



IBM Software Group

# OMEGAMON XE Alert Management Considerations And Best Practices

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**ON** DEMAND BUSINESS™

# Agenda

- The Roadmap
- Traditional OMEGAMON Alert Management
  - ▶ Classic Interface, CUA Interface and OMEGAVIEW
  - ▶ NetView And Automation interfaces
- Tivoli Enterprise Portal (TEP) Alert Management Technology
- Trade Offs, Considerations, and Recommendations
- Summary



## Understanding The OMEGAMON Roadmap

- Tivoli Enterprise Portal (TEP) is the strategic direction of the OMEGAMON products
- OMEGAMON as currently packaged consists of a set of user interfaces (Classic, CUA, XE GUI)
  - ▶ Each has its own inherent components and capabilities
  - ▶ Customers are working to understand the most effective ways to use the technology
- Many customers have large 3270 OMEGAMON deployments
  - ▶ Need assistance developing TEP migration strategies



# In The Beginning...

There was command mode followed by Classic Interface

Major command



Minor Commands



```

_____ ZOPS      VTM      OM/DEX      V520.M2 MVSA  11/28/05  9:26:53
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
=====
>
                                OPERATION STATUS
=====
SCPU10  CPU Utilization  0   10   20   30   40   50   60   70   80   90  100
+      Total          12.00 |---10>
=====
BATX  IMSAMSG1  IMSBMSG1  IMSBIFP1
step  DFSMPR   REGION  DFSIVA4
elap  8:15 DY  8:15 DY  8:15 DY
=====
>      TSO users
#TSOJ      14
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN  ++++++
+      +      Warning:  Channel Path 00 is not operational      +
+      ++++++
+ XCHN  ++++++
+      +      Warning:  Channel Path 01 is not operational      +
+      ++++++
+ XCHN  ++++++

```

- Classic exception screens commonly used in many console rooms
- Uses OMEGAMON classic exception settings stored in classic profiles



# Classic Exceptions

```

ZOPS      VTM      OM/DEX  V520.M2  MVSA  11/28/05  9:26:53  46
+         +         since 11/24/05 10:42:53 - 423415 Records lost
+         +-----+
+ XREP Number of Outstanding Replies = 5
+ FXFR STC *MASTER*      Fixed Frames in use = 1940
+ FXFR STC PCAUTH        Fixed Frames in use = 148
+ WAIT      PCAUTH        Wait: 8:06 DY
+ FXFR STC TRACE         Fixed Frames in use = 427
+ WAIT      TRACE         Wait: 8:05 DY
+ FXFR STC DUMPSRV
+ FXFR STC GRS
+ FXFR STC CONSOLE
+ FXFR STC JESXCF
+ FXFR STC ALLOCAS

XACB LIST=XREP
: XREP
+ DISPLAY Parameters:  THRESHOLD Parameters:  XLF Parameters:
: State=ON             Threshold=1           Auto=OFF
: Group=OP             Display=CLR3         Log=OFF
: Bell=OFF             Attribute=NONE       Limit=0 (0)
: BOX Parameters:     CYCLE Parameters:   Repeat=NO
: Boxchar=NO BOX      ExNcyc=0             Persist=0
: Boxclr=NONE         Stop=0 (1)           SS=
: Boxattr=NONE        Cumulative=1         >11/28/05 09:26:53<
    
```

Profile member

XACB  
command

- Each Classic OMEGAMON (MVS, IMS, DB2, CICS) has a set of pre-defined exceptions
  - Note – OMEGAMON for Mainframe Networks and Storage do not have Classic interface
- Settings are stored in a profile member – may have multiple profiles
- XACB command sets threshold ON or OFF or sets threshold level, enables XLF logging facility, and automated screen facility

# Classic Interface Automated Screen Facility

## An Example

If the TXIQ exception is hit, then execute the REGIONS screen space

```
XACB LIST=TXIQ
: TXIQ
+   DISPLAY Parameters:   THRESHOLD Parameters:   XLF Parameters:
:   State=ON              Threshold=8              Auto=OFF
:   Group=IM              Display=CLR2            Log=OFF
:   Bell=OFF              Attribute=NONE          Limit=0 (0)
:   BOX Parameters:       CYCLE Parameters:       Repeat=NO
:   Boxchar=NO BOX        ExNcyc=0                Persist=0
:   Boxclr=NONE           Stop=0 (0)              SS=REGIONS
:   Boxattr=NONE         Cumulative=0
```

REGIONS		VTM LOG		V510./I IMSP					2/10/05 13:033:12	
RGNA	PRODIMS	DBRC	DLI	IMSMG3	IMSMG5	IMSMG11	IMSMG12	IMSMG13+		
tran	--N/A--	--N/A--	--N/A--	PAYROLLA	DBBU53AC	SDBH1500	--NONE--	--NONE--		
rtyp	CONTROL	DBRC	DLS	MESSAGE	MESSAGE	MESSAGE	MESSAGE	MESSAGE		
ocup	--N/A--	--N/A--	--N/A--	77.52%	72.68%	51.26%	52.10%	37.81%		
clas	--N/A--	--N/A--	--N/A--	1	2	5	--NONE--	--NONE--		
SCLS01	--N/A--	--N/A--	--N/A--	1	1	5	4	3		
SCLS02	--N/A--	--N/A--	--N/A--	3	2	--NONE--	--NONE--	--NONE--		
SCLS03	--N/A--	--N/A--	--N/A--	4	--NONE--	--NONE--	--NONE--	--NONE--		
SCLS04	--N/A--	--N/A--	--N/A--	--NONE--	--NONE--	--NONE--	--NONE--	--NONE--		

Use facilities such as ASF to execute series of screens and commands based upon an OMEGAMON detected exception



# OMEGAMON Interfaces Over Time Interface Options Grew

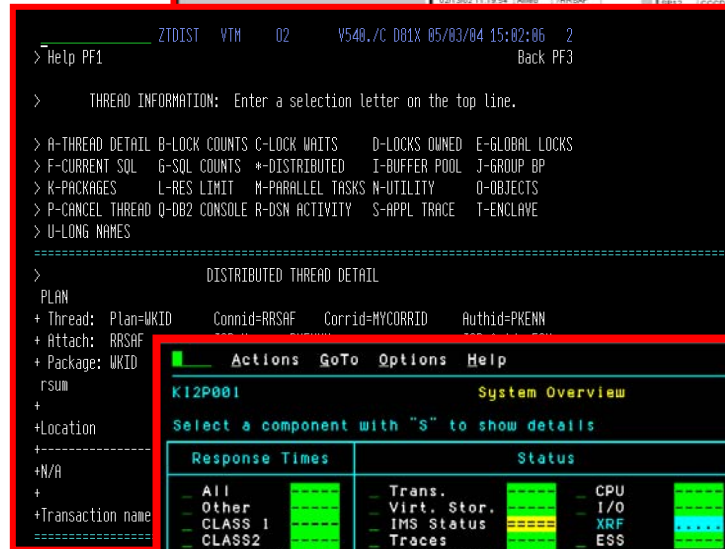
## OMEGAMON XE GUI Interface

- ▶ Java client or web browser – Tivoli Portal
- ▶ Real time and historical
- ▶ Automation & alerts – Situations & Policies
- ▶ Plex level information (CF, n-way)



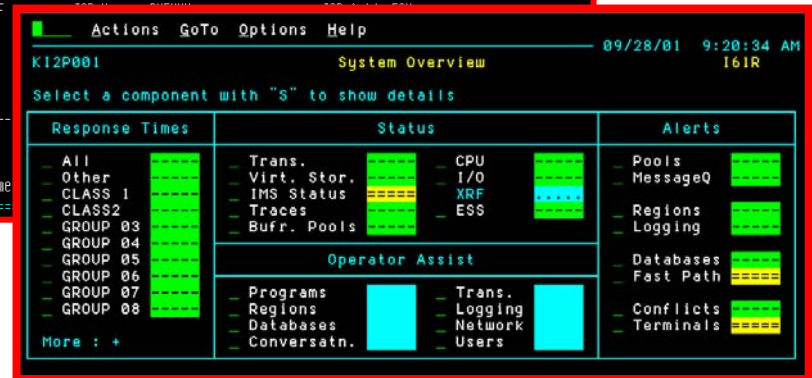
## OMEGAMON Classic

- ▶ 3270 Interface command interface
- ▶ Real Time & Historical
- ▶ Major & Minor commands
- ▶ Exceptions stored in classic profile



## OMEGAMON CUA

- ▶ 3270 interface
- ▶ Different views from Classic
- ▶ Warning & Critical exception alerts
- ▶ OMEGAVIEW Integration – Netview PPI



# OMEGAMON 3270 Address Space Overview

```

ZTDIST VTH 02 1548./C 081X 85/83/84 15:02:06 2
> Help PF1 Back PF3

> THREAD INFORMATION: Enter a selection letter on the top line.

> A-THREAD DETAIL B-LOCK COUNTS C-LOCK WRITS D-LOCKS OWNED E-GLOBAL LOCKS
> F-CURRENT SQL G-SQL COUNTS H-DISTRIBUTED I-BUFFER POOL J-GROUP BP
> K-PACKAGES L-RES LIMIT M-PARALLEL TASKS N-UTILITY O-OBJECTS
> P-CHANNEL THREAD Q-DB2 CONSOLE R-DB2 ACTIVITY S-APPL TRACE T-ENCLAVE
> U-LONG NAMES

-----
DISTRIBUTED THREAD DETAIL
PLAN
* Thread: Plan=WKID Corrid=RRSHF Corrid=MYCORRID Authid=PKENN
* Attach: RRSHF JOB Name=.PKENNU JOB #sid= 53K
* Package: WKID Collection*
rsid*
* Distributed RRSHF Data
* Location TP Addr Port Classer Srvclsname Prod ID Workstation
    
```

↕ Classic

Actions GoTo Options Help 09/20/01 9:20:34 AM  
K12P001 System Overview I61R

Select a component with "s" to show details

Response Times	Status	Alerts
- All	- Trans.	- Pools
- Other	- Virt. Stor.	- MessageQ
- CLASS 1	- IMS Status	- Regions
- CLASS2	- Traces	- Logging
- GROUP 03	- Bufr. Pools	- Databases
- GROUP 04		- Fast Path
- GROUP 05		- Conflicts
- GROUP 06		- Terminals
- GROUP 07		
- GROUP 08		

Operator Assist

- Programs	- Trans.
- Regions	- Logging
- Databases	- Network
- Conversatn.	- Users

