

# Top 10 Problem Solving Scenarios Using OMEGAMON And The Tivoli Enterprise Portal

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# IBM's Integrated Service Management (ISM) framework can optimize costs and streamline operations

This session is focused on:

## Integrated Service Management



### VISIBILITY



*See your business services*

Understand health and performance of services across your enterprise infrastructure

### CONTROL



*Manage service risk and compliance*

Govern and secure complex infrastructure and ensure regulatory compliance

### AUTOMATION



*Optimize business service delivery*

Drive down cost, minimize human error and increase productivity

## Questions

- Are you getting the most from your investment in System z hardware and z/OS software?
- Are you able to recognize and resolve issues efficiently?
- Are you able to maximize the performance and availability of your critical business applications?
- What are the most common issues and how can OMEGAMON address them?

# Common Resources To Consider

- **Operating System**
  - LPARs, CPU, Memory, Address Spaces, DASD, Enqueues
- **Transactions**
  - Subsystems, Regions, Tasks, Transactions, Programs, Messages, Queues, Files, Pools, Buffers, Logging
- **Databases**
  - Subsystems, Files, Database Objects, Calls, Threads, Connections, Virtual Pools, Logging, Locking
- **Network**
  - Network Address Space, Applications, Connections, Interfaces

# Scenario #1 - z/OS Operating System Analyzing z/OS High CPU Usage Issues – Real Time

The screenshot displays the Tivoli Enterprise Portal interface with two main panels. The top panel, titled 'System CPU Utilization', shows a bar chart of overall system metrics and a table of utilization data. The bottom panel, titled 'Address Space Utilization', shows a tree view of address spaces, a bar chart of CPU usage by address space, and a table of address space counts and CPU utilization summary.

**System CPU Utilization**

Average CPU Percent	RMF MVS CPU Percent	RMF LPAR CPU Percent	Total TCB%	Total SRB%	Average IFA Percent	Average zIIP Percent
19	4.9	4.9	20	1	0	0

**Address Space Utilization**

Address Space Count	Started Task Count	Batch Job Count	TSO User Count	APPC Count	Total Enclave Count	Active Enclave Count	Inactive Enclave Count
338	302	9	17	10	9	3	6

Job Name	Step Name	Proc Step	Type	SvcClass	SvcClass Period	ASID	JESJOBID	CPU Percent	TCB Percent	SRB Percent	IFA Percent	IFA on C Percent
CXEGRH	CXEGRH	AGENT	STC	OPSDEF	1	0X0154	STC15630	9.1	9.1	0.0	0.0	0

**System CPU utilization**

**Product provided OMEGAMON z/OS workspaces show overall system CPU utilization, and CPU utilization by address space.**

**Address space utilization**

# Scenario #1 - Analyzing z/OS High CPU A Custom Workspace For CPU Analysis

Tivoli Enterprise Portal Welcome Ed Woods
Log out

File Edit View Help
Plot System CPU over time

**Navigator**

View: Physical

- MQSERIES
- MVS Operating System
  - DEMOPLX:MVSA:MVSSYS
    - Address Space Overview
    - Channel Path Activity
    - Common Storage
    - Cryptographic Coprocess
    - DASD MVS
    - DASD MVS Devices
    - Enclave Information

Physical

**System CPU Utilization**

Average CPU Percent	RMF MVS CPU Percent	RMF LPAR CPU Percent	Total TCB%	Total SRB%
7	5.1	5.1	34	2

**System CPU Plot Chart**

Create a custom workspace that shows both overall system and address space utilization

**Address Spaces Using CPU**

Job Name	CPU Percent	Type	SvcClass	SvcClass Period	ASID	JESJOBID	TCB Percent	SRB Percent	IFA Percent	IFA on CP Percent	zIIP Percent	zIIP on CP Percent	Indepe Enclave
WLM	1.3	STC	SYSTEM	1	0X000C		1.3	0.0	0.0	0.0	0.0	0.0	0.0
GRS	0.4	STC	SYSTEM	1	0X0007		0.4	0.0	0.0	0.0	0.0	0.0	0.0
ADHADB1S	0.4	STC	OPSDEF	1	0X00D1	STC15485	0.4	0.0	0.0	0.0	0.0	0.0	0.0
NETVIEW	0.4	STC	OPSDEF	1	0X0135	STC16169	0.4	0.0	0.0	0.0	0.0	0.0	0.0
CXEG02	0.4	STC	OPSDEF	1	0X0138	STC16688	0.4	0.0	0.0	0.0	0.0	0.0	0.0
RMFGAT	0	STC	SYSTEM	1	0X0139	STC16689	0.4	0.0	0.0	0.0	0.0	0.0	0.0

**CPU Usage**

Where usage greater than 0%

Show address spaces using CPU (versus all tasks)

Consider a custom query

# Take Advantage Of Custom Queries To Optimize The Display Of Information

**Exploit queries to optimize workspace performance**  
**Use "Create Another" to make copies of product provided queries**

**Right click "Properties"**

**Click "Query"**

**Select query from list**

**Custom query requests address spaces using CPU**

Job Name	CPU Percent	Type	SvcClass	SvcClass Period	ASID	JESJOBID	TCB Percent	SRB Percent	IFA Percent	IFA on Perc
WLM	1.3	STC	SYSTEM	1	0X000C		1.3	0.0	0.0	
GRS	0.4	STC	SYSTEM	1	0X0007		0.4	0.0	0.0	

	Managed System	CPU Percent	Job Name	Step Name	Proc Step	Tyt
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	== \$NODE\$	0.0				

# Identify Looping Tasks - Address Space CPU Loop Index

Address Space Bottlenecks Summary - IBM-E9503533F87 - SYSADMIN \*ADMIN MODE\*
Page: 1 of 2

Navigator

View: Physical

- MVS Operating System
  - LPAR400:SP22:MVSSYS
    - Address Space Overview**
    - Channel Path Activity
    - Common Storage
    - Cryptographic Coprocessors
    - DASD MVS
    - DASD MVS Devices
    - Enclave Information
    - Enqueue, Reserve, and Lock Summary
    - LPAR Clusters
    - Operator Alerts
    - Page Dataset Activity
    - Real Storage
    - System CPU Utilization
    - System Paging Activity
    - Tape Drives
    - User Response Time
    - WLM Service Class Resources
    - z/OS UNIX System Services Overview

Selected Execution States

**OMEGAMON XE For z/OS 4.20 added a "looping task" indicator. This attribute can be used to aid in identifying tasks that may be looping, and wasting CPU resources.**

