Building End To End Business Application Views With 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

for **Industries**

for **Design & Delivery**

for **Data Centers**

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

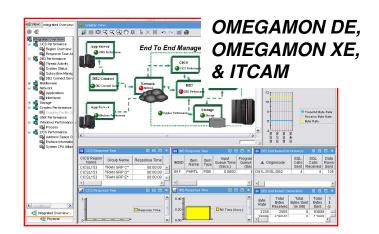Drive down cost, minimize human error and increase productivity
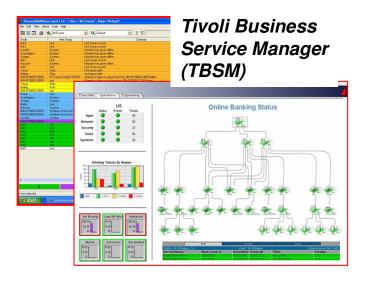
Why Monitoring And Management Dashboards?

- Are you getting the most from your investment in technology, hardware, and software?
- Are you able to recognize and resolve issues efficiently?
  - ➤ *Manage Technology*
- Are you able to manage the enterprise from an 'End to End' perspective?
- Are you able to maximize the performance and availability of you critical business applications?
  - ➤ *Manage Business Systems*

Dashboard Creation Alternatives
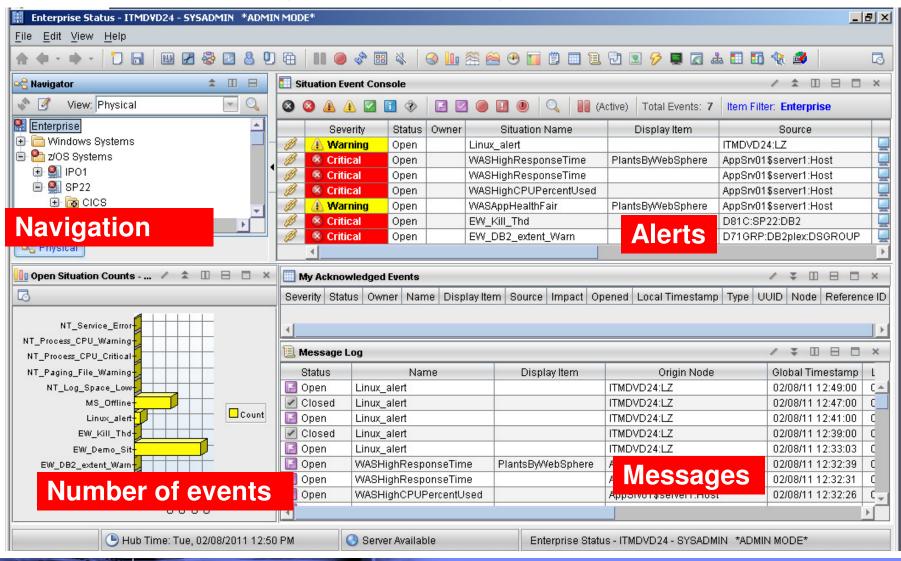## Tivoli Enterprise Portal Versus Tivoli Business Service Manager

- **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

OMEGAMON DE, OMEGAMON XE, & ITCAM

- **Look at TBSM to grow and expand the notion of dashboards and business application management**
  - Components like TADDM can analyze application dependencies and automate the process
  - TBSM shows SLAs
  - Event correlation via OMNIBus
  - Expandable and scalable for large enterprises

Tivoli Business Service Manager (TBSM)

Tivoli Enterprise Portal
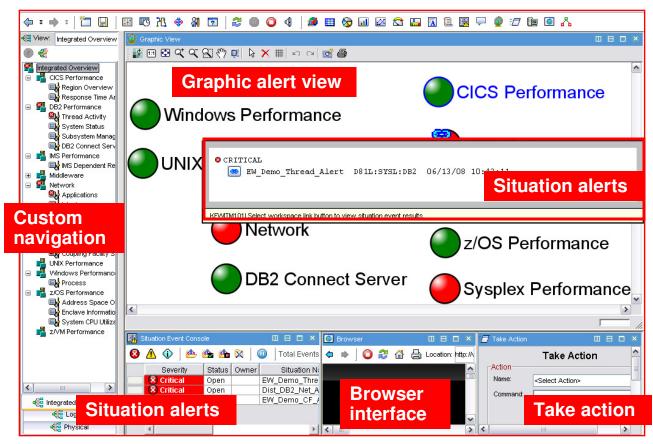# Provides An Integrated Management Interface

Using Tivoli Enterprise Portal (TEP) To Create An Effective Dashboard

- **It's easy to create dashboard views using Tivoli Enterprise Portal**
  - The TEP is flexible and easily customizable
  - Create views using facilities included with OMEGAMON and other Tivoli tools

- **What's required**
  - Tivoli Enterprise Portal
  - OMEGAMON monitoring agents, ITM distributed monitoring, or other various Tivoli solutions
  - OMEGAMON Dashboard Edition (DE)
    - Note – OMEGAMON DE is usually included with ITM distributed monitoring but may be an additional charge item for z/OS only customers (check with your Tivoli rep)

- **What can you include in your view?**
  - Select from a wide array of IBM Tivoli and other sources
    - OMEGAMON, ITM monitoring, ITCAM, Automation, Scheduling
  - Additional sources using means such as Universal agent (UA)
    - File, Socket, SNMP, ODBC and many other data providers

An Example Dashboard
An Integrated Problem Management Paradigm

- Use the graphics and integration capabilities of the Tivoli Enterprise Portal to provided 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

Definition - Business Application View

- **Management of performance and availability from the perspective of a mission critical business application**
  - Technical view - focuses on the status of technical components
  - Business view - focuses on how technology impacts the business
- **Components of a Business Application View**
  - Availability
    - Is the application and it's infrastructure components available?
    - Are users able to access the application?
  - Performance
    - How well is the application performing?
    - What is the end user experience?
    - Are Key Performance Indicators (KPIs) being met?
  - Alerts
    - Notification when issues occur
  - Real time and Historical information available
    - The ability to trend and analyze over time

