



Improving Network Monitoring with OMEGAMON for Mainframe Networks V5.1

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Increasing visibility with mainframe monitoring can improve availability across entire Enterprise

Key Takeaways



1. IBM has provided leadership and best practices with System z Service Management **Visibility, Control and Automation** capability for years
2. Enterprise-wide **Monitoring and Management** provides much better availability and performance results than individual separate products
3. IBM's System z **OMEGAMON family** addresses key requirements, including reducing risk and decreasing costs, with improved productivity

IBM provides Visibility, Control and Automation to respond to changing priorities and to realize business potential



VISIBILITY



CONTROL



AUTOMATION

**React with
agility to
competitive
landscape**

**Execute with
reduced
risk & cost**

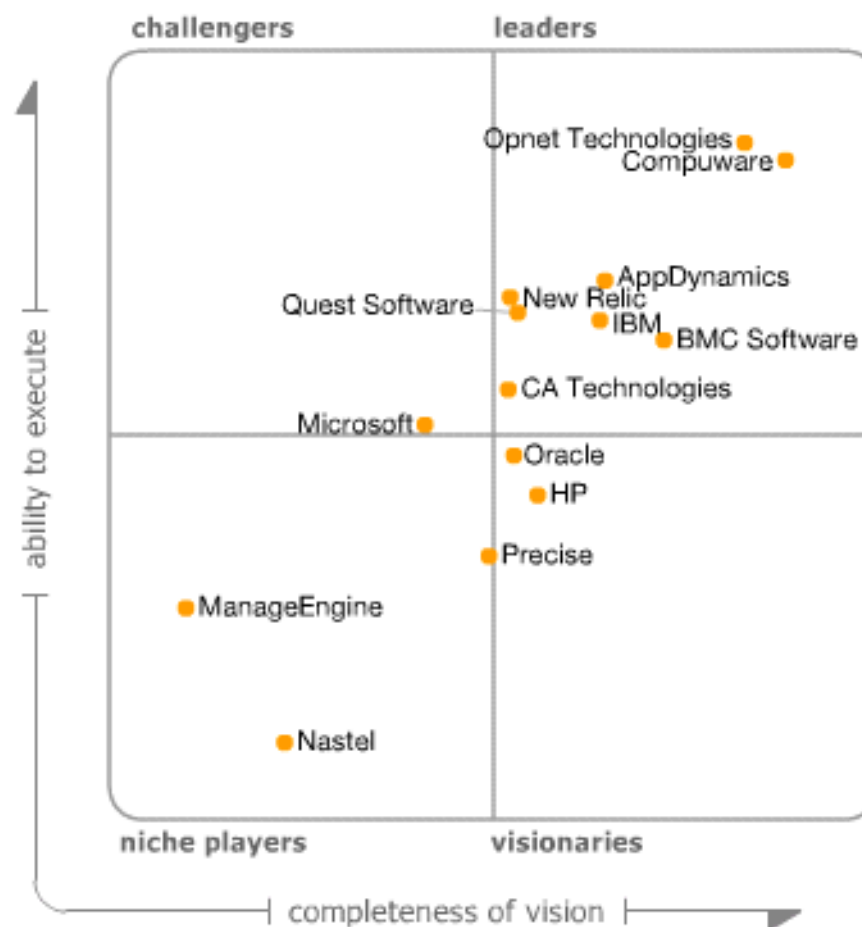
**Achieve
desired
business
outcomes**

Gartner identifies IBM as a Leader in the 2012 Magic Quadrant for Application Performance Monitoring (APM)

Magic Quadrant for Application Performance Monitoring

Will Cappelli, Jonah Kowall

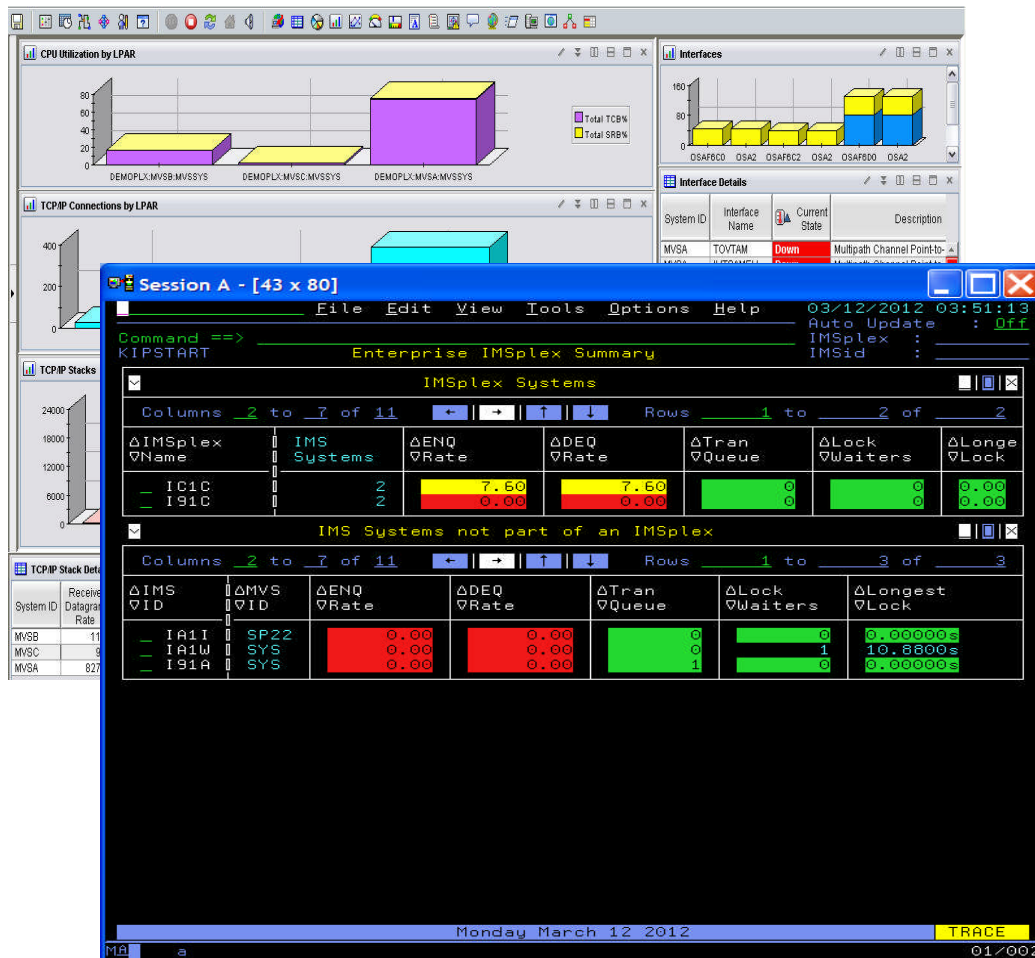
August 16, 2012



As of August 2012

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OMEGAMON V5.1 now has a complete family across System z sub-systems