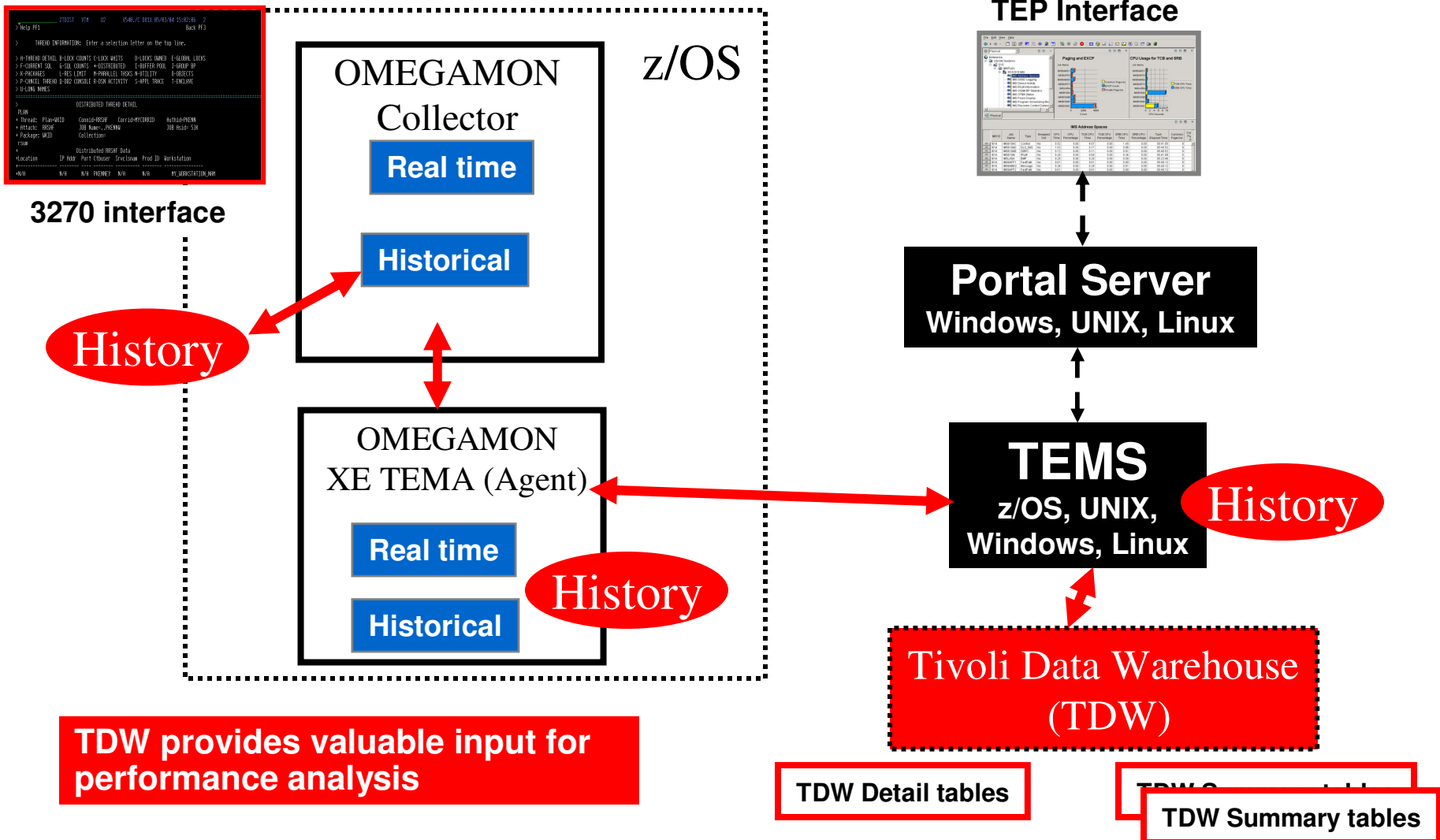
Address Space Bottlenecks Summary - Contention (%) by Resource

ASID	Job Name	Step Name	Proc Step	Type	Service Class	Period	Using CPU	Using IFA	Using zIIP	CPU Wait	IFA Wait	zIIP Wait	<b>CPU Loop Index</b>	Active I/O	Queued I/O	Enqueue Wait	Tape Mount	Resource Group Capping	Paging Wait	Serv Wai
0X001D	SSANTCP1	RUMMIGS		Batch	BATCH	2	86.1	0.0	0.0	13.8	0.0	0.0	<b>100.0</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X0028	VTAM36	VTAM	VTAM36	STC	SYSSTC	1	4.0	0.0	0.0	0.4	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X00E6	§X4SDSST	§X4SDSST	TEMS	STC	STCPROD	1	3.6	0.0	0.0	0.8	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X0006	XCFAS	XCFAS	IEFPROC	STC	SYSTEM	1	3.2	0.0	0.0	0.4	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X0007	GRS	GRS		STC	SYSTEM	1	2.4	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X00D4	M5GBHUB1	M5GBHUB1	TEMS	STC	STC	2	1.6	0.0	0.0	0.4	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X00E3	§BWBRSVR	§BWBRSVR	SCLMDTM	STC	STCPROD	1	1.2	0.0	0.0	0.4	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0X000B	WLM	WLM	I																0.0	0.0
0X00D2	MQRGMSTR	MQRGMSTR	P																0.0	0.0
0X00DE	L3IAMQW9	L3IAMQW9	AGENT	STC	STC	2	0.8	0.0	0.0	0.4	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Situation alerts with "Take Action" may be created using this function.**

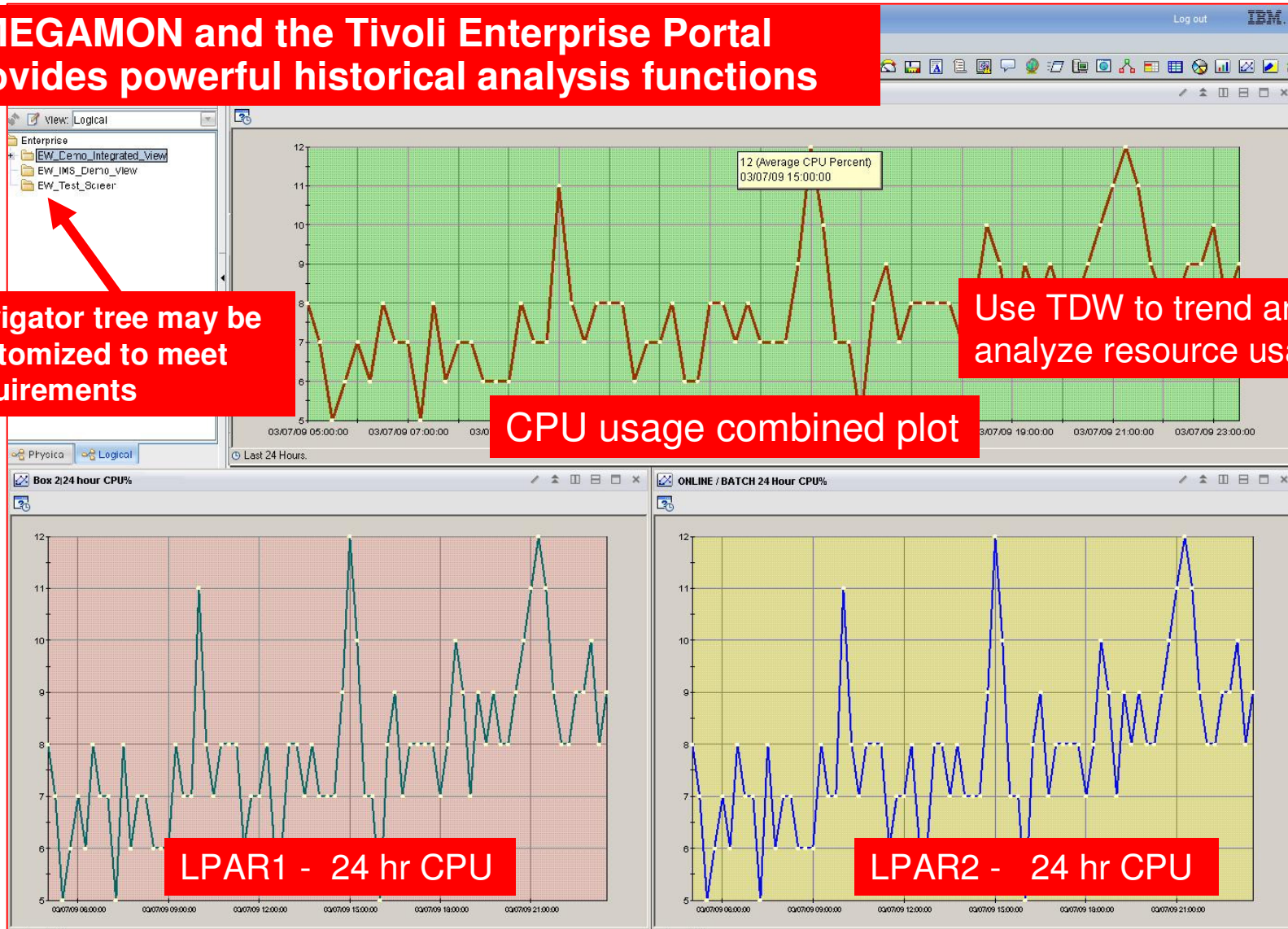


# Scenario #2 – Analyzing CPU Usage Using Tivoli Data Warehouse To Isolate Problems



# Scenario 2 – Analyzing CPU Usage - Historical

**OMEGAMON and the Tivoli Enterprise Portal provides powerful historical analysis functions**



**Navigator tree may be customized to meet requirements**

**Use TDW to trend and analyze resource usage**

**CPU usage combined plot**

**LPAR1 - 24 hr CPU**

**LPAR2 - 24 hr CPU**

# Scenario #3 – Isolating DB2 Performance Bottlenecks

## DB2 Threads Analysis

**DB2 threads are a common starting place for DB2 performance analysis. Common things to look for include:**  
**Threads with high “In-DB2” time**  
**Threads with high Getpage counts**  
**Threads with high wait times (lock/latch, I/O, other)**

