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IBM Software Group | Tivoli Software

OMEGAMON and System z Alert Management Strategies and Best Practices

Ed Woods
IBM Corporation

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Agenda

- **OMEGAMON Alert Management**
 - Classic Interface and CUA Interface
 - NetView And Automation interfaces
- **Tivoli Enterprise Portal (TEP) Alert Management Technology**
 - About situations and policies
- **Types of alerts**
- **Forging an integrated alert management methodology**
- **IBM Tivoli Netcool/OMNIbus**
 - Integration and event correlation
- **Recommendations**
 - Putting it all together

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
    
```

Profile member

**XACB
command**

```

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<
    
```

- 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 As An Alert And Notification Mechanism

Classic Interface requires a monitoring session for each Managed System to get alerts

MVSA

```

ZOPS
> Help PF1      Back PF3
=====
>
SCPUI0 __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 ++++++
```

MVSB

```

ZOPS
> Help PF1
=====
>
SCPUI0 __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 ++++++
```

MVSC

```

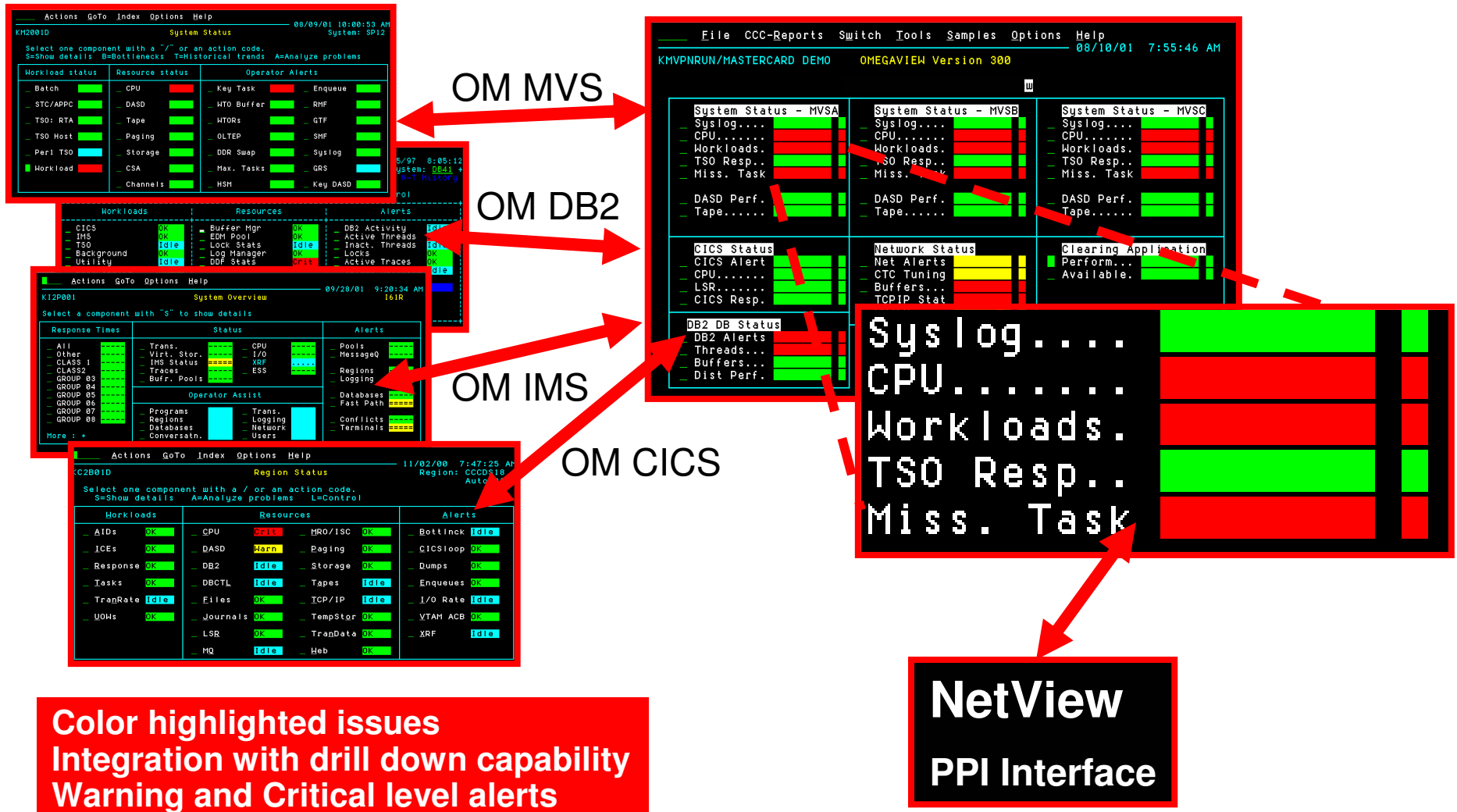
ZOPS
> Help PF1      Back PF3
=====
>
SCPUI0 __CPU Utilization__
+   Enclaves      .03
+   Total         15.92
=====
BATX  IMSAMSG1  IMSBMSG1  IM
step  DFSMPR   REGION  D
elap  16:20  DY 16:20  DY 16:
=====
> Enqueues
SXQCB  TWC8      Exc S
+   TWS8E      Wait Exc S
+   TWS8E      Exc S
+   TWC8      Wait Exc S
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
```

MVSD

```

ZOPS      VTM      OM/DEX  V550.M2 SP12 12/23/05 9:30:15
> Help PF1      Back PF3      Up PF7      Down PF8      Zoom PF11
=====
>
OPERATION STATUS
=====
SCPUI0 __CPU Utilization__ 0 10 20 30 40 50 60 70 80 90 100
+   Enclaves      .03 > . . . . . . . . . . |
+   Total         15.92 |---10-> . . . . . . . . . . |
=====
BATX  IMSAMSG1  IMSBMSG1  IMSBIFP1  IMSTMSG1
step  DFSMPR   REGION  DFSIVA4  DFSMPR
elap  16:20  DY 16:20  DY 16:20  DY 16:20  DY
=====
> Enqueues
SXQCB  TWC8      Exc SYSZDRK  TWC8EQQTWSOE
+   TWS8E      Wait Exc SYSZDRK  TWC8EQQTWSOE
+   TWS8E      Exc SYSZDRK  TWC8EQQTWSIE
+   TWC8      Wait Exc SYSZDRK  TWC8EQQTWSIE
=====
> For more information, place the cursor on the exception name and press PF11.
LXGRPHD  OMEGAMON/MVS Group Exception Analysis
+ XCHN ++++++
```

CUA 3270 Interface Provided Additional Alert Options



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

OMEGAMON Interface With Automation Integration With Classic Interface