- OMEGAMON XE z/OS v 5.1
- OMEGAMON XE CICS v 5.1
- OMEGAMON XE DB2 v 5.1.1
- OMEGAMON XE IMS v 5.1
- OMEGAMON XE Storage v 5.1
- OMEGAMON XE Messaging v 7.1
- OMEGAMON XE
Mainframe Networks v 5.1
- OMEGAMON for z/OS
Management Suite V5.1

Business Agility with improved IT visibility now available with OMEGAMON V5.1 family

Modernized and strengthened OMEGAMON product line for reduced resource usage and faster problem resolution

Increased System Availability with faster problem resolution

- Enhanced 3270 User Interface for SMEs
- Built-in Problem Solving Scenarios

Improved Productivity with simplified information

- Faster Install/Configuration/Maintenance
- zEnterprise monitoring across z196/114 and zBX

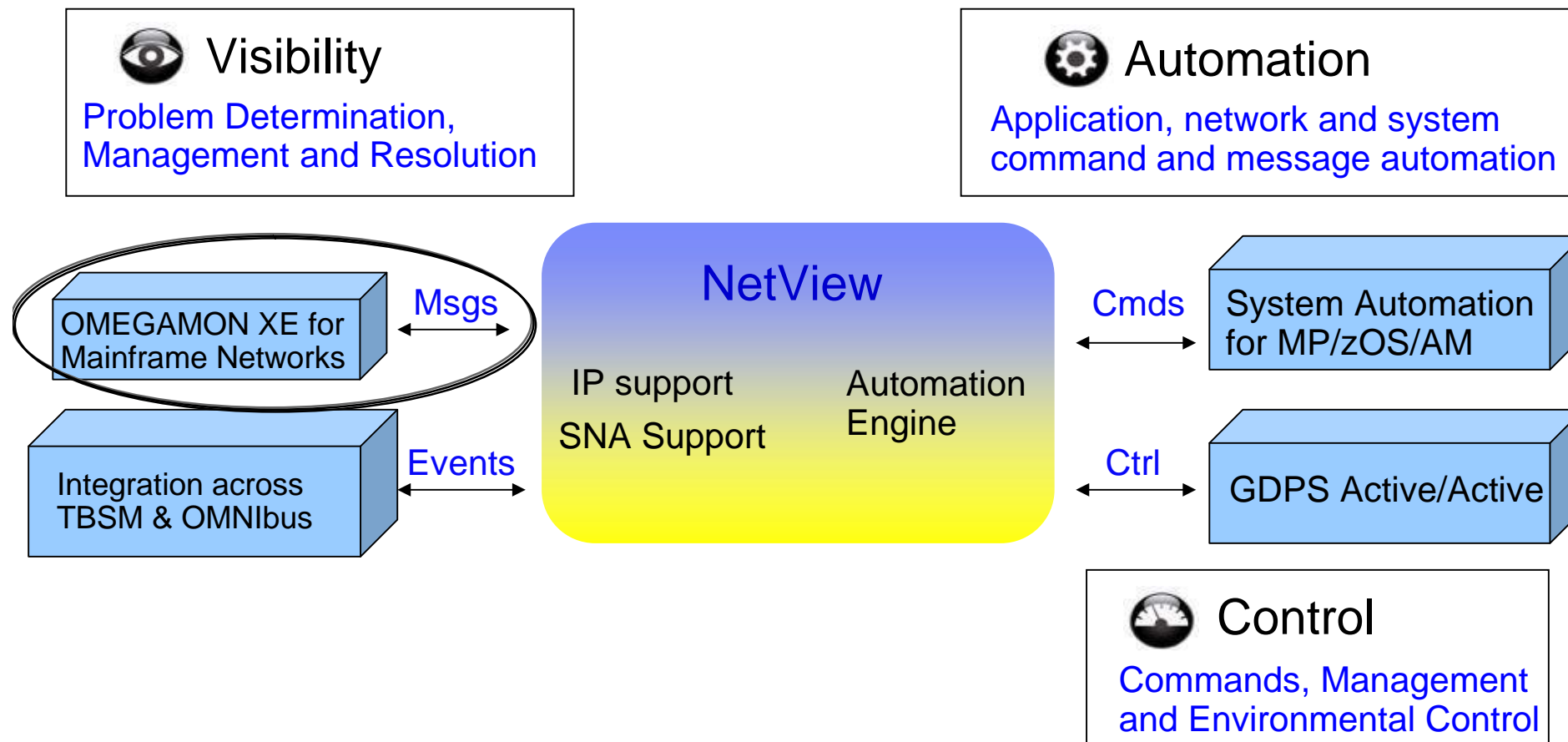
Reduced Costs with decreased resource usage

- Usage of zIIP specialty servers
- Simplified OMEGAMON architecture



Individual products include additional capability

OMEGAMON for Mainframe Networks V5.1 fits into total Integrated Service Management Ecosystem



NetView and OMEGAMON for MfN working together create single view of enterprise networks

