



IBM Software Group

# OMEGAMON XE for IMS V4.1 Situation Usage and Best Practices

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@business on demand.

# Agenda

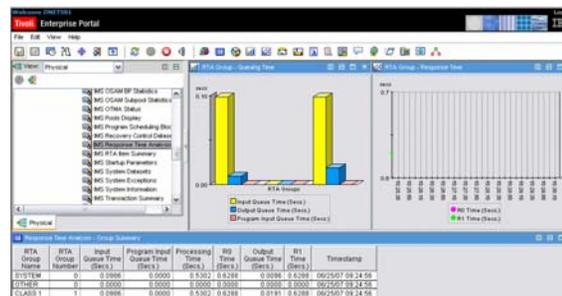
- Introduction to the Tivoli Enterprise Portal
- Introduction to situations and situation benefits
- Recommendations on situation creation and usage
- Types of alerts
- Examples of useful IMS situations
- Summary and questions



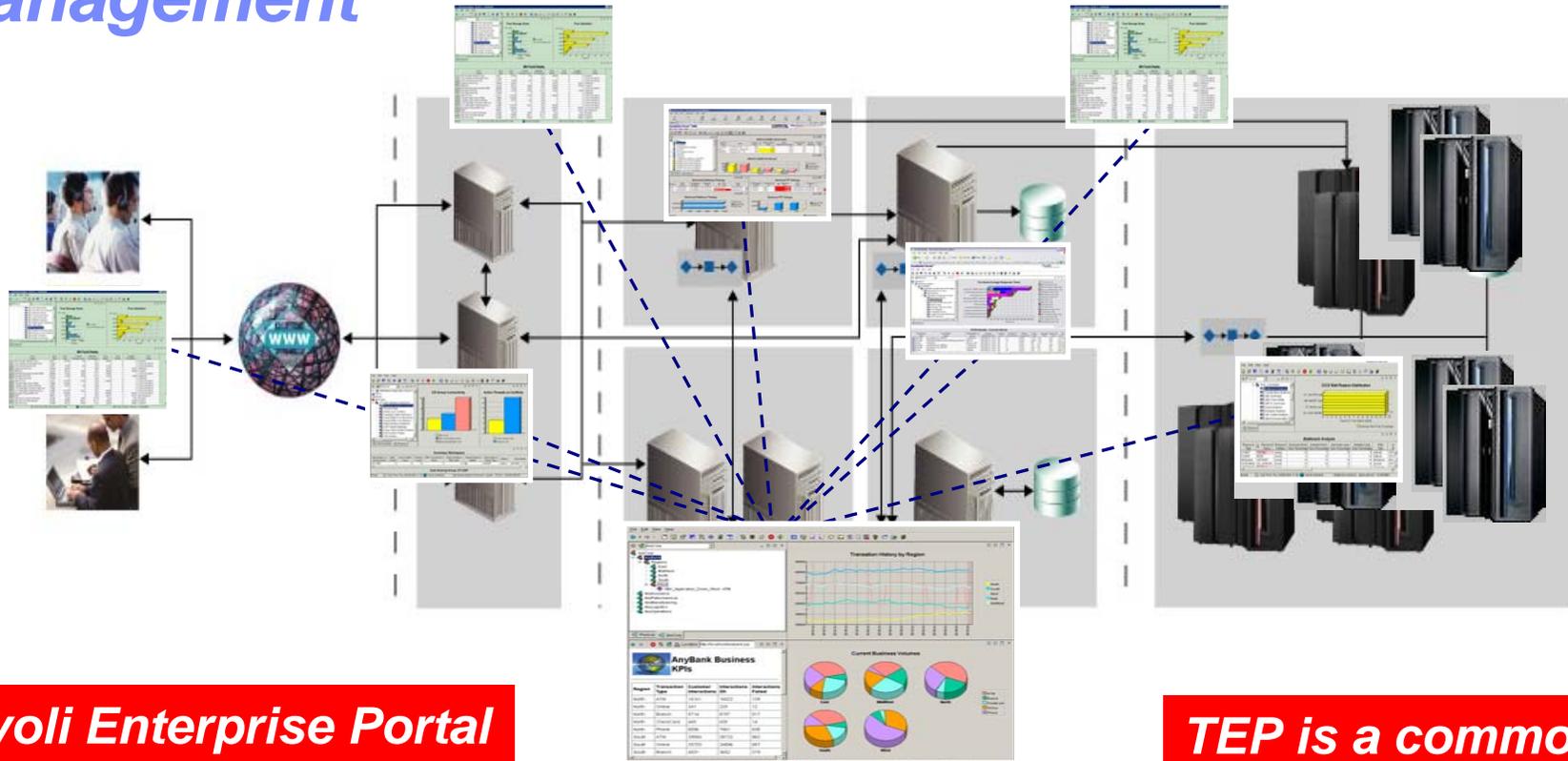
# OMEGAMON XE For IMS on z/OS V4.1

## Components And Facilities – Real Time And Historical

- **Real Time Monitor**
  - ▶ Subsystems, regions, resources, pools, DBs, Fast path
  - ▶ IMS Connect, OTMA
- **Response Time Analysis (RTA)**
  - ▶ Transaction Response time by user defined groups
- **Bottleneck Analysis**
  - ▶ Workload performance and task analysis
- **Operator Assist & Integrated Console Facility**
  - ▶ IMS resource commands
- **Online TRF**
  - ▶ View TRF information in the TEP
- **Trace Facilities**
  - ▶ Application Trace & TRF trace
- **Exceptions & Alerts**
  - ▶ Integrated alert/automation in the TEP
- **Plex level information**
  - ▶ N-way data sharing, MSC, shared queues (in the TEP)
- **EPILOG Historical**
  - ▶ Historical analysis of transaction response, bottlenecks and IMS resources
  - ▶ Stored in VSAM Epilog Data Store (EDS) by group and time interval
- **Transaction Reporting Facility (TRF)**
  - ▶ Detailed transaction & database data – individual transactions
  - ▶ Suitable for performance analysis & chargeback
  - ▶ Data retrieved from IMS log
- **XE Snapshot Historical**
  - ▶ Snapshot historical stored in the Tivoli Data Warehouse



# *Tivoli Enterprise Portal (The TEP) Integrated Performance, Availability, And Systems Management*



***Tivoli Enterprise Portal enables integrated alert and automation capabilities***

**Tivoli Enterprise Portal (TEP)**

***TEP is a common user interface for a variety of Tivoli solutions***



# Most Business Applications Are Complex In Nature And Incorporate A Variety Of Technologies

**Tivoli Enterprise Portal (The TEP) enables integrated alert and automation capabilities**

**Customizable graphic overview**

**User-definable drill downs for detail**

**Combine information from multiple sources**

**OMEGAMON IMS has detected an issue**

Hub Time: Mon, 06/19/2006 07:32 AM | Server Available | Demo Business View - 9.73.221.32 - SYSADMIN

## About Situations

- Situations are the building blocks of systems management logic in the Tivoli Enterprise Portal (TEP)
- Situations may be used to highlight performance problems within key IMS subsystem resources
- Situations may be used to identify IMS subsystem problems that impact IMS availability
  - ▶ Monitor application availability
  - ▶ Monitor IMS subsystem availability
  - ▶ Monitor critical resource availability



## Situations Allow For Powerful And Flexible Alerts

- OMEGAMON XE situation capabilities allow for more intelligent alerts that integrate and correlate status and information
- Situations may incorporate Boolean logic
- Situations may be correlated with other situations
- Situations may in turn drive automated corrections



# Situations – Usage And Benefits

## Highlight Performance And Availability Issues

The screenshot shows the Tivoli Enterprise Portal interface. The main window displays a 'Situation Event Console' with a table of alerts. A red arrow points from the 'EW\_RT\_A\_Trans\_Aler' alert in the table to a flyover pop-up window. The pop-up shows the alert details: 'CRITICAL', 'EW\_RT\_A\_Trans\_Aler', 'IMSA:MVSA:IMS', and '08/06/07 09:28:02'. Another red arrow points from the pop-up to a red callout box. A third red arrow points from the table to another red callout box. At the bottom left, there is a bar chart showing various system metrics.

