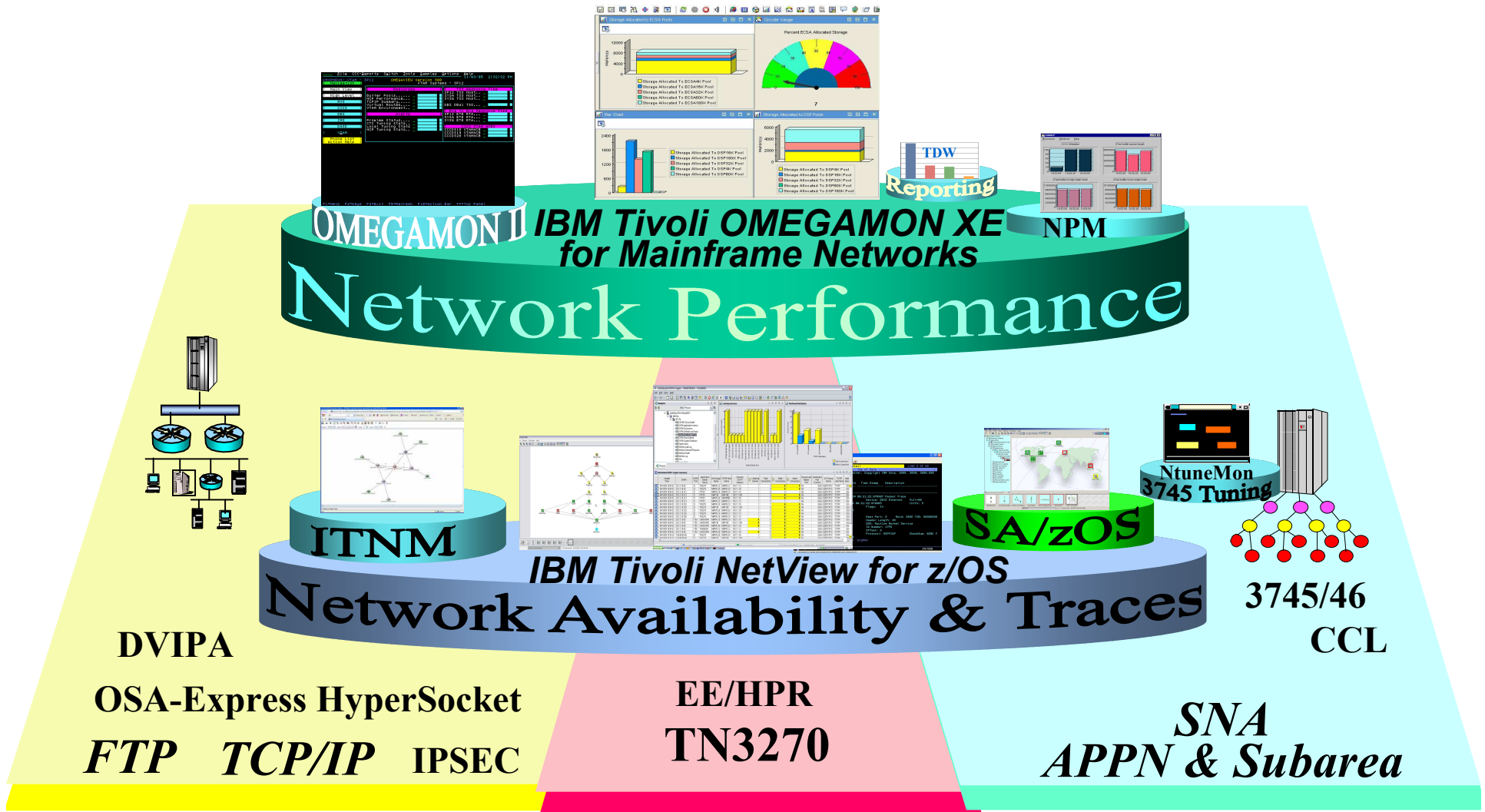


z/OS Communication Server Network Management

1. Real Time TCP/IP Packet Trace
2. Real time OSA Trace
3. OSA Monitoring
4. Hipersockets
5. IP Stacks
6. DVIPA
7. TCP/IP Connections
8. Telnet Server
9. SNA EE/HPR Traces

Next, Overview of Network Management

IBM z/OS Network Performance Monitoring and Management



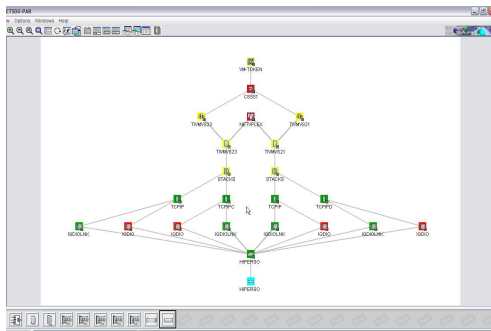
Next, Data collection and User Interfaces

z/OS Network Performance Data Collection and User Interfaces

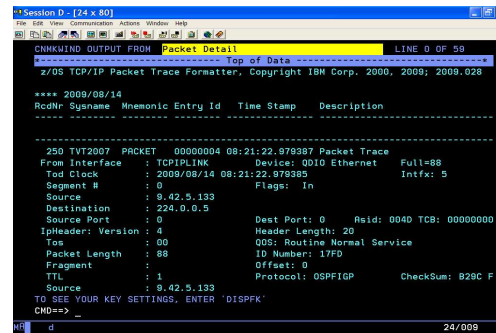
Network Management Console (NMC)

3270

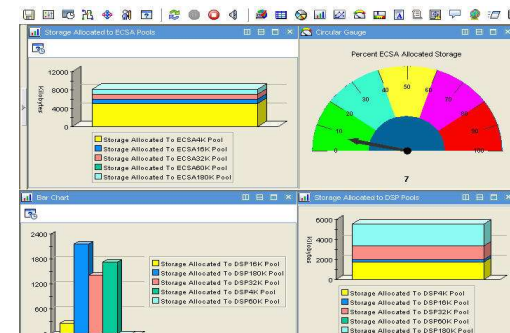
Tivoli Enterprise Portal (TEP)



Topology and Status for Operators



Targeted for Specialists



Integrated for Everyone

NetView for z/OS

OMEGAMON XE for Mainframe Networks

NLDM API

Trace API

VTAM API

TCP/IP API

SNMP

z/OS Communications Server

NMI APIs

Network Management Interface API (NMI)

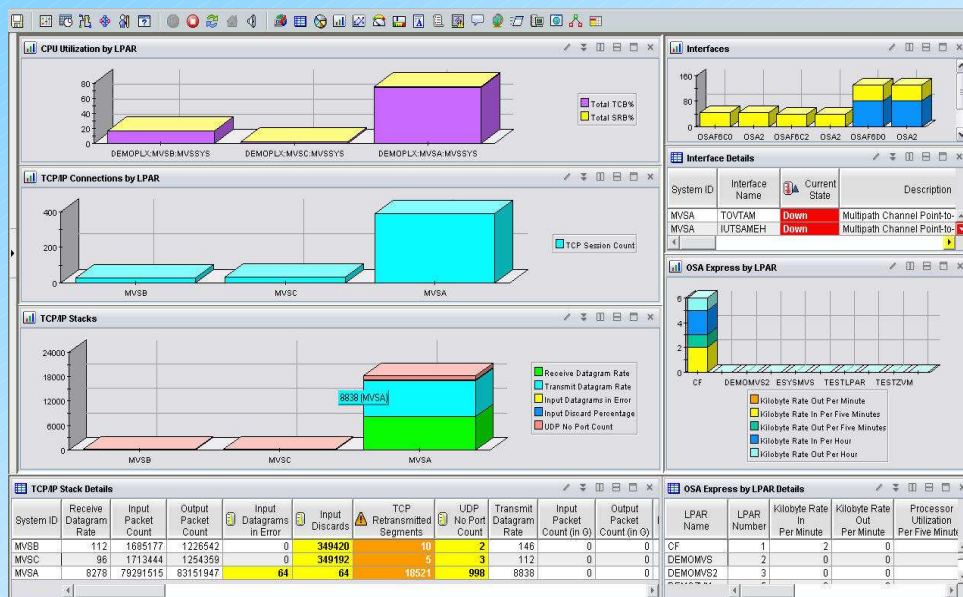
- ✓Fast
- ✓Scalable
- ✓Reliable

Next, what is the TEP?

What is the Tivoli Enterprise Portal (TEP)?

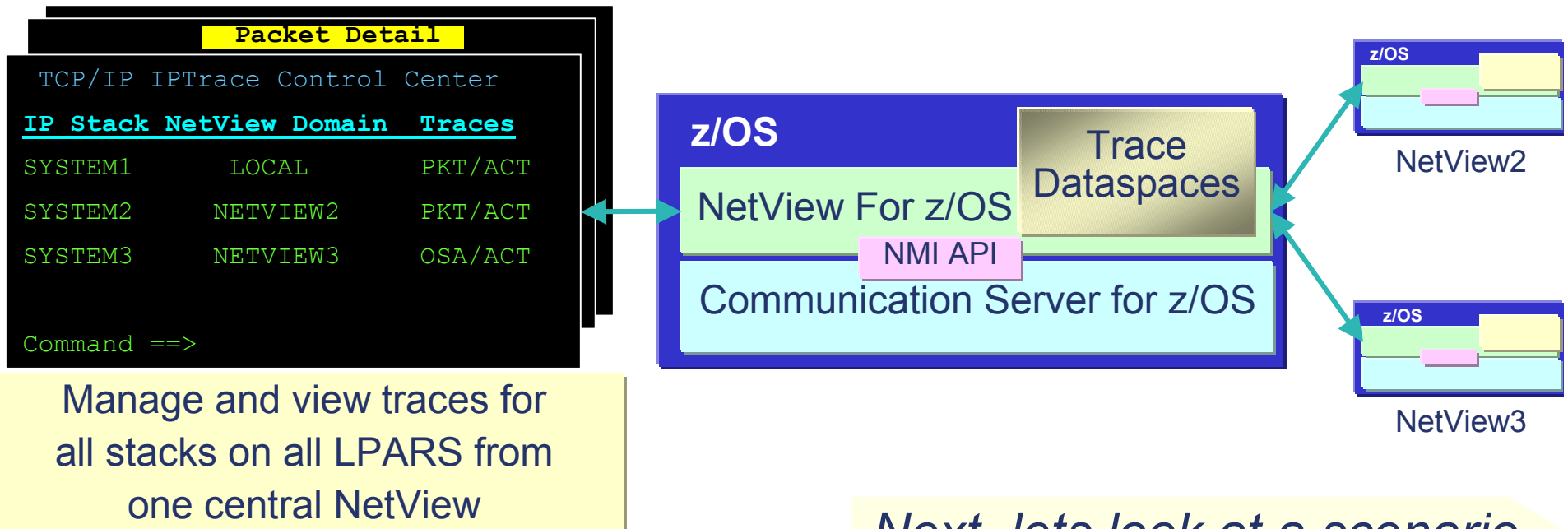
Common user interface

- ▶ Manage z/OS and distributed resources from a single browser interface.
 - ▶ Displays data in graphs, charts and table formats
 - ▶ View real time and historical data, at the same time
- **Easy to configure, right from the TEP**
 - **Out of the box Best Practices**
 - ▶ Workspaces, Situations, and Expert Advice



