



IBM Software Group

# Using OMEGAMON XE Automation To Manage Databases

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**ON** DEMAND BUSINESS™

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# Agenda

- Overview of OMEGAMON XE
- Review of the monitoring architecture
- Database performance and availability management
- OMEGAMON automation capabilities – situations
- OMEGAMON automation capabilities – policies
- Examples of database automation
- Dashboard Edition (DE) integration
- Using Policies and advanced automation



# What Is OMEGAMON XE?

- OMEGAMON XE performs real time and historical performance and availability management
- Provides monitoring and automation capabilities
  - ▶ Automation integrated with real time monitoring
- Choice of interfaces
  - ▶ OMEGAMON XE GUI
  - ▶ OMEGAMON 3270 (CUA & Classic)
  - ▶ ISPF Interface
  - ▶ Historical and real time performance management



# OMEGAMON XE For DB2 UDB on z/OS

## Monitoring For DB2 UDB on z/OS

### Real Time Monitoring -Threads

- ✓ Thread Detail (In-DB2 elapsed, CPU & wait times, locks, SQL stmt counts & text, plan & package information)
- ✓ Triggers, Procedures, & UDFs

### Real Time Monitoring – DB2 subsystem

- ✓ EDM Pool analysis, VP analysis, logging

### Application Trace Facility

- ✓ Detailed performance tracing

### Choice Of Interfaces (XE Interface, 3270 interface)

### Object Analysis

- ✓ I/O & getpage analysis
- ✓ Correlate activity by object & applications

### Lock Conflict Analysis

### Near-Term Historical

- ✓ Near-term history online

### Historical Analysis - Batch

- ✓ Batch reporting from VSAM, DB2 or SMF

### DB2Plex MonitoringView

- ✓ View CF structures
- ✓ Global lock analysis

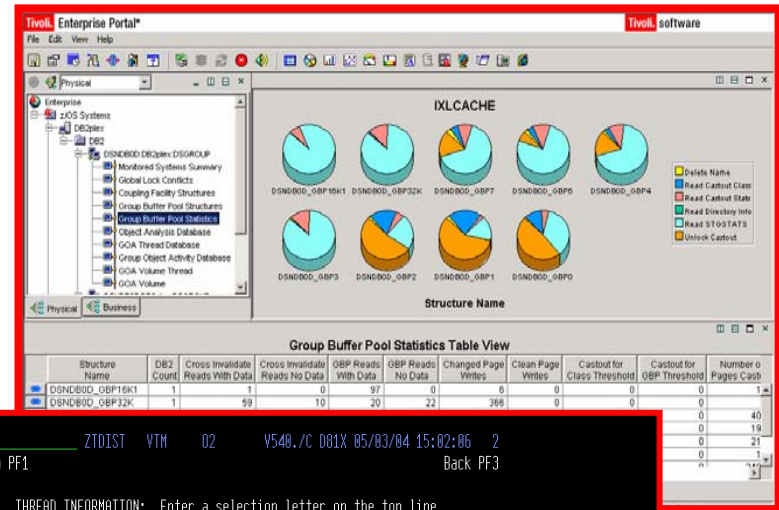
### Automation capabilities



# OMEGAMON DB2 Options & Interfaces

## ■ OMEGAMON XE GUI Interface

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



## OMEGAMON Classic

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

```

ZTDIST VTH 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 *-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 THREAD DETAIL

PLAN
+ Thread: Plan=WKID Connid=BRSRAF Corrid=MYCORRID Authid=PKENN
+ Attach: BRSRAF
+ Package: WKID
rsum
+
+Location
+-----
+N/A
+Transaction name
=====
    
```

## ■ OMEGAMON CUA

- ▶ 3270 interface
- ▶ Different views from Classic
- ▶ Real Time & Historical
- ▶ Warning & Critical exception alerts

The screenshot shows the OMEGAMON CUA 'System Overview' screen. It features a header with 'Actions GoTo Options Help' and a timestamp '09/28/01 9:20:34 AM 161R'. Below the header is a table with three columns: 'Response Times', 'Status', and 'Alerts'. Each cell in the table contains a list of system components with corresponding status indicators (green, yellow, or red bars).

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



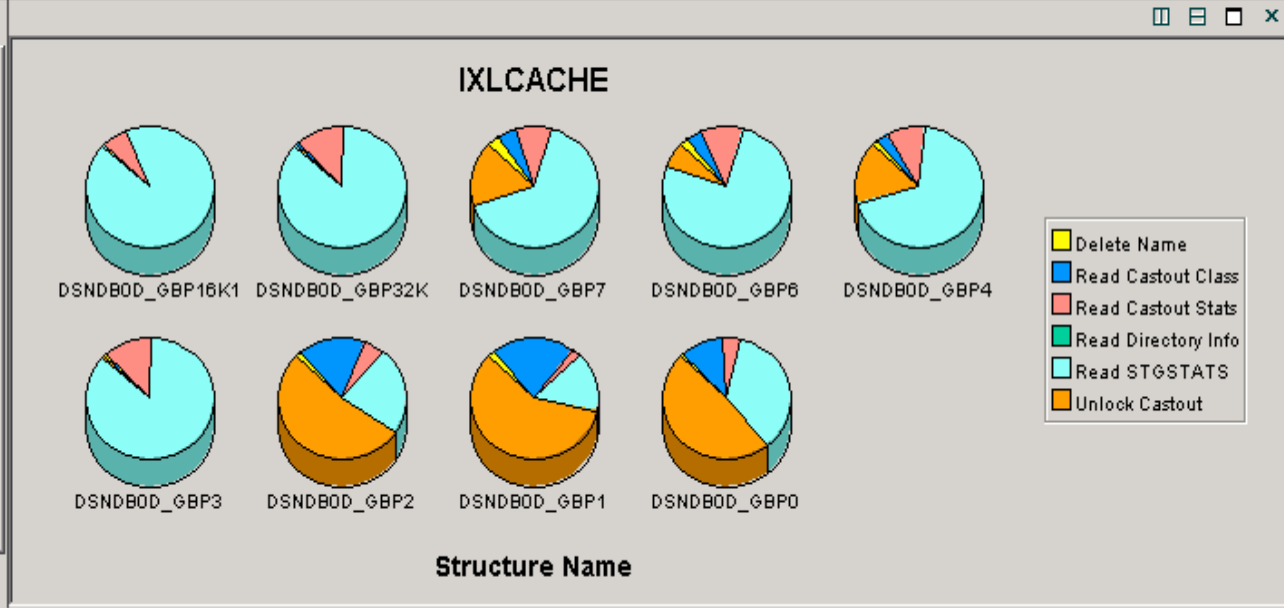
File Edit View Help



Physical

- Enterprise
  - z/OS Systems
    - DB2plex
      - DB2
        - DSNDB0D:DB2plex:DSGROUP
          - Monitored Systems Summary
          - Global Lock Conflicts
          - Coupling Facility Structures
          - Group Buffer Pool Structures
          - Group Buffer Pool Statistics**
          - Object Analysis Database
          - GOA Thread Database
          - Group Object Activity Database
          - GOA Volume Thread
          - GOA Volume

Physical Business



Group Buffer Pool Statistics Table View

Structure Name	DB2 Count	Cross Invalidate Reads With Data	Cross Invalidate Reads No Data	GBP Reads With Data	GBP Reads No Data	Changed Page Writes	Clean Page Writes	Castout for Class Threshold	Castout for GBP Threshold	Number of Pages Cast
DSNDB0D_GBP16K1	1	1	0	97	0	6	0	0	0	1
DSNDB0D_GBP32K	1	59	10	20	22	366	0	0	0	
DSNDB0D_GBP7	1	2	3	1270	160	11166	0	20	0	40
DSNDB0D_GBP6	1	81	0	2106	1236	24622	0	0	0	19
DSNDB0D_GBP4	1	0	1	506	89	2461	0	0	0	21
DSNDB0D_GBP3	1	9	1	38	1365	408	0	0	0	1
DSNDB0D_GBP2	1	254	550	16675	61557	205275	422	0	0	240

Data Sharing Group: DSNDB0D

```

_____ ZTDIST  VTM    02      V540./C D01X 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  *-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 THREAD DETAIL

```

```

PLAN

```

```

+ Thread:  Plan=WKID      Connid=RRSAF   Corrid=MYCORRID   Authid=PKENN
+ Attach:  RRSAF         JOB Name=..PKENNW   JOB Asid= 53K
+ Package: WKID         Collection=

```

```

rsum

```

```

+      Distributed RRSAF Data

```

```

+Location      IP Addr  Port Ctbuser  Srvclsnam  Prod ID  Workstation
+-----
+N/A           N/A     N/A  PKENNEY   N/A       N/A     MY_WORKSTATION_NAM