More : +

↕ CUA

**OMEGAMON  
Classic  
Collector**

**OMEGAMON  
CUA Address  
Space**

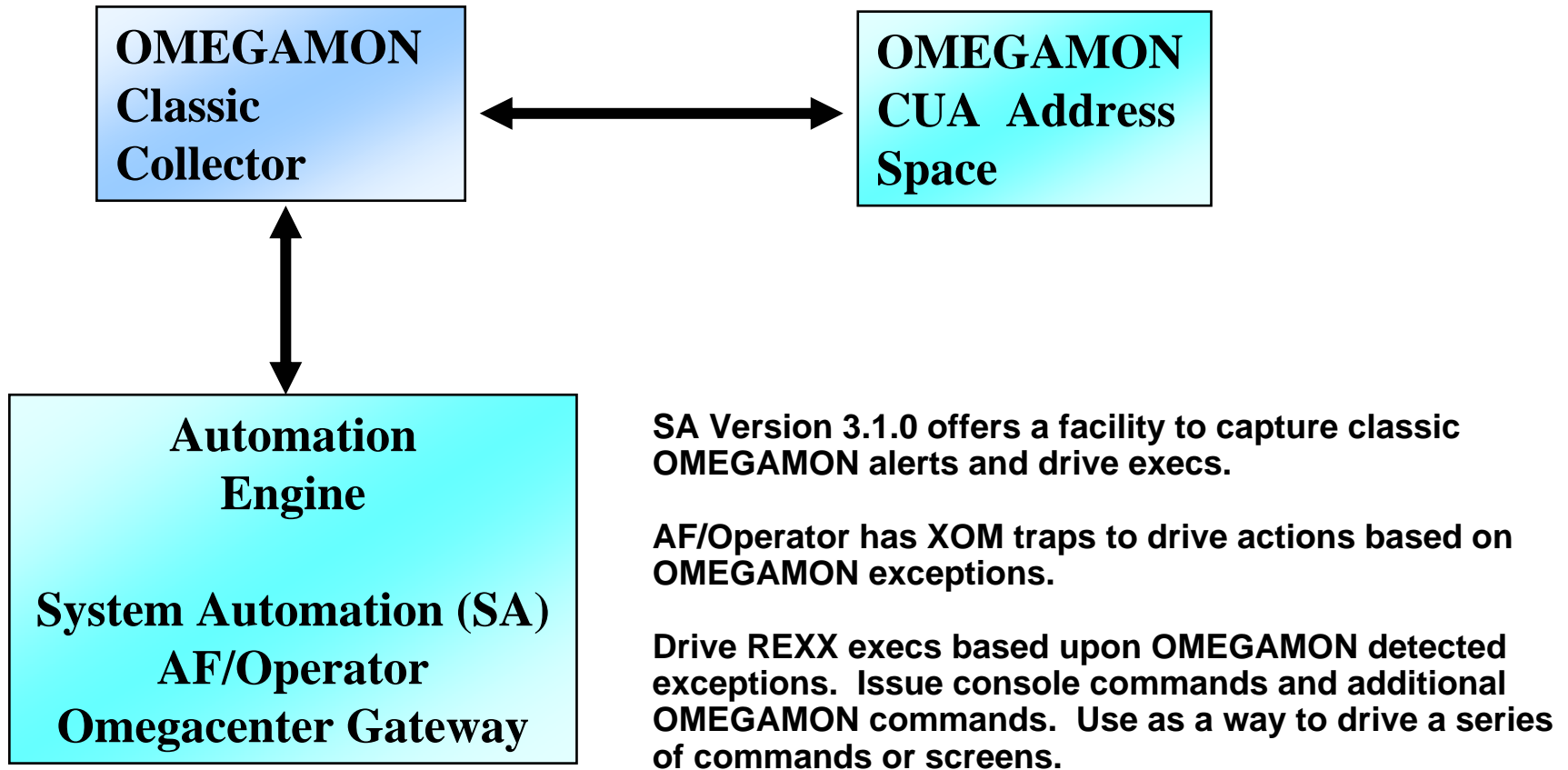


Logon to Classic APPLID  
 XLFOUT DD for classic exceptions  
 2 char classic profile  
 ASF screen facility  
 Interface classic to automation

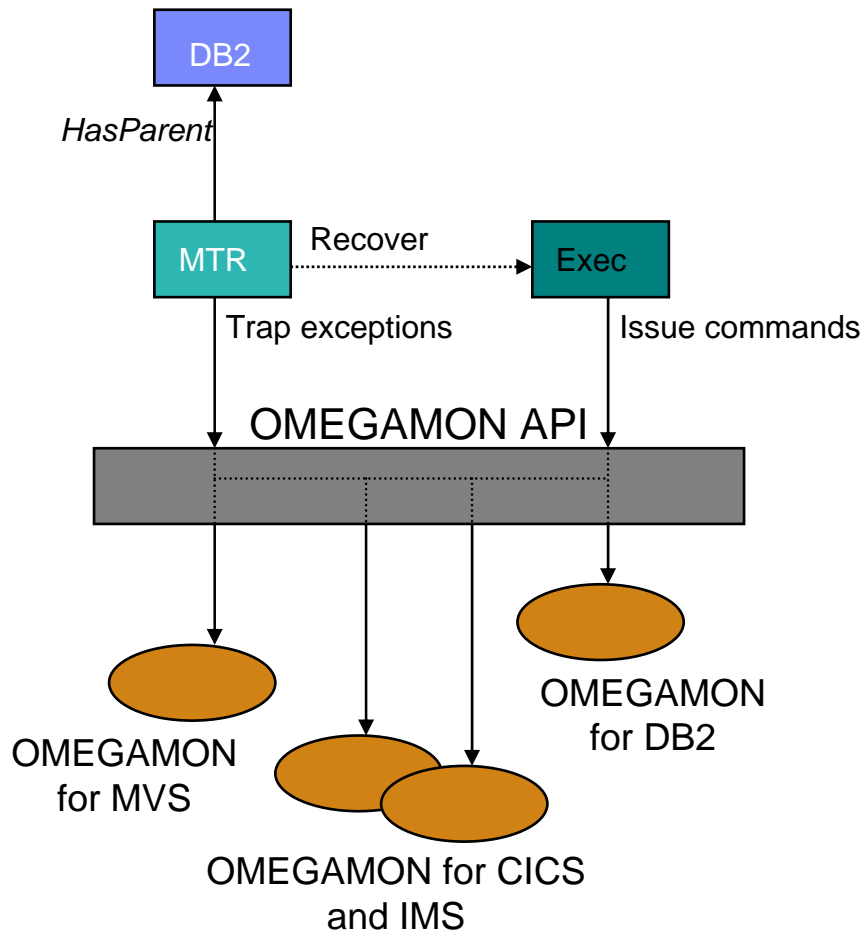
Logon to CUA APPLID (or thru OMEGAVIEW)  
 CUA exception profiles (Warning & Critical)  
 Logon to CUA to drill down to Classic



# OMEGAMON Classic Automation Interfaces

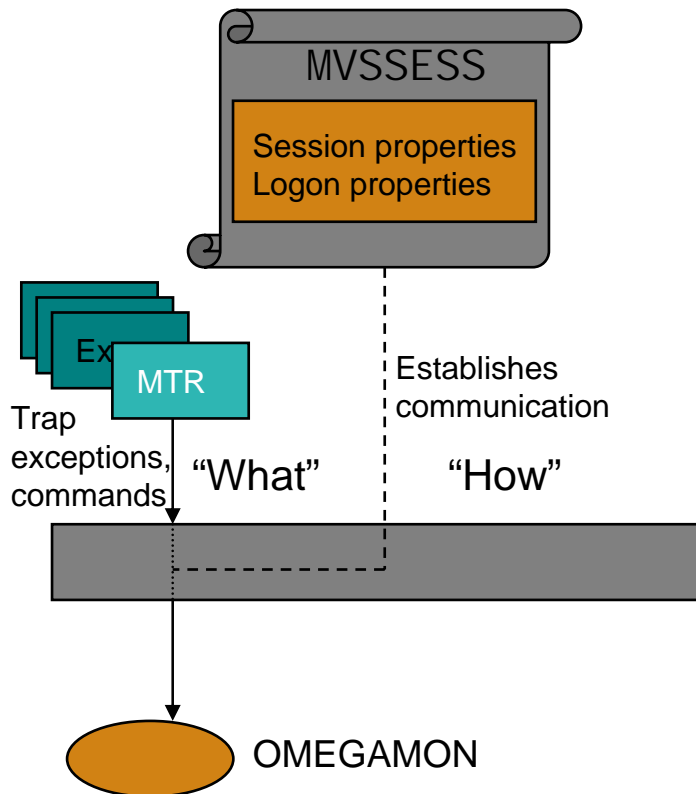


# OMEGAMON And SA Interoperation



- **Use of performance and availability information for application automation**
  - ▶ **More facts, more accurate decisions**
  - ▶ **Sources: OMEGAMON MVS, DB2, CICS, IMS**
- **Provides API to communicate with OMEGAMON monitors to**
  - ▶ **Obtains and filters installation-defined exceptional conditions**
  - ▶ **Sends commands to OMEGAMON, for example to respond to such conditions**
- **Provides exception monitor based on the Monitor Resource concept**
  - ▶ **Monitors „interesting“ set of exceptions**
  - ▶ **Sets application health state based on existence of such exceptions**
  - ▶ **Provides means to react and resolve exceptional conditions**

# SA OMEGAMON Sessions



- **OMEGAMON sessions are defined as policy items in the network policy (NTW)**
- **A definition consists of**
  - ▶ **Session attributes to identify and control VTAM session**
  - ▶ **User attributes to enable logon**
- **A session can be used by multiple operators**
  - ▶ **Automation operators, for example running Monitor Resource commands**
  - ▶ **Human operators**
- **Separate automation operators are reserved to control one or more sessions**

# SA To OMEGAMON API

- **Command INGOMX serves as interface between operators and a particular OMEGAMON session**
- **Possible interactions**
  - ▶ **Call OMEGAMON exception analysis and find interesting exceptions**
  - ▶ **Enter one or more OMEGAMON and other commands**
    - **To collect additional OMEGAMON performance information**
    - **To create an exec that issues a series of OMEGAMON and other commands**
  - ▶ **Do exception checking on a very tight (example 5 second) interval**
- **Monitor command INGMTRAP serves as a customized interface to INGOMX primarily intended to**
  - ▶ **Find interesting exceptions in the context of a monitor command**
  - ▶ **Drive NetView automation table processing to set application health state and for recovery**



## Classic Alert Mechanisms – Trade-offs

- Classic alert methods – Pros
  - ▶ Commonly used and proven mechanism
  - ▶ Easy to set up requiring only mainframe centric technology
  - ▶ Sets of pre-defined alerts
  - ▶ Useful for SA interface alerts
- Classic alert methods – Cons
  - ▶ Requires an active logged on session to get alerts
  - ▶ No integrated automation (except for ASF function)
    - Full automation requires an automation engine (for example SA)
    - No easy way to do things like putting a message on a console
    - No built in e-mail or SNMP interface
  - ▶ Profiles must be managed and copied for each monitoring session
  - ▶ Lacks flexibility - Only get alerts defined by OMEGAMON