NetView

Network Availability

OMEGAMON XE for
Mainframe Networks

Network Performance

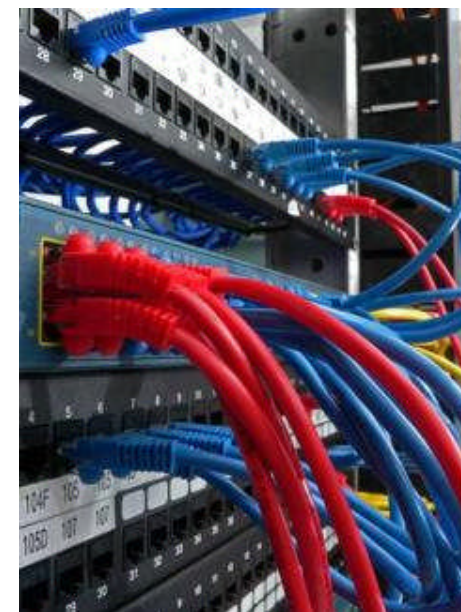
- Common user interface integrates TCP/IP data from both NetView and OMEGAMON XE for Mainframe Networks.
- Integration function provides customers with a consolidated TCP/IP workbench
 - Allowing management of both TCP/IP availability and performance from the same user interface.
- Smart IP tracing to immediately learn where poor or unstable TCP/IP connections hamper application performance



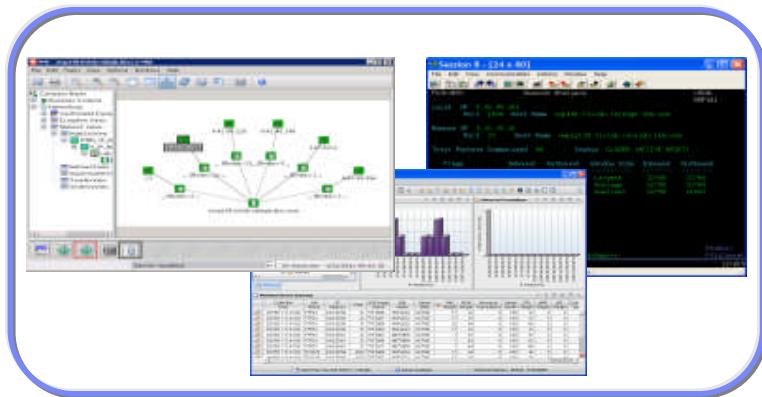
OMEGAMON for Mainframe Networks V5.1 improves network diagnostics and management

In addition to OMEGAMON V5.1 family capability:

- Improved Diagnostics with decreased CPU utilization
 - Exploiting new callable network management interfaces (NMIs) available with zOS v1.12
 - OSA data collection and display to improve diagnostics, visualization, and CPU usage
- New zEnterprise support with ability to monitor both data and management LANs
- Improved CPU control and resource usage with ability to turn data collection on and off:
- Greater synergy with IBM Tivoli NetView for z/OS and IBM Tivoli OMEGAMON XE for DB2 Performance Monitor created through in-context links between products.
- New workspaces, over 300 new data fields (many from customer requirements), and several new monitoring situations
- Improved Management with Take Action commands, NSLOOKUP and TRACERTE added to existing PING and DROP commands.

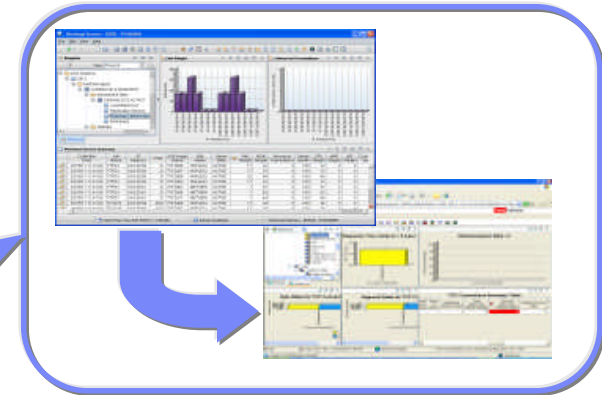


All the components work together to keep applications and services availability

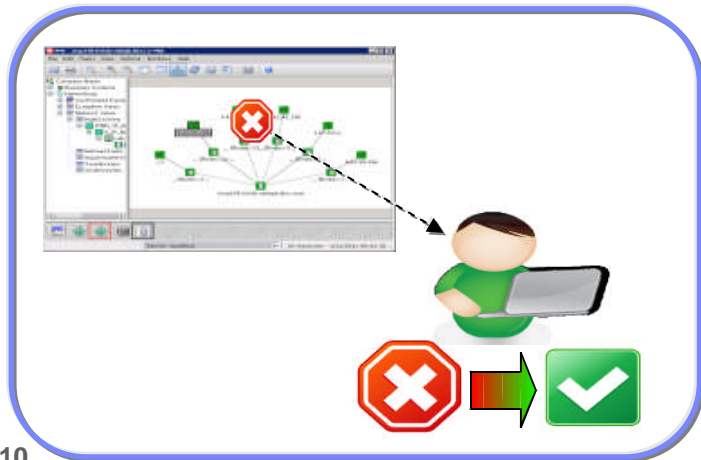


Role appropriate views of the right data at the right time

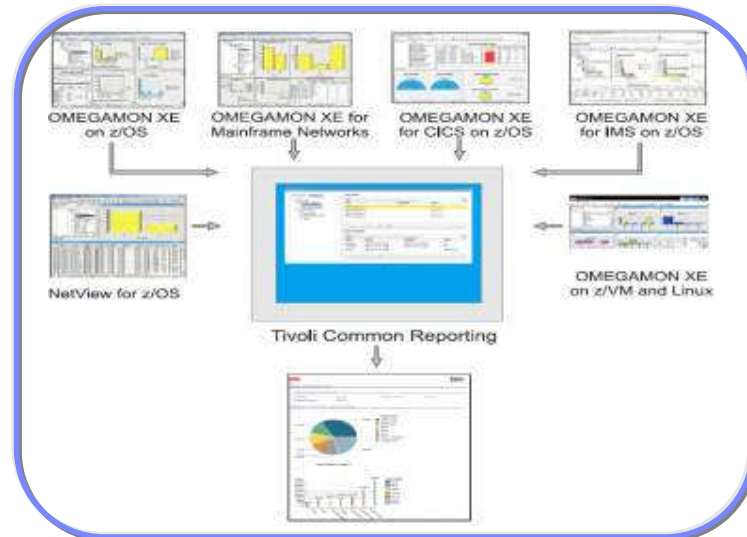
Rapid problem diagnostics via common UI and drill down between products