Building An End To End Business Application View
The Critical Steps
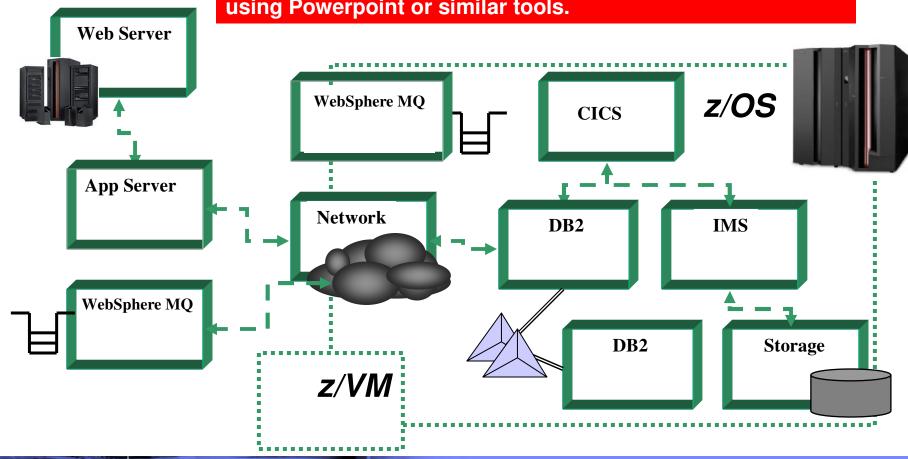
- **Map the application**
- **Identify the major resources**
  - Platforms, processors, and core technology components
  - Software processes and critical tasks
  - Transactions – what constitutes the application flow
  - Databases – data sources (DB2, IMS, Oracle, other)
  - Infrastructure – Network and middleware (ex. MQ)
- **Identify monitoring information sources**
  - OMEGAMON monitoring agents (various components)
  - ITCAM and ITM monitoring agents (distributed and end to end response)
  - Other sources (Universal Agent, automation, network management, and other)
- **Define a working prototype**
  - Creating a Business Application view is an iterative process
- **Define alerts and notifications**

First Step - Map The Application
Create A Graphic That Represents The Application Flow

> ➤ **Start with a "chalk talk" of the application flow.**
> ➤ **Use this process to create a custom graphic to represent the inter-relationship of the core application components using Powerpoint or similar tools.**

Second Step - Identify The Major Resources
Drill Down For More Detail

- **Once the high level map is defined - drill down for more technical detail**
  - Identify the critical path resources required for the application
    - What are the resources and what are the inter-relationships?
    - Usually requires input from SMEs to identify key resources
- **What are the resources?**
  - Computing platforms and operating systems
    - z/OS, z/VM, Linux, UNIX, Windows, Linux on z
    - CPU, disk/DASD storage, memory, paging
  - Software components and critical software processes
    - Web Servers, Application Servers, WebSphere
    - Middleware layers, WebSphere MQ queues

- # What are the resources?   -   continued

- # Databases and critical data sources
  - What are the specific subsystems, databases and tables required?
    - DB2, IMS, and CICS VSAM on z/OS
    - DB2, Oracle, Sybase, SQL Server on LUW platforms
- # Transactional infrastructure
  - CICS and IMS
    - What are the subsystems, regions, transactions and programs?
  - WebSphere MQ queue managers
- # Infrastructure – Network and middleware
  - Network stacks on various platforms
  - Networks connections and network listener processes
  - Network interfaces

Third Step
Identify Monitoring Information Sources

- **General considerations on monitoring data sources**
  - What are the available monitoring information sources?
  - How may the information be visualized?
  - How may the information be integrated?
- **OMEGAMON monitoring agents for z/OS**
  - OMEGAMON XE for z/OS, CICS, IMS, DB2, Storage, Mainframe Networks
  - OMEGAMON for z/VM and Linux on z
- **IT Composite Application Monitoring – ITCAM**
  - ITCAM for Transactions – End to end Transactional analysis
  - ITCAM for Application Diagnostics – application level analysis
- **IBM Tivoli Monitoring (ITM) agents - distributed monitoring**
  - ITM monitoring for LUW operating systems
  - ITM monitoring for distributed databases (DB2, Oracle, Sybase, SQL Server)
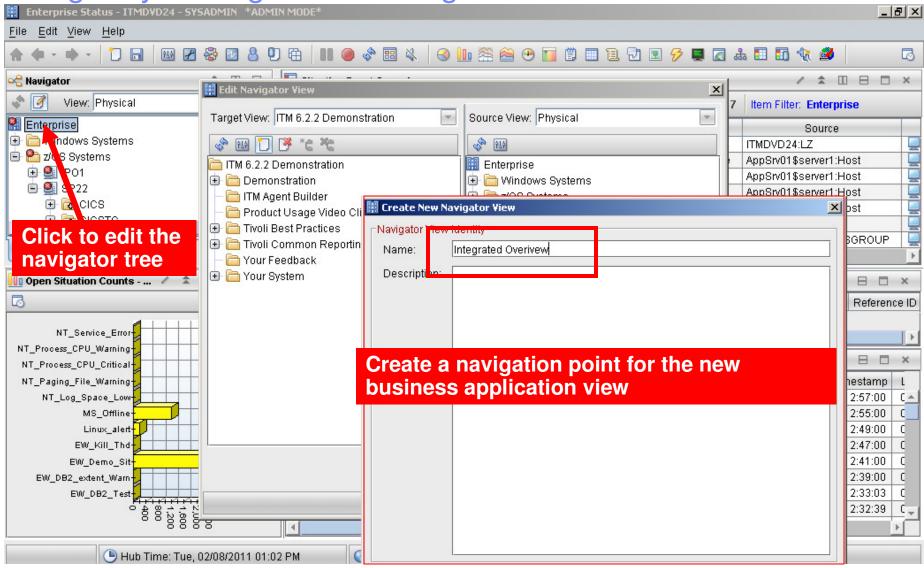
Third Step
Identify Monitoring Information Sources - continued