# OMEGAVIEW And OMEGAMON Integration CUA Interface

OMEGAVIEW

System Status  
System: SP12

Workload status	Resource status	Operator Alerts
Batch	CPU	Key Task
STC/APP	DASD	HTO Buffer
TSO: RTA	Tape	HTORs
TSO Host	Paging	OLTEP
Per1 TSO	Storage	DDR Swap
Workload	CSA	Max. Tasks
	Channels	HSH
		Key DASD

OM MVS

OMEGAMON II for DB2 System Status  
System: DB41

Workloads	Resources	Alerts
CICS	Buffer Mgr	DB2 Activity
IMS	EDM Pool	Active Threads
TSO	Lock Stats	Inact. Threads
Background	Log Manager	Locks
Utility	DDF Stats	Active Traces
Distributed		Volume Activity
All Connections	Bind Stats	DB2 Messages
	SSS Stats	
	SQL Stats	
	Open/Close Stat	
	Command Stats	

OM DB2

System Overview  
System: 161R

Response Times	Status	Alerts
All	Trans.	Pools
Other	Virt. Stor.	MessageQ
CLASS 1	IMS Status	Regions
CLASS2	Traces	Logging
GROUP 03	Buf. Pools	Databases
GROUP 04		Fast Path
GROUP 05		Conflicts
GROUP 06		Terminals
GROUP 07		
GROUP 08		

OM IMS

File CCC-Reports Switch Tools Samples Options Help  
08/10/01 7:55:46 AM  
KMVPRUN/MASTERCARD DEMO OMEGAVIEW Version 300

System Status - MVSA	System Status - MVSB	System Status - MVSC
Syslog...	Syslog...	Syslog...
CPU.....	CPU.....	CPU.....
Workloads..	Workloads..	Workloads..
TSO Resp..	TSO Resp..	TSO Resp..
Miss. Task	Miss. Task	Miss. Task
DASD Perf.	DASD Perf.	DASD Perf.
Tape.....	Tape.....	Tape.....

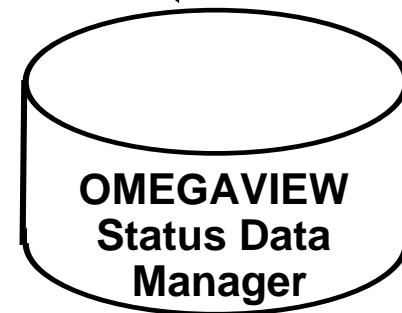
CICS Status	Network Status	Clearing Application
CICS Alert	Net Alerts	Perform...
CPU.....	CTC Tuning	Available.
LSR.....	Buffers...	
CICS Resp.	TCP/IP Stat	
	VR/ER....	

DB2 DB Status	Go To CICS	Go To MVS
DB2 Alerts	> Go To CICS <	> Go To MVS <
Threads...	> Go To Network <	> Go To DB <
Buffers...		
Dist Perf.		

Region Status  
Region: CC0518

Workloads	Resources	Alerts
AIDs	MRO/ISC	BottInck
ICEs	DASD	CICSloop
Response	Paging	Dumps
Tasks	DB2	Enqueues
TranRate	DBCTL	I/O Rate
UOHs	Elies	VTAM ACB
	Journals	XRF
	LSR	
	MQ	
	TempStor	
	Tapes	
	ICP/IP	
	TranDate	
	Web	

OM CICS



# OMEGAMON CUA Exceptions & Thresholds

KD2LOPTN		Locks Thresholds				
r=Rules						
Threshold Description	Code	Warning	Critical	Units	Mon	Xn
-----	----	-----	-----	-----	---	--
Resource wait time	WTRE	48	60	seconds	Yes +	
Wait for Drain Lock	WDLK	48	60	seconds	Yes +	
Wait for Drain of Claims	WCLM	48	60	seconds	Yes +	
Global Lock Wait	WGLK	48	60	seconds	Yes +	

KD2LOPTN		Volume Activity Thresholds				
Threshold Description	Code	Warning	Critical	Units	Mon	Xn
-----	----	-----	-----	-----	---	--
Volume DB2 I/O rate	VDIO	40	50	/sec	Yes +	
Volume extents per DSN	VEDR	8	10	extents	Yes +	
Volume service time	VSRV	20	25	millisec	Yes +	
Volume TL I/O rate	VTIO	48	60	/sec	Yes +	
Volume utilization	VUTL	24	30	%	Yes +	

F1=Help    F4=Prompt    \*\*=Bkwd    \*\*=Fwd    F12=Cancel

CUA allows for warning and critical values (unlike Classic)  
 Settings stored in profiles allocated to CUA address spaces

# For Example - OMEGAMON 3270 DB2 Status Items

DB2session.AACT  
DB2session.AALL  
DB2session.ADB2  
DB2session.AFUN  
DB2session.AINTH  
DB2session.ALOCK  
DB2session.ASTP  
DB2session.ATHRA  
DB2session.ATRG  
DB2session.AVOL  
DB2session.RALL  
DB2session.RBUFF  
DB2session.RDDF  
DB2session.REDM  
DB2session.RLOCK  
DB2session.RLOG  
DB2session.WALL  
DB2session.WBACK  
DB2session.WCICS  
DB2session.WDIS  
DB2session.WIMS  
DB2session.WTSO  
DB2session.WUTIL