Next, how do we trace

- Formatted Real-Time Traces
- Gather, format and refresh packets – With a new trace user interface
 - ▶ IP Packet Trace
 - Requires z/OS Communications Server V9 later
 - ▶ OSA-Express2 Network Traffic
 - Requires z/OS Communications Server V1R11 or later and OSA-Express2 Card
- Reduced overhead by leveraging NetView Dataspaces



Next, lets look at a scenario

Status of All Traces on All Known Stacks

FKXK2A00

TCP/IP for 390 IPTrace Control Center

List of the stacks
known to this NetView

On both local and
remote domains

PKT/ACT = Active Packet Trace.
OSA/ACT = Active OSA Trace.

Service Point/
Stack

Proc
Name

NetView
Domain

Trace
Status

NMP101

TCPIP

LOCAL

CTRACE/ACT

PKT/ACT OSA/ACT

NMP217

TCPIP

NTVE1

Select a stack and press Enter.

Command ==>

F1=Help

F2=Main Menu

F3=Return

F6=Roll

F7=Backward

F8=Forward

F12=Cancel

Status of All Traces on Selected Stack

FKXK2A01

IPTrace Control Center

D52NV

Service Point/Stack: TVT2007

Proc: TCPIP7

Domain: LOCAL

Status/Owner

Start

For

Writer

_ CTRACE SYSTCPIP NONE/NA NA *NONE*

Select TCP/IP Packet Trace hit Enter

_ PKTRACE SYSTCPDA ACTIVE/PHK 2009-08-14-08:18:37 NA *NONE*

= OSATRACE SYSTCPOT ACTIVE/PHK 2009-08-14-08:18:56 NA *NONE*

Command ==>

F1=Help

F2=Main Menu

F3=Return

F5=Refresh

F6 =Roll

F7=Backward

F8=Forward

F12=Cancel

Summary View of Packets

FKXK2A26 PKTRACE SUMMARY D52NV
 More: +

DP	Nr	hh:mm:ss.mmmmm	IpId	Seq_num	Ack_num	Wndw	Flags
<u>IO</u>	255	08:21:29.707500	2E35	protocol=OSPF			
			02010044	C0096701	*....{... ..D..g.*		
IO	253	08:21:25.991207	05F8	protocol=OSPF			
			02010044	C0096A01	*....{... ..D..j.*		
IO	251	08:21:23.572996	0C0D	protocol=OSPF			
			02010044	C0096601	*....{... ..D..f.*		
IO	250	08:21:22.979387	17FD	protocol=OSPF			
			02010044	C0096801	*....{... ..D..k.*		
IO	249	08:21:22.852632	08A7	protocol=OSPF			
			02010044	C0096C01	*....{.%.. ..D..l.*		
IO	248	08:21:21.910456	1795	protocol=OSPF			
			02010044	C0097501	*....{... ..D..u.*		
00	247	08:21:20.849382	079D	protocol=OSPF			
			02010044	C0096B01	*....{.,. ..D..k.*		
IU	246	08:21:20.269648	14FB	protocol=UDP			
			57B20110	00010000	*.....W.....*		

Select a Packet and press PF4 to see the detailed data for that packet

Scroll up and down

F5: Refresh data space with new trace records

F11 Scroll right for more info

Command ==>

F1=Help

F7=Backward F8=Forward

F3=Return

F9=Commands

F4=Details

F5=Refresh

F11=Right

F6=Roll

F12=Cancel



View Formatted Packet Detail

CNMKWND OUTPUT FROM Packet Detail LINE 0 OF 59

----- Top of Data -----

z/OS TCP/IP Packet Trace Formatter, Copyright IBM Corp. 2000, 2009; 2009.028

**** 2009/08/14

RcdNr	Sysname	Mnemonic	Entry Id	Time Stamp	Description
-------	---------	----------	----------	------------	-------------

250	TVT2007	PACKET	00000004	08:21:22.979387	Packet Trace
From Interface	:	TCPIPLINK		Device: QDIO Ethernet	Full=88
Tod Clock	:	2009/08/14 08:21:22.979385			Intfx: 5
Segment #	:	0		Flags: In	
Source	:	9.42.5.133			
Destination	:	224.0.0.5			
Source Port	:	0		Dest Port: 0	Asid: 004D TCB: 00000000
IpHeader: Version	:	4		Header Length: 20	
Tos	:	00		QOS: Routine Normal Service	
Packet Length	:	88		ID Number: 17FD	
Fragment	:			Offset: 0	
TTL	:	1		Protocol: OSPFIGP	Checksum: B29C F
Source	:	9.42.5.133			

TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'

CMD==> _

Use window PF Keys and functions to navigate detail data

Set Filters and number of Records

FKXK2A24

Display Packet Control

LOCAL

Service Point/Stack: TVT2007 Proc: TCPIP7 Infc Name: TCPIPLINK

LAddr * _____

RAddr * _____

PORTNUM * _____ LPort: * _____ RPort: * _____ Protocol 1 1-ALL
2-TCP
3-UDP
4-OSPF
Time: Start * _____
End * _____ 5- _____ (Number)

MaxRecs: 1 1-Last 100 Truncate: 65535
2-First

SET FILTERS

NUMBER OF RECORDS

Command ==>

F1=Help

F3=Return

F4=View Packets

F6=Roll

F8=Extended Options

F12=Cancel

Another Example of Formatted Packet Detail

```
CNMKWIND OUTPUT FROM FMTPACKT LINESIZE=133 FULL LINE 0 OF 4431
*----- Top of Data -----*
BNH773I NUMBER OF PACKETS: N/A , MISSED BUFFERS: 0 , TCPNAME: TCPIP
z/OS TCP/IP Packet Trace Formatter, (C) IBM 2000-2007, 2007.072

**** 2007/09/24
RcdNr Sysname Mnemonic Entry Id Time Stamp Description
-----

17 NMP101 PACKET 00000004 08:10:10.953888 Packet Trace
To Interface : TCPIPLINK Device: QDIO Ethernet Full=44
Tod Clock : 2007/09/24 08:10:10.953885 Intfx: 5
Sequence # : 0 Flags: Pkt Out Ping
Source : 9.42.45.101
Destination : 9.42.45.10
Source Port : 0 Dest Port: 8 Asid: 0032 TCB: 0069BB28
IpHeader: Version : 4 Header Length: 20
Tos : 00 QOS: Routine Normal Service
Packet Length : 44 ID Number: 007E
Fragment : Offset: 0
TTL : 64 Protocol: ICMP CheckSum: 0D91 F
Source : 9.42.45.101
Destination : 9.42.45.10

ICMP
Type/Code : ECHO CheckSum: 4DAE FFFF
Id : 0032 Seq: 1
Time : 2007/09/24 12:10:10.953798
Echo Data : 16
000000 46F7A922 000E8DC6 08090A0B 0C0D0E0F

Ip Header : 20 IP: 9.42.45.101, 9.42.45.10
000000 4500002C 007E0000 40010D91 092A2D65 092A2D0A

Protocol Header : 8
000000 08004DAE 00320001

Data : 16 Data Length: 16
000000 46F7A922 000E8DC6 08090A0B 0C0D0E0F |.7z....F.....F..".|

TO SEE YOUR KEY SETTINGS, ENTER 'DISPFK'
CMD==> _
```


Commands from Packets Summary

```

FKXK2A28          PKTRACE  SUMMARY  COMMANDS          D52NV
                                                         U
DP  Nr hh:mm:ss.mmmmmm IpId      Seq_num *****
IO  255 08:21:29.707500 2E35 protocol=OSP
      02010044 C0096701
IO  253 08:21:25.991207 05F8 protocol=OSP
      02010044 C0096A01
IO  251 08:21:23.572996 0C0D protocol=OSP
      02010044 C0096601
IO  250 08:21:22.979387 17FD protocol=OSP
      02010044 C0096801
IO  249 08:21:22.852632 08A7 protocol=OSP
      02010044 C0096C01
IO  248 08:21:21.910456 1795 protocol=OSP
      02010044 C0097501
OO  247 08:21:20.849382 079D protocol=OSP
      02010044 C0096B01 *****
IU  246 08:21:20.269648 14FB protocol=UDP
      57B20110 00010000 *..... W.....*
  
```

Select 1 for Ping

1 Command

1. Ping (RAddr)
2. TraceRte (RAddr)
3. Hostnames
4. Connections
5. SNMP (RAddr)
6. SNMP (Stack)

F1=Help F3=Return
F6=Roll F12=Cancel

Commands are issued against the IP resource of the selected Packet.