```

ZTDIST  VIM  02  V540./C DB1X 05/03/04 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 WAITS  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-CANCEL THREAD Q-DB2 CONSOLE  R-DSN ACTIVITY   S-APPL TRACE   T-ENCLAVE
>  U-LONG NAMES
>-----
>
>  DISTRIBUTED THR
>
>  PLAN
>  + Threads  Plan=WKID  Connid=BRSAF
>  + Attach  BRSAF    JOB Name=.PKC
>  + Package: WKID  Collection=
>  + rsum
>  +
>  + Distributed BRSAF
>  + Location  IP Addr  Port Ctouser  Srvclsname  Prod ID  Workstation
>-----
  
```

OMEGAMON Classic

OMEGAMON can view the console and issue commands

Automation may check for classic exceptions
Automation may issue OMEGAMON commands

IBM System Automation

z/OS Console

Automation provides a bidirectional interface with the z/OS console

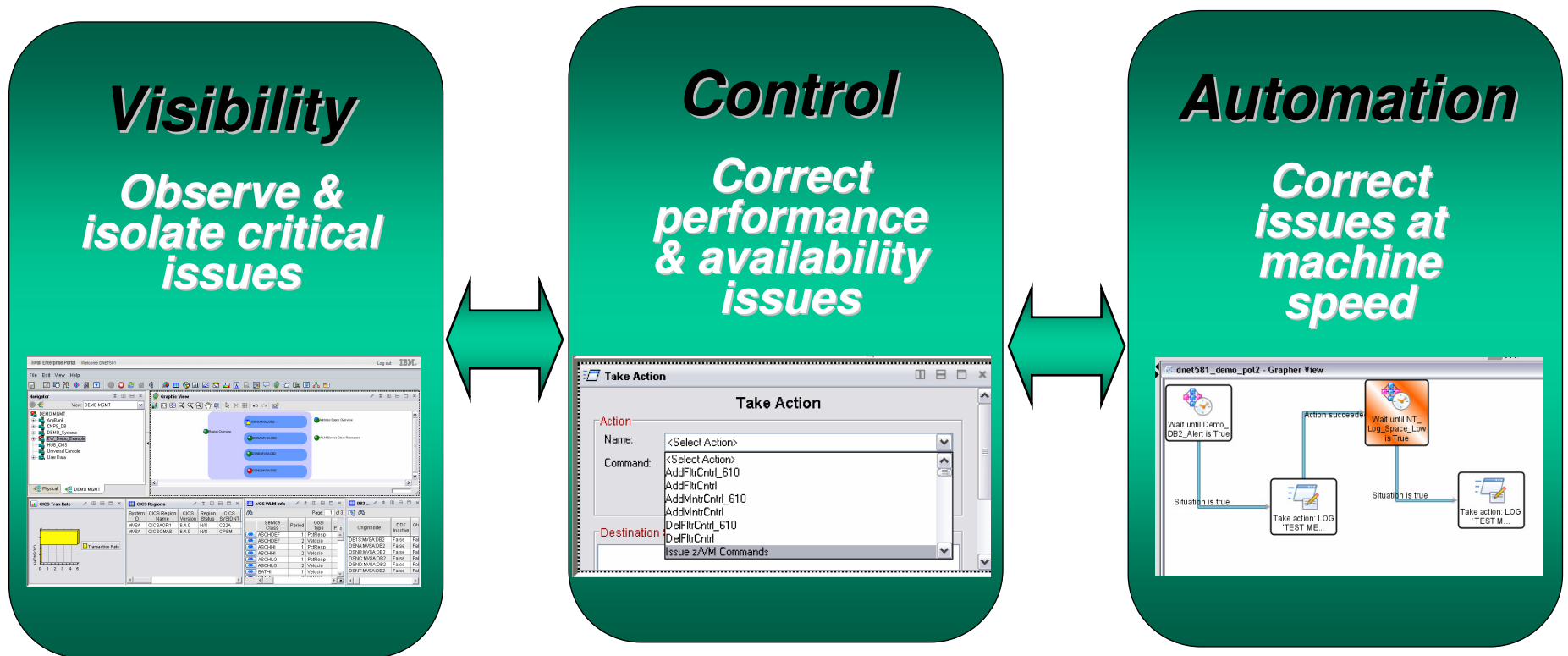
- IBM System Automation and AF/Operator provides a bi-directional interface with OMEGAMON
- Automation may detect OMEGAMON classic exceptions
- Automation may run execs to send traps to Netcool/OMNibus

Classic And CUA 3270 Alert Mechanisms Considerations

- **Classic and CUA 3270 alerts offer certain benefits**
 - Setting exceptions is a commonly used and proven mechanism
 - Easy to set up requiring only mainframe centric 3270 interface based technology
 - Each OMEGAMON provides a set of pre-defined alerts
 - CUA offers the use of color to highlight issues
- **Classic and CUA 3270 alert considerations**
 - Classic interface provides an automated screen facility, but in general full automation of OMEGAMON 3270 exceptions is best done with an automation engine (IBM System Automation or AF/Operator)
 - Pre-defined set of exceptions for each OMEGAMON monitor
 - Exceptions are stored in profiles
 - Advantage is each tool may have multiple profiles, as needed
 - Profiles must be managed and copied for each monitoring session
 - Alert correlation or additional alerts requires the Tivoli Enterprise Portal or Netcool/OMNIBus

Visibility – Control – Automation

Alerts Are An Important Part Of A Management Strategy



An Event Management Strategy

- High level analysis
 - Integrated event management and event correlation
 - Integrated business application topology analysis

- Integrated technical view
 - End to end technical analysis
 - Alerts for problem isolation and automation

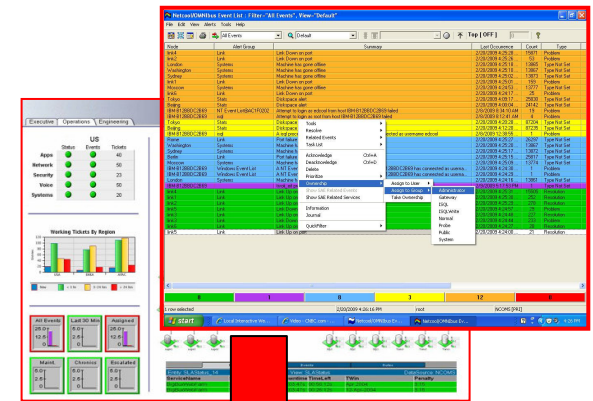
- Technical detail view
 - Technical deep dive analysis
 - Alerts for problem isolation and automation

Netcool/OMNIBus

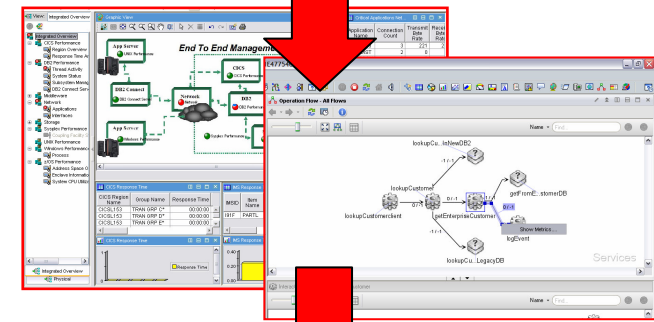
Tivoli Business Service Manager (TBSM)

OMEGAMON DE, OMEGAMON XE, & ITCAM

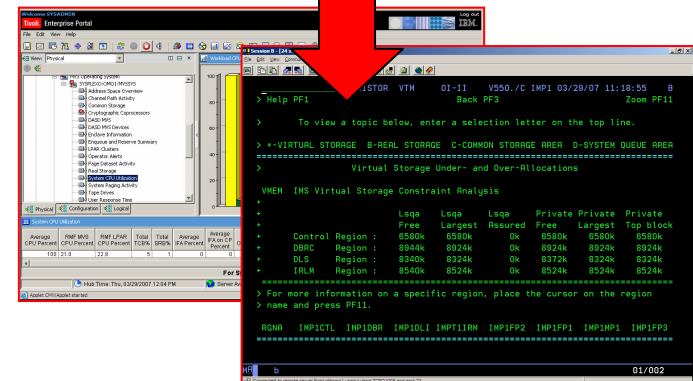
OMEGAMON XE (TEP, 3270) & ITCAM



Drill down



Drill down



Benefits Of An Integrated Alert Management Methodology

- **Improved ability to manage increasingly complex composite applications**
 - Enables an integrated approach to the management of subsystems, platforms, and application components
- **Reduce time to problem resolution**
 - Identify potential issues more rapidly