## Alerts

**Granularity is limited**

**Alerts for each session**

**Sessions maintained by OMEGAVIEW**

**Thresholds values set in OMEGAMON**

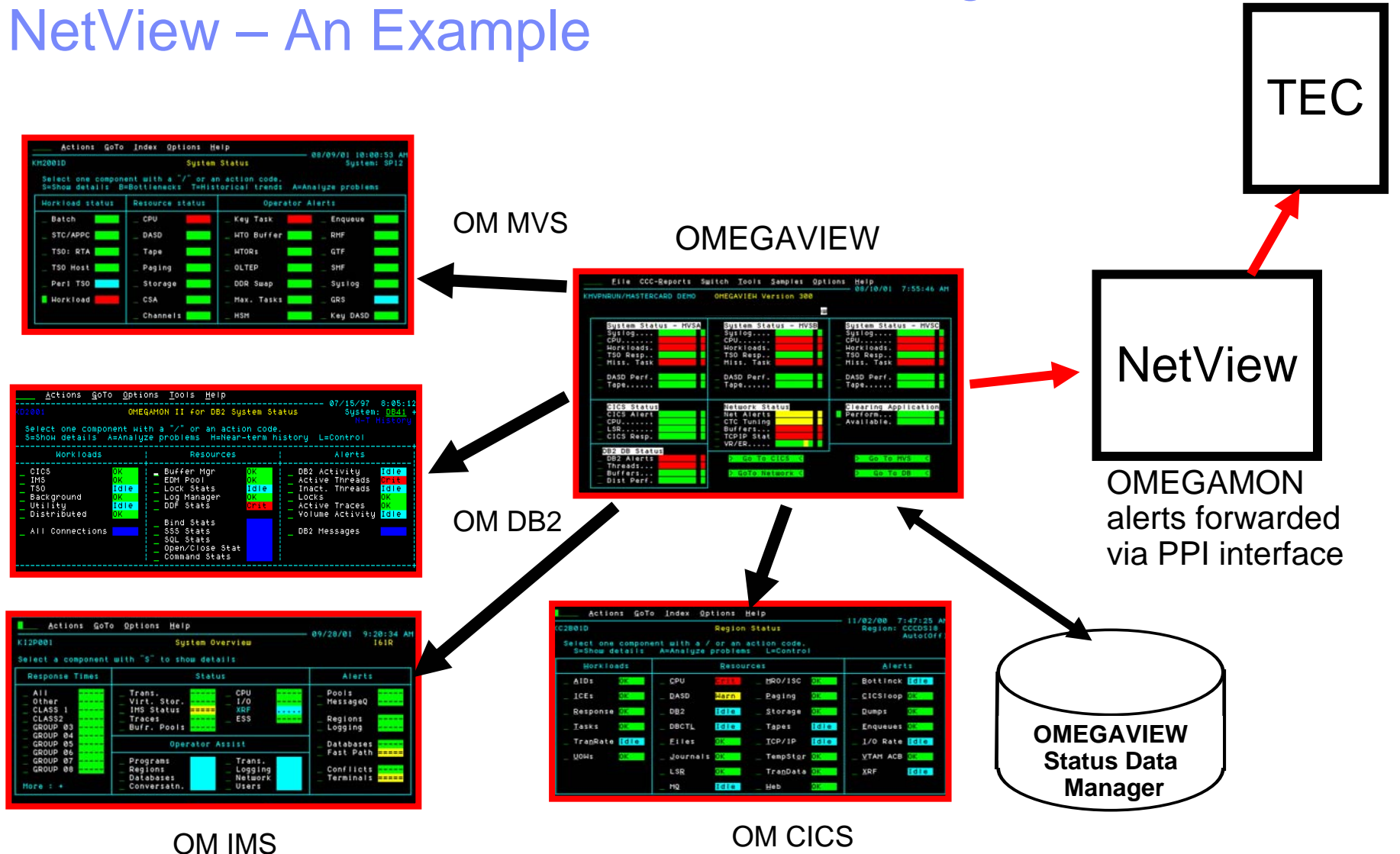
**OMEGAVIEW may forward to Netview**

## Resources

## Workloads



# OMEGAVIEW And OMEGAMON Integration with NetView – An Example

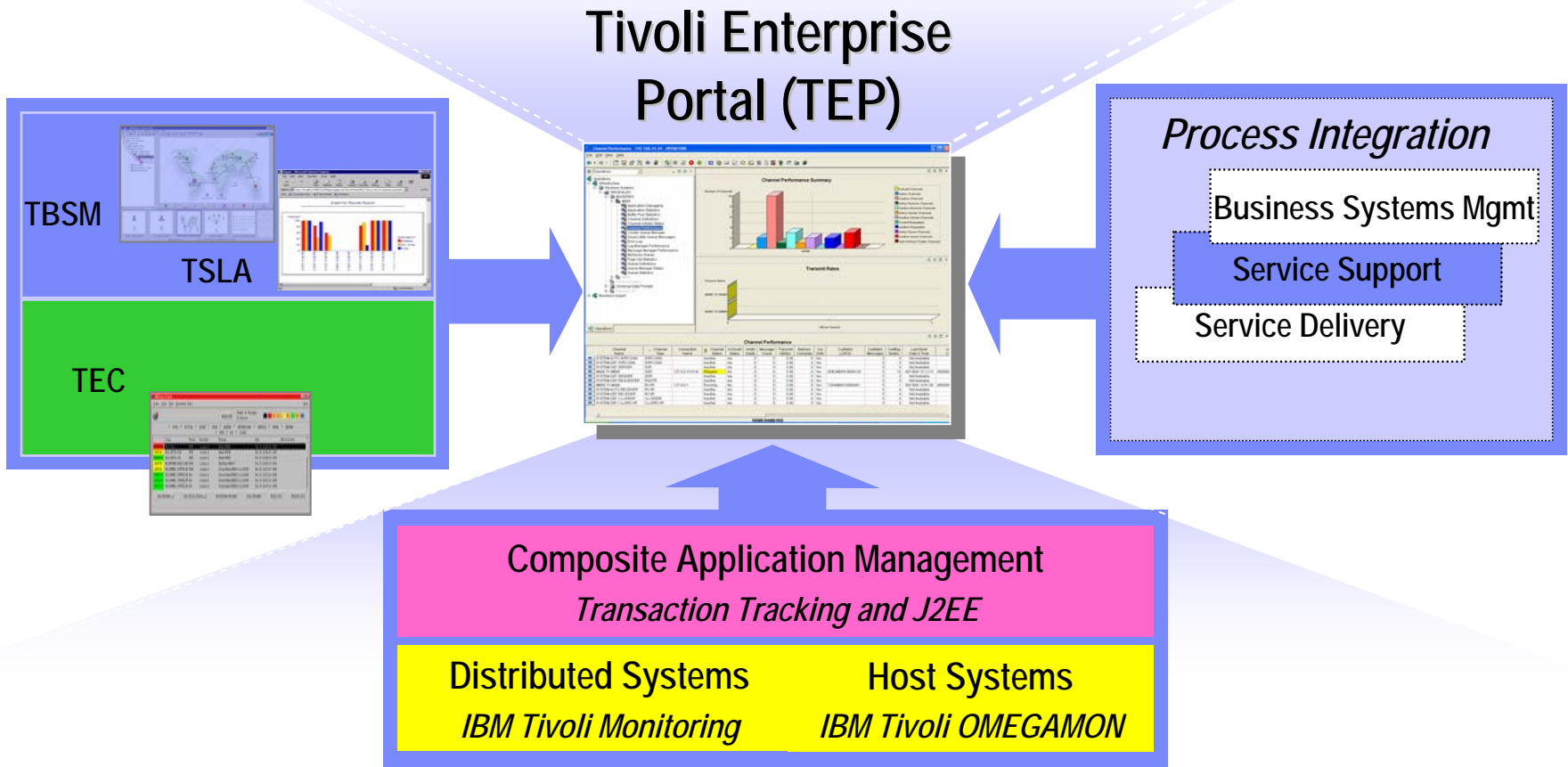


## CUA Alert Mechanisms – Trade-offs

- CUA/OMEGAVIEW alert methods – Pros
  - ▶ Commonly used and proven mechanism
  - ▶ Easy to set up requiring only mainframe centric technology
  - ▶ Sets of pre-defined alerts (Warning & Critical levels)
  - ▶ OMEGAVIEW maintains sessions under the covers
- CUA/OMEGAVIEW alert methods – Cons
  - ▶ No integrated automation
    - Full automation requires an automation engine (for example SA)
    - No easy way to do things like putting a message on a console
      - Forwarding alerts to NetView through OMEGAVIEW is often simplest
    - No built in e-mail or SNMP interface
  - ▶ Profiles must be managed and copied for each monitoring session
  - ▶ Only get alerts defined by OMEGAMON
  - ▶ CUA Interface is not strategic – TEP is the direction

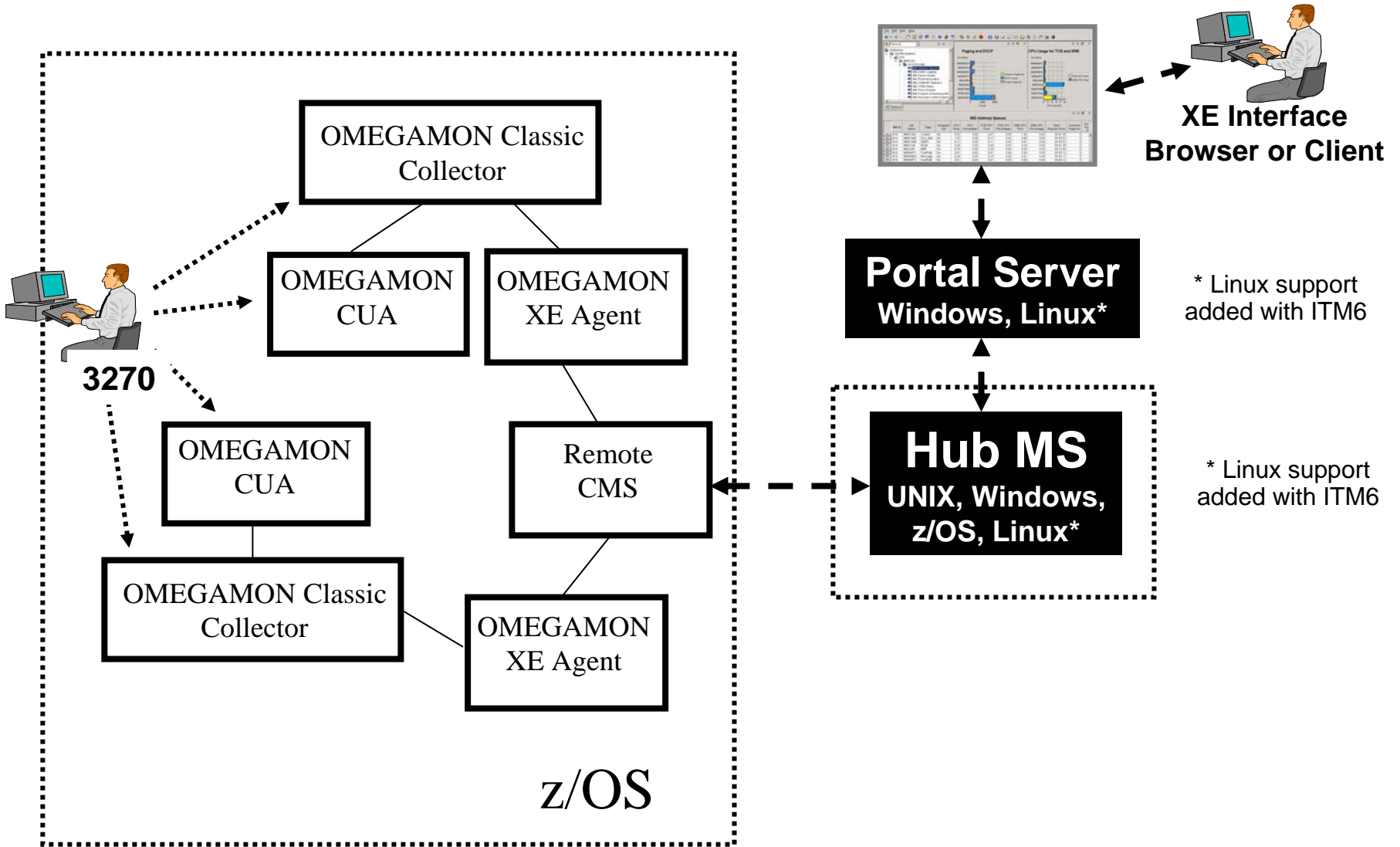


# Tivoli Enterprise Portal (TEP) Tool, Data, and Process Integration



# OMEGAMON XE

## Example OMEGAMON Address Spaces And Components



# Tivoli Enterprise Portal And OMEGAMON DE

**OMEGAMON DE - 'Dashboard Edition' enables multi-component views**

- Customizable graphic overview**
- User-definable drill downs for detail**
- Combine information from multiple sources**
- More flexible and granular than 3270**

The screenshot displays the 'Systems Management Dashboard Overview' window. At the top, it features a menu bar (File, Edit, View, Help) and a toolbar with various icons. The main area contains a graphical representation of a system architecture with components like z/OS Performance, DB2Plex, CICS, IMS, CF Status, Network Performance, and MQ Series. Below the dashboard are several data tables:

z/OS Performance				CICS Region Overview				IMS Address Spaces			DB2 Threads		MQ Series	
Service Class	Period	Goal Type	G Perc	System ID	CICS Region Name	CICS Version	R S	Originating System Identifier	MVS System	IM	Originnode		Origin Node	P
BATCH	1	Velocio		SP12	CCCD18	6.2.0	N/	XEIMS:SP12:MVS	SP12	I71			MQ12:SP12:MQESA	04
BATCH	2	Velocio		SP12	CCCD19	6.2.0	N/	XEIMS:SP12:MVS	SP12	I71			MQ12:SP12:MQESA	03
BATHI		ocio		SP12	CCCD20	6.2.0	N/	XEIMS:SP12:MVS	SP12	I71	D71G:SP12:DB2	02/08	MQ12:SP12:MQESA	02

At the bottom of the dashboard, there are five large black boxes with white text: **z/OS**, **CICS**, **IMS**, **DB2**, and **MQ**.

# Event Management & Problem Isolation

**Red Icons highlight a problem**

The screenshot displays the Systems Management Dashboard Overview for a Demo System. The main area shows a network diagram with various components: z/OS Performance (two instances with red warning triangles), DB2Plex, CICS, IMS, CF Status, and Websphere Status. A callout box with arrows points to the red warning triangles on the z/OS Performance nodes.

Below the dashboard are several data tables:

z/OS Performance			
Service Class	Period	Goal Type	G Perc
BATCH	1	Velocio	
BATCH	2	Velocio	
BATHI	1	Velocio	

CICS Region Overview			
System ID	CICS Region Name	CICS Version	R S
SP12	CCCD18	6.2.0	N/
SP12	CCCD19	6.2.0	N/
SP12	CCCD20	6.2.0	N/

IMS Address Spaces		
Originating System Identifier	MVS System	IM
XEIMS:SP12:MVS	SP12	I71
XEIMS:SP12:MVS	SP12	I71

DB2 Threads	
Originnode	
D71G:SP12:DB2	02/08

MQ Series	
Origin Node	P
MQ12:SP12:MQESA	0
MQ12:SP12:MQESA	0
MQ12:SP12:MQESA	0

Ready | Hub Time: Tue, 02/08/2005 07:10 PM | Server Available. | Shelter Overview - hqdn1.usca.ibm.com - EWOOD \*ADMIN MODE\*

# Event Management & Problem Isolation

The screenshot displays the IBM Systems Management Dashboard Overview. A red box highlights a critical alert: **CRITICAL** EW\_MVS\_CPU\_Critical LPAR400J:SP12:MVSSYS 02/08/05 19:10:54. A red arrow points from the alert to the left-hand navigation tree, and another red arrow points from the alert to a table below.