RADDR issue command to the external address

STACK issue command to the local IP Stack

Ping Results

```
CNMKWIND OUTPUT FROM PING 9.42.45.10 LINE 0 OF 6
*----- Top of Data -----*
BNH765I Pinging nmpipl10.tivlab.raleigh.ibm.com at 9.42.45.10 with 3 packets of
BNH767I 16 bytes received from 9.42.45.10: seq=1 in 3ms
BNH767I 16 bytes received from 9.42.45.10: seq=2 in 1ms
BNH767I 16 bytes received from 9.42.45.10: seq=3 in 1ms
BNH769I 3 packets sent, 3 packets received, 0.00% packet loss
BNH770I Round trip times from 1 to 3 ms, averaging 1ms
*----- Bottom of Data -----*
```

- Supports tracing of OSA packets with OSA-Express2 Network Traffic
- Analyzer Requires OSA Express 2 card or higher
- Requires z/OS V1R11 Communications Server or later

- Allows for capture of
 - ▶ Ethernet data (Ethernet type, source/destination MAC addresses, VLAN tag, LLC fields)
 - ▶ IPv4 & IPv6 data
 - ▶ ARP packets
 - ▶ SNA transmission headers
 - ▶ Direction indicators
 - ▶ Discard code
 - ▶ Interface identification

- Syntax and behavior similar to TCP/IP packet trace

- Simultaneous Capture Filters
 - ▶ IP Address Protocol, Ethernet type, Port, Device, VLAN, MAC Address

OSA Trace Control

FKXK2A30 OSATRACE Control SYSTCPOT ACTIVE for NVDomain: LOCAL

OSA Tracing is active z/OS : V1R11

Service Point/Stack: TVT2007 TCPNAME: TCPIP7

OPKTS: ACTIVE On Task: AUTOOPKT GTF: NO

NetView domain and z/OS level

Star NetView is collecting traced packets.

4-08:18:56

Writer: *NONE*

Options: 1-START 2-STOP 3-VIEW PACKETS

Select OSA Port

Capture Filters

OSA Port	Stat/ Auth	Length	Data	Record	Time	Discard	Nofilter
OSAA	ON	224	1024	2147483647	10080	EXCEPTION	ALL
	LOGICAL		0	118	6	0	
OSA1	OFF	224	1024	2147483647	10080	EXCEPTION	NONE
	UNKNOWN		0	0	0	0	
	NEW	224	1024	2147483647	10080	EXCEPTION	NONE

Command ==>

F3: Apply Capture Filters

F4: Stop OSA Tracing

F1=Help

F3=Return

F4=Stop SYSTCPOT

F5=Refresh

F6=Roll

F7=Backward

F8=Forward

F9=Filters

F10=PKTS Management

F12=Cancel

OSA Express Packet Summary

FKXK2A36

OSA TRACE PACKETS SUMMARY

D52NV

:+

DP	Nr	hh:mm:ss.mmmmm	IpId	Seq_num	Ack_num	Wndw	Flags
00	148	08:27:36.340252	0A16	protocol=OSPF 0201002C C0096B01 *....(,.. ..k.*			
00	147	08:27:36.340227	0A16	protocol=OSPF 0201002C C0096B01 *....(,.. ..k.*			
OG	146	08:27:30.515029	0A14	IGMP_V2_MEMBER_REPORT			
OG	145	08:27:30.515004	0A14	IGMP_V2_MEMBER_REPORT			
OG	144	08:27:28.610664	0A0D	IGMP_V2_MEMBER_REPORT			
OG	143	08:27:28.610640	0A0D	IGMP_V2_MEMBER_REPORT			
<u>00</u>	142	08:27:26.335278	0A0C	protocol=OSPF 0201002C C0096B01 *....(,.. ..k.*			
00	141	08:27:26.335247	0A0C	protocol=OSPF 0201002C C0096B01 *....(,.. ..k.*			

Command ==>

F1=Help

F3=Return

F4=Details

F5=Refresh

F6=Roll

F7=Backward F8=Forward

F11=Right

F12=Cancel

Latest Enhancements for TCP/IP Packet Trace Formatter

NetView users will see Packet Trace formatting enhancements from Communications Server for z/OS.

These updates can be applied to previous Versions of Communications Server for z/OS

Software > Networking > Communications Server >

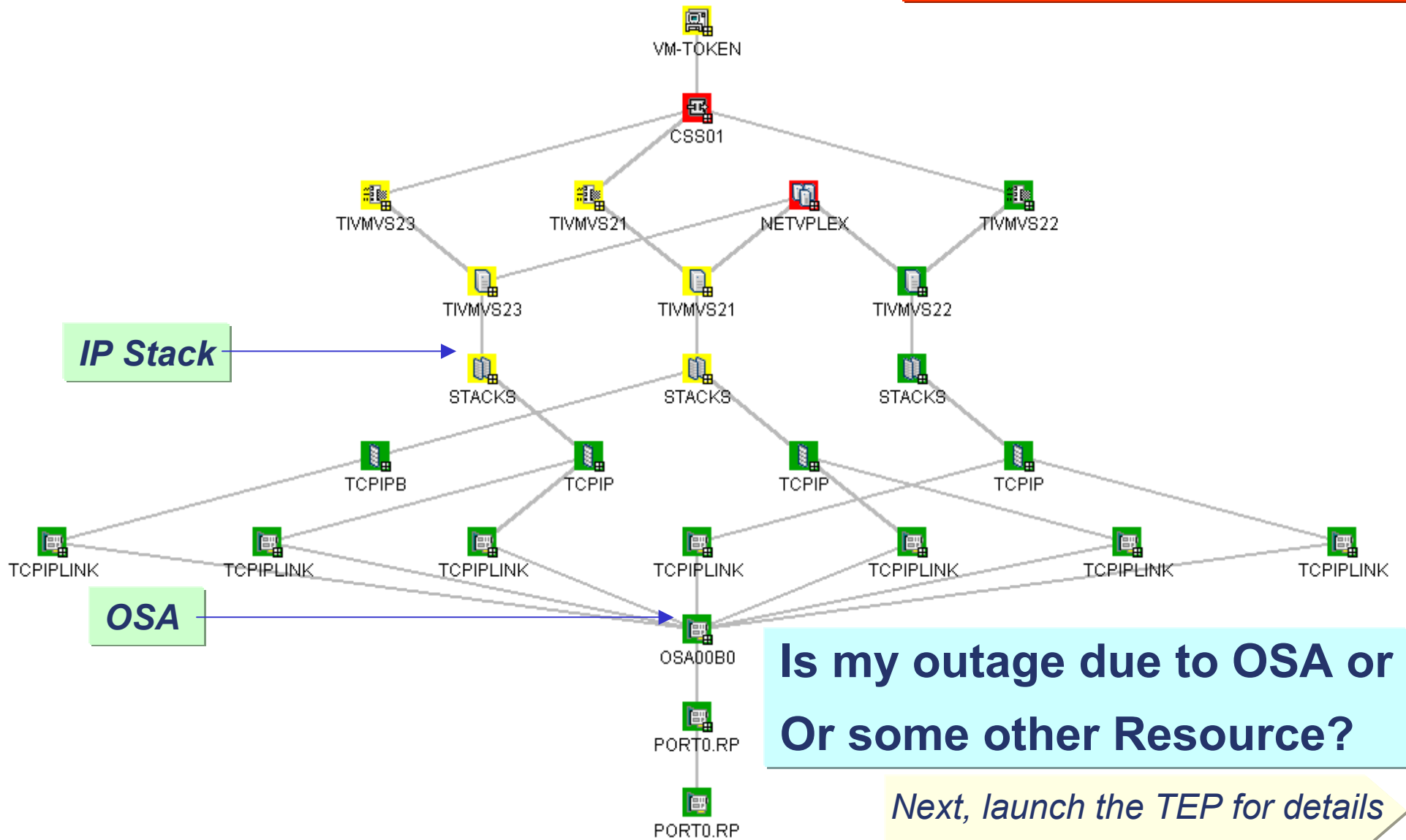
Support & downloads	SYSTCPDA: z/OS Communications Server TCP/IP Packet Trace Formatter	Document information
z/OS Communications Server		Product categories: Software Networking Enterprise Connectivity z/OS Communications Server
Features and benefits	Downloadable files	Operating system(s): z/OS
System requirements	Abstract This is the downloadable package for the z/OS Communication Service Packet Trace Formatter	Software version: 1.8, 1.9, 1.10, 1.11
Library	Download Description This program will format packet trace records created by the z/OS Communications Server SYSTCPDA trace component.	Reference #: 4007395
News	Change History Release Date - 07/03/2004	
Trials and demos	Prerequisites z/OS Communications Server	
How to buy		
Events		
Training and certification		
Services		
Support		

<http://www-01.ibm.com/support/docview.wss?rs=852&context=SSSN3L&dc=D400&uid=swg24007395>

Next, look at OSA within a Topology

NMC Views: OSA Port Parent View

Enhanced with NetView V5.4

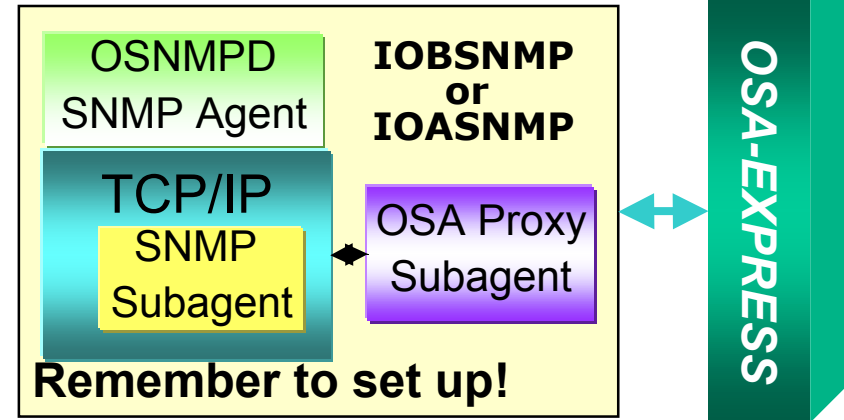


Management of OSA-EXPRESS

New with NetView V5.4

NetView for z/OS OSA Channels and Ports Status and Configuration

- [-] DVIPA Stack-Defined
- [-] DVIPA Sysplex Distributors
- [-] HiperSockets
- [-] NetView Audit Log
- [-] NetView Command Response
- [-] NetView Health
- [-] NetView Log
- [+] **OSA**
- [-] Session Data
- [-] Stack Configuration and Status
- [-] TCPIP Connection Data
- [-] Telnet Server Configuration and Status

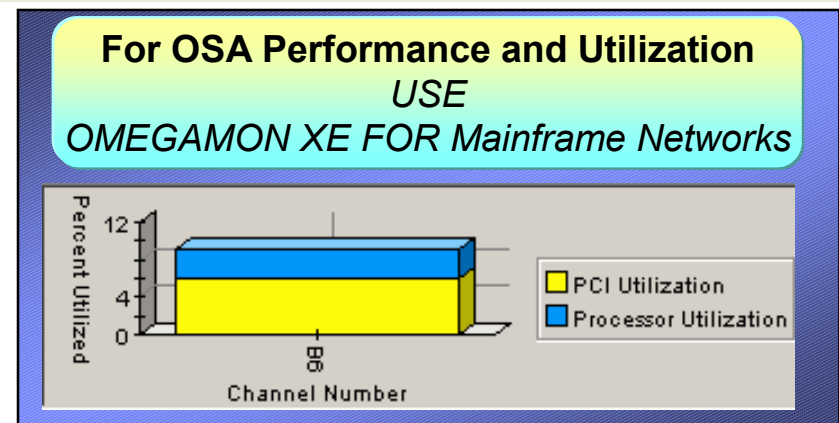


OSA in TEP Requires RODM

OSA Channels and Ports Summary									
Collection Time	Channel Number	Channel Hardware Level	Subtype	Port Name	Port Number	Port Type	Active MAC Address	Bu	Ac
07/27/09 14:07:58	09	osaExp300	oneThousandBaseTEthernet	OSAA	0	oneThousandBaseTEthernet	00145EB712C6	00145	

Is my OSA Configured Wrong?
 What is the MAC Address and Port?
 Is the Configured Speed incorrect?
 Is it in Service Mode?