Severity	Status	Owner	Situation Name	Display Item	Source
Informational	Open		TESTPEEP		DSNB:MVSA:DB2
Informational	Open		Kah_Mtr_Health_Status_Info	DEMO_CPU	DEMOPLX:DEMOPLX:SA
Warning	Open		ZVM_Avail_Mean2G_Low		zdemolx.demopkg.ibm
Warning	Open		N3T_Appl_Datagram_Rate		TCPIP:MVSA
Warning	Open		N3T_Conn_Rnd_Trip_Variance		TCPIP:MVSA
Warning	Open		N3V_Ret_ECPL_Allocated_Str		VTAM:MVSA
Warning	Open				_CBJ DEMOPLX:DEMOPLX:SA
Warning	Open				_CBJ DEMOPLX:DEMOPLX:SA
Warning	Open				DEMOPLX:MVS:SYSPL
Warning	Open				MN2 DEMOPLX:DEMOPLX:SA
Warning	Open				MN2 DEMOPLX:DEMOPLX:SA

**CRITICAL**  
EW\_RT\_A\_Trans\_Aler IMSA:MVSA:IMS 08/06/07 09:28:02

**Click to see alert detail**

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

Status	Name	Display Item	Origin Node	Global Timesta
Open	Sysplex_Workloads_Perfidx_Crit		DEMOPLX:MVS:SYSPLEX	08/06/07 09:28
Open	Kah_Mtr_Health_Status_Warn	DEMOMN2	DEMOPLX:DEMOPLX:SA	08/06/07 09:28
Open	EW_RT_A_Trans_Aler		IMSA:MVSA:IMS	08/06/07 09:28
Open	Kah_Resource_Health_Warn	DEMOMN2	DEMOPLX:DEMOPLX:SA	08/06/07 09:23
Open	Kah_Mtr_Health_Status_Crit	DEMOMN2	DEMOPLX:DEMOPLX:SA	08/06/07 09:08
Open	USS Excess Process UNIX Run Time		DEMOPLX:MVSA:MVSSYS	08/06/07 08:13



# Situations – Usage And Benefits

## 'Action' To Perform Commands And Corrections

**Where command is executed**

**Attribute substitution in the command line**

**System command may be executed when the situation is true**

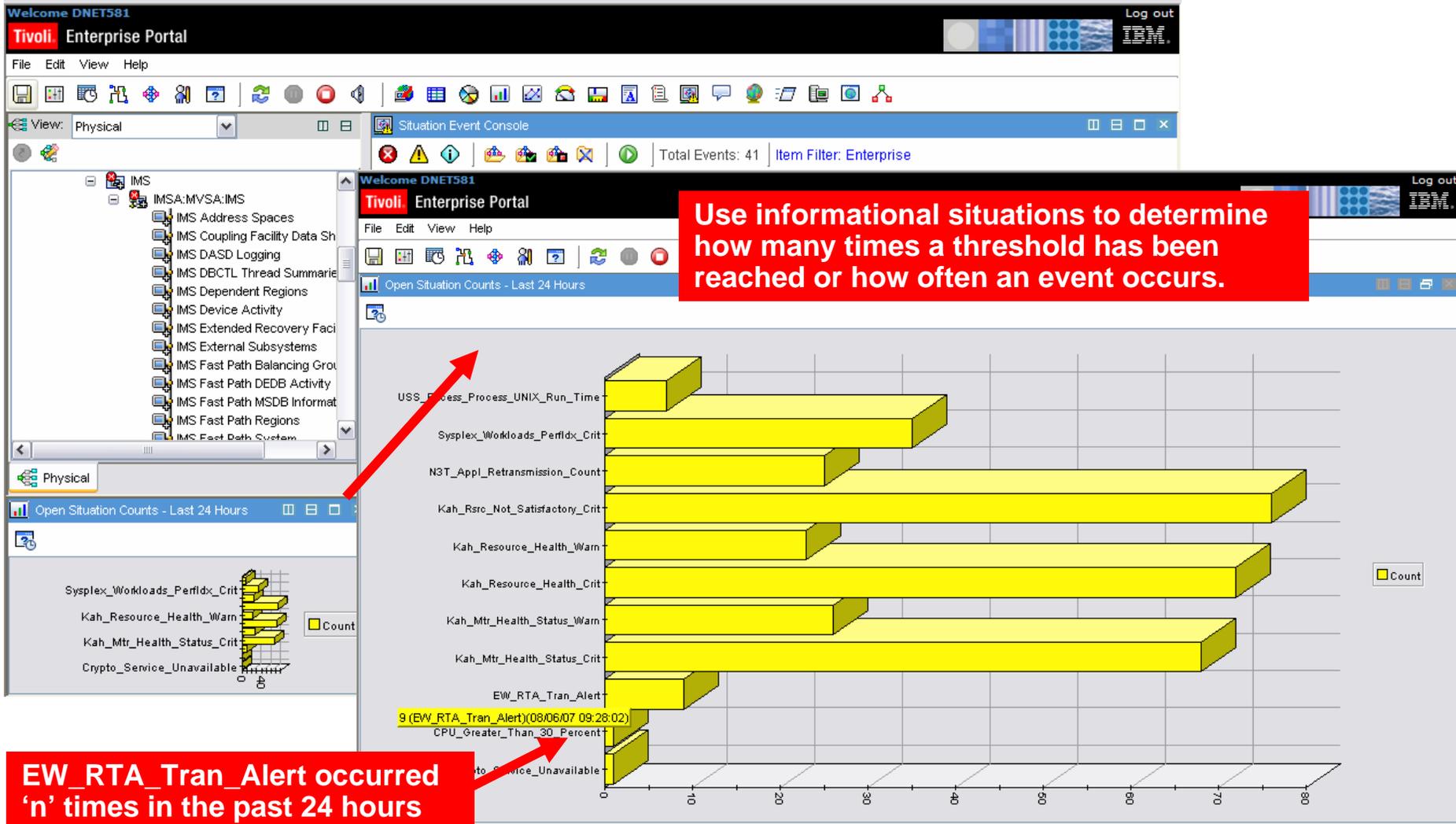
**Examples of actions include:**

- Issuing messages to the console
- Any valid z/OS console command



# Situations – Usage And Benefits

## Use Situations For Informational Event Analysis



# A Basic Example Situation Alert On IMS RTA Response Time Greater Than 'n'

**Start/stop situation** (points to Start Situation button)

**Distribution tab to specify where situation runs. Expert advice is customizable. Action tab to execute command.** (points to Distribution, Expert Advice, and Action tabs)

**Specify alert criteria. This may include one or multiple attribute criteria.** (points to Formula table)

	R1 Time (Secs.)
1	> 0.0200
2	
3	

**Specify sampling interval** (points to Sampling interval field)

**Specify severity and whether to run at Omegamon startup** (points to State dropdown)

**RTA Group Name** The name of an RTA group. Valid format consists of up to eight alphanumeric characters. Example: CLASS2

**RTA Group Number** An identification number of an RTA transaction group. Valid format is in a range of up to 32 integers.