```

```

+
+Transaction name: MYAPPL.EXE
=====

```



File Edit View Help



Physical

- Enterprise
  - z/OS Systems
    - DB2plex
      - DB2
        - DSNDB0D:DB2plex:DSGROUP
          - Monitored Systems Summary
          - Global Lock Conflicts
          - Coupling Facility Structures
          - Group Buffer Pool Structures
          - Group Buffer Pool Statistics**
          - Object Analysis Database
          - GOA Thread Database
          - Group Object Activity Database
          - GOA Volume Thread
          - GOA Volume

```

ZTDIST  VTM  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  *-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 THREAD DETAIL
PLAN
+ Thread:  Plan=WKID      Connid=RRSAF   Corrid=MYCORRID   Authid=PKENN
+ Attach:  RRSASF        JOB Name=..PKENNU   JOB Asid= 53K
+ Package: WKID          Collection=
rsum
+          Distributed RRSASF Data
          Structure Name
    
```

Physical Business

### Group Buffer Pool Statistics Table View

Structure Name	DB2 Count	Cross Invalidate Reads With Data	Cross Invalidate Reads No Data	GBP Reads With Data	GBP Reads No Data	Changed Page Writes	Clean Page Writes	Castout for Class Threshold	Castout for GBP Threshold	Number of Pages Cast
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DSNDB0D_GBP32K	1	59	10	20	22	366	0	0	0	
DSNDB0D_GBP7	1	2	3	1270	160	11166	0	20	0	40
DSNDB0D_GBP6	1	81	0	2106	1236	24622	0	0	0	19
DSNDB0D_GBP4	1	0	1	506	89	2461	0	0	0	21
DSNDB0D_GBP3	1	9	1	38	1365	408	0	0	0	1
DSNDB0D_GBP2	1	254	550	16675	64557	205275	422	05	0	240

Data Sharing Group: DSNDB0D

# OMEGAMON XE For IMS on z/OS

## Major Functions & Components

- **Real Time Monitor**
  - ▶ Monitor subsystems, regions, resources, pools
- **Response Time Analysis**
  - ▶ Transaction Response time by user defined groups
- **Bottleneck Analysis**
  - ▶ Workload performance and task analysis by user defined groups
- **Operator Assist & Integrated Console Facility**
  - ▶ Consolidation of IMS MTO consoles
- **Application Trace Facility**
- **Exceptions, Alerts, Automation (Situations & Policies)**
- **Choice of Interfaces**
  - ▶ Classic – 3270 interface of choice
  - ▶ CUA – 3270 – functionally frozen
  - ▶ XE interface – key direction



# OMEGAMON XE For IMS on z/OS

The screenshot displays the Omeгамon XE for IMS View interface. On the left, a tree view shows the system hierarchy: Enterprise > OS/390 Systems > SYS > IMSPLEX > IMS110 SYS IMS. A red box highlights a list of monitoring options, including IMS Address Spaces, IMS DASD Logging, IMS Device Activity, IMS IRLM Information, IMS OSAM BP Statistics, IMS OTMA Status, IMS Pools Display, IMS Program Scheduling Blo, IMS Recovery Control Datab, IMS System Exceptions, IMS System Information, IMS Transaction Summary, and IMS V/CAM Activity.

Two charts are shown: 'CPU Usage' and 'Page In Counts'. The CPU Usage chart is a horizontal bar chart comparing TCB CPU Time (yellow) and SRB CPU Time (blue) for various IMS components. The Page In Counts chart is a vertical bar chart showing Common Page-Ins (yellow) and Private Page-Ins (blue) for the same components.

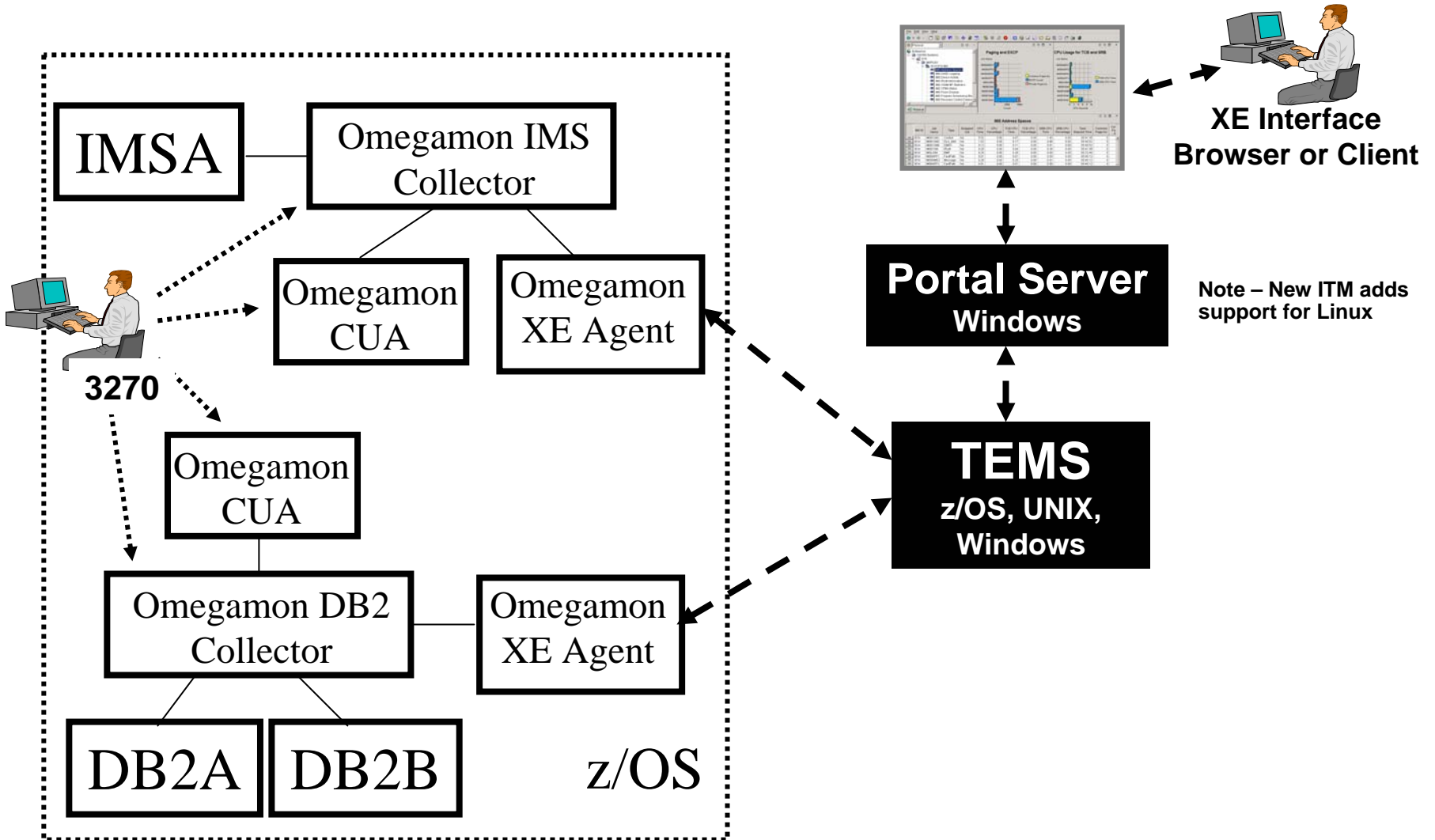
A red banner at the bottom of the charts area contains the text: **Detailed product provided displays** and **User definable displays**.