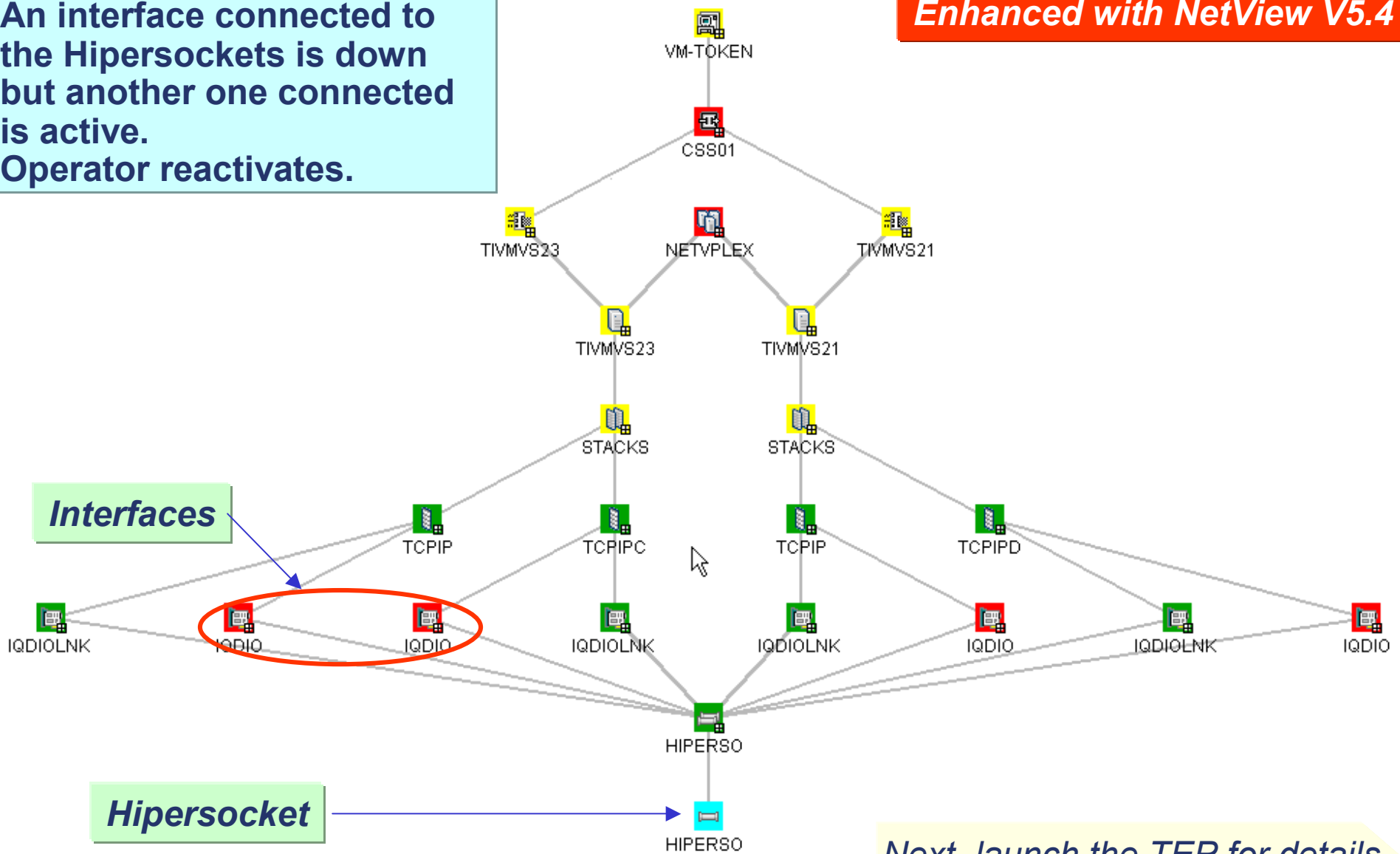
Next, Let's check the Hypersocket



NMC Views: Hipersockets Interfaces

An interface connected to the Hipersockets is down but another one connected is active.
Operator reactivates.

Enhanced with NetView V5.4

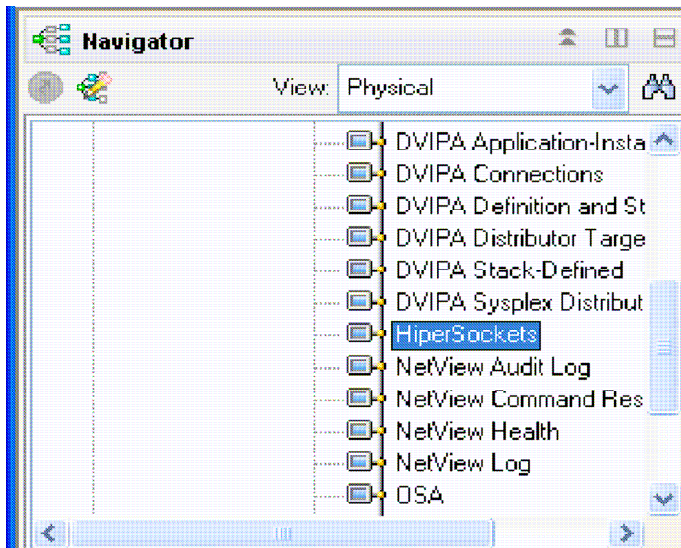


Next, launch the TEP for details

NetView for z/OS Hipersockets Configuration and Status

Is the Hipersockets up?
Is Hipersockets accelerator set?
Is multiple write set to offload to the zIIP?

Requires z/OS V1R11 Communications Server or later



Collection Time	Interface Name	Channel Number	IQD Network ID	Protocol	VLAN ID	Interface Operational Status	Interface Administration Status	IQDIO Routing Enabled	QDIO Accelerator Enabled	QDIO Priority	Multiple Write Enabled
07/27/09 14:47:19	IQDIO	D0	0704	IPv4	0	down	up	No	No	0	No
07/27/09 14:47:19	IQDIOLNKC02A2E61	D0	0704	IPv4	0	up	up	No	No	0	No
07/27/09 14:47:19	IQDIO1	D1	0705	IPv4	510	up	up	No	No	0	No

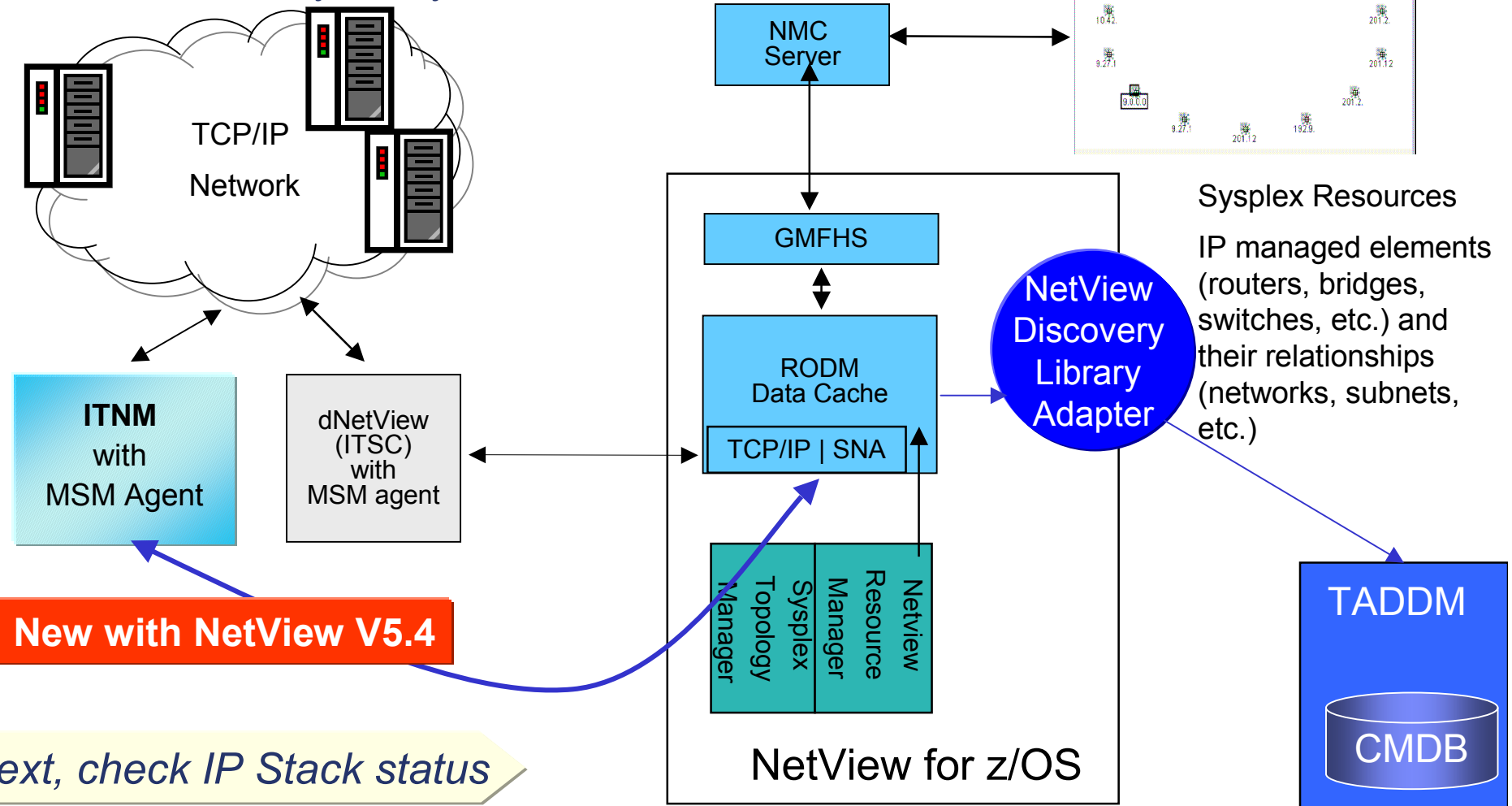
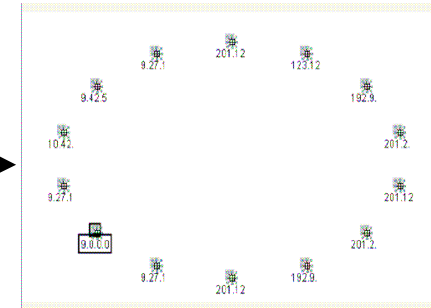
**For Interface Performance and Utilization
USE
OMEGAMON XE FOR Mainframe Networks**