Situation Formula Capacity: 4%

Sound:  Enable critical.wav

State: **Critical**

Run at startup:

# Example RTA Alert Situation Has Fired

The screenshot displays the Tivoli Enterprise Portal interface. On the left, a tree view shows the system hierarchy: Physical > MVSA > CICS > DB2 > IMS. The main area is split into two panes: 'RTA Group - Queuing Time' and 'RTA Group - Response Time'. The 'Response Time' pane contains a line graph showing R0 Time (Secs.) in pink and R1 Time (Secs.) in green over a time period from 10:16:40 to 10:20:40. A red vertical line at approximately 10:19:10 indicates when an alert was triggered. A red-bordered fly-over window is positioned over the graph, displaying a 'CRITICAL' alert: 'EW\_RT\_A\_Trans\_Alert IMSA:MVSA:IMS 08/06/07 09:20:17'. A red arrow points from a red text box 'Click on link icon to see alert detail' to the link icon in the alert message. Another red text box 'Fly-over shows what situation has fired' points to the fly-over window. Below the graph is a table titled 'Response Time Analysis - Group Summary'.

RTA Group Name	RTA Group Number	Input Queue Time (Secs.)	Program Input Queue Time (Secs.)	Processing Time (Secs.)	R0 Time (Secs.)	Output Queue Time (Secs.)	R1 Time (Secs.)	Timestamp
SYSTEM	0	0.0034	0.0000	0.0360	0.0393	0.0121	0.0393	08/06/07 09:19:58
OTHER	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	08/06/07 09:19:58
CLASS 1	1	0.0034	0.0000	0.0360	0.0393	0.0217	0.0393	08/06/07 09:19:58

# Situation Detail For The RTA Alert

The screenshot displays the Tivoli Enterprise Portal interface. On the left, a tree view shows the navigation structure, with 'EW\_RT\_A\_Trans\_Alert' selected under 'IMS Response Time Analysis'. The main area is divided into several panes:

- Initial Situation Values:** A table showing performance metrics for two RTA alerts.
 

R1 Time (Secs.)	Originating System Identifier	RTA Group Number	Input Queue Time (Secs.)	Program Input Queue Time (Secs.)	Processing Time (Secs.)	R0 Time (Secs.)	Output Queue Time (Secs.)	MVS System	IMSID
0.0393	IMSA:MVSA:IMS	0	0.0034	0.0000	0.0360	0.0393	0.0121	MVSA	IMSA
0.0393	IMSA:MVSA:IMS	1	0.0034	0.0000	0.0360	0.0393	0.0217	MVSA	IMSA
- Current Situation Values:** A table identical to the one above, showing the current state of the alerts.
- Take Action:** A pane for defining actions, with a dropdown menu for 'Name' and a text field for 'Command'. A red callout asks 'Any Predefined Actions?'.
- Expert Advice:** A pane displaying text: 'Expert advice is use customizable. If this alert fires it is an example of how to alert on RTA performance information.' A red callout asks 'Any expert advice?'.

Red callout boxes are overlaid on the screenshot with the following text:

- 'What is the problem?' (pointing to the alert list)
- 'What are the details?' (pointing to the situation value tables)
- 'Any Predefined Actions?' (pointing to the Take Action pane)
- 'Any expert advice?' (pointing to the Expert Advice pane)

# Take Advantage Of Boolean Logic Make Situations More Meaningful And Useful

**Situations for - IMS Response Time Analysis (RTA)**

Formula

Description

Formula

	R1 Time (Secs.)	RTA Group Name
1	> 0.0200	== PART
2	>= 0.0300	== SYSTEM
3	>= 0.0250	== DLETPART

RTA Group Name The name of an RTA group. Valid format consists of up to eight alphanumeric characters. Example: CLASS2

RTA Group Number An identification number of an RTA transaction group. Valid format is a range of up to 32 integers.

Situation Formula Capacity  29%

Add conditions... Advanced...

Sampling interval: 0 / 0 : 1 : 0 (ddd / hh : mm : ss)

Sound:  Enable critical.wav Play Edit...

State: Critical  Run at startup

OK Cancel Apply Help

**Note formula capacity to see how much logic may be added**

**Add boolean logic to make situations more robust**

**Click 'add conditions' to add additional attribute logic**

# Use Boolean Logic To Reduce The Number Of Required Situations

**Instead of multiple redundant situations...**

**Use boolean logic to reduce the number of required situations**

- Reduce monitoring/alerting overhead
- Reduce alert management/maintenance

# Use Persistence Option To Smooth Alert Spikes

**With a persistence option the situation must be true 'n' times before the alert fires**

	R1 Time (Secs.)	RTA Group Name
1	> 0.0200	== PART
2	> 0.0300	== SYSTEM
3		

**Click 'Advanced' to specify persistence options**

**User persistence to eliminate alerts that are spikes or outliers**



# Exploit Managed Systems Lists To Simplify Situation Deployment

**Example**

Create a managed systems list for Test IMSs, another for Prod IMSs, and another for All IMSs (default \*MVS\_IMSPLEX)

Managed systems lists are user-definable and customizable.

Managed systems lists simplify the deployment of situations

The screenshot shows a dialog box titled "Situations for - IMS Response Time Analysis (RTA)". It has a tree view on the left showing "IMS Response Time Analysis (RTA)" > "IMS" > "EW\_RTA\_Trans\_Alert". The main area has tabs for "Formula", "Distribution", "Expert Advice", "Action", and "Until". The "Assigned" list contains "TEST\_IMS". The "Available Managed Systems" list contains: "DFSGRUP1:DEMOPLX:SQGROUP", "IMSA:MVSA:IMS", "IMSB:MVSA:IMS", "IMSpIex:IMSpIex:Plexview", "IRL3:DEMOPLX:DSGROUP", and "XEIMS:MVSA:MVS". The "Available Managed System Lists" list contains: "\*MVS\_IMSPLEX" and "PROD\_IMS". A red arrow points from the callout box to the "Available Managed System Lists" list. At the bottom are "OK", "Cancel", "Apply", and "Help" buttons. An "Edit Managed System Lists" button is also present.

# 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



# Situations May Be Correlated With Other Situations

## Correlated Alert Example

**Situation Editor**

Formula | Distribution | Expert Advice | Action | Until

Description

Formula

	EW_RTA_Tran_Alert @IMSA:MVSA:IMS	Demo_DB2_Alert @DSNC:MVSA:DB2
1	== True	== True
2		
3		

Click inside a cell of the formula editor to see a description and to compose the expression.

Add a condition by clicking **Add conditions** and selecting the situations to embed or attributes you want to include.

When you add a second attribute or situation to the formula, enter the second expression in the

Situation Formula Capacity  21%

Attribute 1 | Attribute 2

Add conditions... | Advanced...