- **Improved event management and problem isolation**
 - More meaningful and useful problem alerts
- **Improved event correlation and management**
 - Eliminate the “noise” and focus on key issues
- **Superior performance analysis capabilities**
 - Monitor and manage based upon actual information, not anecdotal data

Categories Of Typical Alerts

IBM Tivoli mainframe and distributed monitoring may be used to create each of these categories

Availability

Application availability
Essential infrastructure availability
Subsystem availability

Examples of typical alerts

Performance

Subsystem performance
Application performance
Identification of performance issues

Resource

Subsystem resource utilization
Application resource utilization

Alert Notification Types And Options

- Visual View – Custom Views – Enterprise View
 - Red/Yellow indicators and icons in Tivoli Enterprise Portal or TBSM 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 3rd 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
 - Issue SNMP traps from the command prompt using situations or policies
- Netcool/OMNIbus events
 - OMNIbus acts as an event correlation engine
 - May receive events via traps or the EIF interface
- Alerts to 3rd party (non-IBM) tools

Tivoli Enterprise Portal Provides An Alert Management Interface

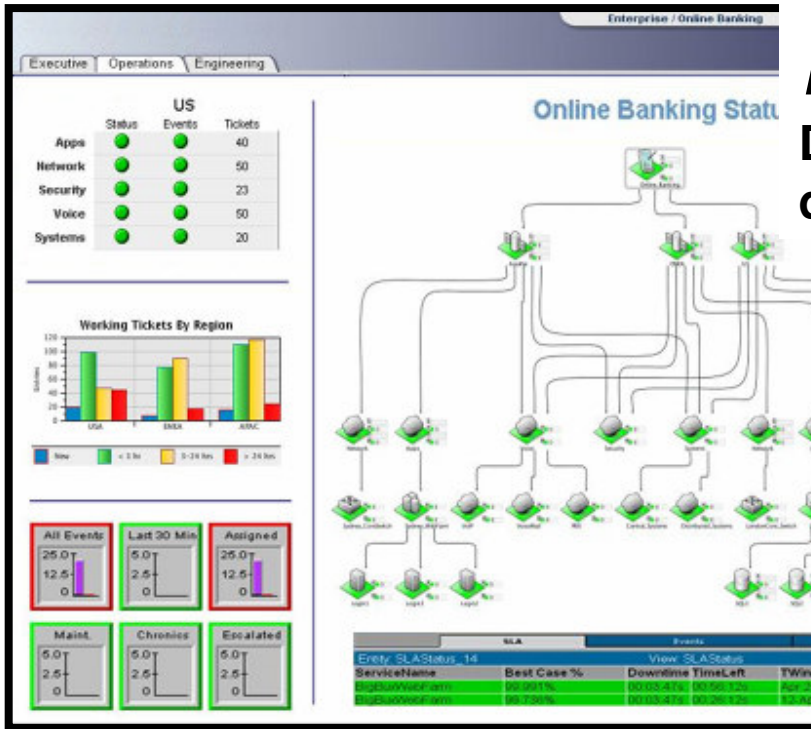
The screenshot displays the Tivoli Enterprise Portal interface with several key components:

- Navigation:** A tree view on the left side of the interface allows users to navigate through system hierarchies such as Linux Systems, Windows Systems, z/OS Systems, and specific system instances like DEMOPLX:MVS:SYSPLEX.
- Alerts:** The central 'Situation Event Console' displays a table of active alerts. The table includes columns for Severity, Status, Owner, Situation Name, Display Item, and Source. Alerts are categorized by severity (Warning, Critical) and status (Open).
- Number of events:** A bar chart titled 'Open Situation Counts - La...' shows the frequency of various alert types, such as 'TDS Total Free Space', 'KS3_Vol_Perf_Resp_Time_Critical', and 'KS3_Cachecu_Read_HitP_Critical'.
- Messages:** The 'Message Log' section at the bottom right provides a detailed view of individual messages, including their status (Closed, Open), name, display item, origin node, and global timestamp.

TBSM Provides Event Management And Business Systems Management Perspectives

Business Perspective

Determine the source of business service disruptions



The screenshot shows the 'Netcool/OMNIBus Event List' window. The table lists events with columns for Node, Alert Group, Summary, Last Occurrence, Count, and Type. A context menu is open over the event 'Attempt to login as edcool from host IBM-B12BDDC2B69 failed', showing options like 'Tools', 'Resolve', 'Related Events', 'Task List', 'Acknowledge', 'Deacknowledge', 'Delete', 'Prioritize', 'Ownership', 'Show SAE Related Events', and 'Show SAE Related Services'. The 'Ownership' menu is expanded to show 'Assign to User' (Administrator, Gateway, ISQL, ISQLWrite, Normal, Probe, Public, System) and 'Assign to Group'.