Next, network discovery

NetView for the z/OS Network Discovery

- Tivoli Network Manager IP Edition (ITNM-IP)
 - Transition from distributed NetView
- Resources that are “1 hop” away from z/OS
- Enhanced discovery of Layer 3 IP resources

NMC



Next, check IP Stack status

TCP/IP IP Stack Status and Configuration

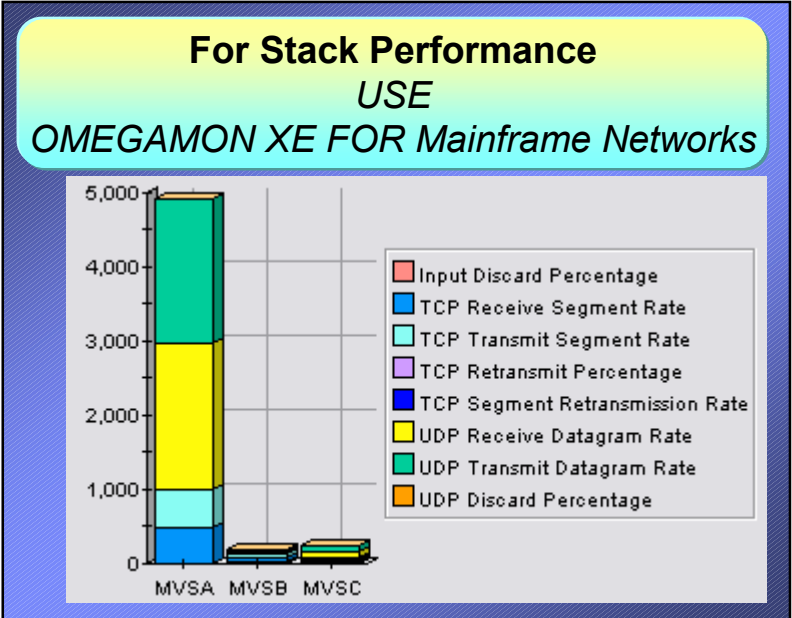
New with NetView V5.4

- NetView Health
- NetView Log
- OSA
- Session Data
- Stack Configuration and Status**
- TCPIP Connection Data
- Telnet Server Configuration and Status

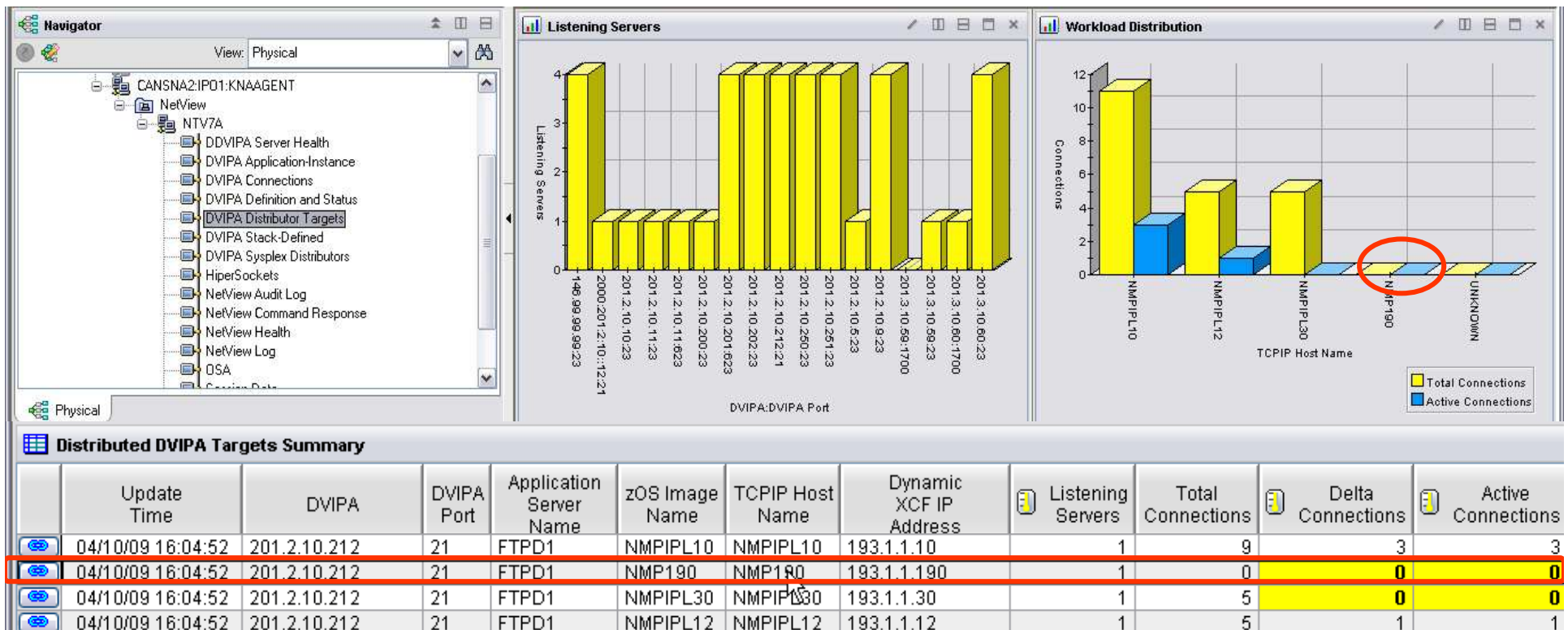
Stack Configuration and Status Summary																		
	Update Time	TCPIP Job Name	TCPIP Host Name	Status	Sysplex Name	XCF Group Name	VTAM XCF Group Name	zOS Image Name	Primary Interface	IP Address	IPv6 Enabled	IPSec Enabled	AT-TLS Enabled	Source VIPA Enabled	TCP Stack Source VIPA Enabled	Segmentation Offload Enabled	zIIP IP Security Enabled	Sysplex WLM Polling Interval
	04/12/09 17:03:16	TCPIPB	NMPIPL12B	INACTIVE	NVDPLEX1	EZBTCPCS	ISTXCF	NMPIPL12	TCPIPLINK	9.42.40.79	Yes	No	No	No	No	No	No	0
	04/12/09 17:03:14	TCPIP	NMPIPL12	ACTIVE	NVDPLEX1	EZBTCPCS	ISTXCF	NMPIPL12	TCPIPLINK	9.42.45.12	Yes	No	No	No	No	No	No	0
	04/12/09 10:10:41	TCPIP	NMPIPL30	ACTIVE	NVDPLEX1	EZBTCPCS	ISTXCF	NMPIPL30	TCPIPLINK	9.42.45.30	Yes	No	No	No	No	No	No	0
	04/12/09 10:10:05	TCPIP	NMP190	ACTIVE	NVDPLEX1	EZBTCPCS	ISTXCF	NMP190	TCPIPLINK	9.42.45.190	Yes	No	No	No	No	No	No	0
	04/12/09 10:10:05	TCPIP	NMPIPL10	ACTIVE	NVDPLEX1	EZBTCPCS	ISTXCF	NMPIPL10	TCPIPLINK	9.42.45.10	Yes	No	No	No	No	No	No	0

Is the IP Stack up?
 Is Segmentation Offload Enabled?
 Is zIIP IP Security offload Enabled?

Next, see how DVIPA is performing



Notice FTP connections are not distributed evenly over DVIPA Targets. This could be caused by WLM or XCF issues.