Alert me when thresholds are breached and enable me to automate corrective actions for the future



Consistent historical views of resource performance and availability data



OMEGAMON V5.1 enhanced configuration and maintenance capability with Self-Describing Agents

Faster, easier, less error-prone for improved reliability and productivity

- Eliminate monitoring outages caused by ITM Server recycles
 - Product upgrades/maintenance requires agent or RTEMS recycles only
- Eliminate maintenance upgrade errors:
 - Applies to new installs, staged upgrades, and maintenance
 - Crosschecks/validates version with installed data and framework
 - Avoids inconsistent application data in ITM framework layers
- Self-describing framework extensible to new capabilities
- Eliminates application data DVDs and CDs:
 - No extra distributed installs or upgrades for mainframe-centric customers



- Moving from 40 hours a week to 4 hours a week maintenance
- 80% improvement in time for installation and maintenance
- 30% improvement in time to configure post installation

Customer Driven improvements simplify Installation and Configuration using Parmgen

Removal of ICAT as primary way to install and configure

*Before -145 ICAT **product-centric** jobs to configure 38 components for 1 LPAR RTE
Today – 8 Parmgen **function-centric** jobs to configure components for 1 LPAR RTE
Customers experiencing over 35% improvement in install and configuration time*

- Install without requirement of distributed server
- Easy to walkthrough steps to complete configuration and customize profile
- Automatically updates hundreds of configuration artifacts, including auto-discovery of system values

single reference book for
upgrade guidance

IBM Tivoli Management Services on z/OS
Version 6.2.3

PARMGEN Reference

The overall process has been simple and quick. Total time for 3-4 products (z/OS, CICS, DB2, TOM plain vanilla) has been about 2 hours Field Engineer

*“I like using the Parmgen approach better than CICAT/ICAT.
I find it much easier to make things repeatable...
I like the fact that Parmgen does not overwrite my running members”
Typical quotes from early adopters program*

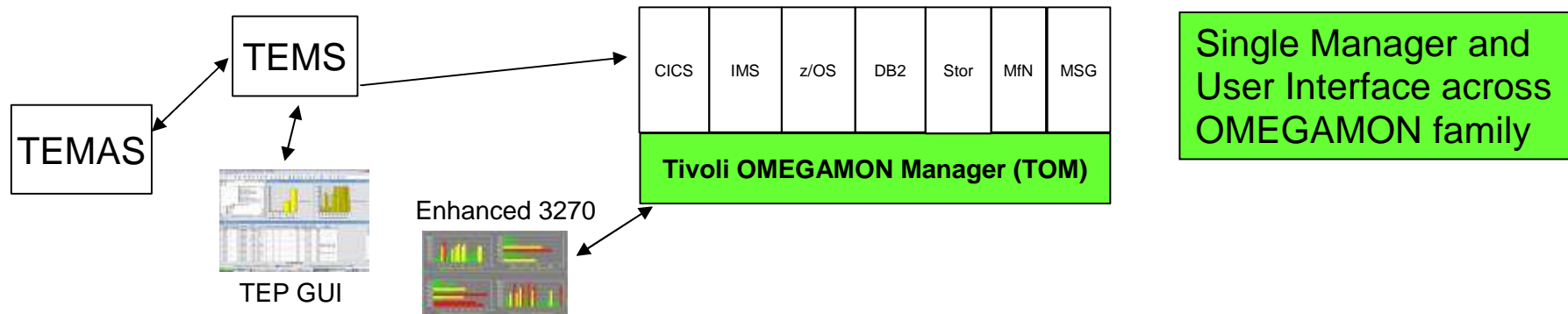
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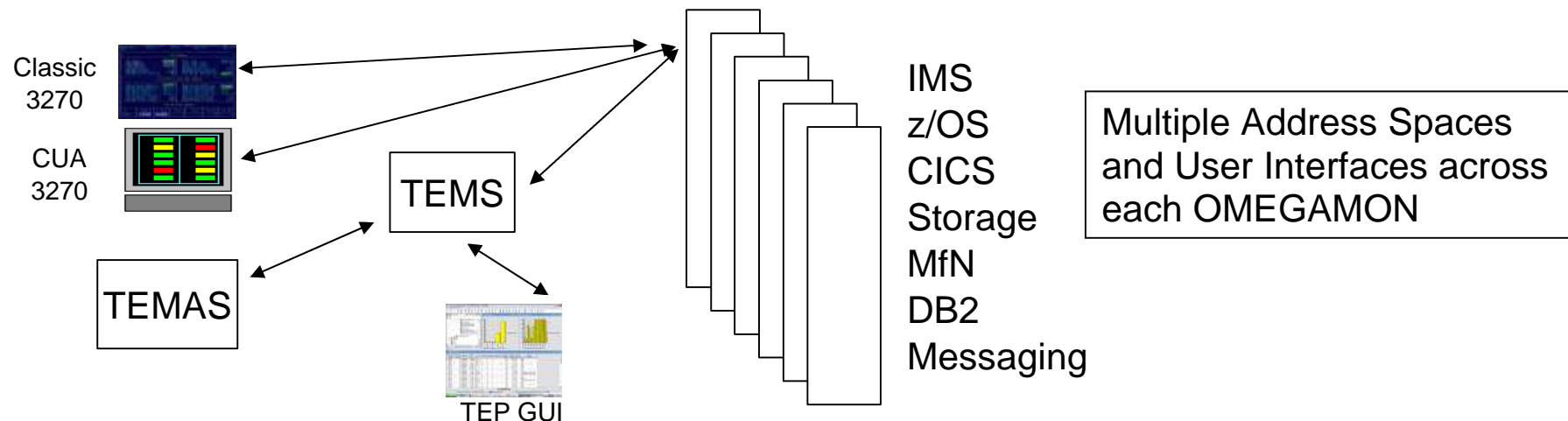
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Moving to simplified architecture driving decreased resource utilization without loss of current function