- **Network management sources**
  - NetView on z/OS – monitoring agent for TEP enablement
  - OMEGAMON Mainframe Networks
  - Netcool/OMNIbus integration with the Tivoli Enterprise Portal
- **Automation**
  - IBM System Automation (SA) integration with the Tivoli Enterprise Portal
    - Track started task/subsystem status, critical messages, WTORs
- **Additional information sources**
  - IBM Universal Agent
    - Many data providers – SNMP, Socket, File, HTTP, JDBC and more
  - Other IBM solutions
    - Tivoli Decision Support, Storage tools, Asset discovery and more

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 DFSMShsm*
Catalog Management	*Advanced Catalog Management for z/OS*
SMF trend analysis Reports	*Tivoli Decision Support for z/OS*

Tivoli Enterprise Portal

Views With Tivoli Enterprise Portal
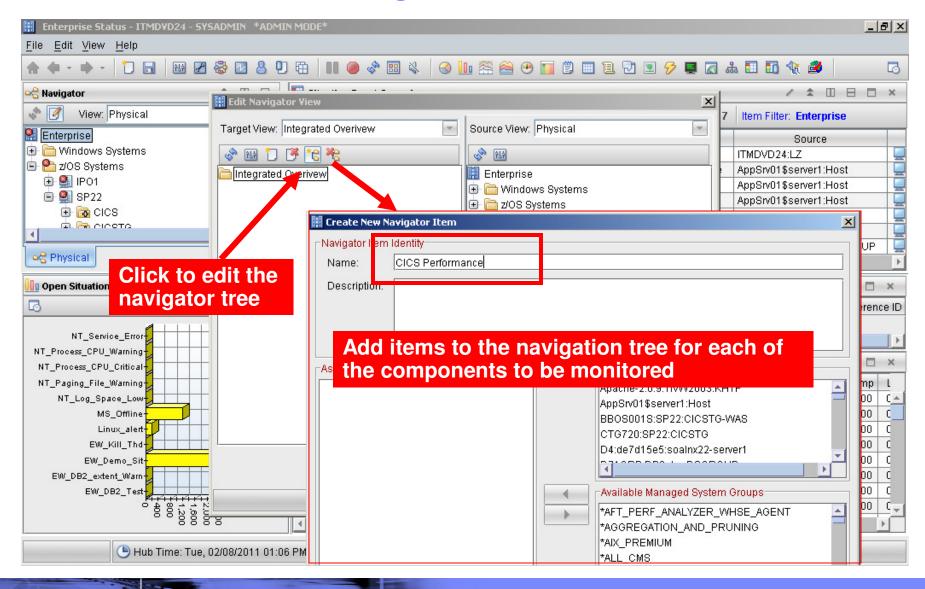
Fourth Step - Create A Working Prototype
Begin By Adding A New Navigation Item For Customization

Add Detail To The Navigation Tree

Click to edit the navigator tree

Add items to the navigation tree for each of the components to be monitored
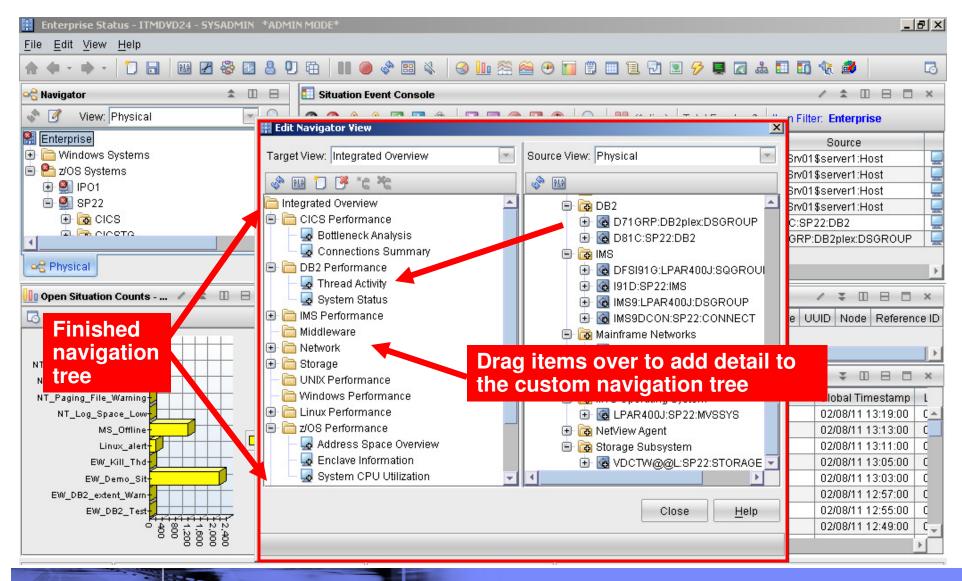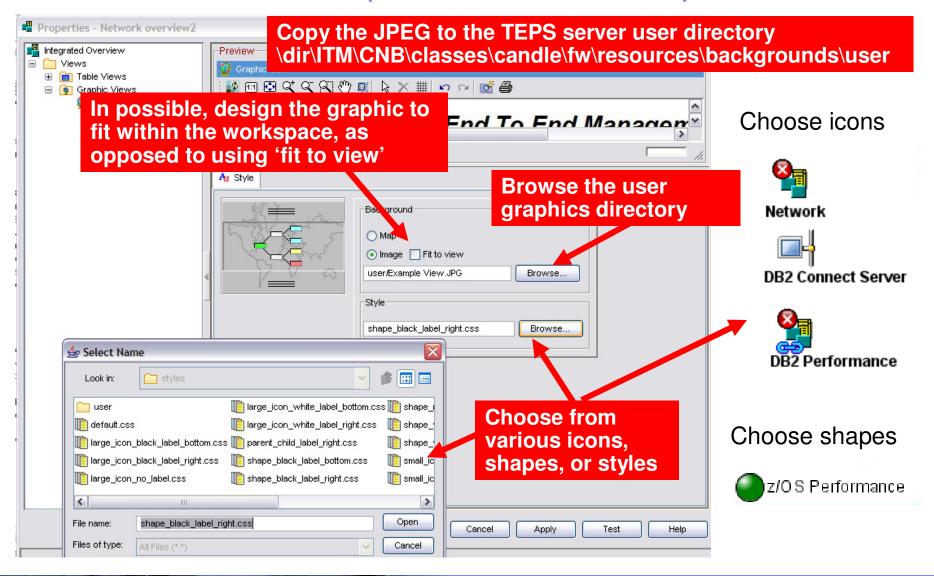
Add Detail To The Navigation Tree - continued