Below the charts is a table titled 'Monitored IMS Systems' with the following data:

Timestamp	IMSID	MVS Level	MPPs Active	BMPs Active	Applications Scheduled	Transactions Queued	RSR Global Service Group	RSR Service Group	RSR TMIName	APPC IMS LUName	APPC IMS NETID	APPC GRNAME	IMS Version
04/25/03 10:15:41	I61A	SYS	2	1	68	65	N/A	N/A	N/A	N/A	N/A	N/A	V6.1
04/25/03 10:15:41	I61M	SYS	1	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	V6.1
04/25/03 10:15:41	I71C	SYS	2	1	1700	0	N/A	N/A	N/A	N/A	N/A	N/A	V7.1

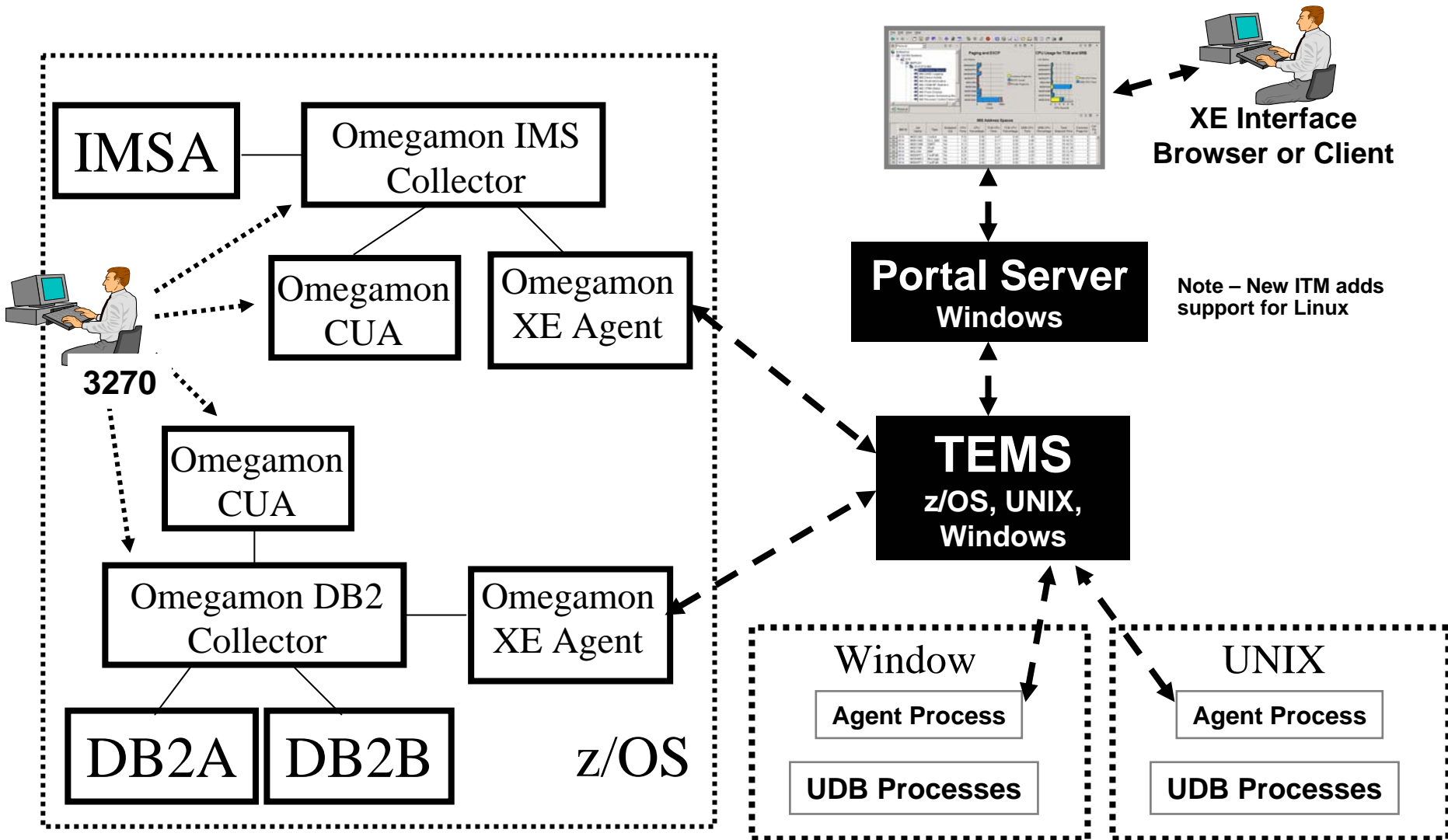
# Mainframe Database Monitoring

## OMEGAMON XE For DB2 UDB & OMEGAMON XE For IMS



# Integrated Database Monitoring

## Add Tivoli Monitoring For Databases on Windows & UNIX



# OMEGAMON Automation And Alert Capabilities

## ■ Situations

- ▶ The basis of Omegamon XE alerts
- ▶ Any monitored attribute may be used in a situation
- ▶ Combines 'reflex' automation with alerting in easy to use GUI interface
- ▶ Typically run in the agent address space (Intelligent Remote Agents – IRAs)

## ■ Policies

- ▶ Combines multiple events (situations, commands, etc) in a single automation policy
- ▶ Use for correlated alerts and automation
- ▶ Run in the Management Server



# Situations – An Example

## The Starting Point For Systems Automation

The screenshot displays the CandleNet Portal interface. At the top, the 'Enterprise Event Console' shows a table of events:

Status	Situation Name	Display Item	Source	Impact
Open	MQSeries_MQ_Channel_Stopped		WMQA:MVSA:MQESA	MQSeries Events
Open	MQSeries_Deaf_Letter		WMQA:MVSA:MQESA	Deaf Letter Queue

Below this, the 'Situation(s) for - Universal Database - DB2:HQDNT2:UD' window is open, showing a list of situations:

- UDB\_Agent\_WaitToken\_High
- UDB\_Agents\_Stolen\_High
- UDB\_Appl\_BP\_Hit\_Ratio\_Low
- UDB\_Appl\_CatCache\_Hit\_Low
- UDB\_Appl\_HJoinOflws\_High
- UDB\_Appl\_HJoinSmOflw\_High
- UDB\_Appl\_Lock\_Warning
- UDB\_Appl\_PkgCache\_Hit\_Low
- UDB\_Appl\_SQL\_Fail\_High
- UDB\_Appl\_Wait\_Lock
- UDB\_BP\_DirtyPg\_Steal\_Clns
- UDB\_BP\_DirtyPg\_thrsh\_clns
- UDB\_BP\_Hit\_Ratio\_Low
- UDB\_Database\_Lock\_Warning
- UDB\_DB\_BP\_Hit\_Ratio\_Low
- UDB\_DB\_File\_Closed\_High
- UDB\_DB\_Sort\_Overflow\_High
- UDB\_DB\_SQL\_Fail\_High

Two red callout boxes highlight key features:

- Situations generate alerts**: Points to the 'Enterprise Event Console' table.
- Product provided situations**: Points to the list of situations in the 'Situation(s) for...' window.

At the bottom left, there is a section titled 'Open Situation Counts - L' with a bar chart showing metrics like 'NT\_Process\_CPU\_Critical', 'EW\_IMS\_DB\_Status', and 'DB2\_CMD\_Thrd\_Wait\_Time\_Critical'.

# Using Situations To Build Alerts

View Favorites Tools Help

Situation(s) for - DSNA:MVSA:DB2

Condition Distribution Expert Advice Action Until

Description

Condition

	DB2 Elapsed Time
1	GT 00:16:40.0
2	
3	

Click inside a cell of the tabular editor above to see a description of the attribute for that column and to compose the expression.

Add an attribute to the condition by clicking Add Attributes and selecting the attributes you want to include.

Add attributes... Advanced...

Sampling interval

0 / 0 : 15 : 0

dd hh mm ss

Sound

Enable critical.wav

Play Edit...

State

Critical

Run at startup

OK Apply Cancel Help

Make alert names meaningful

Specify Situation alert criteria

Specify sampling interval



# Making Alerts Meaningful

Situation(s) for - DSNA:MVSA:DB2

DSNA:MVSA:DB2  
 EV\_Demo\_Thread\_Alert  
 MVS DB2  
 DB2\_CF\_Structure\_Use\_Critical  
 DB2\_CF\_Structure\_Use\_Warnin  
 DB2\_Group\_BP\_Read\_Hit\_Critic  
 DB2\_Group\_BP\_Read\_Hit\_Warr  
 DB2\_Lock\_Waiter\_Time\_Critical  
 DB2\_Lock\_Waiter\_Time\_Warnin  
 DB2\_Thread\_Wait\_Time\_Critical  
 DB2\_Thread\_Wait\_Time\_Warnin

Condition

Description

Condition

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

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

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

Sound

Enable critical.wav

Play Edit...

State

Critical

Run at startup

OK Apply Cancel Help

Specify multiple attributes with And/Or logic

More detailed alerts mean more meaningful & useful alerts. Requires fewer alerts to be created.