**Navigation push-buttons**

**Product provided DB2 Thread workspace provides an easy to sort and view overview of threads. Move columns, click on column header to sort.**

	Elapsed Time	Plan	Package DBRM (Unicode)	CP CPU Rate	Thread Status	In DB2 CP CPU Time	In DB2 Time	Wait Time	Get Page	Updates	Commits	Authorization ID (Unicode)	Job Name
	23 Days	ADHPLAN3	ADHASSCS	0.0	NOT-IN-DB2	00:00:20.258	00:00:51.908	00:00:30.701	646776	2289	11266	AEAGENT	ADHADBS
	23 Days	ADHPLAN3	ADHAAAS	0.0	NOT-IN-DB2	00:00:19.813	00:01:26.904	00:01:06.813	53748	21848	12222	AEAGENT	ADHADBS
	23 Days	ADHPLAN3	ADHMSUMT	0.0	NOT-IN-DB2	00:00:13.792	04:04:47.208	01:34:53.823	74581	11651	2245	KLAYLO	ADHSRV2
	23 Days	ADHPLAN3	ADHAAFLR	0.0	NOT-IN-DB2								ADHADBS
	23 Days	ADHPLAN1		0.0	NOT-IN-DB2								ADHADBS
	00:37:47.1	DB2PM	DGO@PC1	0.0	NOT-IN-DB2								CXEGO2

# DB2 Thread Analysis

## Creating A Custom Thread Analysis Workspace

Create a custom DB2 thread workspace to speed thread analysis. View threads by various categories on the same screen.

**Distributed**

MVS ID	DB2 Subsystem	Plan	Correlation ID	Package DBRM
MVSA	DB1S	DISTSERV	db2jcc_appli	
MVSA	DB1S	DISTSERV	db2jcc_appli	

**CICS/IMS online**

MVS ID	DB2 Subsystem	Plan	Correlation ID	Package DBRM	Aut

**Batch**

MVS ID	DB2 Subsystem	Plan	Correlation ID
MVSA	DB1S	KO2PLAN	OMEGAMON
MVSA	DB1S		ADH ID 1
MVSA	DB1S		
MVSA	DB1S		

**High Getpage**

DB2 Subsystem	Plan	Package DBRM	Get Page
DB1S	DB2PM	DGO@PC1	7948555
DB1S	ADHPLAN3	ADHAAFLR	90996
DB1S			49393
DB1S			7887

**All Threads**

MVS ID	DB2 Subsystem	Plan	Correlation ID	Package DBRM
MVSA	DB1S	ADHPLAN1	ADH ID 1	
MVSA	DB1S	KO2PLAN	OMEGAMON	
MVSA	DB1S	DISTSERV	db2jcc_appli	
MVSA	DB1S	DISTSERV	db2jcc_appli	
MVSA	DB1S	ADHPLAN3		ADHM
MVSA	DB1S			ADHM
MVSA	DB1S		DE1PROC	ABPR

**High "In-DB2"**

**High Getpage**

**Use a custom query or workspace options to filter and sort**

# Creating A Custom Thread Analysis Workspace - Continued

**Start with the product provided workspace, and customize to the needs of the environment workload. Do "Save As" to save the workspace to the portal server.**

**Right click "Properties"**

**Click column headers to control content**

**Properties - EW\_Thread\_Display**

**Preview**

**Distributed Threads**

MVS ID	DB2 Subsystem	Plan	Correlation ID	Package DBRM	Authorization ID	Connection Type	CP CP Rate
MVSA	DB1S	DISTSERV	db2jcc_appli		DDS1621	DBAccess	0
MVSA	DB1S	DISTSERV	db2jcc_appli		DDS1621	DBAccess	0

**Filters**

	MVS ID	DB2 Subsystem	Plan	Correlation ID	Package DBRM	Authorizat
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2			= DISTSERV			
3						

# Scenario #4 – Isolating CICS Performance Issues

## CICS Task Analysis

**Tasks running within a given CICS region are a common starting point for CICS performance analysis**

**Drill downs for additional detail. Dynamic links to navigate to other tools within the TEP.**

System ID	CICS Region Name	CICS SYSIDNT	Transaction ID	Task State	Task Number	CPU Time	Elapsed Time	Resource Type	Resource Name	Wait Type	User ID	Terminal ID	Program ID	E
SP22	CIC8SPG1	SPG1	CSOL	Suspend	00003	00:00:00.01	00:02:48.52	SODOMAIN	SO_NOWOR	Socket	n/a	n/a	DFHSOL	Ni
SP22	CIC8SPG1	SPG1	CSSY	Suspend	00005	00:00:00	00:02:48.5	ICMIDNTE	DFHAPTIM	Interval	n/a	n/a	DFHAPATT	Ni
SP22	CIC8SPG1	SPG1	CSSY	Suspend	00006	00:00:00.01	00:02:48.5	ICEXPIRY	DFHAPTIX	Interval	n/a	n/a	DFHAPATT	Ni
SP22	CIC8SPG1	SPG1	CSTP	Suspend	00008	00:00:00.3	00:02:48.5	TCP_NORM	DFHZDSP	Terminal	n/a	n/a	DFHZCSTP	Ni
SP22	CIC8SPG1	SPG1	CSNC	Suspend	00019	00:00:00	00:02:48.45	CSNC	MROQUEUE	MRO	n/a	n/a	DFHCRNP	Ni

**“Transaction Analysis” workspace will show task info, task state, elapsed time, CPU time, resource being accessed, and current wait reason for the task. Use to determine if the task is processing or waiting, and if waiting what is the reason.**

# Isolating CICS Performance Issues

## CICS Task Analysis And Region Analysis With A Custom Workspace

**CICS region overview (use a custom query) to be able to see CICS activity cross region.**

System ID	CICS Region Name	CICS SYSIDNT	CPU Utilization	Transaction Rate	I/O Rate	Page Rate	Maximum Tasks Percent	VTAM ACB Open	SOS	Region Status	Storage Vi in Last
MVSA	CICSAOR1	C22A	0.0	0	0.0	0.0	3	Yes	No	N/S	
MVSA	CICSAOR2	C22B	0.0	0	0.0	0.0	2	Yes	No	N/S	
MVSA	CICSAOR3	C22C	0.0	0	0.0	0.0	1	Yes	No	N/S	
MVSA	CICSAOR4	C22D	0.0	0	0.0	0.0	2	Yes	No	N/S	

**Add a link to navigate cross-region.**

**Transaction Processor Utilization**

**Create a custom CICS workspace to view CICS region and CICS task activity from a consolidated view.**

**Transaction Analysis**

System ID	CICS Region Name	CICS SYSIDNT	Transaction ID	User ID	Terminal ID	Task Number	Resource Type	Resource Name	Task State	Elapsed Time	CPU Time	Program ID	Exceeds MAXR Threshold	DB2 Correlation Identifier
MVSA	CICSAOR1	C22A	OSEC	SYSSTC	n/a	00070	USERWAIT	SR2WORK	Suspend	17:51:29.69	00:00:00	KOCSR2ZZ	No	n/a
MVSA	CICSAOR1	C22A	OSRV	SYSSTC	n/a	00069	USERWAIT	SRWORK	Suspend	17:51:29.88	00:00:00.18	KOCSR2ZZ	No	n/a
MVSA	CICSAOR1	C22A								1.19	00:00:39.32	EYU9XLOP	No	
MVSA	CICSAOR1	C22A								3.68	00:00:00.01	EYU9XLOP	No	n/a