Finished navigation tree

Drag items over to add detail to the custom navigation tree
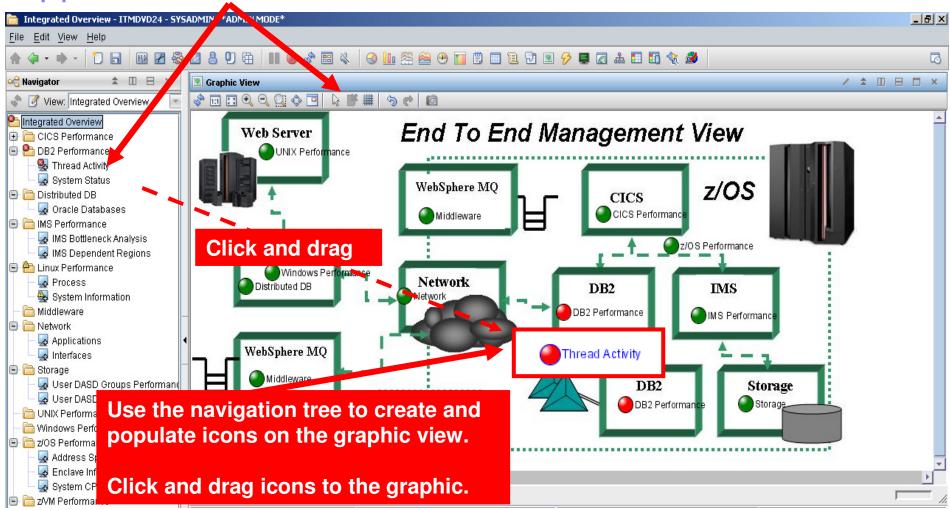
Add The Custom Graphic To The Workspace

Copy the JPEG to the TEPS server user directory \dir\ITM\CNB\classes\candle\fw\resources\backgrounds\user

In possible, design the graphic to fit within the workspace, as opposed to using 'fit to view'

Browse the user graphics directory

Choose from various icons, shapes, or styles

Choose icons

Network

DB2 Connect Server

DB2 Performance

Choose shapes

z/OS Performance
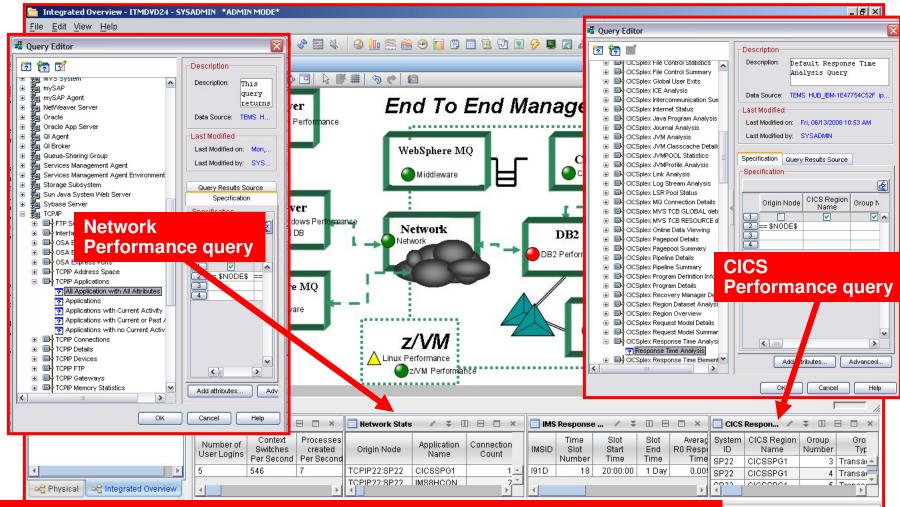
Further Customizing The End To End Business Application View

Click and drag

Use the navigation tree to create and populate icons on the graphic view.

Click and drag icons to the graphic.
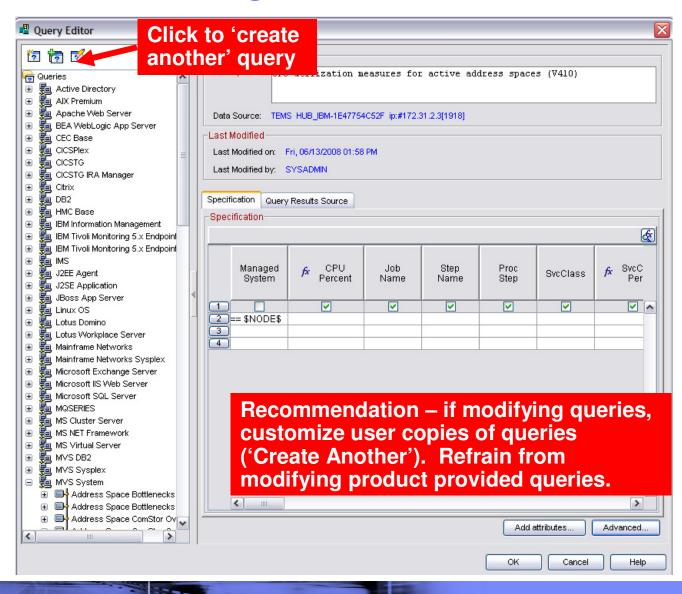
Add More Detail To The Workspace
Queries And Customization To Add More Information

Information from monitoring agent queries and the graphic overview may be integrated into the end to end business application view