**Click to see alert detail**

**Flyover pop-up shows the name of the 'situation' alert**

Service Class	Period	Goal Type	G Perc	System ID	CICS Region Name	CICS Version	R S	Originating System Identifier	MVS System	IM	Originnode	Origin Node	P
BATCH	1	Velocio		SP12	CCCDS18	6.2.0	N/					MQ12:SP12:MQESA	0
BATCH	2	Velocio		SP12	CCCDS19	6.2.0	N/	XEIMS:SP12:MVS	SP12	I71		MQ12:SP12:MQESA	0
BATHI	1	Velocio		SP12	CCCDS20	6.2.0	N/	XEIMS:SP12:MVS	SP12	I71	D71G:SP12:DB2	02/08	0

Ready | Hub Time: Tue, 02/08/2005 07:11 PM | Server Available. | Shelter Overview - hqdn1.usca.ibm.com - EWOOD \*ADMIN MODE\*

# Isolate The Problem

## A Detail Display

The screenshot displays the IBM Tivoli Monitoring console interface. On the left, a tree view shows system components, with 'EW\_MVS\_CPU\_Critical' selected. The main area is divided into two tables: 'Initial Situation Values' and 'Current Situation Values'. A 'Take Action' panel is visible at the bottom left, and an 'Expert Advice' panel is at the bottom right. A status bar at the very bottom shows system time and alert details.

**Initial Situation Values**

Total TCB%	Managed System	Average CPU Percent	CPU Flag	Undispatched Tasks	MVS Overhead	Total SRB%	Total Enclave%	Partition LCPD%
13	LPAR400J:SP12:MVSSYS	6	RMF	0	6	3	0	10

**Current Situation Values**

Total TCB%	Managed System	Average CPU Percent	CPU Flag	Undispatched Tasks	MVS Overhead	Total SRB%	Total Enclave%	Partition LCPD%
11	LPAR400J:SP12:MVSSYS	11	RMF	0	5	2	0	9

**Take Action**

Name:

Command:

**Expert Advice**

This is an example alert. call the following person 1-888-888-7888

**Status Bar:** Ready | Hub Time: Tue, 02/08/2005 07:14 PM | Server Available. | EW\_MVS\_CPU\_Critical - hqdn1.usca.ibm.com - EWOOD \*ADMIN MODE\*

**What is the problem?**

**What are the details?**

**Any Predefined Actions?**

**Any expert advice?**



# Use Situations To Build Alerts

**Make alert names meaningful**

**Specify Situation alert criteria**

**Specify multiple attributes & sampling interval**

**Specify alert level and whether to run at startup**

**Be aware of duper functionality. Keep comparable situations on the same interval.**

	Total TCB%
1	GE 85
2	
3	

Total TCB% integer in the  
Undispatche by the SRM due to constraints. Value is a integer.

Sampling interval: 0 / 0 : 1 : 0  
dd hh mm ss

State: Critical  
 Run at startup

# Alert Flexibility

The XE GUI provides much more flexibility for alerts and alerting

More detailed alerts mean more meaningful & useful alerts. May require fewer situations be created.

**Condition**

Description

Condition

	DB2 Elapsed Time	Package Name	Authorization Identifier
1	GT 00:01:40.0	abc EQ DISTSERV	
2	GT 00:33:20.0	abc EQ TESTBAT	
3	EQ 00:01:20.0	abc EQ DISTSERV	abc EQ CIO

**Authorization Identifier** Authid of the thread. Valid entry is an alphanumeric text string, with a maximum length of eight characters.

**Cancel Command** Command string needed to cancel a thread. Valid entry is an alphanumeric text string, with a maximum length of eight characters.

Sound

Enable critical.wav

Play Edit...

State

Critical

Run at startup

OK Apply Cancel Help

Specify multiple attributes with And/Or logic

# OMEGAMON 3270 Exceptions Ported To XE

The screenshot displays the OMEGAMON 3270 interface. The main window, titled "Situation(s) for - System Status", shows a tree view on the left with "MYS DB2" expanded, listing various exceptions such as "EW\_Demo\_DB2\_Alert", "KDP\_ARCV\_Critical", "KDP\_ARCV\_Warning", "KDP\_DDFS\_Critical", "KDP\_DDFS\_Warning", "KDP\_DRCV\_Critical", "KDP\_DRCV\_Warning", "KDP\_DSND\_Critical", "KDP\_DSND\_Warning", "KDP\_TMAX\_Critical", and "KDP\_TMAX\_Warning". The "Condition" tab is active, showing a description: "Current thread count exceeds critical threshold". Below this, a table shows "Current Thread Count" for three instances, with the first instance having a value of "GE 85".

A "Select attribute" dialog box is open in the foreground. It has two columns: "Group" and "Item". The "Group" column lists various DB2 attributes, with "DB2\_System\_States" selected. The "Item" column lists specific attributes, with "Current Thread Count" selected. The dialog also includes "Select All" and "Deselect All" buttons, and a description: "Use the DB2 System States attributes to create situations to monitor system-level performance and exception alerts." Buttons for "OK", "Cancel", and "Help" are at the bottom.

3270 exceptions may be replicated within the portal

Use as a migration aid from Classic/CUA to the portal

Provides a starting point

# Automation Example

## Command And Console Interfaces Integrated Within The Tool

**For Example – An automated DB2 runaway thread kill scenario.**

This will automatically fill in the correct kill command using attribute substitution to the z/OS console

**Use the built in automation capabilities to solve problems.**

Microsoft Internet Explorer  
 Situation(s) for - D71G:SP12:DB2  
 D71G:SP12:DB2  
 EW\_Kill\_DB2\_Thread

Condition Distribution

**Action Selection**  
 System Command  Universal Message

**System Command**  
 Attribute Substitution...

**When the condition is true for more than one monitored item:**  
 Only take action on first item  
 Take action on each item

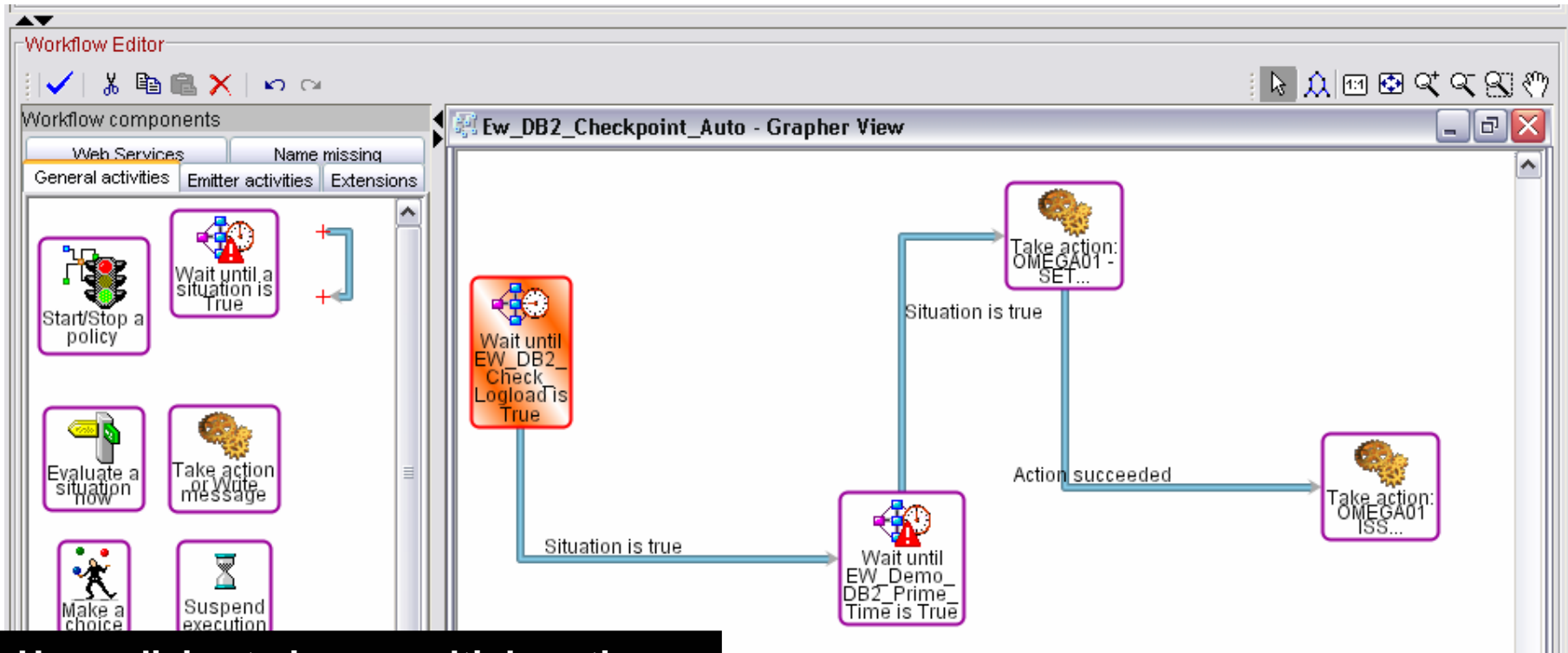
**Where should the Action be executed (performed):**  
 Execute the Action at the Managed System (by Agent)  
 Execute the Action at the Managed System (by Server)

**If the condition stays true over multiple intervals:**  
 Don't take action twice in a row (wait until situation goes false then true)  
 Take action in each interval

Source
handle.com:KUL
NT2:NT
SP12:STORAGE
SP12:STORAGE
SP12:Crypto

# Advanced Automation Capabilities

## Policy Automation Expands The Capabilities



Use policies to issue multiple actions

Use policies for correlation

Use policies for alert integration

Advanced workflow automation integrated within the portal

# Alert Types And Options

- Visual View – Custom Views – Enterprise View
  - ▶ Red/Yellow indicators and icons in XE/DE displays
- Console messages
  - ▶ Example - Issuing messages and commands to the z/OS console
  - ▶ Use this as a mechanism to feed other automation
- Paging and emails
  - ▶ Issue commands to feed paging systems
  - ▶ Use 3<sup>rd</sup> party tools such as Postie to issue emails from the command prompt
  - ▶ Console messages may be used to feed email systems
- SNMP traps and alerts
  - ▶ Universal agent provides a bidirectional SNMP interface
  - ▶ Issue SNMP traps from the command prompt using situations or policies
- Tivoli Enterprise Console (TEC) events
  - ▶ ITM 6 adds TEC integration
- Alerts to 3<sup>rd</sup> party tools
  - ▶ Example – Interfaces to HP/Openview and CA/Unicenter



# Visual Alert Views – Use Graphics With Icons

**Application View - EWOOD-JJW1211:14000 - SYSADMIN**

File Edit View Help

**Application View**

- Application View
  - CICS
    - CICS MQ Q Status
    - CICS Region Status
    - CICS Response Time
  - AIX MQ Status
  - CICS MQ Status
  - DB2
    - DB2A
    - DB2B
    - DB2 CF Status

Application View  
Physical

**Application Overview**

**User definable hierarchy**

**Graphics and icons may be customized**

**Add links for drill down detail**

**Icons show status**

Application Server (App Server)

AIX MQSeries (MQ/Series)

CICS MQSeries (CICS)

IMS

DB2A (DB2)

DB2B

DB2 UDB (DB2 UDB)

z/OS Performance

UNIX OS

# Customizing The Graphic View

## Take Advantage Of Style Options To Customize Icons

**Right click and select 'Properties'**

**User definable graphics to show application view**

**Specify a style to get the shapes**

**User definable JPEG backgrounds**

The screenshot shows the 'Application View' window with a tree view on the left containing nodes like 'CICS', 'DB2', and 'DB2A'. The 'Preview' window displays an 'Application Overview' with a map and a flow diagram. The 'Style' dialog is open, showing options for 'Background' (with a 'Browse...' button) and 'Style' (with a 'Browse...' button). A 'Graph' tab is also visible at the bottom of the dialog.