**Transaction overview for a given CICS region.**

# Scenario #5 – Isolate IMS Bottlenecks Analyze IMS Queues And Processing

**Product Provided IMS Health workspace focuses on many key rate metrics**

The screenshot displays the Tivoli Enterprise Portal interface for IMS Health. The left sidebar shows a tree view with 'IMS Health' selected. The main workspace contains several gauge charts for key metrics:

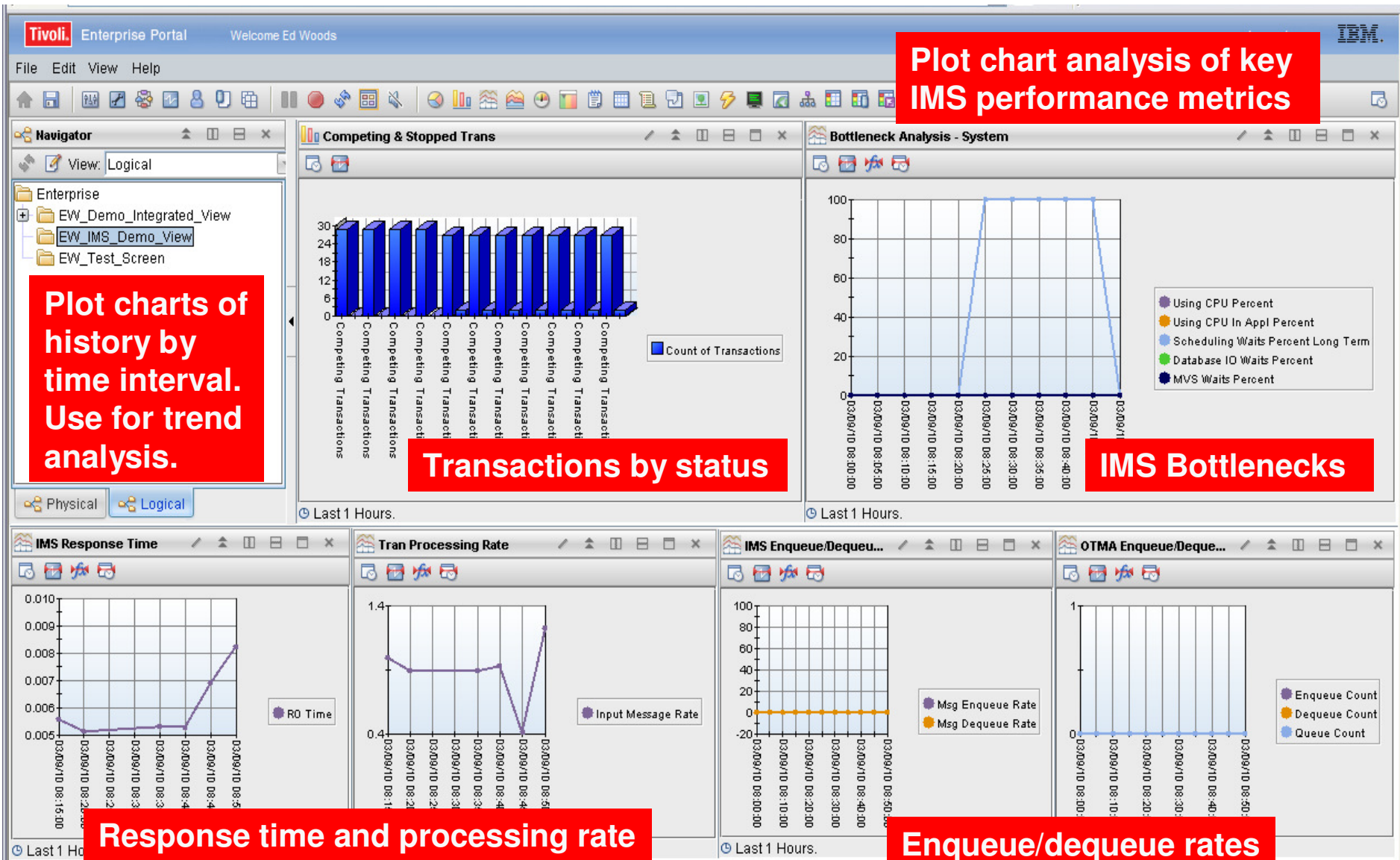
- Total Message ENQ/DEQ Rates:** Two gauges for Total ENQ Rate and Total DEQ Rate, both showing 0.0.
- CPU Percent for Control and Dependent Regions:** Two gauges for Control CPU Percent and Dependent CPU Percent, both showing 0.0.
- Paging and I/O Rates for all IMS address spaces:** Two gauges for Total I/O Rate and Total Paging Rate, both showing 0.0.
- Total Transaction queue depth and rate:** Two gauges for Total Transaction Queue and Total Transaction Rate, both showing 0.0.

Red callout boxes highlight these metrics: 'Enqueue/dequeue rates', 'CPU rates', and 'Tran queue & tran rate'. A red arrow points to the 'IMS Health' folder in the sidebar. A red text box on the left states: 'Understanding and analyzing IMS processing rates and queue activity is key to managing IMS performance.'

IMS ID	FF ENQ Rate	BALG ENQ Rate	Total ENQ Rate	FF DEQ Rate	BALG DEQ Rate	Total DEQ Rate	Control CPU Percent	Dependent CPU Percent	Total CPU Percent	Control I/O Rate	Dependent I/O Rate	Total I/O Rate	Control Paging Rate	Dependent Paging Rate	Total Paging Rate	FF Transaction Queue	BALG Message Queue	Total Transaction Queue	FF Transaction Rate	BALG Message Rate



# IMS Historical Performance Analysis Custom Workspace



# The TEP Provides Powerful Chart Functions And Statistical Analysis Features

The screenshot displays the Tivoli Enterprise Portal interface with several windows:

- Navigator:** Shows a tree view of Enterprise folders including EW\_Demo\_Integrated\_View, EW\_IMS\_Demo\_View, and EW\_Test\_Screen.
- Competing & Stopped Trans:** A 3D bar chart showing transaction counts.
- Bottleneck Analysis - System:** A line graph showing system performance metrics.
- Area Chart:** A line graph showing 'RO Time' and 'AVG' over time. A red callout box points to the 'AVG' line with the text 'Baseline analysis and arithmetic functions'.
- Area Chart:** A line graph showing 'Input Message Rate' over time.
- Area Chart:** A line graph showing 'Msg Enqueue Rate' and 'Msg Dequeue Rate' over time.
- Area Chart:** A line graph showing 'Enqueue Count', 'Dequeue Count', and 'Queue Count' over time.