Sampling interval: 0 / 0 : 15 : 0

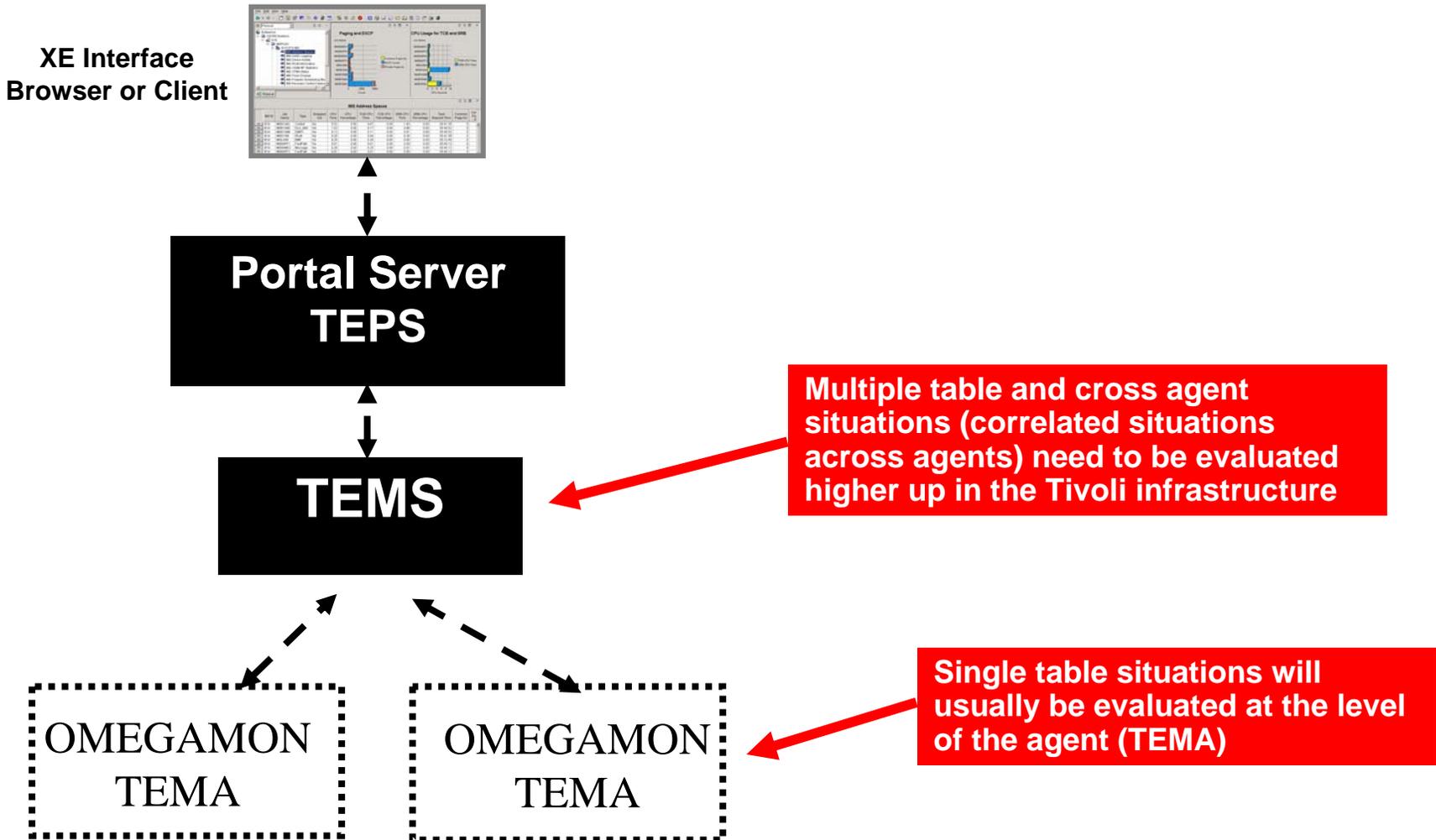
Run at startup

OK | Cancel | Apply | Help

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

Select 'Add Conditions' to add additional logic.

# Considerations For More Complex Situations



# Additional Situation Considerations And Recommendations

- When creating and deploying a set of situations consider
  - ▶ The number of situations being deployed
  - ▶ The number of managed systems (i.e. IMS subsystems)
  - ▶ Refresh frequency of the situations
- Consider carefully the number of required situations
  - ▶ Use boolean logic to reduce the number of needed situations
  - ▶ Do not automatically make a warning alert to go with each critical alert
    - Create a warning if it will allow time to address an issue before going critical
  - ▶ Use managed system lists to send the right situations to the right managed systems
- Be aware of the situation refresh rates
  - ▶ Multiple situations on the same table with the same refresh rate may be optimized by the infrastructure
  - ▶ Potential to reduce monitoring overhead if done appropriately



# Use 'Manage Situations' To Check Situation Status And Sampling Interval

The screenshot shows the Tivoli Enterprise Portal interface. A red box highlights the 'Manage Situations' menu item in the left-hand tree view. A red callout box with white text states: **'Manage Situations' shows what situations are distributed to a managed system and the interval of the situations**. Below this, a window titled 'Manage Situation at Managed System: DSNR.MVSA:DB2' is open, displaying a table of situation details.

Name	Status	Description	Auto Start	Advice	Acti...	Interval
Atest_KDP_DWAT_Critical	Stopped	Wait for remote SQL time exceeds critical limit				0d / 0h : 15m : 0s
DB2_CMD_Lock_Wait_Time_Critical	Stopped	Automatic message when lock elapsed time exceeds 10...				0d / 0h : 2m : 0s
DB2_Lock_Waiter_Time_Critical	Started	Lock waiter elapsed time has exceeded the critical thres...	✓			0d / 0h : 0m : 30s
DB2_Lock_Waiter_Time_Warning	Started	Lock waiter elapsed time has exceeded the warning thre...	✓			0d / 0h : 0m : 30s
DB2_Thread_Wait_Time_Critical	Closed	DB2 thread wait time has exceeded the critical threshold.	✓			0d / 0h : 1m : 30s
DB2_Thread_Wait_Time_Warning	Closed	DB2 thread wait time has exceeded the warning threshold.	✓			0d / 0h : 1m : 30s
Demo_CF_Locks_False_Cont_Crit	Stopped	False Contention				0d / 0h : 1m : 0s
dnet289_lock_conflict	Stopped	detect presence of locking conflicts				0d / 0h : 5m : 0s
DNET546_Conflito_de_Lock_no_DB2	Started		✓			0d / 0h : 0m : 30s
DNET546_Excessivo_Lock_Wait	Stopped	Lock waiter elapsed time has exceeded the warning thre...	✓			0d / 0h : 1m : 0s
dnet956_Lock_Conflict_Exists	Closed	Situation for DB2 Lock Conflict Demo	✓			0d / 0h : 0m : 30s
EW_Thread_Alert	Open					0d / 0h : 1m : 30s
KD5_ETIM_Warning	Stopped	Thread elapsed time exceeds critical threshold				0d / 0h : 15m : 0s
KDP_WTRE_Critical	Started	Time waiting for resource exceeds the critical threshold	✓			0d / 0h : 15m : 0s
KDP_WTRE_Warning	Stopped	Time waiting for resource exceeds the warning threshold				0d / 0h : 15m : 0s

# Eliminating The Noise

## Time Of Day And Day Of Week Considerations

- Some alerts are sensitive to certain times of day or day of week considerations
  - ▶ This may be due to operational or off-hours processing concerns
  - ▶ Workloads will often vary during the day and during the week
  - ▶ Some issues are critical during prime time and not as critical off-hours
- Options for time of day/processing window challenges
  - ▶ Situations may be coded with time of day information built into the situation logic
    - This may work for a limited number of situations, but may add maintenance and limit the flexibility of the situations
  - ▶ Policies may be used to start/stop situations as needed based upon specified logic
    - Does not require coding in the underlying situations



# Using A Policy To Manage Situations

The screenshot displays the Workflow Editor interface. On the left, the 'Workflow components' pane shows various activities, including 'Start/Stop a policy' and 'Start/Stop a situation'. The main workspace, titled 'New\_Policy - Grapher View', contains a flowchart with the following steps:

- Wait until Weekday is True**: A timer icon with a clock face.
- Situation is true**: A transition label connecting to the next activity.
- Start situation EW\_IMS\_Tran\_Q\_Alert**: An activity icon with a crosshair and a green play button.
- Situation started**: A transition label connecting to the final activity.
- Start situation EW\_Demo\_Thread\_Queueing**: A final activity icon with a crosshair and a green play button.