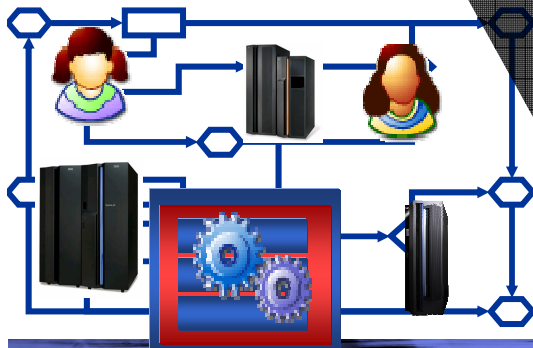
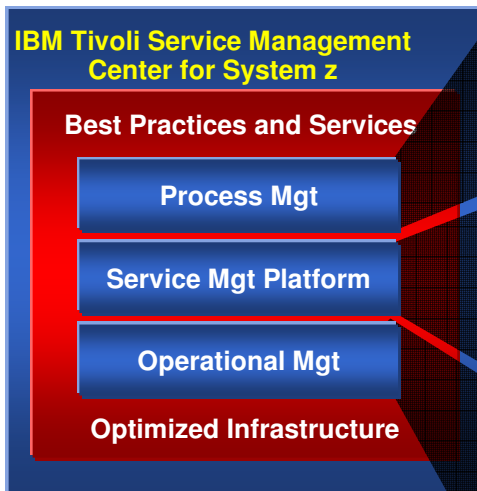
Node	Alert Group	Summary	Last Occurrence	Count	Type
link4	Link	Link Down on port	2/20/2009 4:25:28 ...	15871	Problem
link2	Link	Link Down on port	2/20/2009 4:25:26 ...	53	Problem
London	Systems	Machine has gone offline	2/20/2009 4:25:18 ...	13865	Type Not Set
Washington	Systems	Machine has gone offline	2/20/2009 4:25:10 ...	13867	Type Not Set
Sydney	Systems	Machine has gone offline	2/20/2009 4:25:02 ...	13873	Type Not Set
link1	Link	Link Down on port	2/20/2009 4:25:01 ...	159	Problem
Moscow	Systems	Machine has gone offline	2/20/2009 4:24:53 ...	13777	Type Not Set
link6	Link	Link Down on port	2/20/2009 4:24:17 ...	25	Problem
Tokyo	Stats	Diskspace alert	2/20/2009 4:09:17 ...	25830	Type Not Set
Beijing	Stats	Diskspace alert	2/20/2009 4:00:04 ...	24142	Type Not Set
IBM-B12BDDC2B69	NT Event List@AC1F0202	Attempt to login as edcool from host IBM-B12BDDC2B69 failed	2/8/2009 8:34:10 AM	19	Problem
IBM-B12BDDC2B69	isql	Attempt to login as root from host IBM-B12BDDC2B69 failed	2/8/2009 8:12:41 AM	4	Problem
Tokyo	Stats	Diskspace	2/20/2009 4:20:28 ...	87204	Type Not Set
Beijing	Stats	Diskspace	2/20/2009 4:12:20 ...	87235	Type Not Set
IBM-B12BDDC2B69	isql	A isql proc...	2/8/2009 12:38:55 ...	1	Problem
Rome	Link	Port failure	2/20/2009 4:25:27 ...	26297	Type Not Set
Washington	Systems	Machine h...	2/20/2009 4:25:20 ...	13867	Type Not Set
Sydney	Systems	Machine h...	2/20/2009 4:25:17 ...	13872	Type Not Set
Berlin	Link	Port failure	2/20/2009 4:25:15 ...	25817	Type Not Set
Moscow	Systems	Machine h...	2/20/2009 4:25:09 ...	13774	Type Not Set
IBM-B12BDDC2B69	Windows Event List	A NT Ever...	2/20/2009 4:24:30 ...	1	Problem
IBM-B12BDDC2B69	Windows Event List	A NT Ever...	2/20/2009 4:24:29 ...	1	Problem
London	Systems	Machine h...	2/20/2009 4:24:16 ...	13861	Type Not Set
IBM-B12BDDC2B69	tivoli_ell pr...		2/9/2009 5:17:53 PM	1	Type Not Set

Events

Manage and correlate events from a variety of sources

IBM Tivoli Service Management Center for System z

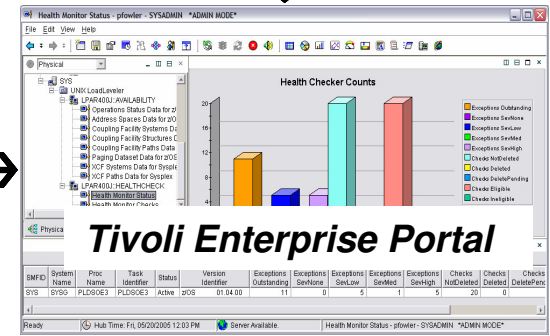
Enabling clients to strategically use their System z as an integrated, enterprise-wide, hub for the efficient management of business and IT services



<i>IBM Tivoli Service Request Manager</i>	<i>IBM Tivoli Change & Release Management</i>	<i>IBM Tivoli Business Continuity Process Manager</i>	<i>IBM Tivoli Business Service Manager</i>
<i>IBM Tivoli Application Discovery and Dependency Manager (TADDM)</i>	<i>IBM Tivoli Change and Configuration Management Database (CCMDB)</i>	<i>IBM Tivoli Service Request Manager</i>	
<i>IBM Tivoli Netview for z/OS, OMEGAMON, IBM Tivoli Composite Application Manager, DFSMS</i>	<i>IBM Tivoli System Automation & IBM Tivoli Workload Automation</i>	<i>IBM Tivoli Accounting & Usage Manager, Tivoli Decision Support for z/OS</i>	<i>IBM Tivoli Identify Manager, IBM Tivoli Access Manager, zSecure, Security Information and Event Mgmt, RACF</i>