Understanding Queries

Click to 'create another' query
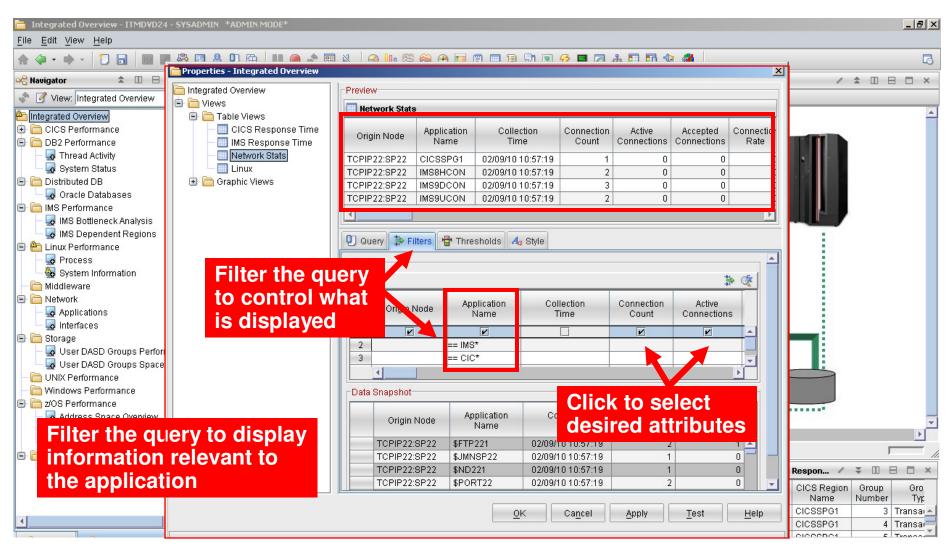
- Queries control the content of the workspaces
- Use queries to make the workspace targeted to the application
- OMEGAMON and other Tivoli solutions provide pre-defined queries for the TEP
- Users may make user defined queries
- User defined queries may be used to pre-process data (filter, sort, etc.)
- Queries may consist of custom SQL

Recommendation – if modifying queries, customize user copies of queries ('Create Another'). Refrain from modifying product provided queries.
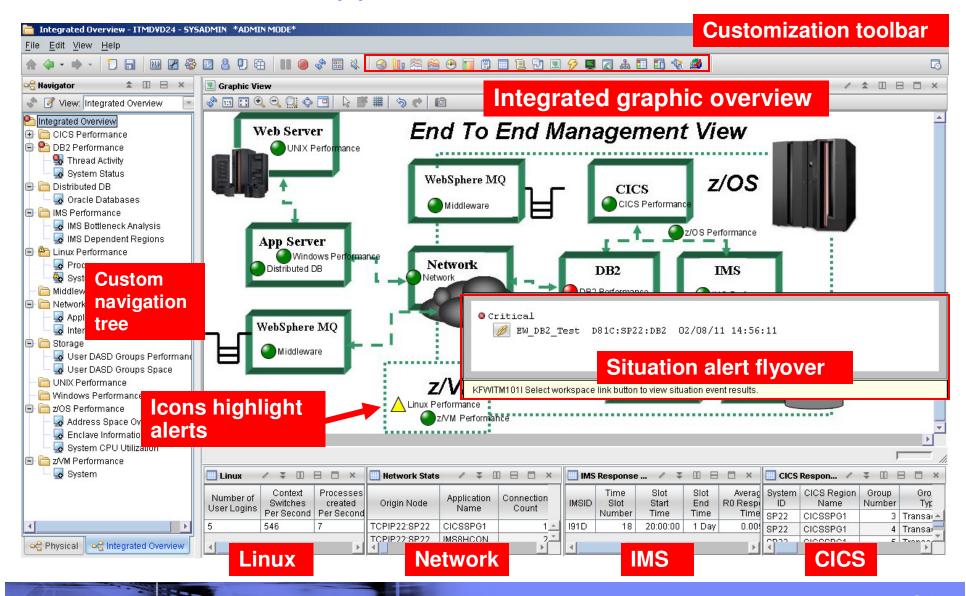
Apply Filters To Customize And Target The Display

Filter the query to control what is displayed

Filter the query to display information relevant to the application

Click to select desired attributes
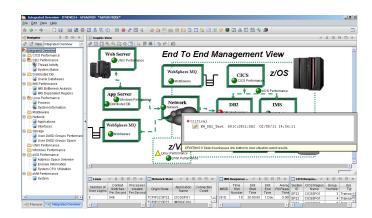
The End To End Application View

Customization toolbar

Integrated graphic overview

Custom navigation tree

Situation alert flyover

Icons highlight alerts

Linux

Network

IMS

CICS

Portal Workspace Customization
General Suggestions And Considerations

- **When customizing workspaces be aware of the target audience**
  - Technical requirements
  - Physical display capabilities
- **Design screens with speed and utility in mind**
  - Responsiveness of the display impacts its potential benefit
- **Considerations that may impact performance**
  - Amount of graphics
  - Graphical overviews
  - Tabular versus chart/graph data
  - Quantity of data requested
  - Number of managed systems referenced in the workspace
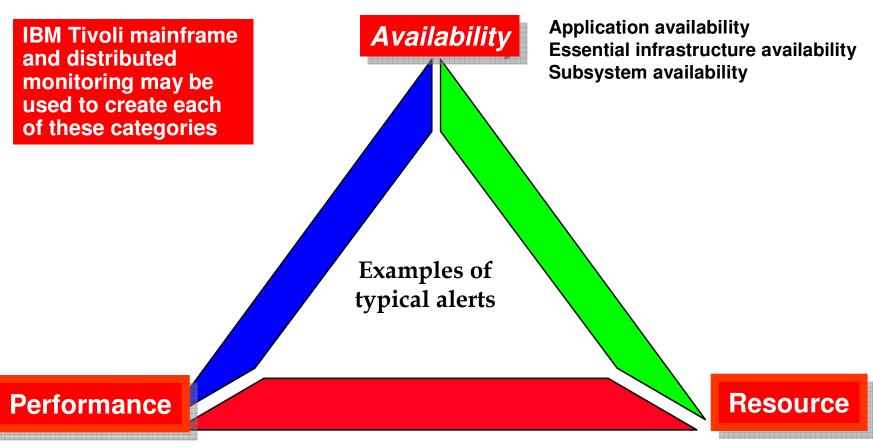
Fifth Step – Add Alerts To End To End Display Alert Notification Types And Options