Next, check the DVIPA Server Health

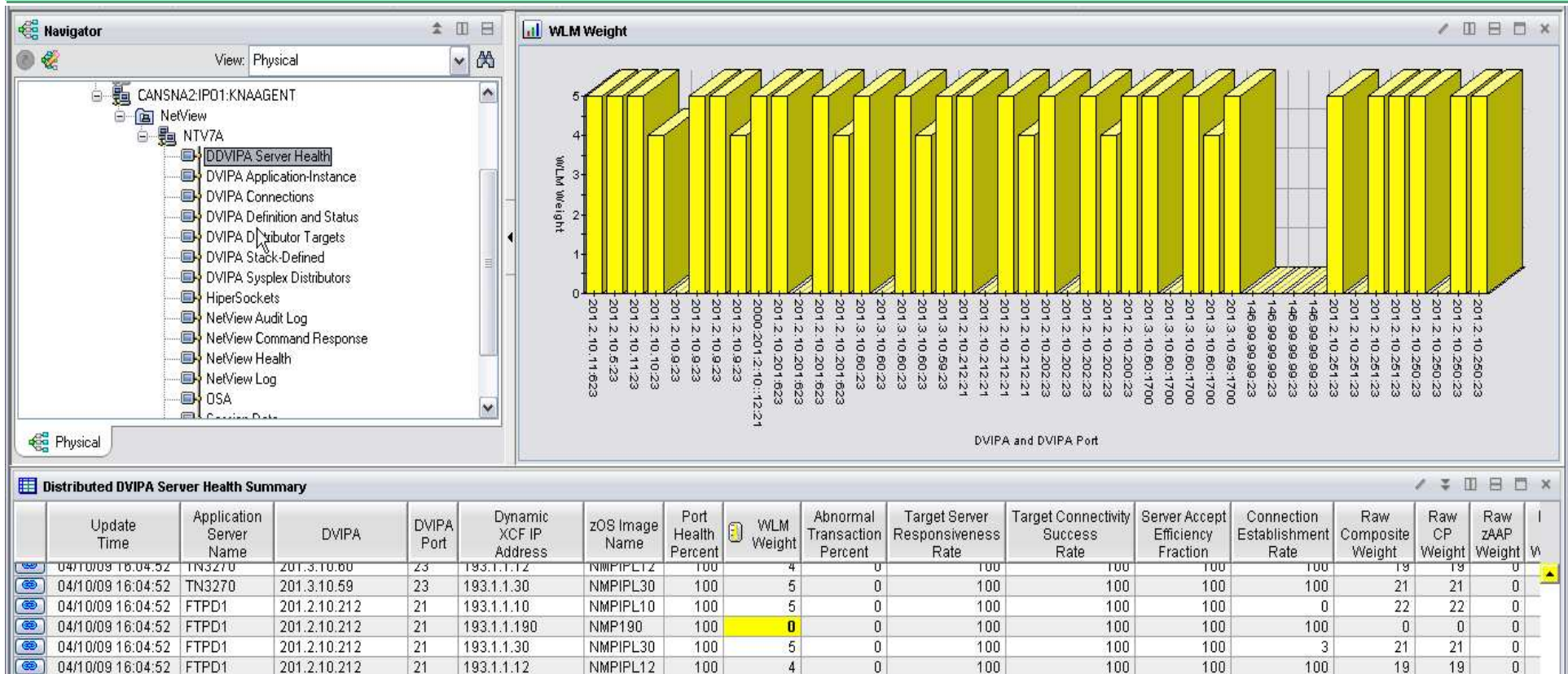
Distributed DVIPA Server Health

New with NetView V5.4

Look at methods and weights, they influence where connections go

- Weights: WLM, zAAP, CP, zIIP, and Composite
- Methods: ROUNDROBIN, BASEWLM, SERVERWLM, WEIGHTEDACTIVE, TARGETCONTROLLED

NetView DVIPA Server Health and Unhealthy Workspaces:



Next, Look at DVIPA Expert Advice

DVIPA Expert Advice Provided with Situations

NAS_DVIPA_Port_Health_Percent

[Situation Description](#)
[Suggested Actions](#)

Situation Description

The port health percent indicates the health of the server application on the target port. If several server applications share the port, it is the average of the individual values for all the server applications sharing the port.

Suggested Actions

Under
(WLM)
less th
work r

The he
WLM
depend
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The image shows a 'Preview' window with a standard toolbar (home, back, forward, stop, refresh, print, search) and an IBM logo in the top right corner. The window title is 'Expert Advice'. The content is for the situation 'NAS_DVIPA_WLM_Weight'. It includes a 'Situation Description' section with a link to 'Suggested Actions', a 'Situation Description' section with two paragraphs of text, a 'Suggested Actions' section with a link to 'Suggested Actions', and a 'Suggested Actions' section with two paragraphs of text.

NAS_DVIPA_WLM_Weight

[Situation Description](#) **Situation Description**

[Suggested Actions](#)

The Workload Manager (WLM) weight indicates the value for either the z/OS image on which the target TCP/IP stack is located or the specific server on the target stack based on the BASEWLM or SERVERWLM group flag.

This value is in the range 0 to 64. The WLM weight is the composite weight; it is the sum of the displayed proportional CP, zAAP, and zIIP weights for this member.

Suggested Actions

The WLM weight value indicates the available processor capacity of the target system. When the weight value is lower, the capacity is also lower. This value is normalized so that the lowest value is 1.

If SERVERWLM is being used as the distribution method and a server has a WLM weight of 0, verify that the server is using the appropriate WLM Policy and that the system is not too overloaded to enable the server to meet its policy goals.

Next, Look at TCP/IP Connections

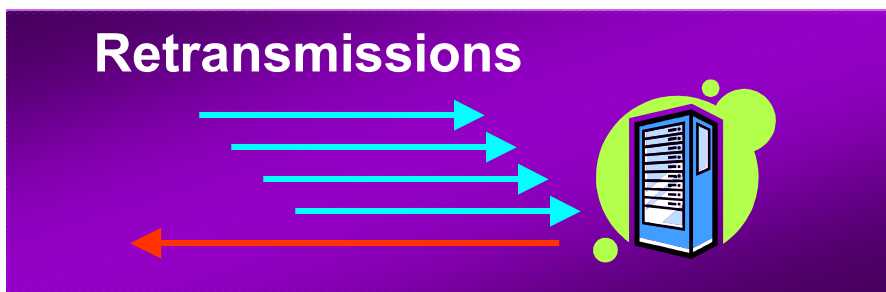
TCP/IP Connections

Enhanced with NetView V5.4

User calls complaining that TCP/IP connections fails all the time. We see that the connection failed due to Excessive Retransmissions.

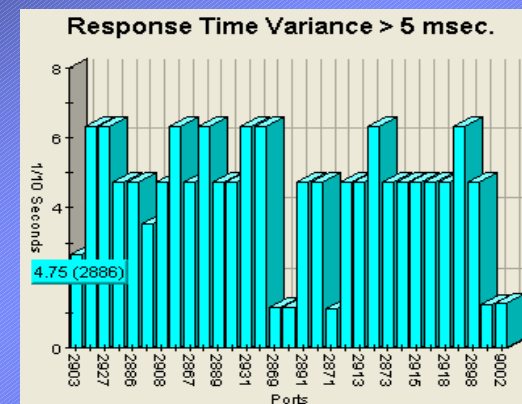
- How often is this connection failing?
- What is the number and percent of segments that were retransmitted
- What is the window size?
- Problem could be caused by high CPU at the remote resource.

Inactive TCPIP Connection Data Summary														
	Local Port	Remote IP Address	Remote Port	Termination Reason Code	Connection Start Time	Connection End Time	Resource Name	Total Bytes Received	Total Bytes Sent	Byte Rate	Telnet APPL Name	Telnet LU Name	Telnet Logmode	Te Prc
	23	9.65.156...	2724	Admin_Action	10/04/09 11:46:15	10/04/09 11:48:04	TN3270	343	4700	2787	NT74TSO3	NTCP7401	SNX32702	TN3
	23	9.65.156...	2686	Admin_Action	10/04/09 11:20:55	10/04/09 11:35:11	TN3270	1497	23313	1739	NT74TSO4	NTCP7409	SNX32702	TN3
	23	9.65.156...	2662	Excessive_Retrans	10/04/09 11:06:03	10/04/09 11:17:26	TN3270	1102	12024	1154		NTCP7407		TN3
	1093	9.27.132...	1918	Client_Sent_Reset	10/01/09 13:28:54	10/01/09 13:47:57	V420N3	46395	4251	2660				N/A
	1095	9.27.132...	1918	Client_Sent_Reset	10/01/09 13:29:06	10/01/09 13:47:57	CANSNA	70808	55916	6723				N/A



Next, see the termination reason codes

For Connection Response times
USE
OMEGAMON XE FOR Mainframe Networks



Connection Termination Reason Codes

New with NetView V5.4

SendErr	An error occurred during a send using FRCA(AFPA), possibly because the stack is stopping.
FIN	A persistent socket used by FRCA(AFPA) is closed by a FIN.
Stack_Terminating	The connection is stopping because the stack is stopping.
Last_DVIPA_Term	The last stack that can own the dynamic VIPA bound to the socket is stopping..
Intrusion_Detect	Intrusion detection found the connection to be malicious and closed the connection
ACK_In_LAST_ACK	The acknowledgment that was received is in the lastack state.
NetAccess_Denied	The connection is denied because of a NetAccess rule.
Admin_Action	The connection is stopped because of an administrator action (for example, using Netstat DRop/-D command or the NMI API).
App_Laddr_Deleted	The connection is stopped because the local IP address bound by the application was deleted from the stack.
App_Close_NoAccept	The connection from a client is stopped because the application closed the socket before performing an accept().
App_Closed	The application using the socket closed the connection using a close().
OrderlyPascalClose	A pascal routine issued an orderly close request.
Pascal_Disconnect	A pascal routine issued a disconnect request.
Pascal_AcceptError	An error occurred during a pascal accept.
Client_Sent_Reset	The connection is stopped because the client sent a reset.
Excessive_Retrans	The connection is closed because the same packet is being retransmitted multiple times.
Window_To_Zero	The connection is closed because the TCP window is reduced to zero and multiple window probes were not acknowledged.
Keepalive_Not_Ackn	The connection is closed because multiple keepalive probes were not acknowledged.
Finwait2_Timeout	The connection is stopped because the stack timed out waiting for a fin in the finwait-2 state.

Next, Telnet Server status

NMC showing Inactive Telnet Server

The screenshot shows the NMC - TELNETSERVERS-MDL interface. The left pane displays a tree view with 'Networking' expanded to 'Network Views', where 'TELNETSERV' is selected. The main pane shows a network diagram with four nodes: 'TN3270' (green), 'TN3270.PORTS' (green), 'TN3270B' (red), and 'TN3270B.PORTS' (green). A green callout bubble points to the 'TN3270B' node with the text 'TN3270B inactive'. A light blue callout bubble at the bottom right contains the text 'User complains they cannot logon. Operator sees a Telnet server is down.' The bottom status bar shows 'Server: pammylins4'.

Next, launch the TEP for detail

NetView TEP Shows Telnet Server Configuration & Status

New with NetView V5.4

The screenshot shows the NetView TEP interface. On the left is a 'Navigator' pane with a tree view of system components, including 'Telnet Server Configuration and Status'. The main window displays a 'Telnet Server Summary' table and a 3D bar chart.