# Distribution & Managed System Lists

Situation(s) for - DSNA: MVSA: DB2

Condition Distribution Expert Advice Action Until

Assigned

DSNA: MVSA: DB2  
DSNB: MVSA: DB2

Available Managed Systems

DEMOMVS: CMS  
DSNC: MVSA: DB2  
DSND: MVSA: DB2  
XEDB2: MVSA

Available Managed System Lists

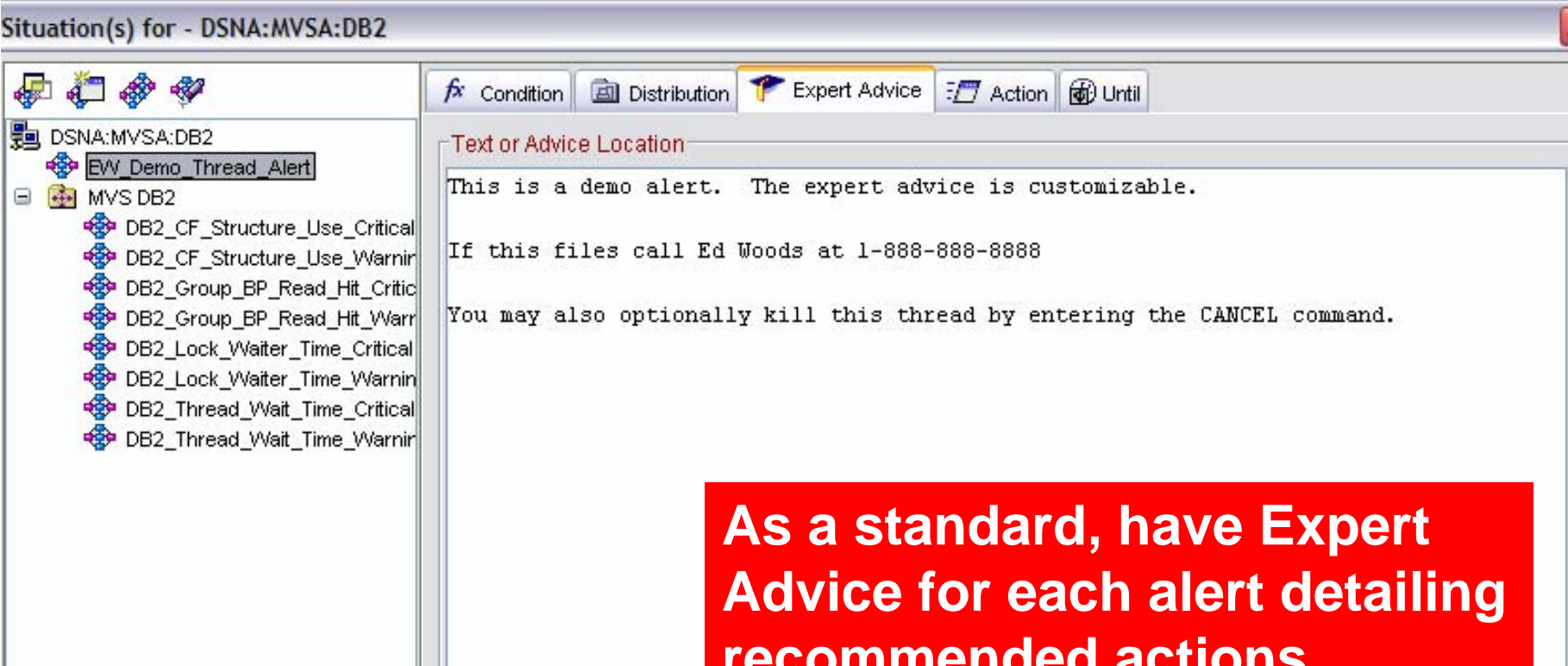
\*EIB  
\*HUB  
\*MVS\_DB2

OK Apply Cancel Help

**Select the managed system to run the alert**

**Managed System lists to manage multiple systems (CICS regions, IMS/DB2 subsystems, z/OS LPARs)**

# Use Expert Advice for Alerts



The screenshot shows the 'Situation(s) for - DSNA:MVSA:DB2' window. The left pane displays a tree view with 'DSNA:MVSA:DB2' expanded to show 'EW\_Demo\_Thread\_Alert' and a list of DB2-related alerts. The right pane shows the 'Expert Advice' tab with a text area containing the following content:

Text or Advice Location

This is a demo alert. The expert advice is customizable.

If this files call Ed Woods at 1-888-888-8888

You may also optionally kill this thread by entering the CANCEL command.

**As a standard, have Expert Advice for each alert detailing recommended actions**

# Integrated Automation

## Solve Problems At Machine Speed

**This will issue the command to the console**

**Specify where to run the action, and how often the command should run.**

**Use the built in automation capabilities to solve problems at machine speed. OMEGAMON will place the command string on the console via SVC call.**

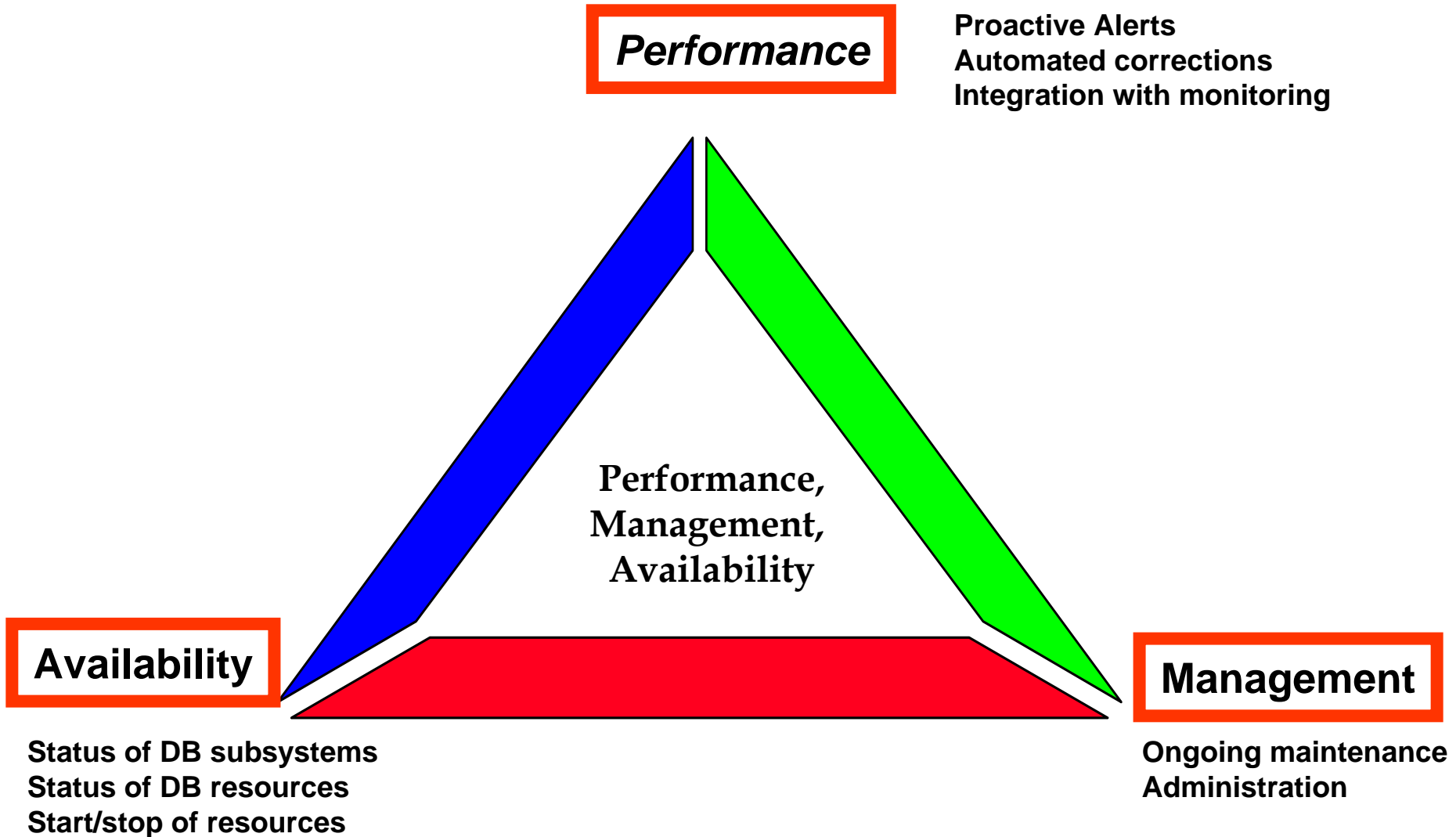
# Advanced Automation Capabilities

## OMEGAMON DE Provides Policy Automation

The screenshot displays the Workflow Editor interface. On the left, a 'Workflow components' panel lists various activities such as 'Start/Stop a policy', 'Wait until a situation is True', 'Evaluate a situation now', 'Take action or Write message', 'Make a choice', and 'Suspend execution'. The main workspace, titled 'EW\_IMS\_Log\_Demo - Grapher View', shows a workflow diagram. It starts with a 'Wait until EW\_IMS\_Log\_Arch\_AlertIs True' activity. A transition labeled 'Situation is true' leads to a 'Take action: OMEGA01 - ...' activity. From there, a transition labeled 'Action succeeded' leads to another 'Take action: OMEGA01 - ...' activity. A final transition labeled 'Action succeeded' leads to a third 'Take action: OMEGA01 - ...' activity. The interface includes a toolbar at the top, a status bar at the bottom with 'Cancel', 'Apply', and 'Help' buttons, and a user profile section at the bottom left for 'Edward A. Wood'.