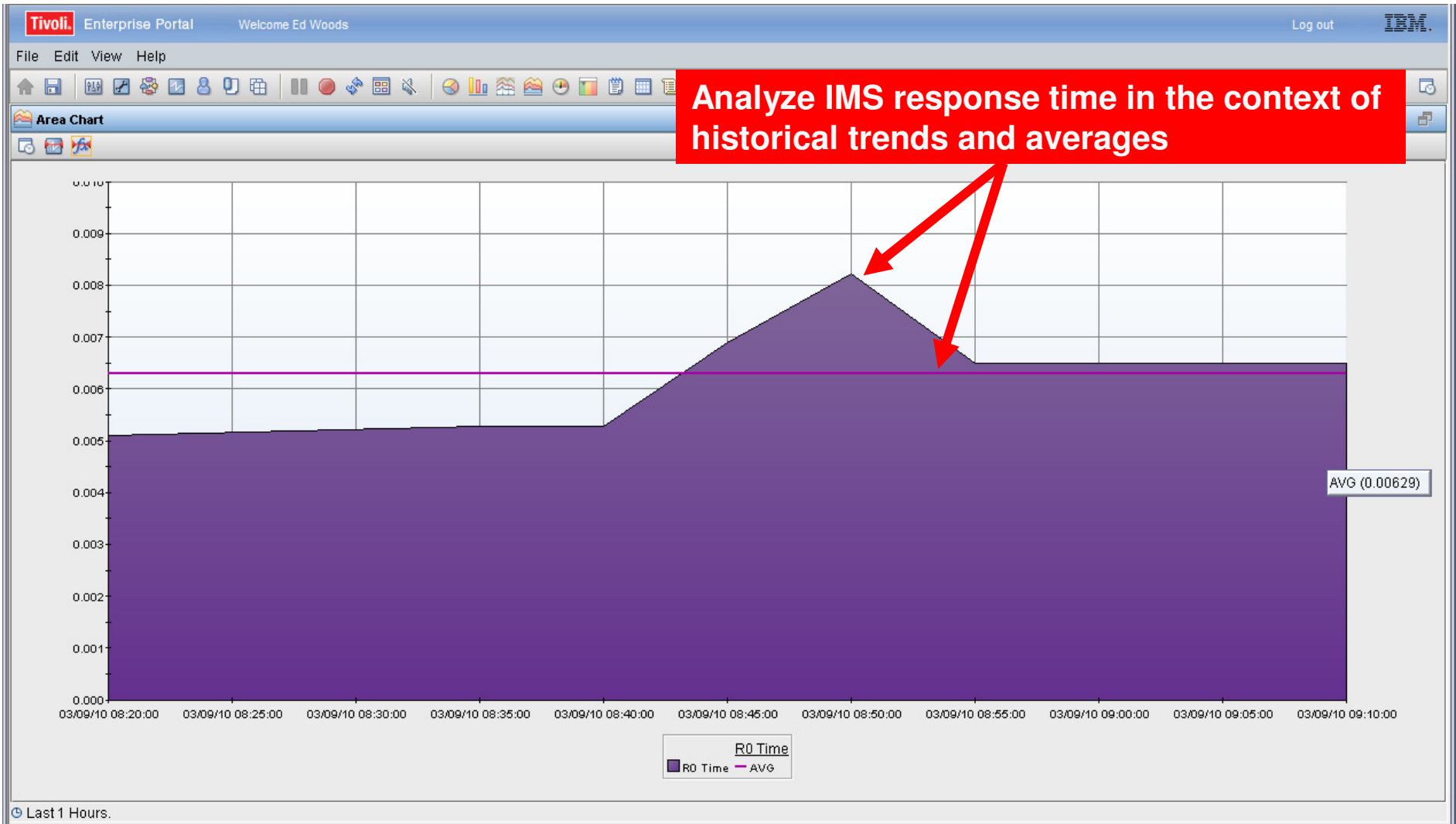
A dialog box titled 'Add Statistical Baseline' is open, showing a table of statistical functions:

Name	Argument	Result
<input type="checkbox"/> RANGE - MIN/MAX		
<input checked="" type="checkbox"/> AVG	+/- 0 standard deviation	
<input type="checkbox"/> MIN	+/- 0 percent	
<input type="checkbox"/> MAX	+/- 0 percent	
<input type="checkbox"/> PERCENTILE	50	
<input type="checkbox"/> MODE		

The dialog also includes an 'Attribute' dropdown set to 'Input Message Rate' and a 'Time Span' dropdown set to 'Last 24 Hours'. A red callout box points to the 'AVG' row in the table with the text 'Area plot charts provide a different perspective of history'.

**Area plot charts provide a different perspective of history**

# Example – Area Plot Chart Of IMS Response Time With Statistical Baseline



# Scenario #6 – WebSphere MQ Isolate MQ Performance Issues

**When looking at WebSphere MQ issues typical starting points are Queue Statistics (Queue status and queue depth), and Channel Performance (Channel status and activity).**

**Click on column header to sort by queue depth**

**Look at queue depth and Msg put and read rate**

Queue Name	Queue Usage	Definition Type	Total Opens	Input Opens	Output Opens	Current Depth	Msgs Put per Sec	Msgs Read per Sec	High Depth Threshold	Highest Depth	% Full	Ret Intvl Exceeded	Get Status	Put Status	Cur Opened Exclusive	C D
WSQM	XmitQ	Predefined	0	0	0	448650	0.0	0.0	80	0	0.0	No	Disa...	Ena...	n/a	Yi
DEMO00.QREP.DATAQ	Normal	Predefined	0	0	0	154343	0.0	0.0	80	0	0.0	No	Ena...	Ena...	n/a	Yi
TGT_QM_ZL	XmitQ	Predefined	0	0	0	75578	0.0	0.0	80	0	0.0	No	Ena...	Ena...	n/a	Yi

# Use Situations To Alert On MQ Queue Depth

The screenshot displays the Tivoli Enterprise Portal interface. On the left is a Navigator pane with a tree view of system components. The main area shows a 'Queue Statistics Summary' window with a 3D bar chart titled 'Number of Queues'. The chart has five bars: a tall yellow bar for 'Monitored Queues' (approx. 750), a blue bar for 'Open Queues' (approx. 100), a red bar for '# Qs With High Depth' (approx. 50), a green bar for '# of Qs Get-Inhib' (approx. 100), and a light blue bar for '# of Qs Put-Inhib' (approx. 100). A legend on the right identifies these categories. Below the chart, a red callout box contains the text: 'Monitor and alert on MQ queue depth to indicate potential bottlenecks'. At the bottom of the screen, a table lists queue statistics. A red box highlights a 'Critical' situation alert: 'EW\_Q\_Depth\_High WMQA:MVSA:MQESA 07/07/10 18:29:07'. A red arrow points to a pencil icon next to this alert, with another red callout box stating: 'Click to get details on the situation alert'. Below the alert is a table with columns: Queue Name, Queue Usage, Definition Type, Total Opens, Input Opens, Output Opens, Cur Opened Exclusive, Curren Depth, Highest Depth, High Depth Threshold, % Full, Ret Intvl Exceeded, Get Status, Put Status, Cur Defn, Trigger Control, Trigger Type, and T.

Queue Name	Queue Usage	Definition Type	Total Opens	Input Opens	Output Opens	Cur Opened Exclusive	Curren Depth	Highest Depth	High Depth Threshold	% Full	Ret Intvl Exceeded	Get Status	Put Status	Cur Defn	Trigger Control	Trigger Type	T
WSQM	XmitQ	Predefined	0	0	0	n/a	448650	0	80	0.0	No	Disa...	Ena...	Yes	No	First	
DEM000.OPER.DATAC	Normal	Predefined	0	0	0	n/a	154343	0	80	0.0	No	Ena...	Ena...	Yes	No	First	

# A Situation To Monitor MQ Queue Depth

**The various tabs control where the situation logic runs, and if the situation takes an action, or sends an alert via the EIF interface**

**Right click and select "Situations"**

**Boolean logic can be used to monitor for multiple scenarios within a single situation**

	Current Depth	Queue Name	Msgs Put per Sec
1	> 100	== WSQM	
2	> 500	== WSQA	
3	== 1000		> 10.0

# Scenario #7 – Network Performance And Availability Understanding The Impact Of The Network On z/OS

**Tivoli Enterprise Portal** Welcome Ed Woods Log out

File Edit View Help

**By integrating information from OMEGAMON Mainframe Networks with information from the other OMEGAMONs, you can get a better understanding of the network impact on the workload**

**Alert graphic view**

Originating System ID	Correlation ID	MVSA ID	D
DB1S:MVSA:DB2	db2jcc_appli	MVSA	D

**DB2 Distributed threads**

System ID	CICS Region Name	Group Number	Group Type	G
<b>CICS Response time</b>				

Application Name	Origin Node	Response Time	Resp Tin Vari
DSNADIST	TCPIP:MVSA	0.00	
DSNADIST	TCPIP:MVSA	0.00	

**DB2 network**

Origin Node	Application Name	Response Time
TCPIP:MVSA	CICSAOR3	0.00
TCPIP:MVSA	CICSWUI	0.00