IBM solutions that integrate via the Tivoli Enterprise Portal

z/OS Health check	z/OS Management Console
z/OS & USS	OMEGAMON XE on z/OS
NetView for z/OS	IBM Tivoli NetView for z/OS V5.3
Network	OMEGAMON XE for Mainframe Networks
DB2	OMEGAMON XE for DB2 PE/PM
CICS	OMEGAMON XE for CICS
IMS	OMEGAMON XE for IMS
Storage	OMEGAMON XE for Storage
WebSphere MQ	OMEGAMON XE for Messaging
WebSphere Appl Server	ITCAM for WAS
z/VM & Linux on z	OMEGAMON XE on z/VM and Linux
Distributed Monitoring	IBM Tivoli Monitoring (ITM) & ITCAM
Automation	SA for z/OS
DFSMS Audit	Advanced Audit for DFSMSshm
Catalog Management	Advanced Catalog Management for z/OS
SMF trend analysis Reports	Tivoli Decision Support for z/OS



Tivoli Enterprise Portal - *The Power Of The Portal*

The Tivoli Enterprise Portal enables integrated technical views and dramatically expands alert management capabilities

End To End Management View

Icons highlight a problem

Add...
CICS
DB2, IMS
Middleware
Network
Storage
z/OS plex
Distributed
z/OS
z/VM
Linux on z

Customizable graphic overview
User-definable drill downs for detail
Combine information from multiple sources

Situations Highlight Alert Scenarios And Provide Drill Down Detail For Analysis

Icons highlight alerts

Click to see alert detail

Alert details

Take Action

Expert Advice

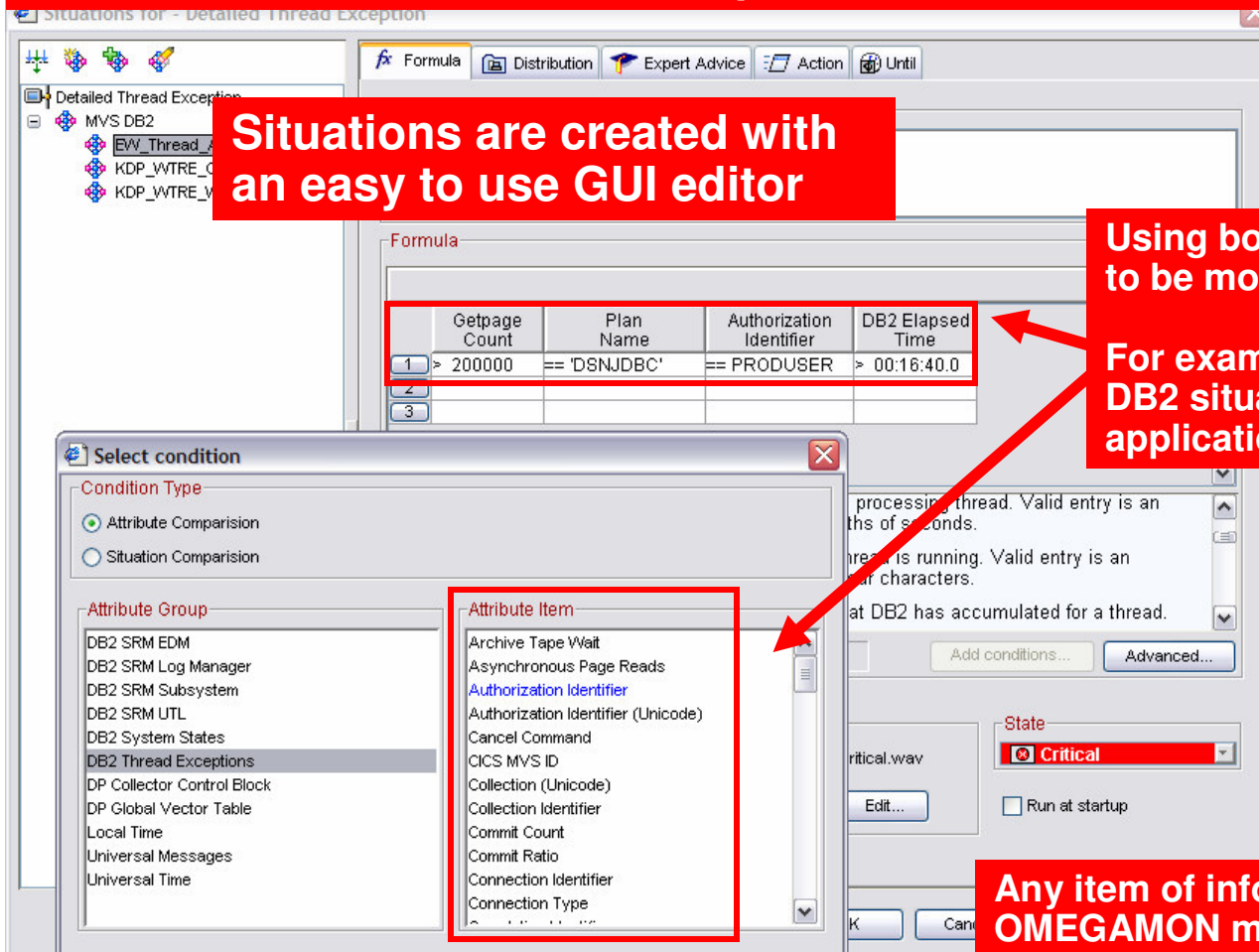
ADVICE("tm5:4*OS390_Allocated_CSA_Crit"),Demo Situation is "TRUE" - deeper analysis necessary!

Area	Allocation Percent	In Use Percent	Managed System	Allocation	In Use	Total Size	Unowned
CSA	62	58.8	DEMOPLX:MVSA:MVSSYS	2342912	2222080	3776512	13312
ECSA	33	33.0	DEMOPLX:MVSA:MVSSYS	133705728	43933760	263751168	471040
SQA	0	23.2	DEMOPLX:MVSA:MVSSYS	0	680960	2928640	25600
ESQA	0	42.8	DEMOPLX:MVSA:MVSSYS	0	28499968	61919232	2048

Area	Allocation Percent	In Use Percent	Managed System	Allocation	In Use	Total Size	Unowned
CSA	62	58.8	DEMOPLX:MVSA:MVSSYS	2342912	2222080	3776512	13312
ECSA	36	36.2	DEMOPLX:MVSA:MVSSYS	133705728	133065728	367751168	761856
SQA	0	23.2	DEMOPLX:MVSA:MVSSYS	0	680960	2928640	25600
ESQA	0	46.0	DEMOPLX:MVSA:MVSSYS	0	28499968	61919232	2048

Boolean Logic Capability Of Situations Makes Event Management More Meaningful And Powerful

OMEGAMON alerts are based upon a mechanism called a situation



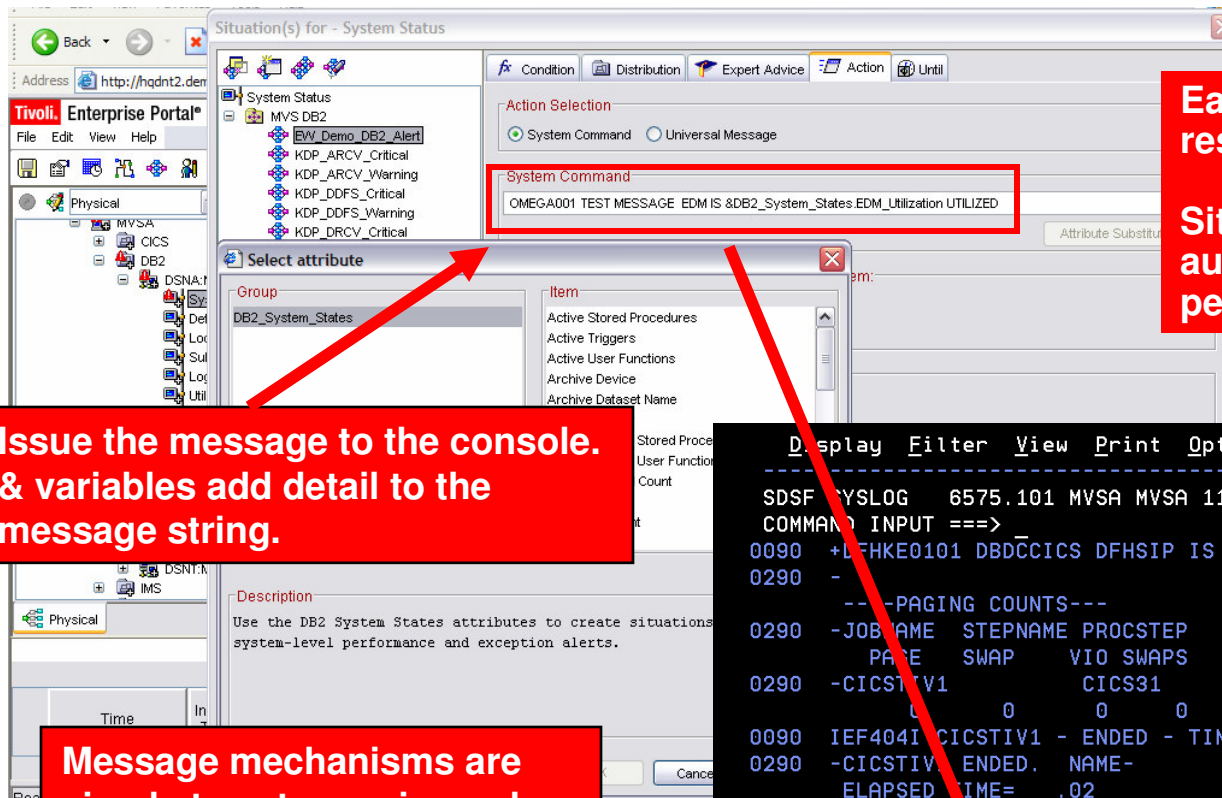
Situations are created with an easy to use GUI editor

Using boolean logic allows the alert to be more meaningful and useful

For example - A single OMEGAMON DB2 situation can handle multiple application or subsystem scenarios

Any item of information monitored by OMEGAMON may be used in a situation

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



Easy integration of automated responses to issues

Situations may be used to drive automated responses to performance issues

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.