A red callout box with white text is positioned above the flowchart, stating: **Situations may be started and stopped using a policy**. Two red arrows point from this box to the 'Start situation EW\_IMS\_Tran\_Q\_Alert' and 'Start situation EW\_Demo\_Thread\_Queueing' activity icons.

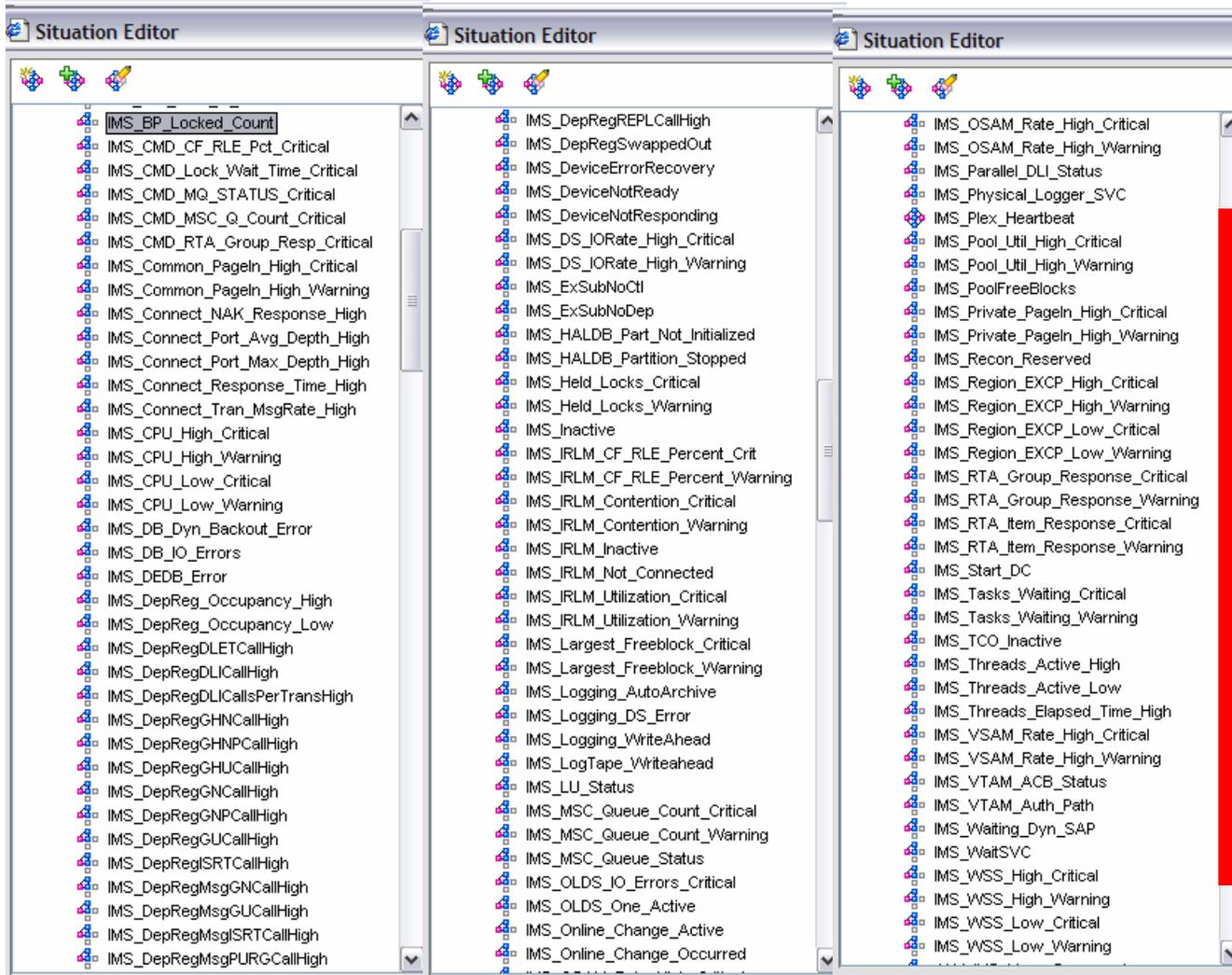
At the bottom of the window, the name 'Edward A. Wood' is visible, along with checkboxes for 'Modify' and 'Start/Stop'. Standard 'OK', 'Cancel', 'Apply', and 'Help' buttons are located at the bottom right.