**CICS network**

IMSID	RTA Group Name	RTA Group Number	Input Queue Time	Proce Tir
IMSB	SYSTEM	0	0.000171	0.00
IMSB	SYSTEM	0	0.000171	0.00
IMSB	SYSTEM	0	0.000171	0.00
IMSB	CLASS 1	1	0.000171	0.00
IMSP	CLASS 1	1	0.000171	0.00
IMS			1171	0.00

**IMS Response time**

Origin Node	Foreign IP Address	Foreign Port	Byte Rate
TCPIP:MVSA		0	0
TCPIP:MVSA		0	0
TCPIP:MVSA		0	0
TCPIP:MVSA		0	0
TCPIP:MVSA		0	0
TCPIP:MVSA		0	0

**IMS network**

**Situation Event Console**

**Alerts**

**Take Action**

**Actions**

# Exploit Queries To Optimize The Display

The screenshot shows the Tivoli Enterprise Portal interface. The main window displays a 'Graphic View' with a network diagram containing nodes for z/OS, CICS, IMS, Network, and DB2. Below this, the 'Properties - EW\_Network\_View' window is open, showing a table of network data:

Application Name	Origin Node	Response Time	Response Time Variance	Byte Rate	IP	Port	Status	Options
DSNADIST	TCPIP:MVSA	0.00	0.00	0				
DSNADIST	TCPIP:MVSA	0.00	0.00	0				

A red arrow points from the 'Query' button in the 'Properties' window to the 'Query Editor' window. In the 'Query Editor', a new query is being configured with the following details:

- Name:** All Connections no Filter
- Description:** This query returns all attributes for all connect
- Formula:** ( Origin Node == \$NODE\$ AND Foreign IP Address == \$FIPAD

The 'Specification' tab shows the query results source and a list of attributes to display. A red box highlights the 'Application Name' attribute, which is filtered to 'DSNADIST':

Application Name	Byte Rate	Colle Tir
DSNADIST	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

A red callout box states: "Created another" query and filtered for DB2 distributed (DSNADIST)".



## Scenario #8 - Storage

### Storage – Understanding I/O bottlenecks

- I/O potentially impacts many types of workload on z/OS
  - DB2, IMS, CICS, MQ, WebSphere and much more.....
  - CPUs are **FAST**, I/O is **SSLLOOWW**.....
- OMEGAMON provides I/O information in several areas
  - OMEGAMON XE For z/OS – I/O by Volser, I/O for tasks, Paging I/O
  - OMEGAMON XE For DB2 – I/O by DB2 object and volser, Logging I/O
  - OMEGAMON XE For CICS – VSAM I/O (LSR stats), task and region delays
  - OMEGAMON XE For IMS – IMS DB I/O, IMS MSG Q data set I/O, IMS log I/O
  - OMEGAMON XE For Mainframe Networks – FTP activity
  - OMEGAMON XE For Messaging – Queues, buffers, logging
- OMEGAMON XE For Storage provides the most robust analysis of storage and I/O on z/OS
  - LCU, Control Unit, Volser, dataset level
  - Virtual tape, Cache control unit (including control unit internal info)
  - SMS and HSM monitoring analysis
  - User defined I/O and space groups, Application I/O and space groups

# Storage – Understanding I/O Bottlenecks

**OMEGAMON Storage provides detailed I/O bottleneck analysis via drill down capability**

The screenshot shows the 'Average Delay Queue' graph for LCU Number 00A. The y-axis is labeled 'Queue' and ranges from 0 to 1. The x-axis is labeled 'LCU Number' and shows values 00A, 00B, 00C, 00D, 016, 017, 018. A red callout box highlights the graph area.

**Use the capabilities of the TEP to sort and filter the display**

The screenshot shows the 'Volume Performance Report' table. A context menu is open over the table, listing various options for sorting and filtering. A red callout box highlights the menu options.

LCU Number	Average Delay Queue	Contention Rate	Director Port Busy Percent	Control Unit Busy Percent	Chan I/O
00A	0.000	0.000	n/a	0.00	
016	0.000	0.000	n/a	0.00	
00D	0.000	0.000	n/a	0.00	
018	0.000	0.000	n/a	0.00	
017	0.000	0.000	n/a	0.00	

Volume	Device Address	Busy Percent	I/O Per Second	IOSQ Delay	Pend Time	Connect Time	Disconnect Time	Response Time	MSR Connect Time Percent	I/O Count	Device MPL	DCBs Open	Reserved Percent	Average HyperPAV Alias Count	Average Command Response Delay
DMPU35	103E	0.0	1.5	0.0	0.1	0.3	0.0	0.4	75.0	2007	1	0	0.0	n/a	0.0
DMP48	1032	0.0	0.6	0.0	0.1	0.6	0.0	0.8	75.0	913	0	34	0.0	n/a	0.0
DMPU51	103A	0.0	0.4	0.0	0.1	0.2	0.0	0.3	66.7	539	0	0	0.0	n/a	0.0
DMP129	1038	0.0	0.4	0.0	0.1	0.1	0.0	0.2	50.0	541	0	0	0.0	n/a	0.0

# Storage – Understanding I/O Bottlenecks From The Application Perspective

It's important to understand the impact of I/O on the application. OMEGAMON Storage provides powerful application level I/O and space monitoring capabilities.

**“Application Summary”** allows the user to target specific workloads for I/O and space monitoring

Application	ASID	I/O Second	Dataset Count	High Dataset MSR	Dataset with High MSR	Volume with High MSR Dataset
DB1SMSTR	131	19	19	0.0		
DB1SIRLM	135	0	1	0.0		
DB1SDBM1	144	2927	4	0.0		
DB1SDIST	146	0	3	0.0		
CICSAOR6	154	2	85	0.0		
DB1SWLM	18	2	7	0.0		
CICSAOR1	293	2	97	0.0		
CICSAOR2	401					

Monitor the application, then drill down for additional detail. Go from Volser down to dataset level detail.

Volume	Device Address	Busy Percent	I/O Per Second	IOSQ Delay	Pend Time	Connect Time	Disconnect Time	Response Time	MSR Connect Time Percent	I/O Count	Device MPL	DCBs Open	Reserved Percent	Average HyperPAV Alias Count	Average Command Response Delay
DMPP30	10A1	0.0	0.4	0.0	0.1	0.1	0.0	0.2	50.0	1119	0	60	0.0	n/a	0.0
DMPP31	1074	0.0	0.0	0.0	0.1	0.1	0.0	0.2	50.0	146	0	47	0.0	n/a	0.0
DMPP08	1071	0.7	11.4	0.0	0.1	0.6	0.0	0.7	85.7	194...	8	85	0.0	n/a	0.0
DMPD02	1300	0.0	0.5	0.0	0.1	0.1	0.0	0.3	33.4	645	0	0	0.0	n/a	0.0
DMPD04	1302	0.0	0.2	0.0	0.1	0.1	0.0	0.2	50.0	697	0	0	0.0	n/a	0.0

# Scenario #9 – Situation Alert Notification Versus Highlighting Thresholds To Identify Issues

**Situations versus highlighting thresholds**  
 Use situations to indicate/notify important events/issues  
 Use highlighting in the TEP for informational purposes

**A situation requires coding and distribution, and will typically be more overhead than threshold highlighting.**

**Highlighting thresholds is fine for informational, but will not drive an action or notification (beyond what is on the screen).**

**Warning**  
 DNET535\_MQ\_Depth WMQB:MVSA:MQESA 06/18/10 16:45:07

KFWITM102I Select workspace link button to view situation event results for: DNET535\_MQ\_Depth

**Queue Statistics for Monitored Queue**

Queue Name	Queue Usage	Predefined	0	0	0	n/a	151	0	80	0.0	No	Ena...	Ena...	Yes	No	First
DEMO.XML1	Normal	Predefined	0	0	0	n/a	151	0	80	0.0	No	Ena...	Ena...	Yes	No	First
SYSTEM.HIERARCHY...	Normal	Predefined	0	0	0	n/a	3	0	80	0.0	No	Ena...	Ena...	Yes	No	First