Update Time	Telnet Server Job Name	Address Space ID	Configured Ports	Active Ports	Server Status
04/13/09 10:56:19	TN3270	0X001F	2	2	ACTIVE
04/13/09 10:55:45	TN3270B	0X0050	1	0	INACTIVE

The 3D bar chart compares 'Configured Ports' (yellow) and 'Active Ports' (blue) for two Telnet Server Job Names: TN3270 and TN3270B. TN3270 has 2 configured and 2 active ports. TN3270B has 1 configured and 0 active ports.

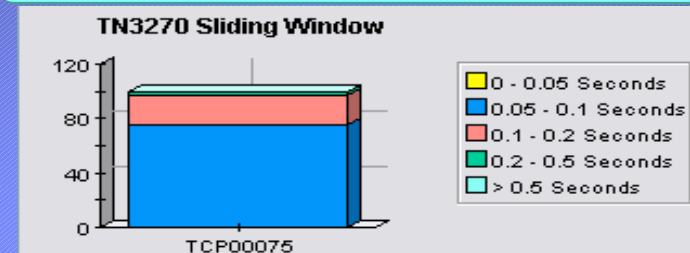
Telnet Server Port Summary

Update Time	Telnet Server Job Name	Address Space ID	Resource Name	Server Status	Port	Port Status	TCPIP Job Name	Active Connections	Dropped Connections	TCPIP Stack Affinity	Sysplex Name	zOS Image Name	zOS Release Level	TCB Address
04/13/09 10:56:19	TN3270	0X001F	TN3270	ACTIVE	2023	ACTIVE	TCPIP	81440	0	NONE	NVDPLEX1	NMPIPL12	V1R11	006D5820
04/13/09 10:56:19	TN3270	0X001F	TN3270	ACTIVE	2023	ACTIVE	TCPIPB	94308	0	NONE	NVDPLEX1	NMPIPL12	V1R11	006D5820
04/13/09 10:56:19	TN3270	0X001F	TN3270	ACTIVE	23	ACTIVE	TCPIP	54736	0	NONE	NVDPLEX1	NMPIPL12	V1R11	006D5600
04/13/09 10:56:19	TN3270	0X001F	TN3270	ACTIVE	23	ACTIVE	TCPIPB	65596	0	NONE	NVDPLEX1	NMPIPL12	V1R11	006D5600
04/13/09 10:55:45	TN3270B	0X0050	TN3270B	INACTIVE	2223	ACTIVE	TCPIP	0	0	TCPIP	NVDPLEX1	NMPIPL12	V1R11	006D54E8

**We Issue QUIESCE / RESUME to server.
Then confirm that Telnet Server recovers.**

Next, manage network availability

**For Performance and Response times
USE
OMEGAMON XE FOR Mainframe Networks**



NetView Availability and Automation with AON

- Issue alert when remote printers are down.
- Then Network Automation

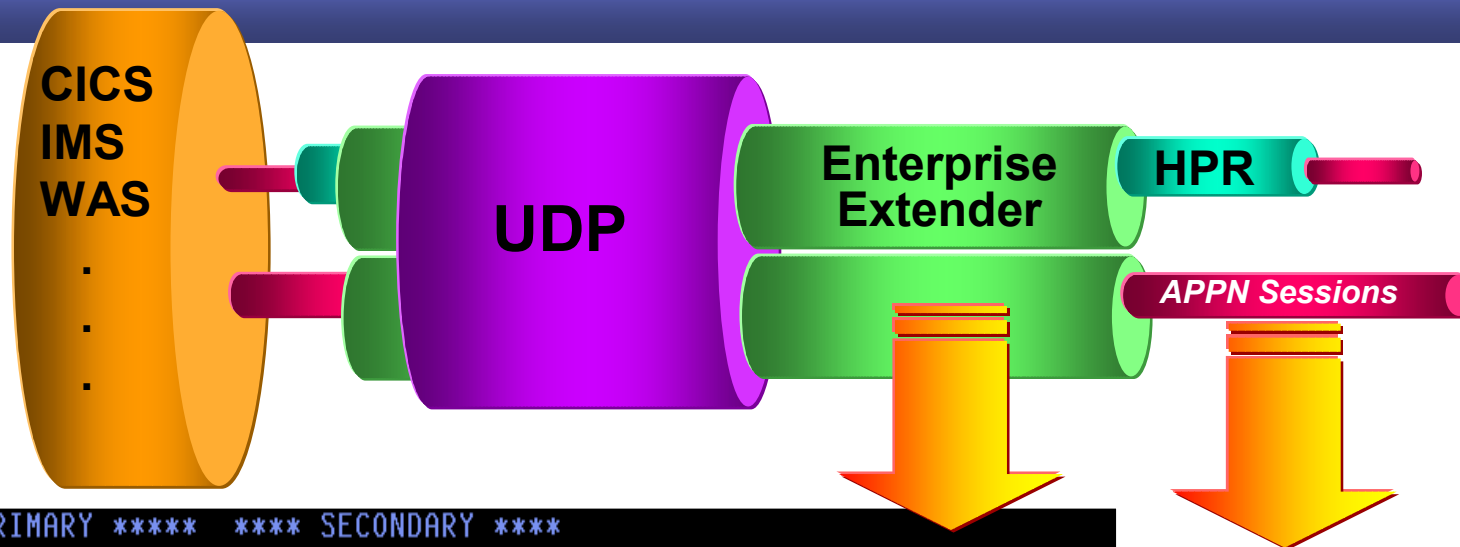
```
FKXK2700          TCP/IP for 390 Resource Management          More: - +
                                     REFRESH: 0
Select an AON control file or monitoring command and press ENTER
1 = ADD/START 2 = DISPLAY/CHANGE 3 = DELETE 4 = START 5 = STOP

Resource          Resource          TCP/IP          Actmon
-----          -----          -----          -----
Resource          Type              Stack           Definition      M Status
-----          -----          -----          -----          -
FTPDP1            IPPORT            DEMOMVS         A              A NORMAL
IOASNMP           IPPORT            DEMOMVS         A              A NORMAL
OPRINTER          IPHOST           DEMOMVS         R              R DOWN
OSAF6D0           IPINFC           DEMOMVS         A              A NORMAL
OSNMPD            IPPORT            DEMOMVS         A              A NORMAL
SMTP              IPPORT            DEMOMVS         A              A NORMAL
SNMPQE            IPPORT            DEMOMVS         A              A NORMAL
TIMWEB1           IPPORT            DEMOMVS         A              A NORMAL
TIVNMIP           IPHOST            DEMOMVS         ALLHOSTS       A NORMAL
TIVSAIOMT        IPHOST            DEMOMVS         ALLHOSTS       A NORMAL
TIVTEPS          IPHOST            DEMOMVS         ALLHOSTS       A NORMAL
TN3270            IPPORT            TN3270S        A              A NORMAL

Command ==>
F1=Help      F2=Main Menu  F3=Return    F4=Commands   F5=Refresh    F6=Roll
F7=Backward  F8=Forward    F9=Display Options  F12=Cancel
```

Next, look at EE and HPR

List APPN Sessions that Transverse over EE



```

**** PRIMARY ****      **** SECONDARY ****
NAME  TYPE  DOM      NAME  TYPE  DOM      START TIME      END TIME
SEPAC  ILU   C-C      NTVD2  LU    NTVD2    01/31 15:25:19  *** ACTIVE ***
NTVD2  LU     NTVD2    SEPAC  ILU   C-C      01/31 15:25:19  *** ACTIVE ***
NTD2M  LU     NTVD2    SEPAC  ILU   C-C      01/31 15:24:11  *** ACTIVE ***
SEPAC  ILU   C-C      NTD2M  LU    NTVD2    01/31 15:24:11  *** ACTIVE ***
    
```

NetView for z/OS
NLDM (Session Monitor)

NLDM SESS name * ACTREF

```

NLDM.CON          SESSION CONFIGURATION DATA          PAGE
----- PRIMARY -----+----- SECONDARY -----
NAME SEPAC  SA 00D2 EL 00000042 | NAME NTVD2 SA 00D2 EL 0000002A
-----+-----
DOMAIN NTVD2 C-C PCID USIBMNT.SEPAC.E747BC617FFEA45E | DOMAIN NTVD2
CNR00004      +-----+ | +-----+
                ALS | | CP/SSCP | NTD2MVS
                LOCAL DATA | APPN TP 03 | SUBAREA PU | NTD2VTAM(0000)
                +-----+ | +-----+
                | | | |
                +-----+ | +-----+
SEPAC(0042) | ILU | | LU | NTVD2 (002A)
                +-----+ | +-----+
                APPNCOS SNASVCMG
                SUBACOS N/A
                LOGMODE SNASVCMG
                PADJ CP SEPAC
                SADJ CP N/A
    
```

- See sessions that transverse EE connections
- Are sessions going over correct EE?

Next, look at HPR Topology

HPR Topology in NetView Session Monitor (NLDM)

```
NLDM.AR APPN SESSION ROUTE CONFIGURATION                                PAGE 1
-- PRIMARY ---+-- SECONDARY --+----- PCID -----+-- DOMAIN --
NAME ECHOA69  | NAME ECHOA29  | NETA.A69M.D2030CADFE6B236A      | CNM99
-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+
|   CP   |
|A69M   | SEC-SA: 000F
+-----+
TG021 | HPR-ABCDEF1234567890
+-----+
| CP(ICN) |
|A99M   |
+-----+
IN-TG |
+-----+
| SUBAREA |
| NODE(S) |
+-----+
```

HPR indicates a TG that is part of an HPR pipe whose TCID number is shown. VTAM reports path switches and NLDM reflects them in the route.