# Control Alert Association

**Tivoli Enterprise Portal** Tivoli software

File Edit View Help

Physical Total Events: 4 | Item Filter: Enterprise

Status	Situation Name	Display Item	Source	Impact
Open	DNET556_Disk_High_RespTime		CXEGA01:MVSA:STORAGE	Storage Subsystem
Open	DEMO_HIGH_CPU_USER_CRIT	WLM	DEMOPLX:MVSA:MVSSYS	Address Space CPU
Open	NT_Log_Space_Low	Application	Primary:HQDNT2:NT	System
Open	NT_Log_Space_Low	Security	Primary:HQDNT2:NT	System

**Situation(s) for - Service Classes Data for Sysplex**

- Service Classes Data for Sysplex
  - MVS Sysplex
    - MVS\_CFStruct\_Status\_Crit
    - MVS\_CFStructStat\_FalseLock\_C
    - Sysplex: XCFSystems\_Statu...

**Situation Editor Assistance**

### Situation Editor

Situations notify you when an event occurs on a managed system. Your OMEGAMON agent provides a set of predefined situations to control where an alert appears on the console. To display a situation, click the situation name in the Situation Editor. To create a new situation by copying another, select the original and click Create Another.

**Select 'Associate' to control where an alert appears on the tree view**

**Open Situation Counts**

Situation Name	Count
NT_Process_CPU_Warning	~15
NT_Physical_Disk_Busy_Critical	~25
DEMO_HIGH_CPU_USER_CRIT	~55

# Using Situations To Issue Messages To The z/OS Console Add Attributes To The Message String

The screenshot shows the Tivoli Enterprise Portal interface. The main window is titled "Situation(s) for - System Status". It has tabs for "Condition", "Distribution", "Expert Advice", "Action", and "Until". The "Action" tab is selected, showing "Action Selection" with "System Command" selected. Below this, a text field contains the message string: "OMEGA001 TEST MESSAGE EDM IS &DB2\_System\_States.EDM\_Utilization UTILIZED". A "Select attribute" dialog box is open, showing a list of attributes under the "DB2\_System\_States" group. The "Description" field at the bottom reads: "Use the DB2 System States attributes to create situations to monitor system-level performance and exception alerts."

**Issue the message to the console. & variables add detail to the message string.**

**Message mechanisms are simple to set up using only situations.**

**Good way to feed existing automation mechanisms.**

# Situations Can Issue Message To The z/OS Console

## See The Message On The Console

```

  Display  Filter  View  Print  Options  Help
-----
SDSF SYSLOG   6575.101 MVSA MVSA 11/21/2005 8W  599285          COLUMNS 51 130
COMMAND INPUT ==>          SCROLL ==> PAGE
0090 +DFHKE0101 DBDCCICS DFHSIP IS NOT APF-AUTHORIZED. CICS WILL TERMINATE.
0290 -                      --TIMINGS (MINS.)--
      ----PAGING COUNTS----
0290 -JOBNAME  STEPNAME PROCSTEP   RC   EXCP   CPU   SRB   CLOCK  SERV  PG
      PAGE    SWAP     VIO SWAPS
0290 -CICSTIV1          CICS31     12   93    .00   .00   .02   162  0
      0        0        0        0
0090 IEF404I CICSTIV1 - ENDED - TIME=14.10.25
0290 -CICSTIV1 ENDED.  NAME-          TOTAL CPU TIME=  .00  TOTAL
      ELAPSED TIME=  .02
0090 $HASP395 CICSTIV1 ENDED
0090 GTM1682E ERROR READING GLOBAL VARIABLE IEF404I CICSTIV1 - ENDED -
      TIME=14.10.25 IN GTMRX019
0090 GTM1683E      RC = 0.  ATTEMPTED RESTART OF SERVER TERMINATED
0290 IEA989I SLIP TRAP ID=X33E MATCHED.  JOBNAME=*UNAVAIL, ASID=0107.
0090 $HASP250 CICSTIV1 PURGED -- (JOB KEY WAS BDF2930E)
0090 *KEYSQUEL QUIESCE MODE IS IN EFFECT FOR FREE EXTENDED STORAGE
0290 OMEGA001 TEST MESSAGE  EDM IS 90 UTILIZED
0090 IEE305I OMEGA001 COMMAND INVALID
0090 AOF100I 14:11:21 : 'MONITOR' COMMAND ISSUED ON TARGET(S) DEMOMVS 098

```

# Issuing E-mails Using Tools Such As Postie

The screenshot shows the 'Situation Editor' window with the 'Action' tab selected. The 'Action Selection' section has 'System Command' selected. The 'System Command' field contains the text 'postie'. Below this, the 'If the condition is true for more than one monitored item:' section has 'Only take action on first item' selected. The 'Where should the Action be executed (performed):' section has 'Execute the Action at the Managing System (CMS)' selected. A terminal window titled 'C:\WINDOWS\System32\cmd.exe' is open, showing the command 'E:\postie>postie' and its usage information. A callout box with a black background and white text points to the 'postie' command field and the terminal window, stating: 'In this scenario if the hub MS is on windows the situation may issue a postie command to send an email.'

**Action Selection**

System Command  Universal Message

**System Command**

postie

Attribute Substitution...

**If the condition is true for more than one monitored item:**

Only take action on first item  
 Take action on each item

**Where should the Action be executed (performed):**

Execute the Action at the Managed System (Agent)  
 Execute the Action at the Managing System (CMS)

**C:\WINDOWS\System32\cmd.exe**

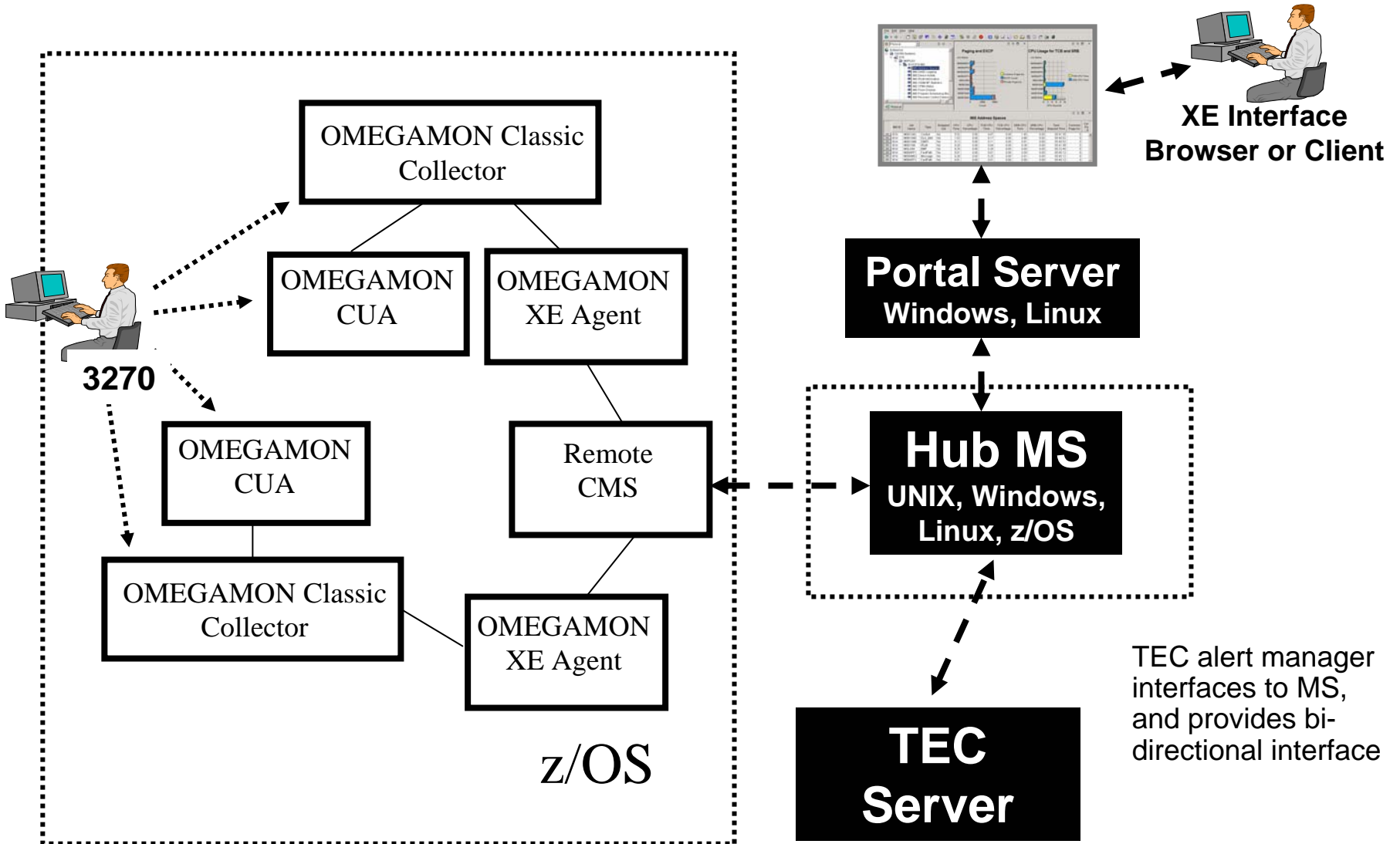
```
E:\postie>postie
Usage: postie [-host:server] [-port:service] [-news [-noarchive]] [-to:address |
-tolist:filename] [-cc:address | -cclist:filename] [-bcc:address | -bcclist:fi
lename] [-from:address] [-replyto:address] [-verify] [-s:subject] [-import!-t] [-
ns] [-file:filename] [-rml [-nomsg | -msg:text]] [-html [-alt]] [-config] [-a:fil
ename ...] [-dir:dirname]
Usage: postie [-host:server] [-port:service] [-imap [-mbox:name]] -user:userid -
pass:password [-file:filename] [-extract:[path]] [-msg:nbr] [-exec:cmd] [-br] [-r
m]
Usage: postie [-connect:astring | -disconnect:astring] [-noop] [options...]
```

E:\postie>

OK Apply Cancel Help

# OMEGAMON XE Interfaces To The TEC

Forwarding Important Availability Alerts Between OMEGAMON & TEC



TEC alert manager interfaces to MS, and provides bi-directional interface

# TEC Integration with Tivoli Enterprise Portal

The screenshot displays the Tivoli Enterprise Portal interface. The main window is titled "Resource Model Historical Data - rlongob1 - SYSADMIN". The left pane shows a tree view of the Enterprise structure, including Linux Systems, Windows Systems, and OS/390 Systems. The right pane shows the "Resource Model TMW\_Process on win-sap1 details" and "Resource Model TMW\_Process on win-sap1 available historical data".