Enhanced OMEGAMON Architecture



Current OMEGAMON Architecture



Enhanced 3270 user interface creates Enterprise wide view of information for improved availability

- Understand transactions across multiple sysplexs
- Color coding to provide ability to find and resolve problems quickly
- Eliminates need to move between multiple screens and monitors

“GUI on a green screen”

Command ==> KOBSTART Enterprise Summary

Auto Update: Auto Update Plex ID:

All Active Sysplexes z/OS-wide sysplex view

Columns 2 to 6 of 9 ← → ↑ ↓ Rows 1 to 1 of 1

♦Sy Na	ent	Highest LPAR Name	ΔHighest ∇LPAR CPU%	ΔPercent LPAR ∇MSU Capacity	+LPAR Grou Name
<u> </u> ZPETPLX2	<u> </u> 3	<u> </u> Z2	<u> </u> 3	<u> </u> 3.4	<u> </u> N/A

Customize Views

All Active CICSplexes CICSplex details views

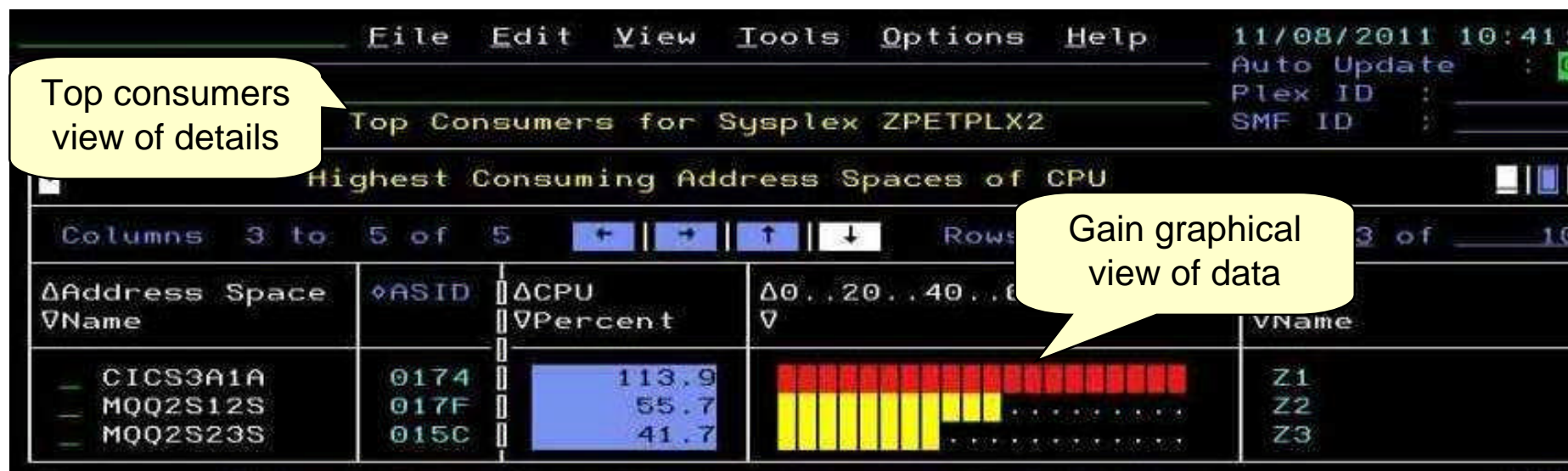
Columns 2 to 6 of 19 ← → ↑ ↓ 3 of 3

ΔCICSplex ∇Name	ΔNumber of ∇Regions	ΔTransaction ∇Rate	ΔCPU ∇Utilization	∇SOS Regions	SOS Region
<u> </u> OMEGPLEX	<u> </u> 1	<u> </u> 0 / m	<u> </u> 0.3%	<u> </u> No	<u> </u> n/a
<u> </u> TESTPLEX	<u> </u> 8	<u> </u> 10985 / m	<u> </u> 18.4%	<u> </u> No	<u> </u> n/a
<u> </u> WUIPLEX	<u> </u> 1	<u> </u> 0 / m	<u> </u> 0.0%	<u> </u> No	<u> </u> n/a

Customer prioritized Problem Solving scenarios built into enhanced 3270 user interface

Easy to see and find critical system and sub-system information for improved performance and availability across System z

- Customized screens focused on customer defined problems
- Screen content based on high priority problems
- Includes Healthcheck and Bottleneck analysis



Example of quickly finding and fixing z/OS Problem

Screen 1 Exceptions

Columns 3 to 5 of 6 Rows 1 to 8 of 8

♦Sysplex Name	♦LPAR Name	ΔException	Value	Waiting Tasks
- LPAR400J	CANSYSG	Performance_Index	7.50	-
- LPAR400J	CANSYSG	Enqueue	SYSDSN	1
- LPAR400J	CANSYSG	GTF_Active	TRUE	-
- LPAR400J	CANSYSG	CPU_Loop_Index	100.0	-
- LPAR400J	CANSP22	Performance_Index	1.76	-
- LPAR400J	CANSYSL	Performance_Index	4.28	-
- LPAR400J	CANSP12	Performance_Index	1.42	-
- LPAR400J				

New E3270UI highlights problems and simplifies resolving them quickly

Possible Looping Job

Screen 2 Exceptions

Columns 3 to 5 of 6 Rows 1 to 7 of 7

♦Sysplex Name	♦LPAR Name	ΔException	Value	Waiting Tasks
- LPAR400J	CANSYSG	Performance_Index	6.66	-
- LPAR400J	CANSYSG	Active_Storage_Alert	WARNING	-
- LPAR400J	CANSYSL	Performance_Index	2.50	-
- LPAR400J	CANSP11	Performance_Index	1.42	-
- LPAR400J	CANSP22	Performance_Index	1.30	-
- LPAR400J	CANSP22	CPU_Loop_Index	99.6	-
- LPAR400J	CANSYSG	Performance_Index	4.28	-