```

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 +LFHKE0101 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
0090 IEF404I CICSTIV1 - ENDED - TIME=14.10.25
0290 -CICSTIV 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 *KLVS000 QUIESCE MODE IS IN EFFECT FOR FREE EXTENDED STORAGE
0290 OMEGA001 TEST MESSAGE EDM IS 90 UTILIZED
0090 AOF100I 14:11:21 : 'MONITOR' COMMAND ISSUED ON TARGET(S) DEMOMVS 098
    
```

0090 *KLVS000 QUIESCE MODE IS IN EFFECT FOR FREE EXTENDED STORAGE
0290 OMEGA001 TEST MESSAGE EDM IS 90 UTILIZED

Situations May Be Correlated With Other Situations

Correlated Alert Example

Correlates two situations. Both must be true for this situation to be true.

EW_CICS_RTA_Alert @MVSA.CICSAOR1	OS390_AvgCPU_Pct_Crit @DEMOPLX:MVSA:MVSSYS
1	
2	
3	

Select 'Add Conditions' to add additional logic.

Situation Formula Capacity: 0%

Buttons: Add conditions..., Advanced...

Situations

General Recommendations And Rules Of Thumb

- Make situations Meaningful, Actionable, and Useful
- Meaningful situations
 - Situation naming is flexible – make the names understandable
 - Adopt a situation naming convention
 - Makes it easier to identify customer created versus product provided situations
- Actionable situations
 - Have appropriate notification
 - A workspace with an alert icon, command/message notification
 - As a standard have expert advice
 - Have pre-defined take actions where appropriate
- Useful situations
 - Eliminate phony alert indicators – tune out the noise
 - If an alert situation fires it should indicate an actual issue
 - An alert, an owner, and a consequence

Tivoli Enterprise Portal

Advantages Of TEP Alert Mechanisms

- Tivoli Enterprise Portal alert advantages
 - Most flexible
 - Any monitored information may be used in an alert
 - Easy to set alerts for disparate systems from a single point of control
 - Easy to set up with GUI technology
 - Sets of pre-defined alerts (Product Provided Situations)
 - Automation capability integrated within the tool
 - Easiest way to integrate alerts with other core technologies (such as Netcool/OMNIBUS)
 - Superior monitoring and alert integration
 - Superior problem isolation and root cause analysis

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

The screenshot displays a single GUI window with several data panels:

- Global Enqueue and Reserve Data:** A table showing system enqueues.

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:** A table showing CPU usage for different system components.

Managed System	Average CPU Percent	MVS Overhead	Undispatched Tasks	Partition LCPD%	Partition PCPD%	Partition Overhead%	Total Enclave%
SP12:M...	6	5	0	7	7	0.30	0
SP22:M...	11	11	0	18	18	0.27	0
- Address Space CPU Utilization (MCPU02):** A table showing CPU usage for specific address spaces.

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:** A table showing paging statistics.

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:** A list of system alerts.

Status	Situation Name	Display Item	Origin Noc
Raised	Sysplex_DASD_Dev_ContIdx_Warn		LPAR400J:MVS:SY
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVS:SY
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVS:SY
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVS:SY
Raised	Sysplex_Workloads_PerfIdx_Crit		LPAR400J:MVS:SY

TWO MVS LPARS SP12 & SP22

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

Tivoli Enterprise Portal Integrated Command And Automation Options

- The TEP provides multiple command options
 - Manual 'Take Action', Situations, Policies
- Take Action provides for manual command capability
 - Commands may be predefined
- Situations are the basic building blocks for alerts and notification
 - Situations drive alerts and notification
 - Situations offer automated reflex action command function
- Policies allow for multiple step commands, checks, and automated actions
 - Policies consist of a combination of situations, commands, and other checks
 - Policies provide added flexibility and power
 - Policies may be used as a form of event correlation

Basic Policy - Example Scenario

Have A Situation Trigger Multiple Commands

The screenshot displays the 'Workflows' application window. At the top, the 'Policy Details' section shows the policy name 'dnet581_demo_basic_pol' and a red annotation 'Policy executes & restarts' pointing to the 'Restart' checkbox. The main area is the 'Workflow Editor' in 'Grapher View' for the policy 'dnet581_demo_basic_pol'. The workflow consists of three main steps:

- Wait until Demo_DB2_Alert is True:** A red annotation 'Check for DB2 Alert' points to this step.
- Take action: LOG 'This is...':** A red annotation 'Issue first command' points to this step, which is reached via a transition labeled 'Situation is true'.
- Take action: LOG 'This i...':** A red annotation 'Issue second command' points to this step, which is reached via a transition labeled 'Action succeeded' from the first action.

The 'Workflow components' pane on the left shows available activities: 'Wait until a situation is True', 'Evaluate a situation now', and 'Take action or Write message'. The bottom of the window shows the user 'Edward A. Wood' and standard 'OK', 'Cancel', 'Apply', and 'Help' buttons.

Policy Example

Multiple Situations, Multiple Commands

Correlate by host name

Check DB2 alert

Issue command

Check MQ alert

Issue command

Note – The DB2 alert and the MQ alert are independent events. The same would apply for two situations of the same agent type or managed system.