- **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**

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

Resource
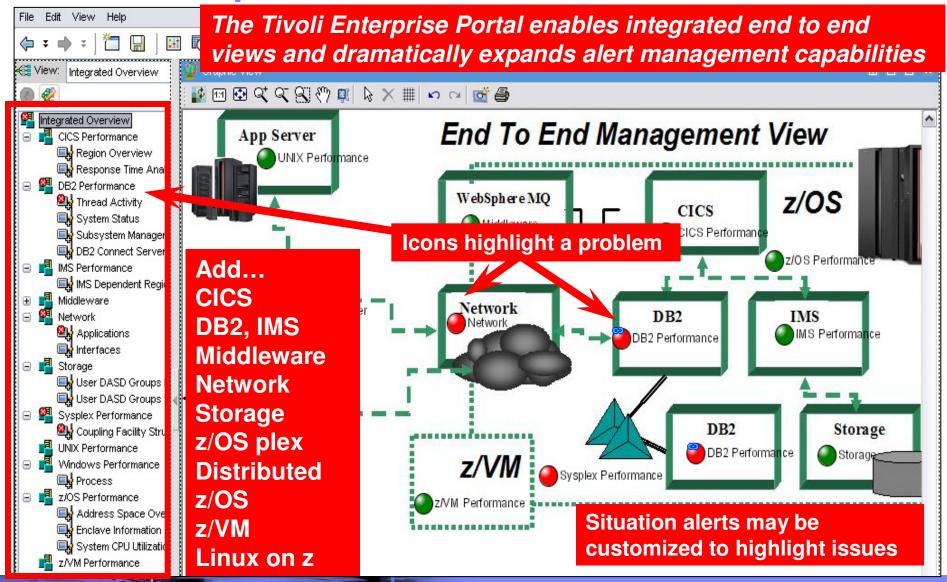
Subsystem performance
Application performance
Identification of performance issues

Subsystem resource utilization
Application resource utilization

Tivoli Enterprise Portal - *The Power Of The Portal*

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

File   Edit   View   Help

View: Integrated Overview

Integrated Overview
- CICS Performance
  - Region Overview
  - Response Time Ana...
- DB2 Performance
  - Thread Activity
  - System Status
  - Subsystem Manager
  - DB2 Connect Server
- IMS Performance
  - IMS Dependent Regio
- Middleware
- Network
  - Applications
  - Interfaces
- Storage
  - User DASD Groups
  - User DASD Groups
- Sysplex Performance
  - Coupling Facility Stru
- UNIX Performance
- Windows Performance
  - Process
- z/OS Performance
  - Address Space Ove
  - Enclave Information
  - System CPU Utilizatio
- z/VM Performance

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

Graphic View

End To End Management View

App Server
- UNIX Performance

WebSphere MQ
- Middleware

CICS
- CICS Performance

z/OS

- z/OS Performance

Icons highlight a problem

Network
- Network

DB2
- DB2 Performance

IMS
- IMS Performance

z/VM
- z/VM Performance

DB2
- DB2 Performance

Storage
- Storage

- Sysplex Performance

Situation alerts may be customized to highlight issues

Situations Highlight Alert Scenarios And Provide Drill Down Detail For Analysis

Icons highlight alerts

Click to see alert detail

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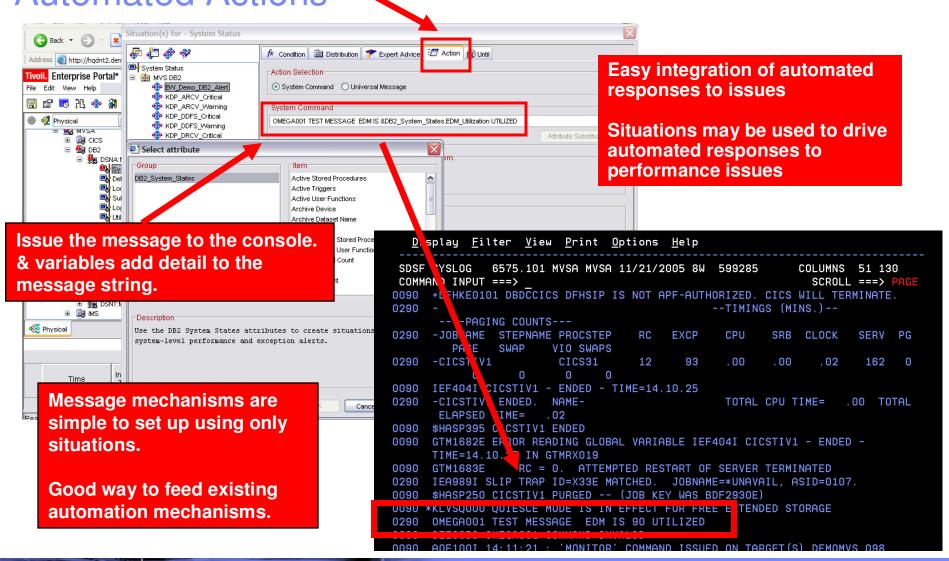
Boolean Logic Capability Of Situations
Makes Event Management More Meaningful And Powerful