**Situations may be used to indicate events and notify about problems. Situations may be used to indicate performance, resource, or availability issues.**

# Using The Threshold Function For Informational Highlighting

**The Threshold function works well to highlight information for easy to see eyecatchers**

**Highlight BP hit ratio for informational purposes**

**From "Properties" select the "Threshold" tab.**

**Specify thresholds and highlighting level (Critical, Warning, etc).**

**Take Action...  
Link To...  
Launch...  
Export...  
Split vertically  
Split horizontally  
Remove  
Print Preview...  
Print...  
Find...  
Properties...**

Virtual Buffer Pool Size	VPOOL Buffers Allocated	VPOOL Buffers In Use	VPOOL Buffers to be Deleted	Use Count	Hiperpool Size	HPOOL Buffers Allocated	HPOOL Buffers Backed	HPOOL Buffers to be Deleted	Castout Attribute
3000	3000	0	0	3	0	0	0	0	YES

Pool ID	VP Sequential Thresh	Deferred Write Thresh
BP8K0	80	30

GetPages Per Synchronous I/O	Prefetch Per I/O	Sequential Prefetch Per I/O	Buffer Pool Hit Percent Random	Buffer Pool Hit Percent Sequential	Page Write
3.55	1.00	0.00	71.8	0.0	

Use Icons	Maximum Concurrent Prefetch	Buffer Pool Hit Percent Random	Buffer Pool Hit Percent Sequential	Page Write
1		< 75.0		Wr
2		< 90.0		
3			< 90.0	

# Using Situations To Drive Event Notification

**Situation editor to specify situation logic.**

	Current Depth	Queue Name	Storage Class
1	> 4500	'ASN.QSNW.ADMINQ'	DEFA
2			
3			

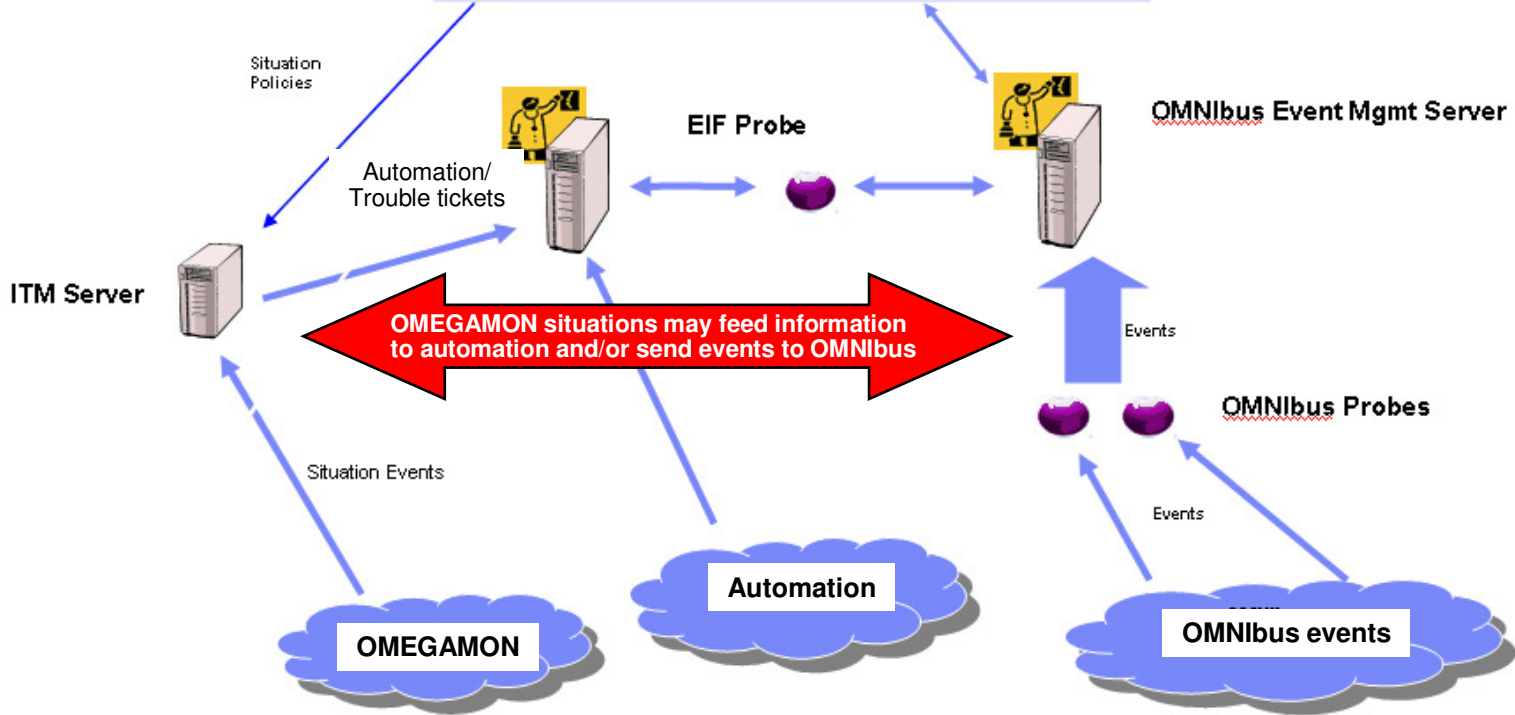
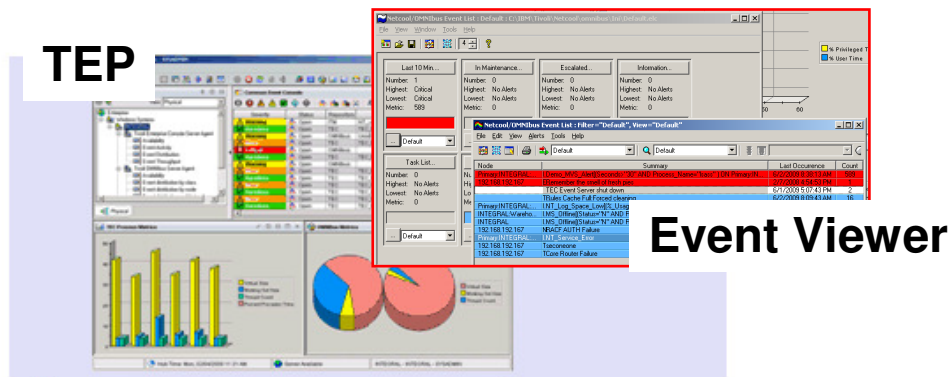
**Use "Action" to have the situation issue a corrective command.**

**Use "EIF" to have the situation send the event to OMNIBus.**

**Using the EIF interface may be more efficient than using the "Action" tab on the situation editor.**

# Use The EIF Interface To Send Events To OMNIBus

**OMNIBus Integration enables customer to forward events reported by OMEGAMON XE monitoring agents . The interface is bi-directional.**



## Situations And Alerts Versus Threshold Highlighting

- Not all information requires an alert
  - In general alerts imply some type of event that requires an action to address
- Some information needs to be highlighted for informational purposes, but does not require an action
  - Nice to know, but does not require immediate intervention
- Use situation alerts for events or information that
  - Requires additional analysis or immediate action
  - Requires some form of corrective action
  - Has an “owner” responsible for addressing an issue
- Consider threshold highlighting for
  - Information that is of diagnostic interest
  - Information that is useful for analysis and may indicate a potential issue, but does not require immediate action
- For informational purposes threshold highlighting will be more efficient than coding, creating, distributing, and executing a situation



## Scenario #10 – A Dashboard To Provide An Integrated Problem Management Paradigm

The screenshot displays the Tivoli Enterprise Portal interface with several key components highlighted by red callouts:

- Custom navigation:** A tree view on the left side of the dashboard.
- Graphic alert view:** A central dashboard area showing various performance indicators such as CICS Performance, Windows Performance, UNIX, Network, z/OS Performance, DB2 Connect Server, and Sysplex Performance.
- Situation alerts:** A console window showing a list of alerts, including a critical alert for 'EW\_Demo\_Thread\_Alert'.
- Browser interface:** A window showing a table of situation events.
- Take action:** A window for performing actions on the selected situation.