Enter 'c' to cancel job

Screen 3 Cancel Address Space

Press ENTER to continue

Address Space Name : MGRABZ
ASID : 0044
Address Space Type : BATCH
SMF ID : SP22

♦Sysplex Name : LPAR400

Exceptions

Columns 3 to 5 of 6 Rows 1 to 4 of 4

♦Sysplex Name	♦LPAR Name	ΔException	Value	Waiting Tasks
- LPAR400J	CANSP13	Performance_Index	2.85	-
- LPAR400J	CANSP13	Active_Storage_Alert	WARNING	-
- LPAR400J	CANSP22	CPU_Loop_Index	99.6	-
- LPAR400J	CANSYSG	Performance_Index	4.10	-

Job Cancelled

In prior releases this would have taken from 5 to 15 screen interactions

New Problem Determination and Management allows Operations and SMEs to see what is happening sooner

Increase availability by monitoring over time to identify and fix potential problems before they become outages

- Set exceptions to quickly alert operators across entire sysplex
- Warned about a problem 98% faster than before

KM5MSUO 4-Hour Rolling Average MSU Statistics SMF ID : SP22

☑ LPAR

4 Hour MSUs.....	6	LPAR Define	Yes
% LPAR MSU Capacity.....	6.0	Average %	0.0
LPAR Capacity Limit.....	100	Average % 1	100.0
LPAR Capacity Limit Basis.	Entitled		

☑ LPAR Group

LPAR Group Name	Average Unused Group MSUs	LPAR Group Capacity Limit	Group LPAR MSU Limit
CANDLE	93	100	100

☑ 5 Minute Intervals

Columns 2 to 6 of 8

Time Period	% Time Uncapped	Uncapped MSUs/Hour	% LPAR Uncapped	Uncapped MSUs/Hour
08:59-09:02	100.00	8.83	8.83	0.00
08:54-08:59	100.00	6.59	6.59	0.00
08:49-08:54	100.00	6.52	6.52	0.00
08:44-08:49	100.00	7.25	7.25	0.00

4 Hour Rolling Average

5 minute intervals

New Take Action commands on TEP and e3270ui allow for easier network management

- Trace route to monitor, ping or drop connection
- Drop Connection (D) can be issued directly on Connections Summary for selected application.
- Use option ! to see action list and take an action from the list

The screenshot shows a terminal window titled 'Session A - [43 x 80]' with a menu bar including File, Edit, View, Communication, Actions, Window, and Help. The host is 'TIVVM4.RALEIGH.IBM.COP' and the port is '23'. The terminal displays an 'Options Menu' with the following text:

```

Options Menu
Select an option and then press ENTER
-
0-Trace route to monitor, ping or drop connection
1-Trace route to monitor
2-Ping
3-Drop connection
4-Trace route to monitor, ping or drop connection
5-Trace route to monitor
6-Ping
7-Drop connection
8-Trace route to monitor, ping or drop connection
9-Trace route to monitor
0-Ping
1-Drop connection
2-Trace route to monitor, ping or drop connection
3-Trace route to monitor
4-Ping
5-Drop connection
6-Trace route to monitor, ping or drop connection
7-Trace route to monitor
8-Ping
9-Drop connection

```

A yellow callout bubble points to the 'Drop connection' option (3) with the text: 'Issue Commands from Take Action Dropdown'.

Below the menu, there is a 'TCP Listeners Summary for V510DSST' table:

Local IP Address	Port	Conn In	Backlog	Rejected	Tot Backlog	Rejected	Idle Time
0.0.0.0	19218	0	0	0	0	0	
...

The terminal footer shows the date: 'Wednesday September 26 2012'.

Enterprise level Network Health provides view across LPARs based on user criteria priority

Displays summary of applications which meet one or more predefined criteria

Session J - [43 x 80] 08/31/2012 16:54:19
 File Edit View Tools Options Help Auto Update : Off
 Command ==> Plex ID :
 KN3START Enterprise Applications Health Sys ID :

Network Health for Applications

Columns 3 to 7 of 2 Rows 1 to 25 of 25

ΔSystem VID	ΔJob VName	ΔSegs InOfOrder	ΔTot Segs VOutOfOrder	ΔConn in VBacklog	Backlog Rejected	ΔTot Bac VRejecte
SP22	L3ITDSW8	28	189.1K	0	0	0
SP22	\$TN22	0	0	0	0	0
SP22	TSSQDS	0	0	0	0	0
		0	0	0	0	0
		0	136	0	0	0
		0	0	0	0	0
		0	2	0	0	0
		0	1	0	0	0
		0	0	0	0	0
		0	0	0	0	0
		0	1	0	0	0
		0	0	5	0	9.4K
SP22	M5T421DS	0	32	0	0	0
SP13	M530DSST	0	1	0	0	0
SP13	L3IAI538	0	0	0	0	0
SP13	L3IAC534	0	0	0	0	0
SP13	V9M2W@@L	0	0	0	0	0
SP13	V9CTW@@L	0	0	0	0	0
SP13	CVTZ510D	0	0	0	0	0
SP13	C5B0CP13	0	1	0	0	0
SP13	V9C5W@@L	0	0	0	0	0
SP13	M5GBRMTD	0	0	0	0	0
SP13	\$13SDSST	0	0	0	0	0
SP13	L3IAN338	0	0	0	0	0
SP13	\$TN13	0	0	0	0	0

Friday August 31 2012 01/002

Mainframe network problem solving views to simplify overall network management

```
netmenu_ File Edit View Tools Options Help 10/03/2012 06:11:23
Auto Update : Off

Command ==>
KOBSTART

Columns
System ID
4080

KOBSTART Enterprise Network Workspaces

Select one of the following, then press ENTER
1. A Enterprise Application Health
2. L Enterprise TCP Listeners Overview
3. C Enterprise Connections Health
4. N Enterprise TN3270 Servers Overview
5. I Enterprise Interfaces Overview
6. C Enterprise OSA Interfaces Overview
7. C Enterprise HiperSocket Interfaces Overview
8. Enterprise OSA Express Ports Overview
9. Enterprise OSA Express Channels Overview
10. Enterprise TCPIP Stack Performance Overview
1. Enterprise Memory and CSM Storage Overview
7. Command and Response Log
```