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
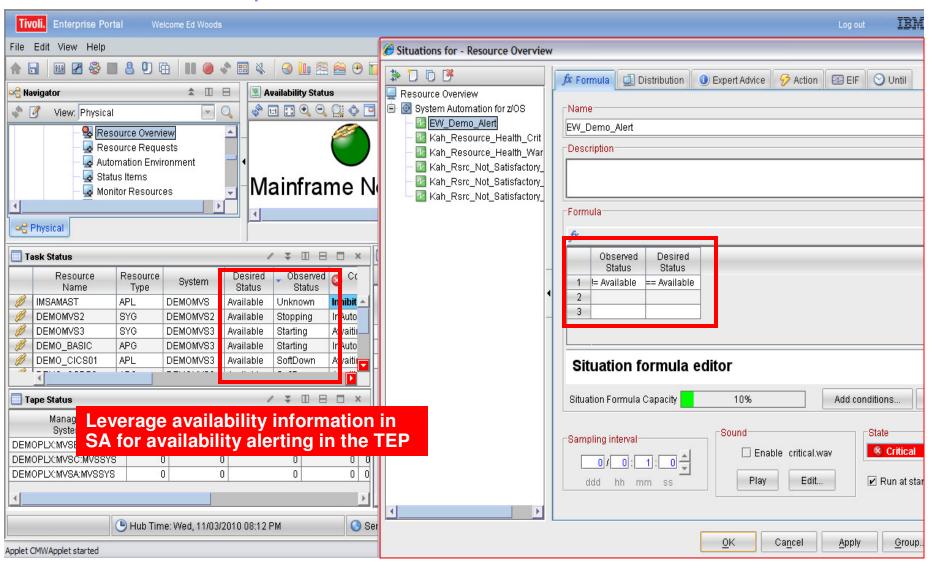
The 'Action' Tab In The Situation Editor Enables Automated Actions

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.

IBM SA Integration With The Tivoli Enterprise Portal Enables Powerful Alert Capabilities

Leverage availability information in SA for availability alerting in the TEP

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
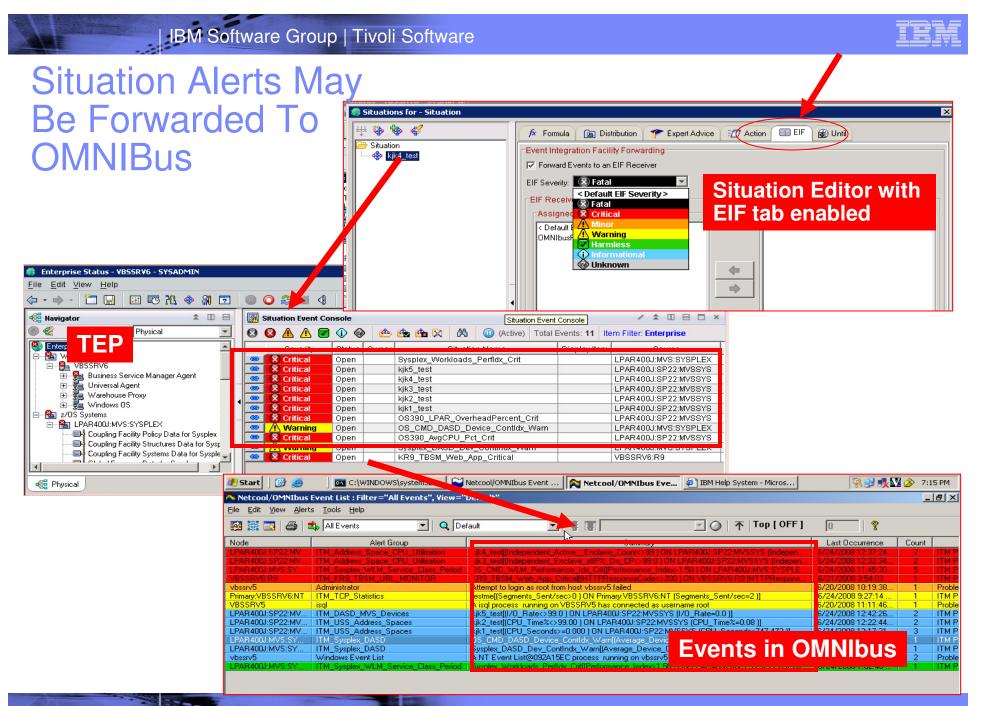
- **Tivoli Enterprise Portal alert advantages**
  - Most flexible
    - Any monitored information may be used in an alert
    - Easy to set alerts for disparate systems from a single point of control
  - Easy to set up with GUI technology
  - Sets of pre-defined alerts (Product Provided Situations)
  - 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
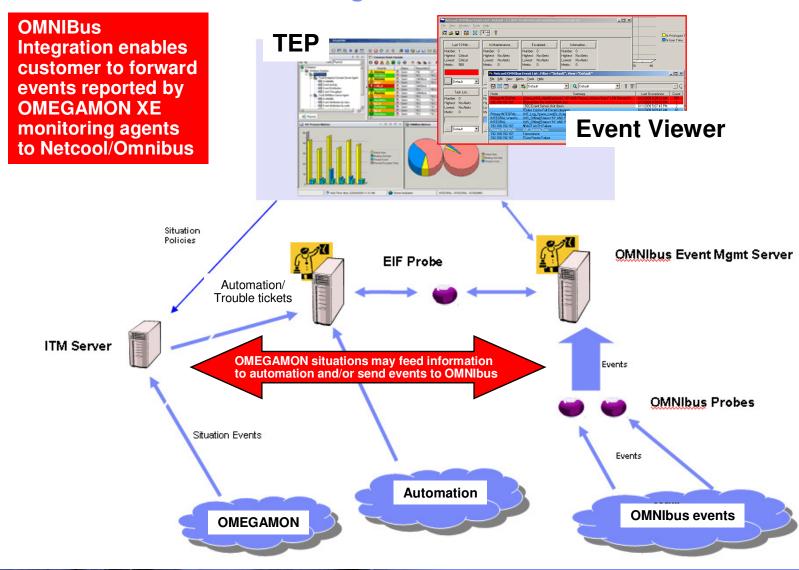
About IBM Tivoli Netcool/OMNIbus

- **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

Situations for - Situation

Formula | Distribution | Expert Advice | Action | EIF | Until

Event Integration Facility Forwarding

☑ Forward Events to an EIF Receiver

EIF Severity: ☒ Fatal

< Default EIF Severity >
☒ Fatal
☒ Critical
⚠ Minor
⚠ Warning
☑ Harmless
ⓘ Informational
⬦ Unknown

EIF Receiv...

Assigned...

< Default E...
OMNIbusR...