Integrated Automation With SA for z/OS

Situation: TxIMSMON

OMEGAMON XE for z/OS:
 If growth of "CSA Usage of IMS" exceeds threshold
 THEN
 Tell SA z/OS about this via the INGSIT command

Action Selection
 System Command Universal Message

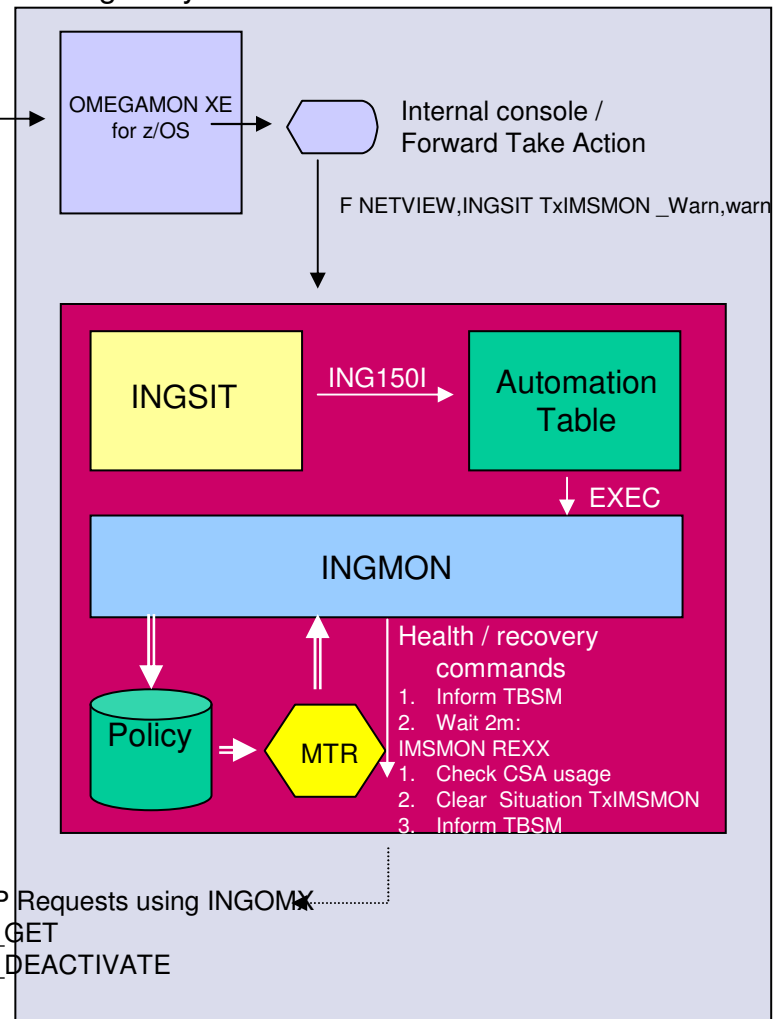
System Command
 F NETVIEW,INGSIT TxIMSMON _Warn,warn

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 (TEMS)

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

Managed System



Considerations for Automation Levels Of Automated Actions

- Automated actions may be invoked at various levels
 - Situations, Policies, IBM System Automation
- Situations may be used for basic ‘fire and forget’ type corrective actions
 - Issue commands based upon a check
- Policies may be used for multi-check and multi-command scenarios
- For more complex automation requirements, automation is best done by an automation engine (such as IBM System Automation)
 - Use Situations and Policies as a way to feed alerts and information to console automation

Considerations For Event Correlation

- Event correlation helps to improve the ability to manage increasingly complex composite applications
 - Applications are more complex
 - Infrastructure is more complex
 - Alerts are more complex
- Event correlation helps to eliminate the “noise” and focus on key issues
 - Tune out false alerts and focus on root cause analysis
 - Identify potential issues more rapidly
 - Reduce time to problem resolution
- Event correlation helps to enable an integrated approach to the management of subsystems, platforms, and application components

About IBM Tivoli Netcool/OMNIbus

- IBM Tivoli Netcool/OMNIbus is the cornerstone of the IBM Tivoli Consolidated Operations Management solution
 - Delivers real-time, centralized monitoring of complex networks and IT domains
 - Event processing scalability that can exceed over 100 million events per day
- Netcool/OMNIbus includes over two hundred out-of-the-box probes (and more than 25 vendor alliances)
 - Enables the ability to include events from virtually any management system or device in the network or IT environment
- Unique manager-of-manager capabilities for reduced operational expense
 - Depth and breadth of event coverage and correlation
 - Software failover for highly available consolidated operations management
 - Event-processing efficiency resulting in cost savings and unmatched scalability

Situation Alerts May Be Forwarded To OMNIBus

Situation Editor with EIF tab enabled

TEP

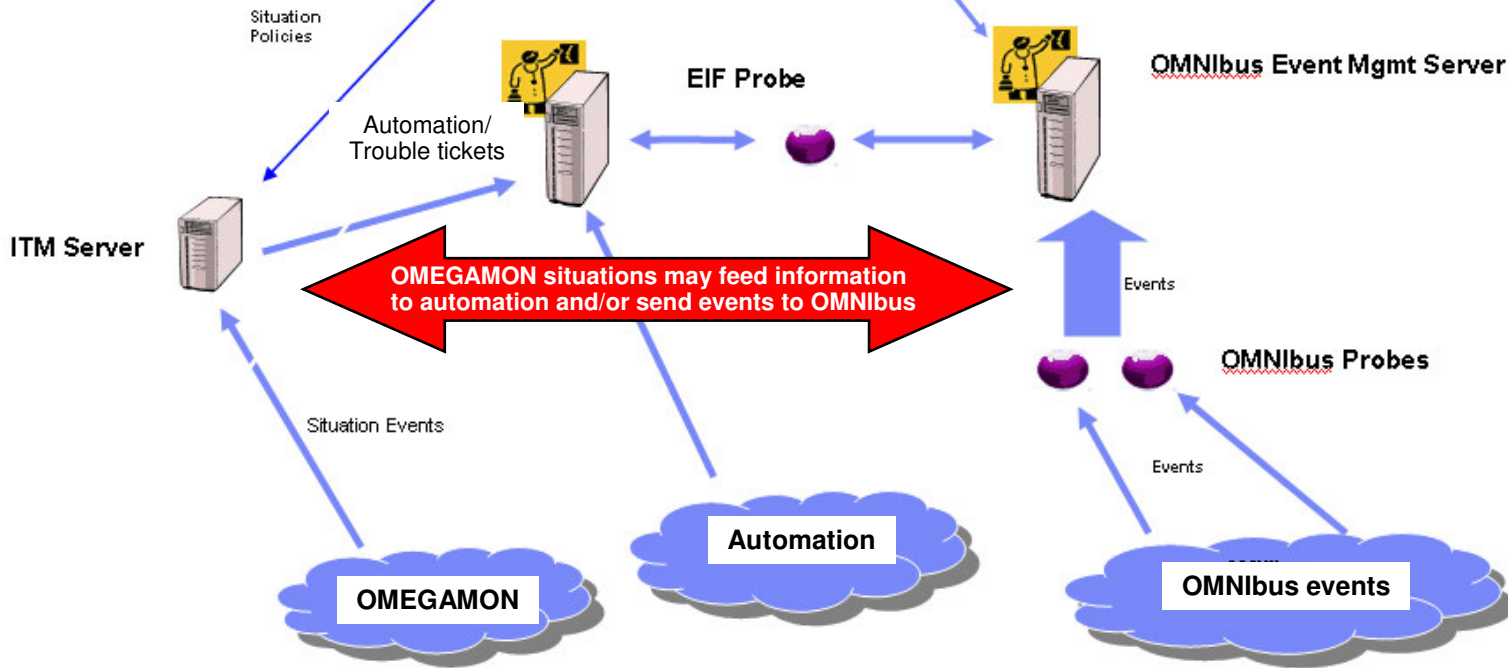
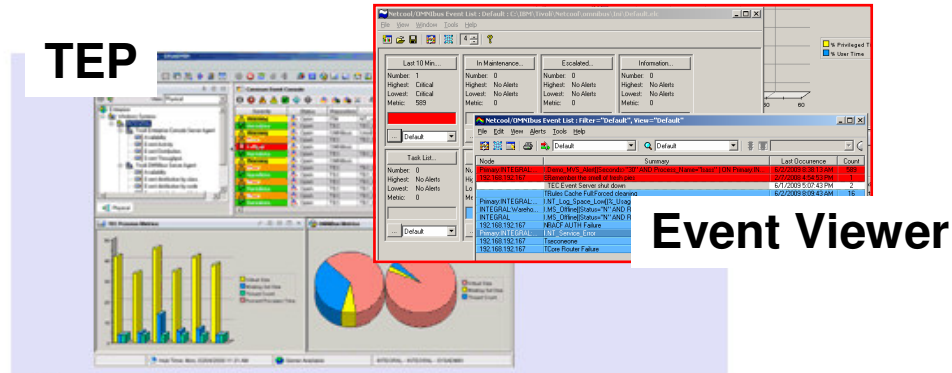
Severity	Status	Source	Situation Name	Display Item	Source
Critical	Open	Sysplex_Workloads_PerfIdx_Crit			LPAR400J:MVS:SYSPLEX
Critical	Open	kjk5_test			LPAR400J:SP22:MVSSYS
Critical	Open	kjk4_test			LPAR400J:SP22:MVSSYS
Critical	Open	kjk3_test			LPAR400J:SP22:MVSSYS
Critical	Open	kjk2_test			LPAR400J:SP22:MVSSYS
Critical	Open	kjk1_test			LPAR400J:SP22:MVSSYS
Critical	Open	OS390_LPAR_OverheadPercent_Crit			LPAR400J:SP22:MVSSYS
Warning	Open	OS_CMD_DASD_Device_ContIdx_Warn			LPAR400J:MVS:SYSPLEX
Critical	Open	OS390_AvgCPU_Pct_Crit			LPAR400J:SP22:MVSSYS
Warning	Open	Sysplex_DASD_Dev_ContIdx_Warn			LPAR400J:MVS:SYSPLEX
Critical	Open	KR9_TB3M_Web_App_Critical			VBS5RV6:R9

Events in OMNIBus

Node	Alert Group	Summary	Last Occurrence	Count	
LPAR400J:SP22:MV...	ITM_Address_Space_CPU_Utilization	kjk4_test[[Independent_Active_Enclave_Count<99] ON LPAR400J:SP22:MVSSYS (Indepen...	6/24/2008 12:37:24...	2	ITM P
LPAR400J:SP22:MV...	ITM_Address_Space_CPU_Utilization	kjk3_test[[Independent_Active_Enclave_allP%_On_CP<>99.0] ON LPAR400J:SP22:MVSSYS (Indepen...	6/24/2008 12:32:34...	2	ITM P
LPAR400J:MVS:SY...	ITM_Sysplex_WLM_Service_Class_Period	OS_CMD_WLM_Performance_Idx_Crit[[Performance_Index>1.50] ON LPAR400J:MVS:SYSPL...	6/24/2008 11:45:30...	5	ITM P
VBS5RV6:R9	ITM_KR9_TB3M_URL_MONITOR	KR9_TB3M_Web_App_Critical[[HTTPResponseCode<>200] ON VBS5RV6:R9[HTTPRespons...	6/21/2008 3:54:03...	1	ITM P
vbs5rv5	Administrator	Attempt to login as root from host vbs5rv5 failed	6/20/2008 10:19:38...	1	Proble
Primary:VBS5RV6:NT	ITM_TCP_Statistics	estme[[Segments_Sent/sec<0] ON Primary:VBS5RV6:NT (Segments_Sent/sec=2]]	6/24/2008 9:27:14...	1	ITM P
VBS5RV5	isql	isql process running on VBS5RV5 has connected as username root	6/20/2008 11:11:46...	1	Proble
LPAR400J:SP22:MV...	ITM_DASD_MVS_Devices	kjk5_test[[I/O_Rate<>99.0] ON LPAR400J:SP22:MVSSYS (I/O_Rate=0.0]]	6/24/2008 12:42:26...	2	ITM P
LPAR400J:SP22:MV...	ITM_USS_Address_Spaces	kjk2_test[[CPU_Time%<>99.00] ON LPAR400J:SP22:MVSSYS (CPU_Time%=0.08]]	6/24/2008 12:22:44...	2	ITM P
LPAR400J:SP22:MV...	ITM_USS_Address_Spaces	kjk1_test[[CPU_Seconds%>=0.000] ON LPAR400J:SP22:MVSSYS (CPU_Seconds%=747.473)]]	6/24/2008 12:17:31...	3	ITM P
LPAR400J:MVS:SY...	ITM_Sysplex_DASD	OS_CMD_DASD_Device_ContIdx_Warn[[Average_Devic...		1	ITM P
LPAR400J:MVS:SY...	ITM_Sysplex_DASD	Sysplex_DASD_Dev_ContIdx_Warn[[Average_Devic...		1	ITM P
vbs5rv5	Windows Event List	NT Event List@092A15EC process running on vbs5rv5		2	Proble
LPAR400J:MVS:SY...	ITM_Sysplex_WLM_Service_Class_Period	Sysplex_Workloads_PerfIdx_Crit[[Performance_Index>1.50] ON LPAR400J:MVS:SYSPL...		1	ITM P

Improving The Integration How Does The TEP Integrate With Netcool?

OMNIBus
Integration enables customer to forward events reported by OMEGAMON XE monitoring agents to Netcool/Omnibus



Enabling The EIF Interface (z/OS Hub TEMS)