# OMEGAMON XE For IMS V4.1

## Product Provided Situations



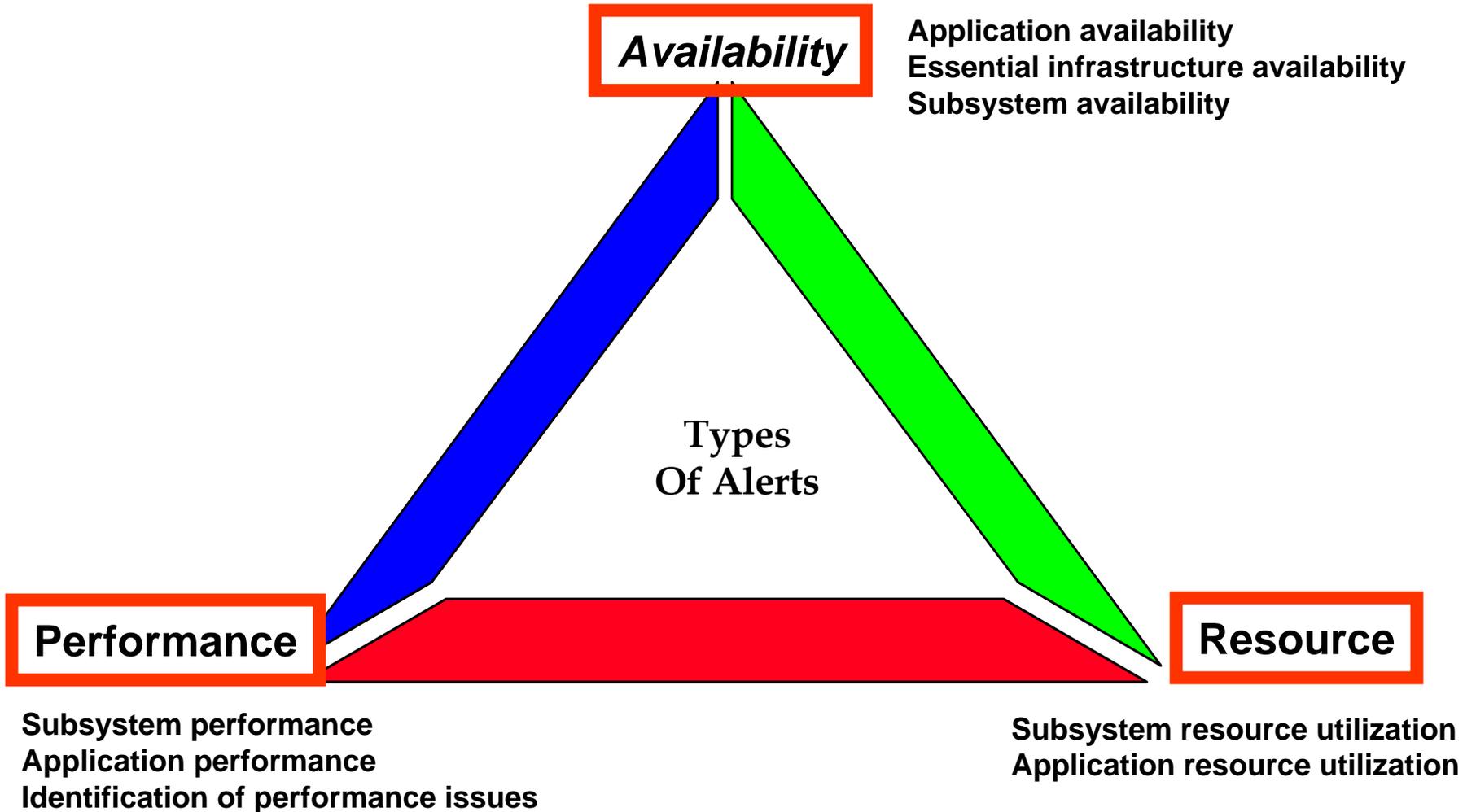
**Product provided situations provide a starting point and a means of migrating alerts from Omegamon Classic/CUA 3270 interface to the Tivoli Enterprise Portal**

### *Recommendations*

**Use product provided situations as examples and a starting point**

**For large deployments create more meaningful situations**

# Categories Of Typical Situation Alerts



# What Are The Resources?

## Key IMS Resources That Need To Monitored

- IMS Regions, Transactions, Programs, Databases, Links, Queues
  - ▶ Queuing activity at the subsystem, transaction, link level
  - ▶ Key resources in a stopped, unavailable or error status
    - Example – stopped programs or databases
- IMS Database Locking activity
  - ▶ Lock activity, lock contention, data sharing locking
- IMS Logging
  - ▶ IMS logging status, log volume, archive status
- IMS Pools And Pool Utilization, Critical IMS Datasets
  - ▶ Pool size and utilization, Dataset I/O activity
- IMS Subsystem and address spaces
  - ▶ Address space availability, Address space CPU utilization and paging activity



# Application Performance Example Situations To Monitor Response Time

	R1 Time (Secs.)	RTA Group Name
1	> 0.0200	== 'PART'
2	> 0.0300	== 'SYSTEM'
3		

**Using boolean logic allows the alert to be application sensitive. This assumes that the KOIGBLxx macro is customized.**

**A single situation can handle multiple application groups, if needed.**

**Note – this is the RTA group name**

**Consider alerting on R0 versus R1 response time. R0 only considers Input Queue and processing time, and excludes outqueue time.**

**Consider using the persistence option to filter out outliers**

# Another Application Performance Example

## Alert When Response Time Is High & Input Queue Time Is High

**Situations for - IMS Response Time Analysis (RTA)**

Formula

Description

Formula

R1 Time (Secs.) > 0.2000

	R1 Time (Secs.)	RTA Group Name	Program Input Queue Time (Secs.)
1	> 0.2000	== SYSTEM	> 0.1000
2			
3			

R1 Time The total host response time of a transaction. This time is the sum of the Input Queue Time (or Program Input Queue Time) and the Output Queue Time. Valid format is an integer in the range of 0 - 99,999.9 seconds

RTA Group Name The name of an RTA group. Valid format consists of up to eight alphanumeric characters. Example: CLASS2

Situation Formula Capacity 14%

Sampling interval 0 : 0 : 1 : 0

Sound  Enable critical.wav

State  Critical

Run at startup

OK Cancel Apply Help

**In this example the situation will fire if R1 response time for the system is high and it is due in large part to high Input Queue time.**

**Consider using the persistence option to filter out outliers**

# Another Application Performance Example Response Time Alerts Using Online TRF Data

The screenshot shows a configuration window for a situation named 'IMS TRF DLI Summary'. The 'Formula' section contains a table with the following data:

Transaction Name	R0 Time Average Milli
1 == PART	== 100.000
2	
3	

Below the table, there is a list of 'Attribute Item' options including CPU Time, DLI Calls Average, DLI Calls Maximum, and various DLI counts. A 'State' dropdown is set to 'Critical'.

Online TRF allows for the inclusion of Transaction name in the situation alert

If Online TRF is enabled situations may be created for response time alerts with more granularity including transaction name, CPU time, # DLI calls, etc.

# Application Performance Example

## Monitoring Transaction Level Queuing

Situations for - IMS Transaction Summary

Formula Distribution Expert Advice

**Monitor the queuing and status of the PART transaction.**

**If PART is queued or the Queue depth is beyond a certain level generate an alert**

Description

Formula

Transaction Name

	Status	Messages Enqueued	Transaction Name
1	== 'Queued'		== PART
2	== 'Queueing'		== PART
3		> 0	== 'PART'
4			

groups. See the Tivoli Enterprise Portal help for instructions on specifying timestamp attributes in situations and queries.

**Transaction Name** The name of the subject IMS transaction. Valid format is a text string of up to eight alphanumeric characters.

Situation Formula Capacity  Add conditions... Advanced...

Sampling interval  /  :  :   
ddd hh mm ss

Sound  Enable critical.wav Play Edit...

State  Critical Run at startup

OK Cancel Apply Help



# Application Performance Example

## Monitoring Transaction Level Queuing

**Situation Editor**

Formula

Description

Formula

Transaction Name

	Messages Enqueued	Transaction Name	Transaction Name	Transaction Name	Transaction Name
1	> 10	= 'PART'	= DEMO	= ADDPART	TEST
2					
3					

== Equal  
 != Not equal  
 > Greater than  
 >= Greater than or equal  
 < Less than  
 <= Less than or equal

intended for logging and reporting data collection times rather than to specify a time of day for monitoring, use attributes from the Universal time or Local time groups. See the Tivoli Enterprise Portal help for instructions on specifying timestamp attributes in situations and queries.

**Transaction Name** The name of the subject IMS transaction. Valid format is a text string of up to eight alphanumeric characters.

Situation Formula Capacity  20%

Add conditions... Advanced...

Sampling interval

0 / 0 : 1 : 0  
ddd hh mm ss

OK Cancel Apply Help

Monitor the transaction queue depth.

Tune out certain transactions that will typically queue by using 'not equal' logic.

In some shops it may be normal and acceptable to have certain transactions queue.