Situation Editor with EIF tab enabled

Enterprise Status - VBSSRV6 - SYSADMIN

File Edit View Help

Navigator

Physical

Enterp...
VBSSRV6
  Business Service Manager Agent
  Universal Agent
  Warehouse Proxy
  Windows OS
z/OS Systems
  LPAR400J:MVS:SYSPLEX
    Coupling Facility Policy Data for Sysplex
    Coupling Facility Structures Data for Sysp
    Coupling Facility Systems Data for Sysple

Physical

TEP

Situation Event Console | Situation Event Console

(Active) Total Events: 11 Item Filter: Enterprise

Severity	Status	Owner	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_ContIndx_Warn		LPAR400J:MVS:SYSPLEX
☒ Critical	Open		KR9_TBSM_Web_App_Critical		VBSSRV6:R9

Start | C:\WINDOWS\system... | Netcool/OMNIbus Event ... | Netcool/OMNIbus Eve... | IBM Help System - Micros... | 7:15 PM

Netcool/OMNIbus Event List : Filter="All Events", View="Default"

File Edit View Alerts Tools Help

All Events Default Top [OFF] 0

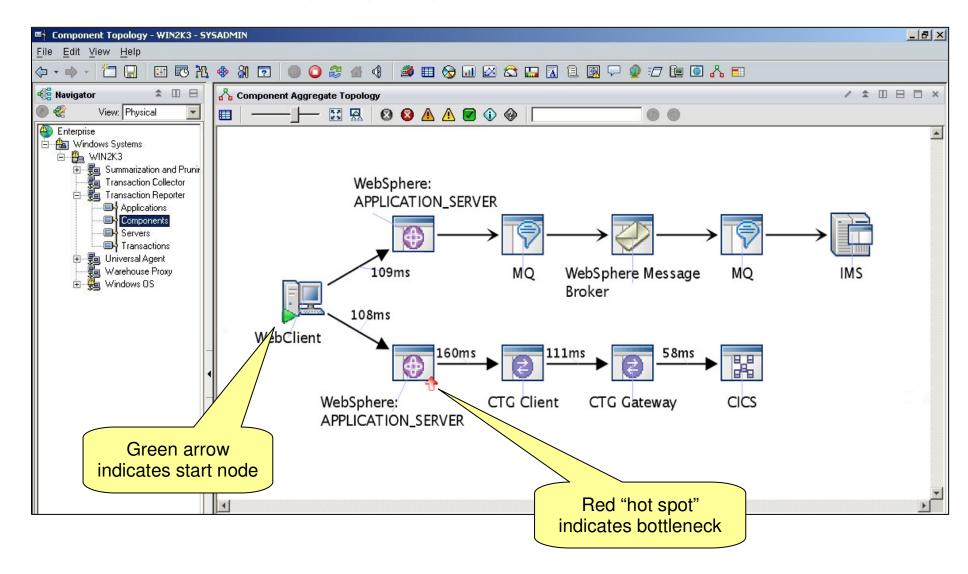| Node	Alert Group	Summary	Last Occurrence	Count	
LPAR400J:SP22:MV...	ITM_Address_Space_CPU_Utilization	kjk4_test[(Independent_Active__Enclave_Count<>99) ON LPAR400J:SP22:MVSSYS (Indepen...	6/24/2008 12:37:24...	2	ITM P
LPAR400J:SP22:MV...	ITM_Address_Space_CPU_Utilization	kjk3_test[(Independent_Enclave_zIIP%_On_CP<>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:SYSPLE...	6/24/2008 11:45:30...	5	ITM P
VBSSRV6:R9	ITM_KR9_TBSM_URL_MONITOR	KR9_TBSM_Web_App_Critical[(HTTPResponseCode<>200) ON VBSSRV6:R9 (HTTPRespons...	6/21/2008 3:54:03 ...	1	ITM P
vbssrv5	Administrator	Attempt to login as root from host vbssrv5 failed	6/20/2008 10:19:38...	1	Proble
Primary:VBSSRV6:NT	ITM_TCP_Statistics	testme[(Segments_Sent/sec>0) ON Primary:VBSSRV6:NT (Segments_Sent/sec=2)]	6/24/2008 9:27:14 ...	1	ITM P
VBSSRV5	isql	A isql process running on VBSSRV5 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%>99.0) 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_Device...		1	ITM P
LPAR400J:MVS:SY...	ITM_Sysplex_DASD	Sysplex_DASD_Dev_ContIndx_Warn[(Average_Device_C...		1	ITM P
vbssrv5	Windows Event List	A NT Event List@092A15EC process running on vbssrv5...		2	Proble
LPAR400J:MVS:SY...	ITM_Sysplex_WLM_Service_Class_Period	Sysplex_Workloads_PerfIdx_Crit[(Performance_Index>1.5...	6/24/2008 ...		ITM P

Events in OMNIbus

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

TEP

Event Viewer

Situation Policies

Automation/ Trouble tickets

EIF Probe

OMNIbus Event Mgmt Server

ITM Server

OMEGAMON situations may feed information to automation and/or send events to OMNIbus

Events

Situation Events

OMNIbus Probes

Events

Automation

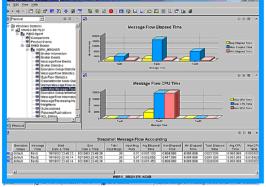**OMEGAMON**

OMNIbus events

Transaction Tracking Topology

Isolate Problem – Drill Down to Resolve

ITCAM for Transactions

OMEGAMON XE for Messaging

- Uses Dynamic Workspace Links to launch in context into appropriate SME tool.

- Launch destinations depend on type on data source. E.g:

  – MQ -> OMEGAMON XE for MSG

  – WAS -> ITCAM for WAS

  – CICS -> OMEGAMON for CICS

  – IMS ->OMEGAMON for IMS

  – DB2 -> Data Studio (roadmap)

- Where appropriate, will drill down to specific workspace (ie. In MQ, Queue Manager drilldown links to the Queue Manager Status Workspace for the specific Queue Manager).

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

VISIBILITY	**CONTROL**	**AUTOMATION**
See your business services	Manage service risk and compliance	Optimize business service delivery

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

Thank You!

Check Out My Blog

http://tivoliwithaz.blogspot.com