**Resource Model TMW\_Process on win-sap1 details**

RM Name	Status	RM WorstHealth	RM Type	Category	RM LastRetCode	RM CycleTime	Resource
TMW_Process	Running	0			555	60	

**Resource Model TMW\_Process on win-sap1 available historical data**

Region	RM Name	RM Logging Resource	RM Logging Context	RM Logging Instance
region	TMW_Process	Process	Handle Usage	ID= 2472.0000;Process=IEXPLORE;
region	TMW_Process	Process	Handle Usage	ID= 4.0000;Process=System;
region	TMW_Process	Process	Handle Usage	ID= 844.0000;Process=winlogon;
region	TMW_Process	Process	Handle Usage	ID= 1580.0000;Process=explorer;
region	TMW_Process	Process	Handle Usage	ID= 808.0000;Process=csrss;
region	TMW_Process	Process	Handle Usage	ID= 1500.0000;Process={1}svchost;
region	TMW_Process	Process	CPU Usage	ID= 3336.0000;Process={1}webshots.scr;

The bottom pane shows "HandleCount data for instance ID= 1580.0000;Process=explor..." and a "Working Queue" table.

**HandleCount data for instance ID= 1580.0000;Process=explor...**

RM Logging MetricValue	RM Logging MetricName
534000000.000000	HandleCount
536000000.000000	HandleCount
535000000.000000	HandleCount
539000000.000000	HandleCount
539000000.000000	HandleCount
534000000.000000	HandleCount
535000000.000000	HandleCount
537000000.000000	HandleCount
534000000.000000	HandleCount
543000000.000000	HandleCount
542000000.000000	HandleCount
542000000.000000	HandleCount

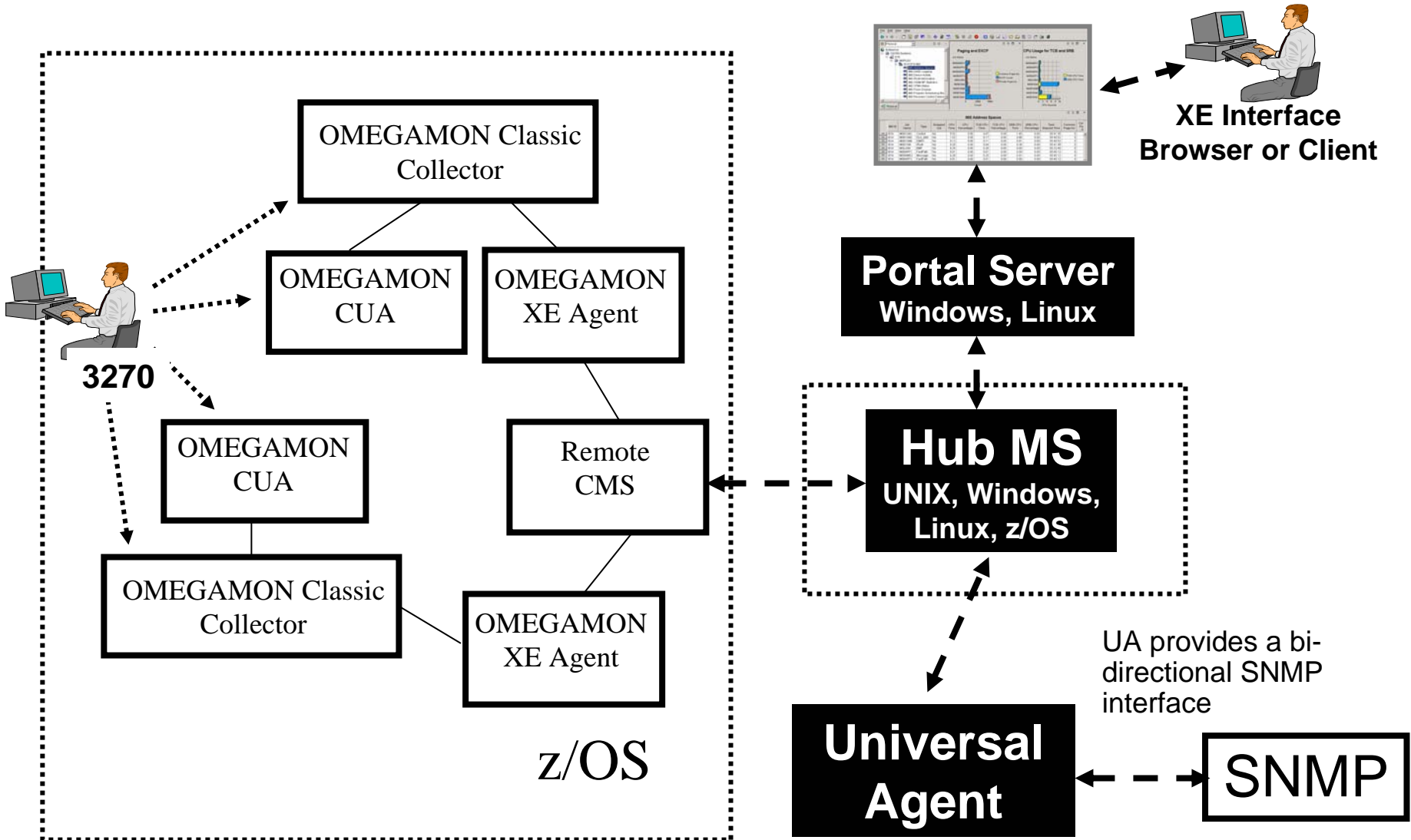
**Working Queue**

Time Rec...	Event Type	Class	Hostname	Severity	Status	Mess:
September...	Other	EVENT		Critical	Open	testing
September...	Other	EVENT		Critical	Open	testing
September...	Other	EVENT		Critical	Open	testing
September...	Other	EVENT		Critical	Open	testing
September...	Other	EVENT		Critical	Open	testing
September...	Other	EVENT		Fatal	Open	testing
September...	Other	EVENT		Fatal	Open	testing
September...	Other	EVENT		Fatal	Open	testing
September...	Other	EVENT		Fatal	Open	testing
September...	Other	EVENT		Fatal	Open	testing

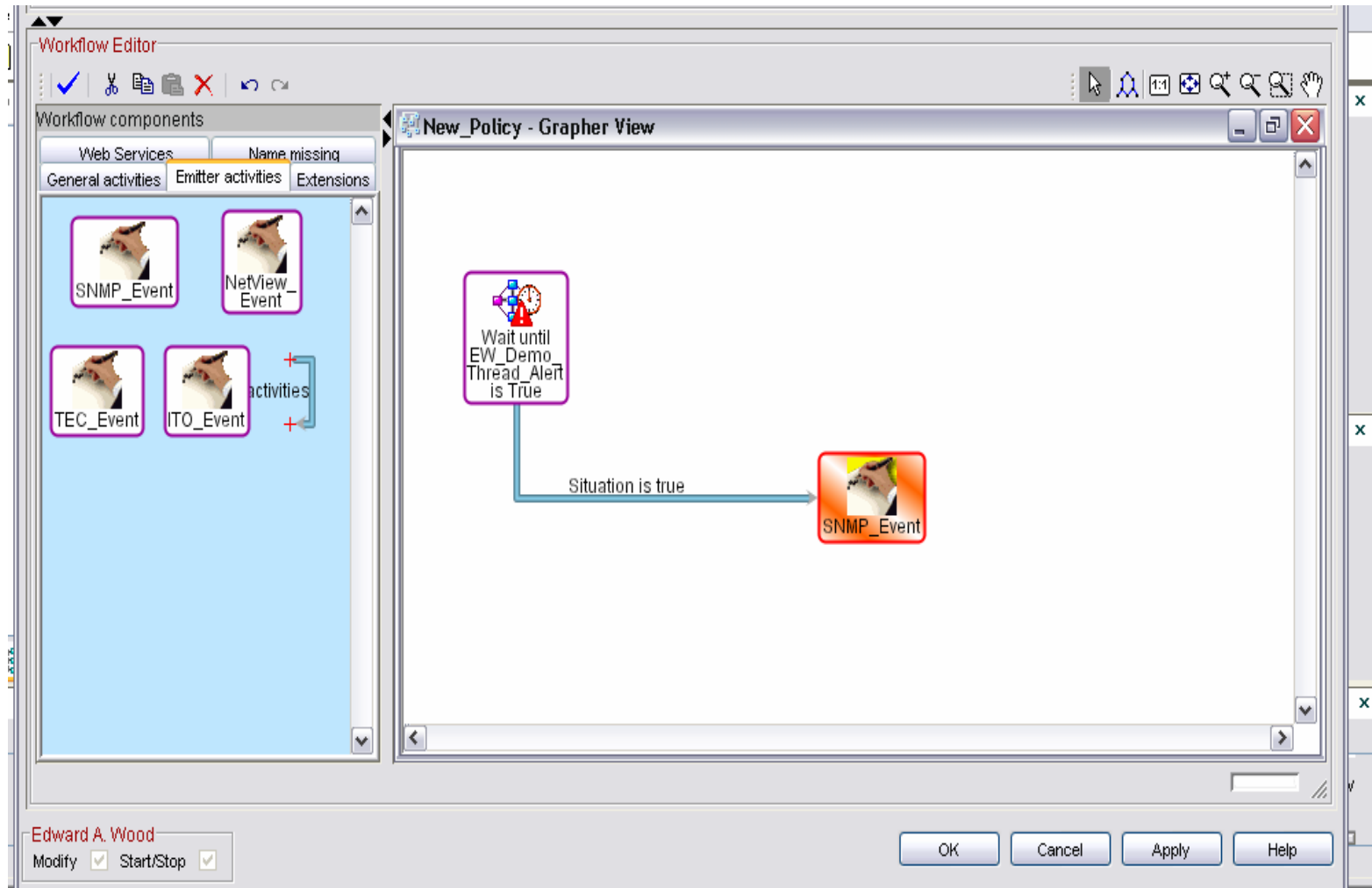
- TEC console as a drop down view for any workspace
- Bi-directional support
- From resource view to TEC events in context
- Requires ITM6 level of portal support be enabled