Next, look at tracing HPR/EE

APPN Trace Formatting in NetView - NLDM

```
NLDM.PIUT                      SESSION TRACE DATA                      PAGE 1
----- PRIMARY -----+----- SECONDARY -----+-- DOM -
NAME NDCMVSA SA 0010 EL 00000008 | NAME PCOM SA 0010 EL 00010555 | CNM16
-----+-----
SEL#  TIME  SEQ# DIR  TYPE  ***** REQ/RESP HEADER ***** RULEN SENS N
( 1) 09:27:22 3E12 P-S LOCATEN FMH.OC.ER.....BBCB..... 105
( 2) 09:27:27 3E13 P-S LOCATEN FMH.OC.ER.....BBCB..... 105
( 3) 09:27:32 3E14 P-S LOCATEN FMH.OC.ER.....BBCB..... 105
( 4) 09:27:37 3E15 P-S LOCATEN FMH.OC.ER.....BBCB..... 105
( 5) 09:27:42 3E16 P-S LOCATEN FMH.OC.ER...PAC.BBCB..... 105
( 6) 09:27:42 0079 S-P (+)RSP ...OC.NR...PAC..... 3
( 7) 09:27:47 3E17 P-S LOCATEN FMH.OC.ER.....BBCB..... 105

END OF DATA
ENTER SEL# (RU DETAIL), SEL# AND F (FORMATTED RU), OR COMMAND
CMD==> 1 F
```

New APPN Trace Formatting

APPN Trace Formatting in NetView - NLDM

```
NLDM.PIUF                SPECIFIC RU FORMATTED DATA                PAGE 1
----- PRIMARY -----+----- SECONDARY -----+-- DOM --
NAME NDCMVSA  SA 0010 EL 00000008 | NAME PCOM      SA 0010 EL 00010555 | CNM16
-----+-----+-----+-----+
RU TYPE: LOCATEN  SELECTED: ( 1) 09:27:22 3E12 P-S
OFFS HEX-ENCODING  MEANING
0000 280502FF      FM Header 5 LU 6.2 Attach
0004 00            User ID not verified, no persistent verification,
                        password in clear if password subfield present,
                        no PIP follows FMH-5,
                        Authentication Token Data GDS var does not follow FMH-5
0005 03            Length of fixed parms
0006 D00000        Half-duplex basic, synchronization=none,
                        reconnection not supported
0009 04            TP name length
000A 22F0F0F3      TP name
000E 00            Access security length
000F 18            Logical-unit-of-work length
0010 0FE4E2C9C2D4... Logical-unit-of-work

0028 004112C4      LOCATE length and key
002C 400000        Chain indicator: discard, request/reply: complete reply,
                        locate chain keep not supported,
                        resubmission not required, do not suppress subarea search
002F 0000          Search number

ENTER TO VIEW MORE DATA
ENTER 'R' TO RETURN TO PREVIOUS DISPLAY - OR COMMAND
CMD==>
```

Or **Set Hex On** to see raw data

Drill down to see Session Failures in NetView - NLDM

```
NLDM .SESS                                     PAGE 1
                                SESSION LIST
NAME: PCOM                                     DOMAIN: CNM16
-----
```

SEL#	NAME	TYPE	DOM	NAME	TYPE	DOM	START TIME	END TIME
(1)	NDCMVSA	CP	CNM16	PCOM	CP	CNM16	03/28 09:17:39	*** ACTIVE ***
(2)	PCOM	CP	CNM16	NDCMVSA	CP	CNM16	03/28 09:17:38	*** ACTIVE ***
(3)	NDCMVSA	CP	CNM16	PCOM	CP	CNM16	03/28 08:42:42	03/28 09:17:35
							REASON CODE 0F	SENSE 80020000
(4)	PCOM	CP	CNM16	NDCMVSA	CP	CNM16	03/28 08:42:41	03/28 09:17:35
							REASON CODE 0F	SENSE 80020000
(5)	NDCMVSA	CP	CNM16	PCOM	CP	CNM16	03/28 06:49:56	03/28 08:42:41
							REASON CODE 0F	SENSE 08120010
(6)	PCOM	CP	CNM16	NDCMVSA	CP	CNM16	03/28 06:49:55	03/28 08:42:41
							REASON CODE 0F	SENSE 08120010
(7)	NDCMVSA	CP	CNM16	PCOM	CP	CNM16	03/27 22:22:09	03/28 01:01:44
							REASON CODE 0F	SENSE 80020000
(8)	PCOM	CP	CNM16	NDCMVSA	CP	CNM16	03/27 22:22:09	03/28 01:01:44
							REASON CODE 0F	SENSE 80020000
(9)	NDCMVSA	CP	CNM16	PCOM	CP	CNM16	03/27 20:35:51	03/27 22:19:22
							REASON CODE 0F	
(10)	PCOM	CP	CNM16	NDCMVSA	CP	CNM16	03/27 20:35:51	03/27 22:19:22
							REASON CODE 0F	
(11)	CNM16	LU	CNM16	PCOM	LU	N/A	03/27 20:26:24	*** INITF ***
								SENSE 08400007
(12)	PCOM	ILU	C-C	CNM16	LU	CNM16	03/27 20:14:03	03/27 20:26:23
							REASON CODE 0F	SENSE 80200000

ENTER TO VIEW MORE DATA

ENTER SEL# (CONFIG), SEL# AND CT (CONN. TEST), SEL# AND STR (TERM REASON)

CMD=> **11 STR (See details on failure code)**

See Session Failure codes Details - NLDM

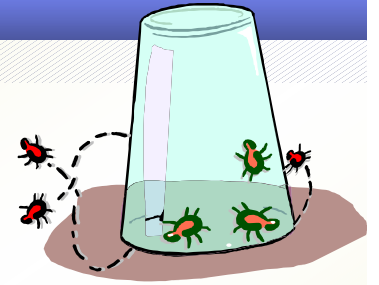
```
NLDM.PIUD                SPECIFIC RU DETAIL DATA                PAGE 1
----- PRIMARY -----+----- SECONDARY -----+-- DOM --
NAME NDCMVSA  SA 0010 EL 00000008 | NAME PCOM      SA 0010 EL 00010537 | CNM16
-----+-----
```

```
RU DATA:                8002000032                *.....*
SENSE DATA:
CATEGORY - (80) o If this system is running on a 9221
MODIFIER - (02) processor, and if message IST446I indicates
BYTE 2   - (00) DEVICE NOT OPERATIONAL 00,00FE,00 has been
BYTE 3   - (00) received when activating a LAN major node,
              the problem might be caused by missing
              IODEVICE statements in the IOCCP GEN.
```

```
RU DATA:                8002000032                *.....*
SENSE DATA:
CATEGORY - (80) Link failure: Data link failure.
MODIFIER - (02)
BYTE 2   - (00) No specific code applies.
BYTE 3   - (00) VTAM Hints:
              o If the IST1097I message group is displayed
                with this sense code, followed by a display
                of the IST1110I message group with sense
                code X'80140001', then the CP-CP session
                failed due to the loss of the last
                CP-capable connection with the adjacent
                control point.
              o If 80020000 received for session using a
                switched PU that has DISCNT=YES and is in
                the process of inactivating because there
                are no more LU-LU sessions, this is a
                temporary condition and the session might
                be retried.
              o If 80020000 received for session using a
                switched PU that is receiving simultaneous
                inbound and outbound calls, this is a
                temporary condition and the session might
                be retried.
```

Summary

▪ Addressing Networking Challenges with IBM NetView for z/OS V5.4



z/OS Communication Server Network Management

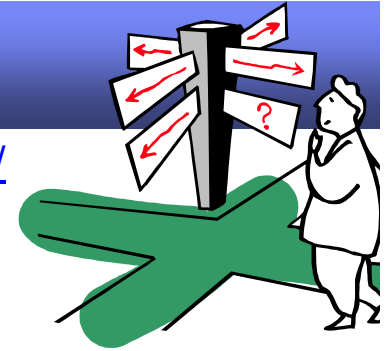
- ✓ Real Time TCP/IP Packet Trace
- ✓ Real time OSA Trace
- ✓ OSA Monitoring
- ✓ Hipersockets
- ✓ IP Stacks
- ✓ DVIPA
- ✓ TCP/IP Connections
- ✓ Telnet Server
- ✓ SNA EE/HPR Traces

Questions?

For More Information

NetView Home Page <http://www.ibm.com/software/tivoli/products/netview-zos/>

- ▶ Downloads (NMC, MSM agents, tools)
- ▶ Release comparison
- ▶ Link to Announcement letter
- ▶ Links to other online information sources
- ▶ More



NetView Documentation

<http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.itnetviewforzos.doc/toc.xml>

NetView Customer Forum

<http://groups.yahoo.com/group/NetView/>

Network Traffic Analysis (NTA)

- IBM Service offering to help analyze traces

ftp://ftp.software.ibm.com/networking/.../network_traffic_analysis

For z/OS Performance Managing: OMEGAMON XE for Mainframe Networks

<http://www-01.ibm.com/software/tivoli/products/omegamon-xe-mainframe/>

Classes

- New / updated classes
 - ▶ NetView for z/OS 5.3 Technical Update
 - October 27-28, Zurich, Switzerland
 - [http://www.ibm.com/services/learning/de/ta-iris.nsf/\(ExtCourseNr\)/TM78D0DE](http://www.ibm.com/services/learning/de/ta-iris.nsf/(ExtCourseNr)/TM78D0DE)
 - ▶ NetView for z/OS 5.3 Workshop: Fundamentals, Automation, REXX and PIPEs
 - October 13-17, Pittsburgh
 - November 3-7, Dallas
 - November 10-14, Stuttgart, Germany
 - December 1-5, Raleigh
 - <http://www.ibm.com/software/tivoli/education/U188790N96197Y71.html>
 - ▶ NetView for z/OS 5.3 Workshop: Fundamentals
 - ▶ NetView for z/OS 5.3 Workshop: Automation Techniques
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IBM Tivoli NetView for z/OS

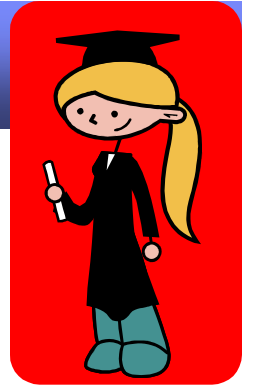
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- Examples
 - ▶ NetView for z/OS 5.3 Enterprise Management Agent (EMA)
 - ▶ TCP/IP Management – Part 1
 - ▶ TCP/IP Management – Part 2
 - ▶ Automation
 - ▶ Time to Value, Ease of Use, and Migration Considerations

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- <http://www-01.ibm.com/software/tivoli/systemz-advisor/?&ca=spotlights&me=W&met=inli&re=Imiitsm>



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