Severity	Status	Owner	Situation N:
Critical	Open		EW_Demo_Thre
Critical	Open		Dist_DB2_Net_A
			EW_Demo_CF_7

- Use the graphics and integration capabilities of the Tivoli Enterprise Portal to provide custom dashboard views targeted for specific audiences
  - Technical views, Operational views, Alert management views, SME views, End to end business application views, Management by exception views

# Integrated Technical View Using The TEP

**An integrated view of some of the most commonly referenced performance information**

**Custom navigation allows you to target the most important information**

**z/OS system and address space CPU**

Managed System	Average CPU Percent	RMF MVS CPU Percent	RMF CP
DEMOPLX:MVSA:MVSSYS	4	6.2	6.3

**DB2 Threads**

MVS ID	DB2 Subsystem	In DB2 CP CPU Time	In DB2 Time	Plan	A
MVSA	DSNC	00:00:00.009	00:00:00.014	PSADPLAN	D
MVSA	DSNC	00:00:00.302	00:00:04.662	KO2PLAN	D
MVSA	DSNC		2.592	KO2PLAN	D
MVSA	DSNC		2.611	KO2PLAN	D

**CICS Tasks**

System ID	CICS Region Name	CICS SYSIDNT	Transaction ID	User ID	Terminal ID	T Nur
MVSA	CICSAOR1	C22A	OSEC	SYSSTC	n/a	000
MVSA	CICSAOR1			3STC	n/a	000
MVSA	CICSAOR1			3STC	n/a	000

**Network**

Origin Node	Application Name	Connections in Backlog	Total Segments Retransmitted
TCPIP:MVSA	ADHSRVS		

**DASD I/O bottlenecks**

Managed System	Address	Volume	Response	Storage Group	I/O Rate	Cache Status	Percent Reserve
----------------	---------	--------	----------	---------------	----------	--------------	-----------------

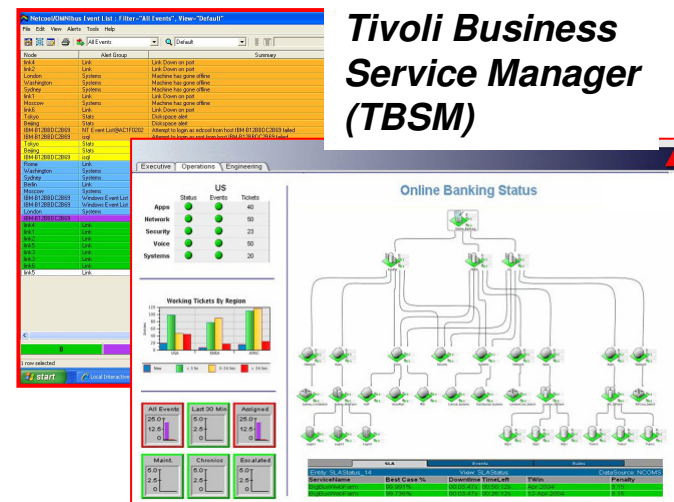
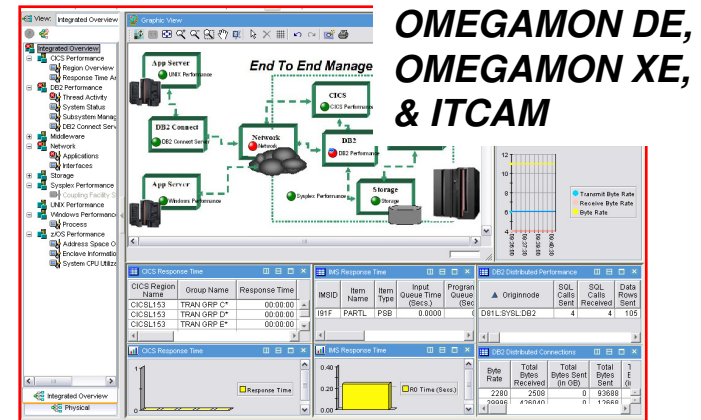
**Alerts**

Severity Status Owner Display Item Source Impact Opened

Hub Time: Thu, 07/01/2010 11:33 PM Server Available EW\_Demo\_Integrated\_View - dem17Inx.democentral.ibm.com - Ed Woods

# Dashboard Alternatives – TEP Versus TBSM

- Use Tivoli Enterprise Portal to establish the premise of a Management Dashboard
  - Powerful and flexible graphics and integration capabilities of the Tivoli Enterprise Portal enable the creation of targeted dashboards
  - Use the TEP to establish the concept of an integrated management dashboard in your shop
  
- Look at TBSM to grow and expand the notion of dashboards and business application management
  - Components like TADDM can analyze application dependencies
  - TBSM shows SLAs
  - Event correlation via OMNIBus
  - Expandable and scalable for large enterprises



## Summary

- The Tivoli Enterprise Portal provides a powerful and flexible integrated capability to identify and manage common performance and availability challenges
- The Tivoli Enterprise Portal enables you able to recognize and resolve issues efficiently
- The Tivoli Enterprise Portal allows you to target the most common issues and ensure that you are getting the most from your investment in System z hardware and z/OS software
- By building dashboards you can use the Tivoli Enterprise Portal as a way to begin the process end to end business application management

# IBM's Integrated Service Management approach is recognized as best in class

## Integrated Service Management



IDC Market Share rankings:

- #1 Overall in Systems / Network Management
- #1 in Overall Performance and Availability Mgt.
- #1 Performance Management
- #1 Event Automation
- #1 Network Management
- #1 Output Management
- #1 Archiving
- #1 Identity and Access Management
- #1 Security and Vulnerability Management
- #1 Enterprise Asset Management



Learn more - <http://www.ibm.com/software/tivoli/features/zsmc/>

# Check Out My Blog

## http://tivoliwithaz.blogspot.com

**Tivoli With A z**

This is a blog to discuss what is happening in the area of IBM z/Series, Tivoli, OMEGAMON monitoring, System Automation, and other relevant IBM Tivoli technology for z/OS performance and availability management.

Ed Woods  
IBM Corporation

Friday, February 5, 2010  
**OMEGAMON DB2 Near Term History**

OMEGAMON DB2 has a very useful Near Term History (NTH) function. NTH provides an easy way to be able to retrieve and review DB2 Accounting and Statistics records from the past few hours of DB2 processing. The data is stored in a set of VSAM files allocated to the OMEGAMON collection task. How far back the history goes depends upon the size of the files and the amount of data being written to these files. Now some of the data volume is driven by the DB2 workload activity. Accounting records are typically written when a DB2 thread terminates processing, and it is the Accounting data that is often looked at by the analyst when studying what DB2 applications have been doing. Statistics records are created on a time interval basis. Usually, you will have much more accounting data than statistics data. Also, OMEGAMON has the ability to pull in additional trace IFCIDs to get information on things such as dynamic SQL activity.

To understand the amount of data being gathered by NTH, there are displays that show the number of records written to the NTH files, by type. In the example I show, you see an example of common NTH settings/options, and then you see the record count in the NTH record information display. If you look carefully you see that 'Perf-Dyn SQL' has a lot of records written relative to the other record types. This is a good way to understand the impact of enabling certain collection options, such as dynamic SQL collection, and see how many trace records are being gathered, as a result.

Posted by Ed Woods at 3:13 PM 0 comments

**ED WOODS**

I'm an IT Specialist with IBM Corporation supporting Tivoli Performance solutions on z/OS. Please note that comments made on this blog are my own, and do not necessarily reflect the position of IBM Corporation.

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- [Article on monitoring DB2 dynamic SQL](#)
- [IMS historical performance analysis](#)

**Useful Links**

- [Link to IBM Tivoli product information](#)
- [Link To Tivoli User Group](#)
- [Link to OPAL](#)
- [Tivoli System z Blog](#)

# Thank You!