# OMEGAMON XE Interfaces To SNMP

Universal Agent Provides A Bi-directional SNMP Interface

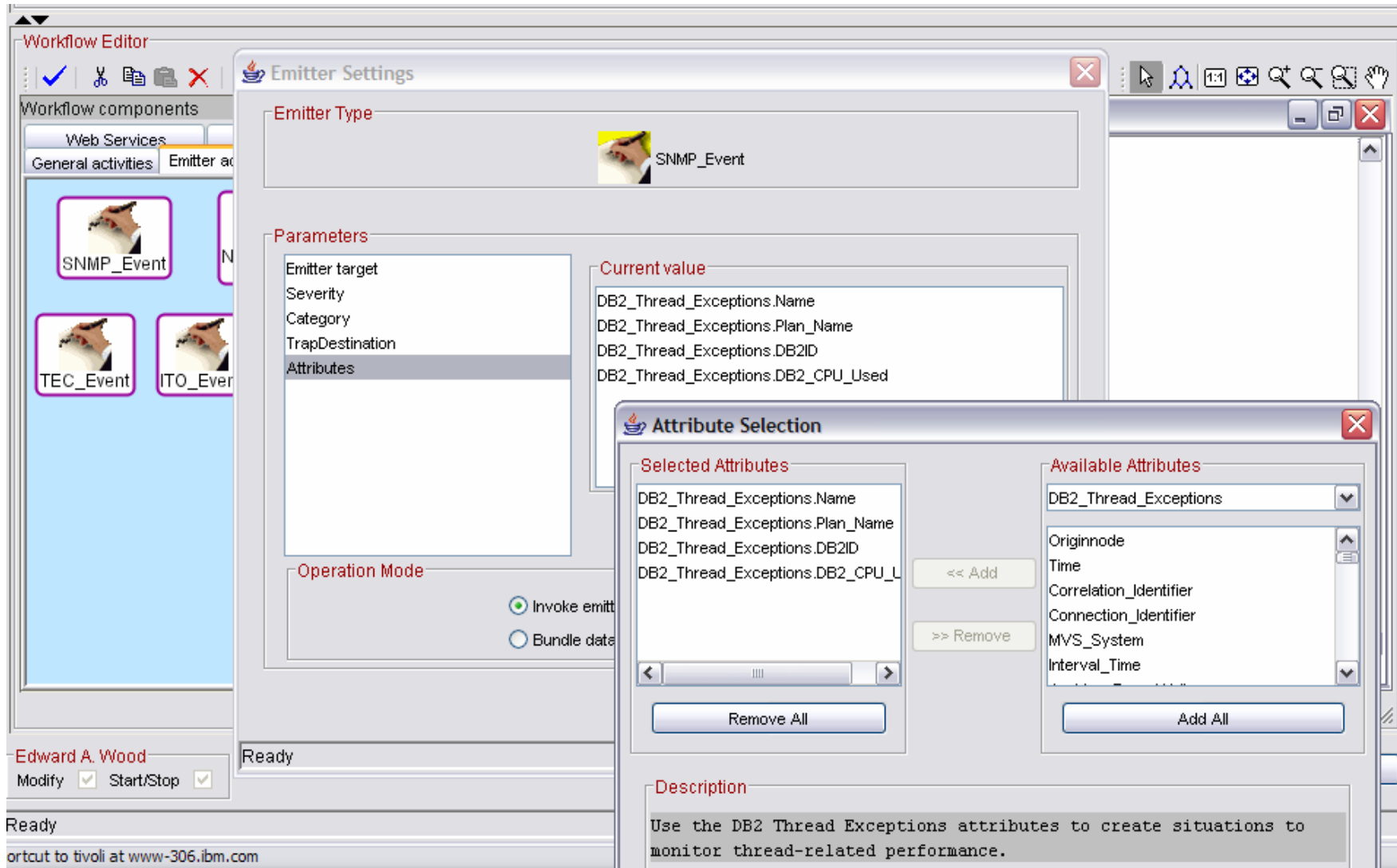


# Using SNMP Events – Universal Agent Requires a Policy Mechanism






# Pass Attributes Through The SNMP Event



**Workflow Editor**

Workflow components: Web Services, General activities, Emitter activities

Emitter Settings

Emitter Type:  SNMP\_Event

Parameters:

- Emitter target
- Severity
- Category
- TrapDestination
- Attributes

Current value:

- DB2\_Thread\_Exceptions.Name
- DB2\_Thread\_Exceptions.Plan\_Name
- DB2\_Thread\_Exceptions.DB2ID
- DB2\_Thread\_Exceptions.DB2\_CPU\_Used

Operation Mode:

- Invoke emitter
- Bundle data

Ready

Edward A. Wood  
Modify  Start/Stop

Ready

Shortcut to tivoli at [www-306.ibm.com](http://www-306.ibm.com)

**Attribute Selection**

Selected Attributes:

- DB2\_Thread\_Exceptions.Name
- DB2\_Thread\_Exceptions.Plan\_Name
- DB2\_Thread\_Exceptions.DB2ID
- DB2\_Thread\_Exceptions.DB2\_CPU\_Used

Available Attributes:

- DB2\_Thread\_Exceptions
- Originnode
- Time
- Correlation\_Identifier
- Connection\_Identifier
- MVS\_System
- Interval\_Time

Remove All

Add All

Description:

Use the DB2 Thread Exceptions attributes to create situations to monitor thread-related performance.

# Alert Considerations

- Visual View – Custom Views – Enterprise View
  - ▶ Someone must be logged on and looking to see alert
- Console messages
  - ▶ Simple to do and only requires a situation
  - ▶ Good way to feed automation
- Paging and emails
  - ▶ Simple to do and may only require a situation (depending on customer facilities)
  - ▶ Customers often want this capability
- SNMP traps and alerts
  - ▶ Universal Agent approach typically will require a policy
- Tivoli Enterprise Console (TEC) events
  - ▶ Requires a policy to drive alert to TEC
- Alerts to 3<sup>rd</sup> party tools
  - ▶ Always complexities when interfacing to 3<sup>rd</sup> party technology



## TEP Alert Mechanisms – Trade-offs

- TEP Portal alert methods – Pros
  - ▶ Most flexible – anything monitored may be used in an alert
  - ▶ Easy to set up if comfortable with GUI technology
  - ▶ Sets of pre-defined alerts (Product Provided Situations)
  - ▶ Automation capability integrated within the tool
  - ▶ Easy way to integrate with management frameworks and 3<sup>rd</sup> party tools
    - TEC and SNMP methods
  - ▶ Superior monitoring and alert integration
- TEP Portal alert methods – Cons
  - ▶ Requires a portal
    - Requires a Windows box or zLinux
  - ▶ Some users still prefer 3270 based solutions



# TEP Provides Superior Integration - An Example

Classic Interface Requires A Monitoring Session For Each Managed System To Get Alerts

Many shops still have multiple classic sessions running in the console room

```

ZOPS
> Help PF1      Back PF3
=====
>
SCPU10 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION D
elap  16:20 DY 16:20 DY 16
=====
>   Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8       Wait Exc S
=====
> For more information, pla
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
    
```

```

ZOPS
> Help PF1      Back PF3
=====
>
SCPU10 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION D
elap  16:20 DY 16:20 DY 16
=====
>   Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8       Wait Exc S
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
    
```

```

ZOPS
> Help PF1      Back PF3
=====
>
SCPU10 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION D
elap  16:20 DY 16:20 DY 16
=====
>   Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8       Wait Exc S
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
    
```

```

ZOPS
> Help PF1      Back PF3
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>
SCPU10 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION D
elap  16:20 DY 16:20 DY 16
=====
>   Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8       Wait Exc S
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
    
```

```

ZOPS
> Help PF1      Back PF3
=====
>
SCPU10 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION D
elap  16:20 DY 16:20 DY 16
=====
>   Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8       Wait Exc S
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
    
```

OMEGAMON  
MVS session for  
each LPAR

# Let The Portal Do The Work Of Multiple Classic Screens With A Single XE Screen

**Global Enqueue and Reserve Data**

Owning Address Space	Waiting Address Space	System Name	Swapped	Type	ASID	Wait Time	Major Name	Minor Name
			NotSwapped	Exclusive	0	0	KLVGLOCK	SYSG
			NotSwapped	Exclusive	0	0	SYSZJES2	PPSMP1SYS1

**System CPU Utilization**

Managed System	Average CPU Percent	MVS Overhead	Undispatched Tasks	Partition LCPD%	Partition PCPD%	Partition Overhead%	Total Enclave%
LPAR400J:SP12:MVSSYS	6	5	0	7	7	0.30	0
LPAR400J:SP22:MVSSYS	11	11	0	18	18	0.27	0

**Address Space CPU Utilization (MCPU02)**

Managed System	Job Name	CPU Percent	TCB Percent	SRB Percent
LPAR400J:SP12:MVSSYS	RMFGAT	3.9	3.9	0.0
LPAR400J:SP12:MVSSYS	CCCDEM01	2.7	2.6	0.1
LPAR400J:SP22:MVSSYS	XCFAS	2.7	1.4	1.3

**System Paging Activity**

Managed System	Page Fault Rate	System Page Rate	Unreferenced Interval Count	ASM Queue Length
LPAR400J:SP12:MVSSYS	0	0.3	254	0
LPAR400J:SP22:MVSSYS	108	11.2	1800	0

**Situations Raised**

Status	Situation Name	Display Item	Origin Node
Raised	Sysplex_DASD_Dev_ContIndx_Warn		LPAR400J:MVSSYS
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVSSYS
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVSSYS
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVSSYS
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVSSYS

**TWO MVS LPARS SP12 & SP22**

Take advantage of the capability of XE/DE to “tweak” the view to meet the needs of the customer.

## Some Different Examples – Where Classic Alerts May Be Useful

- Customer wants to use OMEGAMON IMS or OMEGAMON DB2 to alert on lock conflicts
  - ▶ In the TEP situations may only execute on a 30-second interval at the narrowest
  - ▶ Often inadequate to catch lock conflict information in a timely manner
  - ▶ Customer may use a classic session to catch conflict alerts on a 5 second interval
- Customer wants to execute a set of OMEGAMON commands based upon an alert
  - ▶ Similar to ASF scenario shown earlier
  - ▶ Automation checks a classic session for an alert and then executes and logs an OMEGAMON classic screen space



# Considerations And Recommendations

- Understand the infrastructure and requirements
  - ▶ What is the alert Manager Of Managers (if any)?
  - ▶ Are there any mechanisms in place for notification (paging, emails, etc.)?
- Feed existing infrastructure where possible
  - ▶ Most customers already have email, paging, and other alert processes in place
  - ▶ Use OMEGAMON command capabilities to feed existing mechanisms
- Be prepared to review the various alert mechanisms and weigh the pros and cons
  - ▶ 3270 Classic versus 3270 CUA versus TEP
  - ▶ Keep in mind the direction of OMEGAMON towards the TEP



## More Considerations And Recommendations

- This presentation is really about how to build a road map
  - ▶ To understand how to get where you need to go, you need to understand where you are now
  - ▶ Many customers have CUA and Classic implemented now and want to implement TEP
  - ▶ Tivoli Enterprise Portal is flexible and powerful and many customers need guidance in how and where to begin
- TEP is the strategic direction of the OMEGAMON product set
  - ▶ Customers need to be educated on the benefits of this strategy
  - ▶ Customers need assistance in planning how to migrate and implement TEP technology





# Thank You!