# Application Performance Example – Connect Monitor IMS Connect Transaction Performance

**Product provided situation example**

**IMS Connect monitoring allows for transaction level response time alerts**

	Response Time
1	> 3.000
2	
3	

**Add additional logic to the situation including input and output time, etc.**

**Attribute Item**

- Input Pre-OTMA Time
- Input Read Exit Time
- Input Read Socket Time
- Input SAF Time
- Max Response Time
- Message Count
- Messages Per Second
- NAK Count
- Originating System Identifier
- Output Confirm Time
- Output Post-OTMA Time
- Output XMIT Exit Time

**Note – Connect monitoring requires IMS Connect Extensions along with OMEGAMON XE For IMS**

**State**

Critical

Run at startup



# Application Performance Example

## Monitor IMS DBCTL Thread Performance

The screenshot displays the configuration interface for a situation named "IMS Threads Elapsed Time High".

- Description:** IMS Threads Elapsed Time High
- Formula:** A table with 3 rows and 2 columns. The first row contains "Elapsed Thread Time" and "> 5".
- Attribute Item List:** A scrollable list of attributes including CICS Jobname, CICS Target Node, CICS Task Number, CICS Terminal ID, CICS Transaction ID, Database I/O Count, DEDB Buffer Waits, DEDB UOW Contentions, DLI Call Count, Elapsed Thread Time, Elapsed Wait Time DBIO, and Elapsed Wait Time Intert.
- State:** A dropdown menu set to "Critical".
- Run at startup:** An unchecked checkbox.

**Product provided situation example**  
**DBCTL thread elapsed time greater than 'n'**

**Add additional logic to the situation including CICS job name, transaction id, DB I/O counts, and more**

# Subsystem Availability Example

## Track IMS Logging Status

**Situations for - IMS Transaction Summary**

Formula   Distribution   Expert Advice   Action   Until

**Description**  
Logging dataset inactive

**Formula**  
Auto Archive == Inactive

	Auto Archive
1	Inactive
2	
3	

**Auto Archive** The status of Auto Archive activity. Valid values include Active and Inactive.

**IMS ID** The IMS Subsystem identifier. Valid format is a text string of up to four alphanumeric characters. Example: I61A.

**Logger Status** The Logging status. Valid values include Active and Inactive.

Situation Formula Capacity 4%

**Sampling interval** 0 / 0 : 15 : 0  
ddd hh mm ss

**Sound**  
 Enable critical.wav  
Play Edit...

**State**  
 Critical  
 Run at startup

OK Cancel Apply Help

**Example of a Product Provided situation.**

**Use this to monitor IMS OLDS auto archive status**

# Subsystem Availability Example

## Monitor External Subsystem Connection Status

**Status of 'not equal' to connected.**

**This situation will monitor the status external subsystems (examples – MQ and DB2) connected to IMS. One situation can monitor multiple subsystems and types.**

	Running Status	Subsystem Name
1	≠ Connected	== WMQA
2	≠ Connected	== DSNA
3		

**Subsystem Name** The name of the subject external subsystem. Valid format is a text string of up to 32 alphanumeric characters.

**Timestamp** The date and time when the monitoring agent retrieved the data. This attribute is intended for logging and reporting data collection times rather than for creating situations. To specify a time of day for monitoring, use attributes from the Universal Time or Local Time groups. See the Tivoli Enterprise Portal help for instructions on specifying timestamp

Situation Formula Capacity  18%

Sampling interval: 0 / 0 : 3 : 0 (ddd hh mm ss)

Sound:  Enable critical.wav (Play Edit...)

State: Critical  Run at startup

Buttons: OK Cancel Apply Help

# Subsystem Availability Example

## Monitor MSC Link Status

**This is an example of a Product Provided situation.**

**This will monitor the status of MSC links. You may optionally modify this situation to track the status of specific links.**

**Add additional logic to make the situation more specific.**



# Subsystem Performance Example

## Monitor Dependent Region Processing

**Situation Editor**

Formula Distribution Expert Advice Action Until

**Description**

Region Occupancy for Dependent Region is High

**Formula**

	Region Occupancy Percentage	Region Name	Type
1	> 50.00	== DEMORGN	== Message
2	> 40.00	== DEMORGN2	== Message
3			

**Region Name** The job name of the subject IMS address space. Valid format is a text string of up to eight alphanumeric characters.

**Region Occupancy Percentage** The dependent region occupancy percentage. The formula must include an integer, Init, and N/A.

**Region Status** Indicates the current status of the dependent region. Valid format is a text string of up to eight alphanumeric characters.

Situation Formula Capacity 33%

**Sampling interval**

0 / 0 : 2 : 0  
ddd hh mm ss

Run at startup

Region occupancy measures how busy the message region is.

Create situations to monitor region occupancy by region type and/or region name.

# Subsystem Performance Example

## Monitoring Queuing At The Subsystem Level

**Situations for - IMS System Information**

Formula   Distribution   Expert Advice   Action   Until

**Description**  
This situation tracks queue depth for the system

**Formula**  
Transactions Queued >= 100

	Transactions Queued	
1	>=	100
2		
3		

intended for logging and reporting data collection times rather than for creating situations. To specify a time of day for monitoring, use attributes from the Universal Time or Local Time groups. See the Tivoli Enterprise Portal help for instructions on specifying timestamp attributes in situations and queries.

**Transactions Queued** Current number of transactions queued. Valid format is an integer.

Situation Formula Capacity   0%   Add conditions...   Advanced...

**Sampling interval**  
0 / 0 : 4 : 0  
ddd hh mm ss

**Sound**  
 Enable critical.wav  
Play   Edit...

**State**  
 Critical  
 Run at startup

This situation will alert on transaction queue depth for the subsystem.

Note – this is a subsystem level number. For more granular queue alerts you may use other situation examples.



# Subsystem Performance Example

## Monitoring Queuing At The Fast Path BALG Level

Situations for - IMS Fast Path Balancing Groups

IMS Fast Path Balancing Groups  
EW\_FP\_Alert

Formula

Description

Formula

Input Queue Length > 20

	BALG Name	Input Queue Length
1	== DEMBG	> 10
2	== DEMBG2	> 20
3		

Input Queue Length The current number of message queued on the balancing group. Valid format is an integer.

Message Ident Set to non-zero if the message was generated by agent. Valid format is an integer.

Messages Processed The number of messages this balancing group processed since it

Situation Formula Capacity  21%

Add conditions... Advanced...

Sampling interval  
0 / 0 : 2 : 0  
ddd hh mm ss

Sound  
 Enable critical.wav  
Play Edit...

State  
 Critical  
 Run at startup

This situation will alert on queue depth at the Fast Path BALG level.

The situation may take into account BALG name and other attributes.

# Subsystem Performance Example

## Monitor Queuing At The MSC Link Level

	Queue	Count
1	>=	100
2		
3		

**This is an example of using a Product Provided situation as a starting point.**

**Situations may be created to track MSC link queue count. Thresholds may be set by queue name and IMSID, among other attributes.**

**Add additional logic to make the situation more specific.**

# Subsystem Resource Performance Example

## Lock Contention

The screenshot shows the 'Situation Editor' window. On the left is a tree view of various situation attributes. The main area is divided into sections: 'Description' (High data-sharing contention rates), 'Formula' (Real Contention Rate >= 80), and 'Attribute Group' (Internal Resource Lock Manager). A table below the formula lists conditions for the 'Real Contention Rate' attribute.

	Real Contention Rate
1	>= 80
2	
3	

Below the formula section, there is a description: 'Real Contention Rate' indicates IRLM global contention rate, as contentions per second. Valid format is an integer.