**Advanced workflow automation integrated within the Dashboard. Check multiple situations. Issue one or more commands.**

# Database Automation Triangle



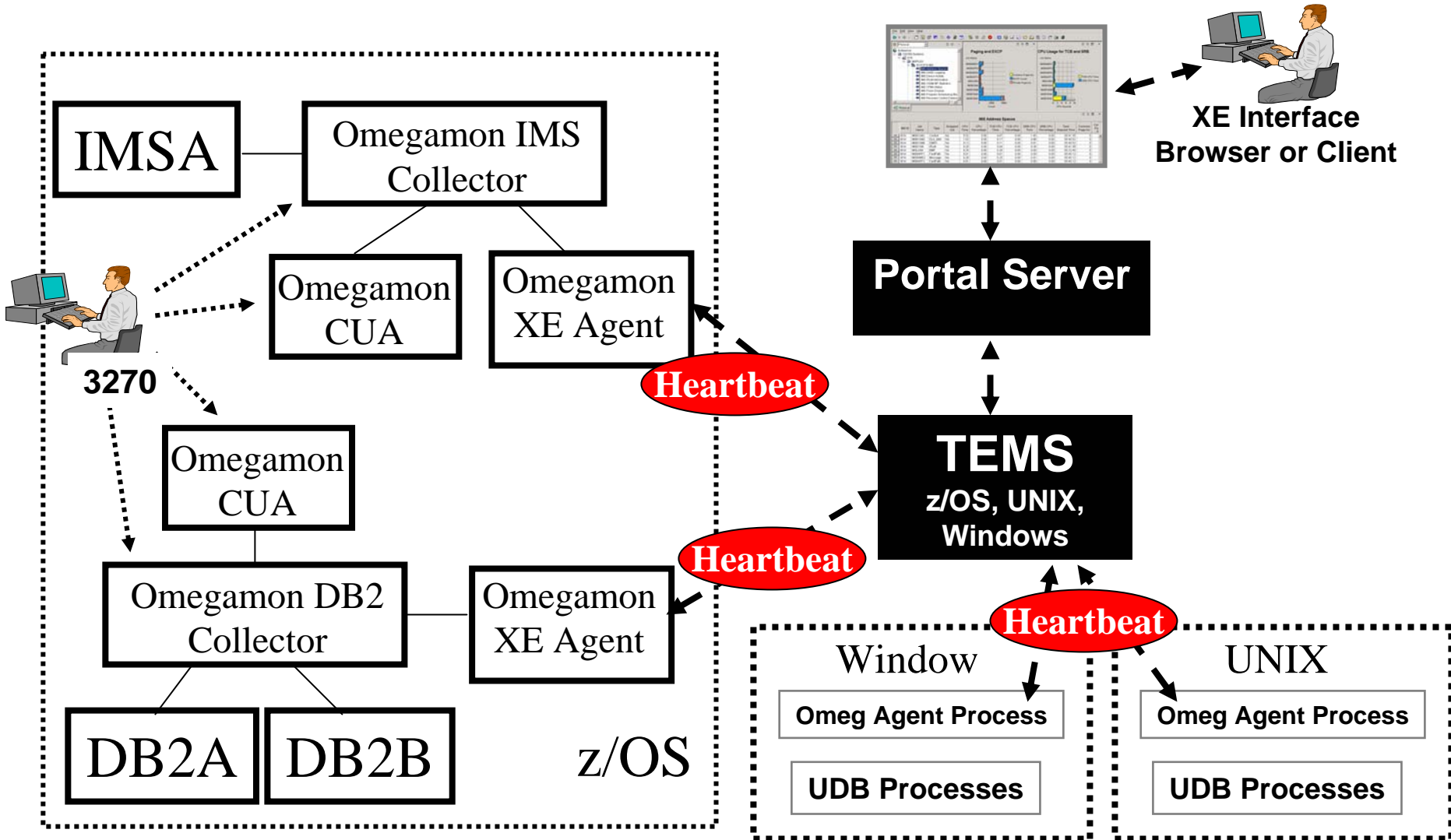
## Availability Automation Examples

- Tracking the status of Database subsystems
  - ▶ Subsystem available/online or not
- Tracking the status of Database resources
  - ▶ Databases started/stopped, threads, pools, etc.
- Start/stop of resources
  - ▶ Automating the start up or shutdown of resources
- Sources of information
  - ▶ OMEGAMON XE heartbeat status
  - ▶ Console messages, subsystem error/event logs



# Monitoring Database Availability

## Monitor Subsystem Online/Offline Status





# Availability Situation Condition Tab

**Give situation a meaningful name**

**Check for an OFFLINE status**

**Optionally add additional attributes to the situation**

**Specify frequency of checks**

**Build a situation to track the online/offline status of a 'managed system'**

Situation(s) for - Enterprise

Condition

This situation will fire if the managed system is OFFLINE

Status	
1	EQ *OFFLINE
2	
3	

Sampling interval: 0 / 0 : 1 : 0

Sound

# Availability Situation Distribution Tab

The screenshot shows a software interface titled "Situation(s) for - Enterprise". The interface has a left-hand navigation pane with a tree view containing "Enterprise", "CT system", "PrimeShift", and "Demo\_DB\_Status". The main area is divided into two panes: "Assigned" and "Available Managed Systems". The "Assigned" pane contains the text "\*HUB" and "DEMOMVS:CMS". A red arrow points from a red callout box to "DEMOMVS:CMS". The "Available Managed Systems" pane is empty. Below the "Available Managed Systems" pane are two arrow buttons and the text "Available Managed System Lists". At the top of the main area, there are tabs for "Condition", "Distribution", "Expert Advice", "Action", and "Until".

**Assign this type of situation to the hub CMS**

# When The Situation Is 'True' An Alert Will Appear

**CandleNet Portal**® !Candle  
Managing what matters most™

File Edit View Help

Physical Total Events: 10 | Item Filter: Enterprise

### Enterprise Event Console

Status	Situation Name	Display Item	Source	
Open	USS_File_System_Free_Space_Crit		SYS1:P390:UNIX	Mounted
Open	Demo_DB2_EDM_Pool_Full		DSN1:SYS1:DB2	EDM Pool
Open	MQSeries_Dead_Letter		CSQ1:SYS1:MQESA	Dead-Letter
Problem	EW_Demo_Console_Log_Alert		tivom01:ALERT_LOG00	tivom01:...
Open	CAT_NT_Missing_Process	clipsrv	Primary:TIVOM01:NT	Process
Open	Q400_Missing_Job_Meas		Q400ATAM	Jobs on
Open	Server_Offline		X1519P3	Enterprise
Open	Server_Offline		dyn9073235210.usil.ibm.com:UA	Enterprise
Open	Server_Offline		TIVOM01:Warehouse	Enterprise
Open	Server_Offline		DB2:TIVOM01:UD	Enterprise

**Note several managed systems in an offline status**

### Message Log

Status	Name	Display Item	Origin
Problem	EW_Demo_Console_Log_Alert		
Open	Server_Offline		X1519P3
Open	Demo_DB2_EDM_Pool_Full		DSN1:SYS1:DB2
Open	MQSeries_Dead_Letter		CSQ1:SYS1:MQE
Open	USS_File_System_Free_Space_Crit		SYS1:P390:UNIX

CICSplex\_RTAGroup\_Warning Count

# Availability Situation - Action Tab

## Issue Commands When The Situation Is True

The screenshot shows the 'Action' tab of a situation configuration window. The left pane shows a tree view with 'Enterprise' expanded to 'CT system', 'PrimeShift', and 'Demo\_DB\_Status'. The right pane has tabs for 'Condition', 'Distribution', 'Expert Advice', 'Action', and 'Until'. The 'Action' tab is active, showing the following configuration:

- Action Selection:**  System Command,  Universal Message
- System Command:** A text field containing 'Script commands or MVS console command'.
- If the condition is true for more than one monitored item:**  Only take action on first item,  Take action on each item
- Where should the Action be executed (performed):**  Execute the Action at the Managed System (Agent),  Execute the Action at the Managing System (CMS)
- 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

Red callout boxes with arrows point to specific fields:

- One box points to the 'System Command' text field with the text: **Issue UNIX commands, BAT files, MVS console commands**
- Another box points to the 'Execute the Action at the Managed System (Agent)' radio button with the text: **Execute the command either at the agent or the CMS**
- A third box points to the 'Don't take action twice in a row...' radio button with the text: **Once or multiple times**

Once or multiple times

Issue UNIX commands, BAT files, MVS console commands

Execute the command either at the agent or the CMS

# Availability Example

## Monitor The Status Of An IMS Database

**Check the status of specific IMS DBs, and issue a command as appropriate**

**Check for specific DBs**

**Check the status of IMS DBs (Available, Not Found, etc.)**

**Description**  
This alert tracks the availability status of IMS databases

**Condition**  
Status  NE Available

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

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

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

**State**  
 Critical  
 Run at startup

# Assign The Availability Check To Various Subsystems

**Add an action command**

**Assign where the check is performed**

**Use Managed System Lists to simplify the assignment**

# IMS DB Availability Alert

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Physical Total Events: 18 | Item Filter: Enterprise

- Resource Groups Data for Sysplex
- Service Classes Data for Sysplex
- Service Definition Data for Sysplex
- Shared DASD Groups Data For Sysplex
- XCF Groups Data for Sysplex
- XCF Paths Data for Sysplex
- XCF Systems Data for Sysplex
- MVSA
  - CICS
    - DB2
    - IMSPLEX

### Enterprise Event Console

Status	Situation Name	Display Item	Source	Impact
Open	MQSeries_MQ_Channel_Stopped		WMQA:MVSA:MQESA	MQSeries Events
Open	MQSeries_Dead_Letter		WMQA:MVSA:MQESA	Dead-Letter Queue M
Open	N3T_Conn_Current_Retransmits		TCPIP:MVSA	Connections
Open	N3T_Conn_Rnd_Trip_Time		TCPIP:MVSA	Connections
Open	EW_IMS_DB_Status		IMSA:MVSA:IMS	IMS VSAM/OSAM Activ
Open	EW_IMS_Log_Arch_Alert		IMSA:MVSA:IMS	IMS DASD Logging
Stopped	EW_IMS_Trans_Q_Alert		IMSA:MVSA:IMS	IMSA:MVSA:IMS
Stopped	DB2_CMD_Connection_Failed		DSND:MVSA:DB2	Detailed Thread Exce

**CRITICAL**

EW_IMS_DB_Status	IMSA:MVSA:IMS	03/24/05 16:43:30
EW_IMS_Log_Arch_Alert	IMSA:MVSA:IMS	03/24/05 16:43:05
EW_IMS_Trans_Q_Alert	IMSA:MVSA:IMS	03/23/05 15:44:04

Select workspace link button to view event results for: EW\_IMS\_DB\_Status

Count	Status	Situation Name	Source
1	Open	N3T_Conn_Current_Retransmits	TCPIP:MVSA
1	Open	N3T_Conn_Rnd_Trip_Time	TCPIP:MVSA
1	Open	DB2_Thread_Wait_Time_Warning	DSNC:DB2plex:D
1	Open	DB2_Thread_Wait_Time_Warning	DSNR:DB2plex:D

Alert will fire when IMS DB is unavailable

Click on the alert 'flyover' to see more detail

# Situation Detail View

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---

Physical

- IMS Pools Display
- IMS Program Scheduling Bloc
- IMS Recovery Control Databe
- System Exceptions
- System Information
- Transaction Summary
- IMS VSAM Activity
- IMS VSAM/OSAM Activity
- EW IMS\_DB\_Status**
- Startup Parameters Details
- MQSeries Status Details
- Coupling Facility Data Sharing
- IMSB: MVSA: IMS
- Mainframe Networks

### Initial Situation Values

Status	Originating System Identifier	IMS ID	Database Name	Access Method	Write Error	Dynamic Backout Error	Type	EXCP Rate	EXCP Count	DDName
	IMSA: MVSA: IMS	IMSA	VPDB2		No	No		0	0	
DMB_Not_Found	IMSA: MVSA: IMS	IMSA	VPDB4		No	No	MSDB	0	0	
	IMSA: MVSA: IMS	IMSA	VPDB3		No	No				

### Current Situation Values

Status	Originating System Identifier	IMS ID	Database Name	Access Method	Write Error	Dynamic Backout Error	Type	EXCP Rate	EXCP Count	DDName
DMB_Not_Found	IMSA: MVSA: IMS	IMSA	VPDB4		No	No	MSDB	0	0	
	IMSA: MVSA: IMS	IMSA	VPDB3		No	No	DEDB	0	0	
	IMSA: MVSA: IMS	IMSA	VPDB3		No	No	DEDB	0	0	

### Take Action

Action Name:

Arguments:

**Customizable expert advice**

Expert Advice

**Alert**

**Alert details**

**Customizable action commands**





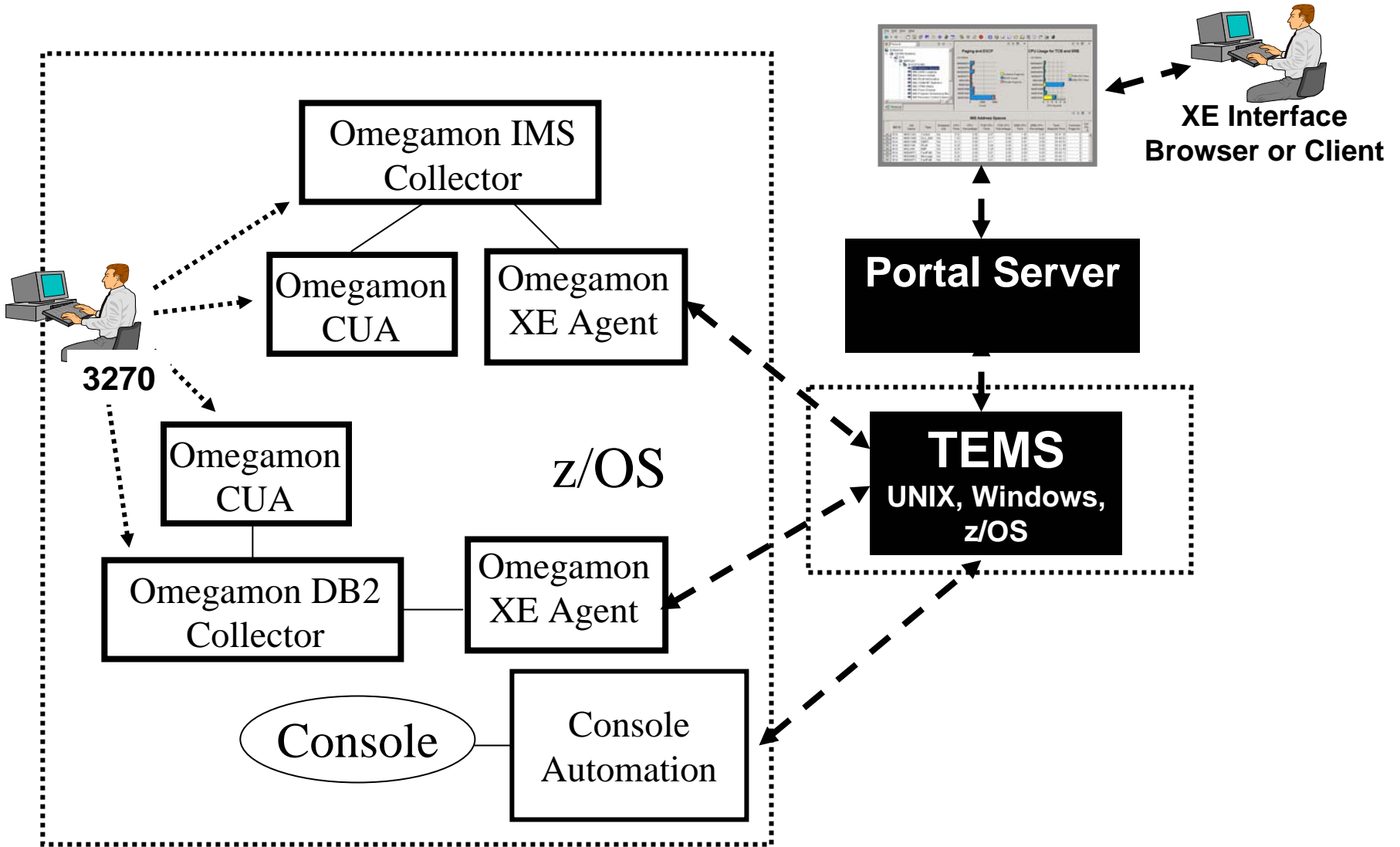
# Availability Automation Tracking Messages & Consoles