Component monitoring of network problems

Wednesday October 03 2012

Define and display key metrics of application connection problems making it easier to monitor

Display summary of applications, with: percent out-of-order $\geq 5\%$, or Total out-of-order segments $\geq 15\%$, or connections in backlog > 0 , or backlog connections rejected > 0 , or percent segments retransmitted > 3 , or Total segments retransmitted $> 10\%$

File Edit View Tools Options Help 10/03/2012 06:43:09
 Auto Update : Off
 TCP STC : *
 SMF ID : *

Command ==> Enterprise Applications Health

KN3TAPO

Applications Summary

System ID	Job Name	Idle Time	Conn Count	Active Conns	Highest Conns	Conn in Backlog
4083	V510DSST	17.83	27	14	15	0
4084	V510N3	182.74	16	3	3	0
4083	V510N3	0.00	16	3	3	0
5096	V510N3	182.79	16	3	3	0
1062	V510N3	1.53	14	2	2	0

Percent Out of Order Segments OR Total Out of Order Segments

% Segs Out of Order	Tot Segs Out of Order	Segments Out of Order	Tot Segs Sent	+Tot S Recei
0	595	0	365.7K	

Backlog OR Total Backlog Connections Rejected No Data

Percent Segments Retransmit OR Total Segments Retransmit

System ID	Job Name	% Segs Retrans	Tot Segs Retrans	Segs Retrans	Retrans Rate	Conn Count
1062	FTPD1	1	32	1	0	11
4083	TN3270	0	85	0	0	4
4083	V510DSST	0	525	1	0	27
4083	FTPD1	0	43	0	0	1

Wednesday October 03 2012

Filtered list showing over-threshold applications

Show Network Interfaces with bad status or errors to assist in finding problems before they become outages.

Displays stats, status, summary data for all interfaces across the enterprise

```

File Edit View Tools Options Help 10/03/2012 06:49:44
Auto Update : Off
Command ==>
KN3IFSO Enterprise Interfaces Overview TCP STC : *
SMF ID : *
  
```

Interface Errors

Columns 3 to 6 of 16 Rows 1 to 6 of 19

System ID	Interface Name	% Packets in Error	% In Pkts in Error	% Out Pkts in Error	% Packets Discarded
SP13	OSAQDIO	0	0	0	33
SP13	TCPIPLINK	0	0	0	0
SP13	LOOPBACK6	0	0	0	0
SP13	LOOPBACK	0	0	0	0
SYS	TCPIPLINK2	0	0	0	0
SYS	OSAQDIO	0	0	0	0

Sorted, Color Coded Interface Status

Interface Status

Columns 3 to 6 of 14 Rows 1 to 6 of 37

System ID	Interface Name	ΔInterface Status	ΔDevice or Datapath	ΔActual MTU	+Duplicate Addr Coun
0238	ETHOR8023	Not Active	Not Active	0	0
0238	ETH8023	Not Active	Not Active	0	0
0238	ETH	Not Active	Not Active	0	0
0238	TR	Not Active	Not Active	0	0
0238	LHCH	Not Active	Not Active	0	0
0238	LCTC	Not Active	Not Active	0	0

Interface Statistics

Columns 3 to 6 of 15 Rows 1 to 6 of 19

System ID	Interface Name	ΔBandwidth or Util	Bytes Recv or Xmitd	ΔTransmit Pkt Rate	ΔReceive Pkt Rate
SP13	OSAQDIO	0	624	6	0
SP13	TCPIPLINK	0	915.9K	947	843

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Monitor TN3270 Servers across enterprise from one screen for improved productivity

Displays TN3270 server summary information for TN3270 listeners across enterprise

File Edit View Tools Options Help 10/03/2012 05:58:06
 Command ==> Enterprise TN3270 Server Overview Auto Update : Off
 KN3TCLO2 TCP STC : * SMF ID : *

System ID	Job Name	Local Port	Conn in Backlog	Backlog Rejected	Tot Backlog Rejected	Idle Time
4084	TN3270	23	0	0	0	139.34
4084	TN3270B	1123	0	0	0	160.24
4084	TN3270	23	0	0	0	160.24
4084	TN3270	23	0	0	0	160.24
1062	TN3270	23	0	0	0	32.70
5096	TN3270	23	0	0	0	213.03
4083	TN3270	23	0	0	0	0.37

TN3270 Servers sorted by criteria

Wednesday October 03 2012

View related TN3270 Stack information sorted for simplified, productive management

File Edit View Tools Options Help 10/03/2012 08:12:05
 Command ==> Auto Update : Off
 KN3GIC0 Enterprise TCPIP Stack Performance Overview TCP STC : *
 SMF ID : *

Sorted IP Layer Metrics

IP Layer Metrics

System ID	TCPIP STC Name	ΔInput ∇Discard	% Input Discard	ΔOutput ∇Discard	% Output Discard	Total No Route
— SP13	TCPIP13	0	0	0	0	0
— SP13	TCPIP13	0	0	0	0	0
— SYS	TCPIPG	0	0	0	0	0
— SYS	TCPIPG	0	0	0	0	0
— SYS	TCPIPG2	0	0	0	0	0
— SYS	TCPIPG2	0	0	0	0	0
— 0238	TCPIP	0	0	0	0	0
— 0238	TCPIP	0	0	0	0	0

TCP Layer Metrics

TCPIP Layer Metrics

System ID	TCPIP STC Name	ΔTot % ∇Retrans	Δ% Segs ∇OutOfOrder	Total Output Window Probes	ΔTot Segs ∇Retrans	ΔTot ∇Retr
— SP13	TCPIP13	0	0	963	8.0K	
— SYS	TCPIPG	0	0	0	13.5K	
		0	0	0	0	
		0	0	0	65	