The 'Attribute Group' section is expanded to show 'Internal Resource Lock Manager' with the following 'Attribute Item' list:

- False Contention Rate
- Global False Contention
- IMS ID
- IRLM Active
- IRLM Active in Data Sharing Group
- IRLM Name

This is another example of starting with a Product Provided situation.

The contention rate is the number of contentions per second. This rate is workload dependent, and will vary by system.

Add additional logic to take into account real versus false contention.

# Subsystem Resource Utilization Example

## Track Critical IMS Pool Usage And Activity

**Situations for - IMS Pools Display**

Formula Distribution Expert Advice Action

Description: Set critical pool thresholds

Formula

	Pool Name	Utilization Percentage	Largest Free Block
1	'PSB Work Pool'	>= 80.00	
2	'DMB Pool'	> 80.00	
3			

Pool Name dropdown options: Enqueue Pool, Expedited Message Handler Buffer, Extended PCB Pool, Fast Path Buffer Pool, Fast Path Work Pool, Fetch Request Element Pool, High I/O Pool, ISAM/OSAM Buffer Pool

Pool Name: 32 alphanumeric characters. Valid format is a text string of up to 32 alphanumeric characters.

Pool Size: The size of the pool in bytes. Valid format is an integer.

Pool Type: The type of the subject IMS storage pool. Valid format is a text string of four alphanumeric characters. Valid values include CIOP, CWAP, CESS, DBOS, DBVS, DBWP.

Situation Formula Capacity: 23%

Sampling interval: 0 / 0 : 15 : 0 (ddd hh mm ss)

Sound:  Enable critical.wav (Play Edit...)

State: **Critical** (Run at startup checked)

**Alert based on pool utilization. Set thresholds based on pool size, utilization, largest free block, and/or combinations.**

**Use a single situation to monitor multiple pools at various threshold levels.**

# Subsystem Resource Performance Example

## Alert On IMS Databases With High I/O Rates

**Description**

VSAM dataset I/O rate high

**Formula**

	EXCP Rate	Database Name
1	>= 80	== DEMDB1
2	> 80	== DEMDB2
3		

**Database Name** == DEMDB2

**Database Name** The name of the subject IMS database. Valid format is a text to eight alphanumeric characters.

**DDName** Displays the DDname which makes up the database. Valid format is a text string of up to eight alphanumeric characters.

Situation Formula Capacity ██████████

**Sampling interval**

0 / 0 : 3 : 0  
ddd hh mm ss

**Advanced Situation Options**

Situation Persistence

Situation Persistence

Consecutive true samples: 3

**Alert on critical databases with high I/O rates.**

**Threshold level may be set by database or database type.**

**Note – the EXCP count will be very workload dependent. The numbers shown here are examples.**

**For rate type alerts using the persistence option may be helpful.**

# Subsystem Resource Performance Example

## Buffer Pool Hit Ratio Low

**Situations for - IMS OSAM Subpool Statistics**

Formula   Distribution   Expert Advice   Action   Until

Description

Formula

**Subpool Hit Ratio** < 85

	Subpool Number	Subpool Hit Ratio
1	== 1	< 90.00
2	== 2	< 85.00
3	== 3	< 95.00

**Subpool Hit Ratio** The percentage of total Locate Calls that were satisfied from the subpool. Valid format is an integer in a range of 0 to 100.

**Subpool Identifier** The name of the subpool, if available. Valid format is a text string of up to four alphanumeric characters.

**Subpool Number** The subpool identification number. Valid format is an integer.

Situation Formula Capacity 30%   Add conditions...   Advanced...

Sampling interval: 0 / 0 : 2 : 0  
ddd hh mm ss

Sound:  Enable critical.wav   Play   Edit...

State: Critical    Run at startup

**OMEGAMON will track the OSAM/VSAM buffer pool hit ratios.**

**These ratios may be used for alerts, for example if hit ratio is below a desired level.**

**May set different hit ratio thresholds for various pools, and types of pools.**

# Application Availability Example

## Alert On Critical Transactions In A Stopped Status

**Situation Editor**

Formula Distribution Expert Advice Action Until

Description

Formula

Status  == PStopped

Transaction Name	Status	Hours	Hours
1 == 'PART'	== Stopped	> 8	< 17
2 == 'PART'	<input checked="" type="checkbox"/> == PStopped	> 8	>= 17
3			

**Status** Scheduling status of the subject IMS transaction. Valid values include Active, Idle, Locked, Purged, Queued, PStopped, Stopped, Suspended, UStopped, Queuing, NoRegions, and RCTEStopped.

**Suspend Count** Displays the suspend count for the subject IMS transaction. Valid format is an integer.

Situation Formula Capacity  29%

Add conditions... Advanced...

Sampling interval

0 / 0 : 1 : 0

ddd hh mm ss

Run at sta

Alerts may be set at the transaction level for status.

Logic may be added for time of day and day of week.

**Status** Scheduling status of the subject IMS transaction. Valid values include Active, Idle, Locked, Purged, Queued, PStopped, Stopped, Suspended, UStopped, Queuing, NoRegions, and RCTEStopped.

**Suspend Count** Displays the suspend count for the subject IMS transaction. Valid format is an integer.

Various transaction statuses that may be alerted on.

# Application Availability Example

## Alert On Critical Databases In A Status Other Than Available

**Situation Editor**

Formula | Distribution | Expert Advice | Action | Until

Description

Formula

Status  Available

	Status	Database Name
1	<input type="checkbox"/> Available	abc == IVP
2		
3		

**Status** Indicates the scheduling status for DMB, an IMS control block in main storage that describes and controls a physical database. Valid values include DBD\_Cmd\_Act, DMB\_Not\_Found, DMB\_Stopped, DMB\_Locked, Wait\_Pool\_Space, Active, Available, Dyn\_Backout\_Err, and Not\_Allocated.

**Timestamp** The date and time when the monitoring agent retrieved the data. This attribute is intended for logging and reporting data collection times rather than for creating situations. To specify a time of day for monitoring, use attributes from the User-Def Time or Local Time

Situation Formula Capacity  10%

Add conditions... Advanced...

Sampling interval

0 / 0 : 1 : 0

ddd hh mm ss

Run at s

Alerts may be set at the database level for status.

Logic may be added for time of day and day of week.

**Status** Indicates the scheduling status for DMB, an IMS control block in main storage that describes and controls a physical database. Valid values include DBD\_Cmd\_Act, DMB\_Not\_Found, DMB\_Stopped, DMB\_Locked, Wait\_Pool\_Space, Active, Available, Dyn\_Backout\_Err, and Not\_Allocated.

**Timestamp** The date and time when the monitoring agent retrieved the data. This attribute is intended for logging and reporting data collection times rather than for creating situations. To specify a time of day for monitoring, use attributes from the User-Def Time or Local Time

Various database statuses that may be alerted on.



# Essential Infrastructure Availability Example

## Monitor Key Address Space Availability

**Alert if a required IMS address space is not available. For example if essential MPR region 'DEMORGN' is not found the alert fires.**

	Job Name
1	'DEMORGN'
2	
3	

**Note - This uses the 'not found' option and Omegamon XE for z/OS to monitor address space availability.**

## Summary

- Situations are an essential building block of the Tivoli Enterprise Portal
- Situations may be used to highlight performance and availability problems within IMS
- Understanding the dynamics of how situations may be effectively built and deployed drives the relative benefits
- It is recommended to have a situation deployment strategy and methodology



**Thank  
You!!!**