- Mainframe console message options
  - ▶ Console automation
    - Use as a console interface
    - Interfaces to TEMS via SOAP interface or Agent interface
  - ▶ REXX exec interface to Universal Agent
    - REXX exec sends alert to CMS using Universal Agent as interface
- Distributed platforms
  - ▶ Monitor Windows event logs
  - ▶ Monitor UNIX log files
  - ▶ Universal Agent provides several types of 'data providers'



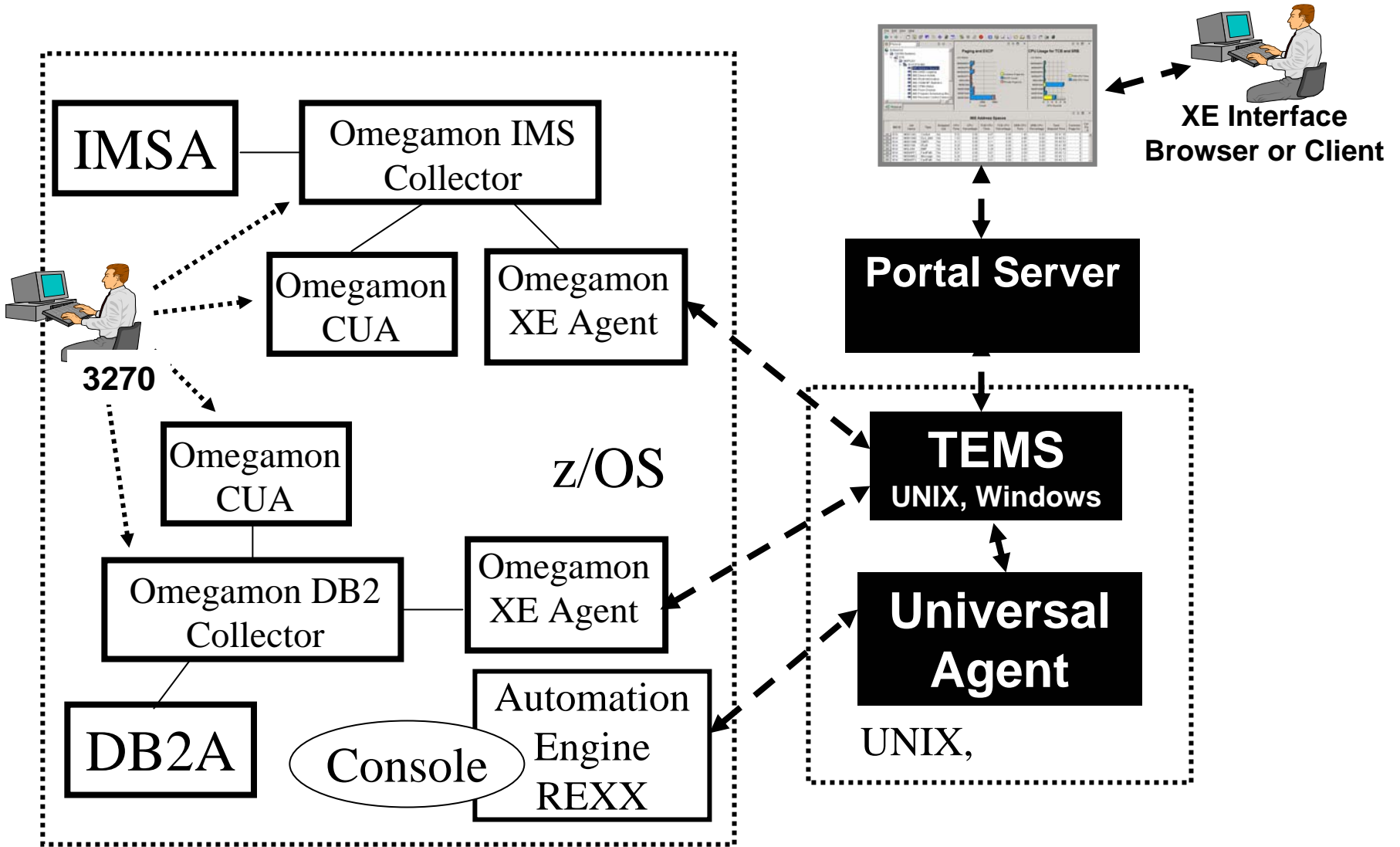
# Console Interfaces

Using Console Automation To Interface To XE/DE



# Console Interfaces

Forwarding Important Availability Messages To OMEGAMON XE/DE



## Build A Situation To Check For The Message

The screenshot displays the configuration interface for a situation in IBM Tivoli Enterprise Console. The left pane shows a tree view with the following structure:

- tivom01:ALERT\_LOG00
  - EW\_Demo\_Console\_Log\_Alert

A red arrow points from a red box labeled "Situation" to the "EW\_Demo\_Console\_Log\_Alert" node.

The right pane shows the configuration for the selected situation. The "Condition" tab is active. The "Description" field is empty. The "Condition" section contains a table with the following content:

	DP Log Text
1	abc EQ DSN* SAMPLE MESS
2	
3	

A red arrow points from a red box labeled "Message Text" to the text "abc EQ DSN\* SAMPLE MESS" in the first row of the table.

**For a good example of messages to check for refer to  
"Health Check Your DB2 System" by John Campbell,  
IBM Corporation**

# Using Universal Agent For Console Interface

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help

Jobs Resources Devices Tools Filter View Options Help

SYSLOG STC41888 Start: 2005.124 14:24 (SYSLOG05) Line 3095 of 3210
Command ==> Scroll ==> PAGE
Current Find Text: Dataset 1 of 1
<-----3-----4-----5-----6-----7-----8-----9----->
1717034 -%KHTEST DEMO MESSAGE
1717039 SYT R= CNMP25 SOCKET INITIALIZE = 0
1717039 SYT R= CNMP25 SOCKET CREATE = 0
1717039 SYT R= CNMP25 SOCKET CONNECT = 0
1717039 SYT R= CNMP25 SOCKET SEND = 0
1717039 SYT R= CNMP25 SOCKET RECEIVE = 0
    
```

z/OS console messages may be trapped, highlighted, and acted upon by Omegamon XE

zOS\_SA390\_Netview\_Messages - Microsoft Internet Explorer

Address: <http://165.26.65.101:1920//.../kdh/lib/cnp.html?12000=SYSADMIN&5001=MOPHYSICAL&1021A=REPORT&1020=tcplpsyt:SA39000@zkum.SA390MESSAGE500&2400=p...>

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Physical

- Enterprise
  - Windows Systems
    - CAT539416
      - Universal Data Provider
        - CAT539416SOCKdp:UAGENTOC
          - ACTION
          - DPL0G
          - tcplpsyt:SA39000
            - MESSAGES
- OS/390 Systems
  - TTST

**Consolidated Console Messages**

MsgDate	MsgTime	SMFID	MsgID	MsgText
DEMO	MESSAGE			
DEMO	MESSAGE			

# Performance Automation

- Proactive alerts of performance problems
- Automated corrections
  - ▶ Correct performance bottlenecks at machine speed
- Integration with other monitoring technology



# Performance Automation

## Automated Corrections

- Monitor problem applications on an ongoing basis
- Monitor for runaway threads
- Automate the termination of runaway threads
  - ▶ Automated 'kill' capability
  - ▶ Use intelligent situation logic to target problem applications



# Automated Corrections Runaway Thread Scenario

Situation(s) for - DSN1:SYS1:DB2

Condition Distribution Expert Advice Action Until

Description

Condition

	Getpage Count	Plan Name
1	GT 1000	abc EQ DSNES
2		
3		

Click inside a cell of the tabular editor above to see a description of the attribute for that column and to compose the expression.  
Add an attribute to the condition by clicking Add Attributes and selecting the attributes you want to include.

Add attributes... Advanced...

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

Sound:  Enable critical.wav, Play, Edit...

State: Critical,  Run at startup

**Create an alert tracking for problem DB2 threads. Click add attributes to add more logic to the check.**



# Automated Corrections

## Specifying The Cancel Command

The screenshot displays the 'Situation(s) for - DSN1:SYS1:DB2' configuration window. The left-hand tree view shows the hierarchy: DSN1:SYS1:DB2 > MVS DB2 > EW\_Demo\_Runaway\_Thread. The right-hand pane is the 'Action' tab, which is selected. It contains the following sections:

- Action Selection:** Radio buttons for 'System Command' (selected) and 'Universal Message'.
- System Command:** A text field containing the command '&DB2\_Thread\_Exceptions.Cancel\_Command'. A red arrow points from a text box to this field. To the right of the field is a button labeled 'Attribute Substitution...'. Below this field are two radio button options: 'Only take action on first item' (selected) and 'Take action on each item'.
- Where should the Action be executed (per interval):** Radio buttons for 'Execute the Action at the Managed System' (selected) and 'Execute the Action at the Managing System'.
- If the condition stays true over multiple intervals:** Radio buttons for 'Don't take action twice in a row (wait until situation goes false then true again)' (selected) and 'Take action in each interval'.

A red text box with white text is overlaid on the right side of the screenshot, pointing to the 'System Command' field. The text in the box reads: 'Action tab allows specification of the DB2 Cancel command with the correct token already specified.'

# Monitoring The Problem Thread

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File Edit View Help

---

Physical

- Enterprise
  - OS/400 Systems
  - Windows Systems
    - TIVOM01
      - Universal Agent
      - Universal Database - DB2:TIVOM01:UD
      - Universal Data Provider
      - Windows NT
    - OS/390 Systems
      - SYS1
        - CICS
        - DB2
          - DSN1:SYS1:DB2
            - System Status
            - Detailed Thread Exception

### Locks Owned

### Detailed Thread Exceptions

Package Name	Authorization Identifier	DB2ID	CPU Utilization	Elapsed Time	Getpage Count	Thread Status
DSNESM68	P390A	DSN1	7.2	00:00:22	10577	IN_DB2

**DB2 System: DSN1, MVS System: SYS1**

Ready Hub Time: Mon. 04/04/2005 02:59 PM Server Available. Detailed Thread Exception - 9.73.235.210 - SYSADMIN \*ADMIN MODE\*

# Automated Corrections

## The Cancel Command Is Issued