```

----- PRODUCT COMPONENT SELECTION MENU -----

The following list of components requires configuration to make the product
operational. Refer to the appropriate configuration documentation if you
require additional information to complete the configuration.
To configure the desired component, enter the selection number on the command
line. You should configure the components in the order they are listed.

Note: It may not be necessary to configure Tivoli Enterprise Monitoring Server
(TEMS) component, if listed below. Press F1 for more information.

COMPONENT TITLE
1 Tivoli Enterprise Monitoring Server
2 OMEGAVIEW
3 OMEGAVIEW II for the Enterprise
    
```

The ICAT configuration tool I used to configure OMEGAMON on z/OS. ICAT has an option to enable the EIF interface.

```

----- CONFIGURE THE TEMS / RTE: TVT5036 -----

Each RTE can contain only one TEMS. To configure
the TEMS for this RTE, perform these steps in order:

I Configuration information (What's New) <=== Revised

1 Create LU6.2 logmode 09/09/16 11:31
2 Specify configuration values 09/06/09 12:45
3 Specify communication protocols 09/06/09 12:45
4 Create runtime members 09/09/15 00:58
5 Configure persistent datastore 09/08/19 12:06
6 Complete the configuration

Optional:

7 View TEMS list and registration status
8 Generate sample migration JCL 09/06/09 12:45
    
```


Enabling The EIF Interface (z/OS Hub TEMS) - continued

```

----- SPECIFY CONFIGURATION VALUES -----
Started task          ==> CANSDSST
Type (Hub or Remote) ==> HUB
Hub TEMS type        ==>     (HA=High Availability)

Security settings:
Validate security?   ==> N (Y, N)

TMS password encryption information:
Integrated Cryptographic Service Facility (ICSF) installed? ==> N (Y, N)
ICSF load library
==> CSF.SCSFMODE
TMS encryption key
==> IBMTivoliMonitoringEncryptionKey

Program to Program Interface (PPI) information:
Forward Take Action commands to NetView for z/OS? ==> N (Y, N)
NetView PPI receiver ==> CNMPCMDR
TEMS PPI sender      ==>    
Enter=Next F1=Help F3=Back F5=Advanced
    
```

Hit 'F5' for the advanced option to enable EIF

```

----- SPECIFY ADVANCED CONFIGURATION VALUES -----
Enable Web Services SOAP Server          ==> Y (Y, N)
Enable Tivoli Event Integration Facility (EIF) ==> N (Y, N)
Enable startup console messages          ==> Y (Y, N)
Enable communications trace               ==> N (Y, N, D, M, A)
Reconnect after TCP/IP recycle           ==> N (Y, N)
Enable storage detail logging            ==> Y (Y, N)
  Storage detail logging: Hours          ==> 00 (0-24) Minutes ==> 60 (0-60)
  Flush VSAM buffers: Hours              ==> 00 (0-24) Minutes ==> 30 (0-60)
Virtual IP Address (VIPA) type            ==> N (S=Static, D=Dynamic, N=None)
Minimum extended storage                  ==> 768000 K
Maximum storage request size              ==> 16 (Primary) ==> 23 (Extended)
Language locale                           ==> 1 (Press F1=Help for a list of codes)
    
```

Enabling The EIF Interface (Windows Hub TEMS)

The screenshot shows the 'Manage Tivoli Enterprise Monitoring Services - TEMS Mode - [Local Computer]' window. A table lists various services, including 'Tivoli Enterprise Monitoring Server' (TEMS1). A context menu is open over the TEMS1 entry, with 'Reconfigure...' selected. A red arrow points from this menu to the 'Tivoli Enterprise Monitoring Server Configuration' dialog box. In this dialog, the 'Tivoli Event Integration Facility' checkbox is checked. Another red arrow points from the 'Tivoli Event Integration Facility' checkbox back to the 'Reconfigure...' menu item. A third red arrow points from a red text box at the bottom left to the 'Tivoli Enterprise Monitoring Server' entry in the table.

Service/Application	Task/SubSystem	Configured	Status	Startup	Account	Desktop	HotStdy	Versic
✓ Demo Monitoring Agent for Sybase	Primary	Yes (TEMS)	Stopped	Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Oracle	Primary	Yes (TEMS)	Stopped	Manual	LocalSystem	No	No	06.20
✓ Demo Monitoring Agent for Micros...	Primary	Yes (TEMS)	Stopped	Manual	LocalSystem	No	No	06.10
✓ Monitoring Agent for Windows OS	Primary	Yes (TEMS)	Stopped	Manual	LocalSystem	Yes	No	06.21
✓ Demo Monitoring Agent for Mainfra...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for WebSp...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for z/OS	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Linux OS	Primary			Manual	LocalSystem	No	No	06.20
✓ Demo Monitoring Agent for TEC He...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for I...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Micro...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for ITCAM...	Primary			Manual	LocalSystem	No	No	06.10
✓ Warehouse Proxy	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for CICSTG	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Lotus D...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Micros...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Active ...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Eaton P...	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for DB2 on ...	Primary			Manual	LocalSystem	No	No	06.10
✓ ITCAM for SOA	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for CICS	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for i5OS	Primary			Manual	LocalSystem	No	No	06.10
✓ Demo Monitoring Agent for Active ...	Primary			Manual	LocalSystem	No	No	06.10
✓ Tivoli Enterprise Monitoring Server	TEMS1	Yes	Stopped	Manual	LocalSystem	No	No	06.10

Tivoli Enterprise Monitoring Server Configuration

TEMS Type: Hub Remote

TEMS Name: HUB_IBM-1E47754C52F

Protocol for this TEMS:

- Protocol 1: IP.UDP
- Protocol 2:
- Protocol 3:

Tivoli Event Integration Facility

Disable Workflow Policy/Tivoli Emitter Agent Event Forwarding

Configure Hot Standby TEMS

OK Cancel

Right click on the windows TEMS to access the configuration option

OMEGAMON Integration With OMNIbus

- In many environments alerts are forwarded from the mainframe to OMNIbus via SNMP trap interfaces
 - For example, have SA Automation issues a REXX exec to send a trap
 - Process works and is easy to set up
 - SNMP traps may offer limited granularity of detail that may be passed on to OMNIbus
- EIF interface
 - More integrated and flexible to use
 - Integrated directly within the Tivoli Enterprise Portal interface
 - Pass more detailed information (EIF information may be customized)
 - Map Tivoli Portal attributes to be passed through the EIF interface

Pulling It All Together

- OMEGAMON Classic provides a basic set of alert functions
 - Classic alerts are limited to those provided by the OMEGAMON tool
- The Tivoli Enterprise Portal provides more robust alert capabilities in the form of Situations and Policies
 - Situations provide for more meaningful and robust alerts
 - Situations and policies provide easy to invoke automation functions
 - Situations and policies provide basic event correlation
 - Use situations and policies to tune out the noise and provide the most useful and meaningful alerts
- More robust event correlation is best done by a correlation engine, such as OMNIbus
 - OMNIbus may handle millions of events per day
 - OMNIbus may be fed via a variety of interfaces, such as SNMP or the EIF interface
 - OMNIbus may in turn feed Business views of the enterprise

Thank You!