UDP Layer Metrics

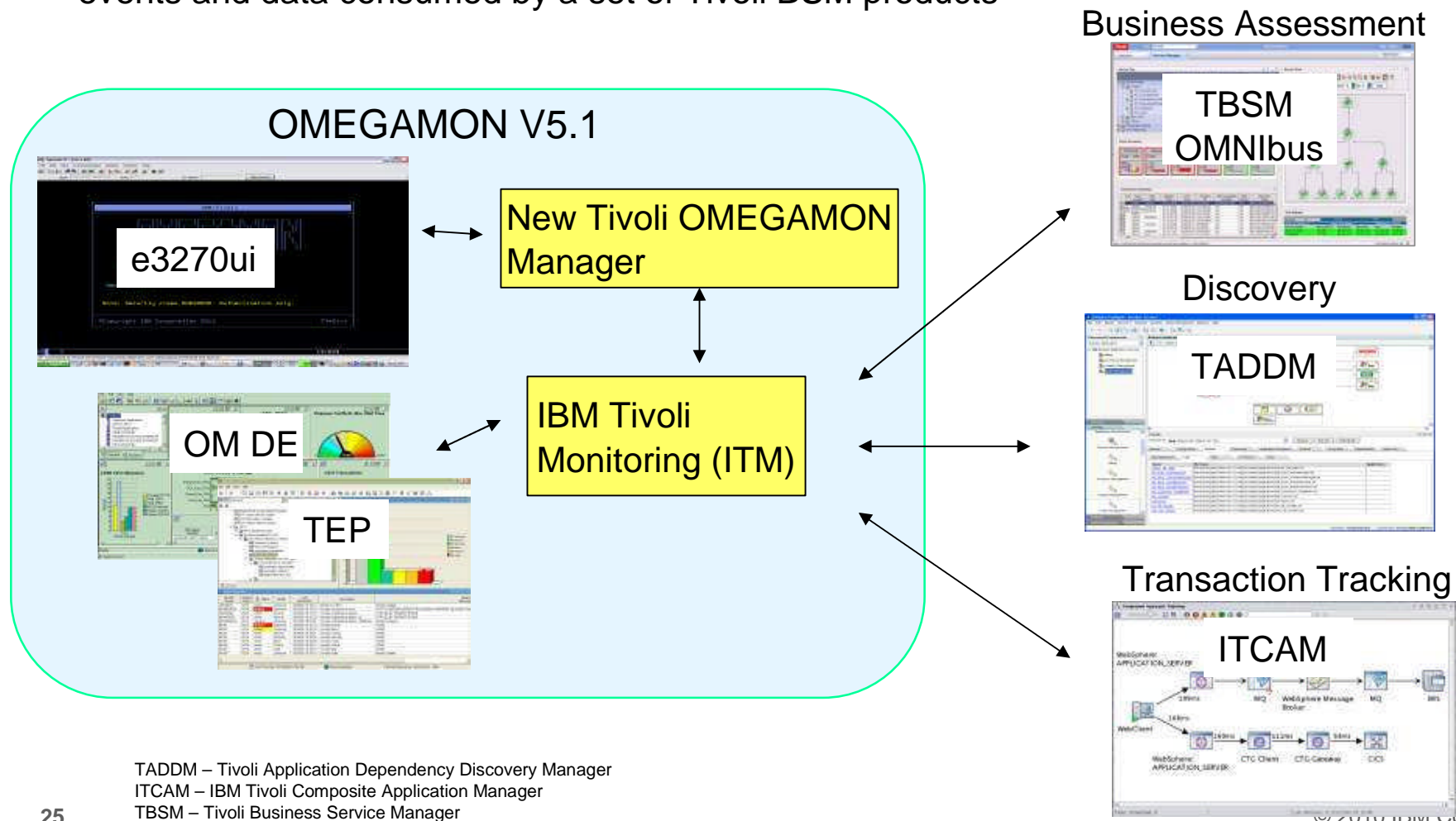
UDP Layer Metrics

ΔSystem ∇ID	ΔTCPIP ∇STC Name	Δ% ∇Discard	ΔDatagram ∇Error %	ΔTot % ∇Discard	ΔTot Disc ∇Datagrams	ΔTot In Err ∇Datagrams
— SYS	TCPIPG2	100	0	100	11.3K	0
— SP13	TCPIP13	0	0	2	61.5K	0

Wednesday October 03 2012 MOREV

OMEGAMON integrates within a total System z Business Service Management solution

OMEGAMON Portfolio provides performance and availability visibility for System z events and data consumed by a set of Tivoli BSM products



TADDM – Tivoli Application Dependency Discovery Manager
 ITCAM – IBM Tivoli Composite Application Manager
 TBSM – Tivoli Business Service Manager

Business success is directly dependent on the health of underlying IT systems, applications, and networks



- Complexity of today's enterprise environments demands **solutions that integrate** across all aspects of enterprise network, whether distributed or z/OS.
- IBM in unique position to deliver **monitoring and management** solutions across enterprise subsystems, including mainframe network
- **IBM Tivoli OMEGAMON for Mainframe Networks V5.1** key to system and network availability and integration, providing **Visibility, Control, and Automation**

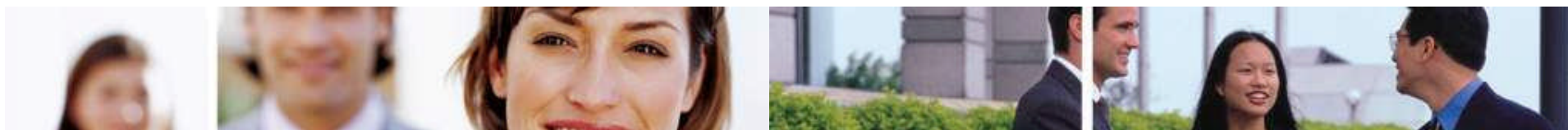
Learn more about IBM's entire Tivoli System z portfolio at upcoming Pulse Conference



Register at:

<http://www-01.ibm.com/software/tivoli/pulse/>

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