```

Display Filter View Print Options Help
-----
SDSF SYSLOG      12.101 SYS1 SYS1 04/04/2005 2W      32267      COLUMNS 38 117
COMMAND INPUT ==>          SCROLL ==> CSR
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
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STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000090  CSV002I REQUESTS FOR MODULE KPDCSVG EXCEED MAXIMUM USE COUNT
STC00625 00000290  - CANCEL THREAD(556)
STC00023 00000090  DSNV426I - DSNVCT THREAD '556' HAS BEEN CANCELED
STC00023 00000090  DSN3201I - ABNORMAL EOT IN PROGRESS FOR USER=P390A 855
      855 00000090  CONNECTION-ID=TSO CORRELATION-ID=P390A JOBNAME=P390A ASID=004
      855 00000090  TCB=008E1798
5 DFS996I *IMS READY* IVP1
3 ISTEXC200 - DYN COMMANDS MAY BE ENTERED
***** BOTTOM OF DATA *****

```

# Performance Automation Situations Versus Policies

- Policies allow for more sophisticated automation
  - ▶ Issue multiple commands and check if commands worked
  - ▶ Situations are single command functions
- Situations typically run in the agent
- Policies run in the TEMS



## Performance Automation And Policies

- Use Policies for more sophisticated performance automation scenarios
- Automate corrections
- Implement machine speed corrective actions, issue alerts, and allow for later human intervention
- Use for dynamic subsystem management and ‘tweaks’ as the workload changes
  - ▶ Not permanent fixes, but to keep the workload running
- Policies allow for correlated automation of composite applications



# Many Applications Are ‘Composite’ Applications

**Composite application management requires the ability to view, analyze, and manage activity across multiple platforms and technologies.**

The dashboard displays a complex system architecture. On the left, a tree view shows a hierarchy of components including EFERN, EKONO, ESEFT, ETUCZ, EWOOD, CF Status, CICS, DB2, DB2Plex, Demo Overview, Example Overview, IMS, MQ Series, Network Performance, and SY1. The main area shows a network diagram with server racks and database cylinders connected by lines. A lightning bolt icon indicates a network performance issue. Below the dashboard are five data tables: z/OS Performance, CICS Region Overview, IMS Address Spaces, DB2 Threads, and MQ Series. Red boxes with white text are overlaid on the bottom of the dashboard, labeling the components: z/OS, CICS, IMS, DB2, and MQ.

Service Class	Period	Goal Type	G Perc
BATCH	1	Velocio	
BATCH	2	Velocio	
BATHI		ocio	

System ID	CICS Region Name	CICS Version	R S
SP12	CCCD818	6.2.0	N/
SP12	CCCD819	6.2.0	N/
SP12		2.0	N/

Originating System Identifier	MVS System	IM
XEIMS:SP12:MVS	SP12	I71
XEIMS:SP12:MVS	SP12	I71

Originnode	
D710:SP12:DB2	02/08

Origin Node	P
MQ12:SP12:MQESA	04
MQ12:SP12:MQESA	03
MQ	n4

**z/OS**

**CICS**

**IMS**

**DB2**

**MQ**

# Policies Support The Ability To Do Correlated Alerts And Commands

The screenshot displays the IBM Policy Manager interface. At the top, the 'Policy Details' window shows 'New Policy' with various configuration options like 'Distributed', 'Auto start', and 'Correlate by'. Below this is the 'Workflow Editor' with a 'Workflow components' pane on the left containing various activity icons. The main 'New\_Policy - Grapher View' shows a workflow graph with three nodes: 'Wait until Application\_End\_User\_Alert is True' (labeled 'CICS'), 'Wait until EW\_Demo\_CICS\_Alert is True' (labeled 'CICS'), and 'Wait until EW\_Lock\_Conflict is True' (labeled 'DB2'). Arrows indicate flow between these nodes. A 'Take action: Console Comm...' node is connected to the 'DB2' node. An 'Action Settings' dialog is open in the foreground, showing 'System Command' selected and 'Console Command' entered in the text field. A red box labeled 'Command' points to this dialog. A large red box at the bottom center contains the text 'Advanced workflow automation integrated within the Dashboard'. The system tray at the bottom left shows 'SYSADMIN' and 'Modify Start/Stop' options.

**Advanced workflow automation integrated within the Dashboard**

**Command**

# Using Policies For Dynamic Performance Management

**Workflow Editor**

**Workflow components**

- Web Services
- Name missing
- General activities
- Emitter activities
- Extensions

**New\_Policy - Grapher View**

**If true issue console commands**

```

    graph TD
      A[Wait until EW_Demo_Thread_Queueing is True] -- "Situation is true" --> B[Wait until CICSplex_delay_in_Database is True]
      A -- "Situation is true" --> C[Take action: SET SYS Parm...]
      B -- "Situation is true" --> C
      C -- "Action succeeded" --> D[Take action: OMEGA01 DSNZ...]
    
```

**Check if threads creation into DB2 is bottlenecked**

**Check if DB2 is queuing and response time is bad**

**If so dynamically adjust settings in DSNZPARM**

Edward A. Wood  
 Modify  Start/Stop

OK Cancel Apply Help



# Using Policies For Dynamic Performance Management

The screenshot displays the IBM Workflow Editor interface. On the left, the 'Workflow components' pane shows various activity icons, including 'Start/Stop a policy', 'Wait until a situation is true', 'Evaluate a situation now', 'Take action or write message', 'Make a choice', 'Suspend execution', and 'Start/Stop a situation'. The main workspace, titled 'New\_Policy - Grapher View', shows a workflow diagram. It starts with a 'Wait until EW\_Demo\_Thread\_Queueing is True' activity, which triggers a 'Take action: -SET SYSPARM...' activity. An 'Action Settings' dialog box is open, showing the 'System Command' field with the text '-SET SYSPARM LOAD(DSNZPARM) RELOAD'. The dialog also has options for 'Universal Message' and 'System Command', and buttons for 'OK', 'Cancel', 'Attribute...', 'XML...', 'More options', and 'Help'. A red callout box at the bottom of the dialog reads: 'Issue SET SYSPARM command to activate new ZPARM settings'. The bottom of the editor shows the user name 'Edward A. Wood' and checkboxes for 'Modify' and 'Start/Stop'.

**Issue SET SYSPARM command to activate new ZPARM settings**

# Policies Are Distributed To The TEMS

The screenshot displays the IBM Policy Manager interface, specifically the 'Policy Details' and 'Workflow Editor' sections. The 'Policy Details' section shows the policy name 'EW\_IMS\_Log\_Demo' and its status 'Distributed' (checked). The 'Workflow Editor' section shows a 'Change Policy Distribution' dialog box. A red arrow points from a red box labeled 'Policy distribution' to the 'Assigned' list, which contains 'DEMOMVS:CMS'. The 'Available Managed Systems' list includes various system identifiers such as 'CELL1.BB0C001.BBOS0:DEMOMVS:KWWV5'. The 'Available Managed System Lists' list includes various system lists such as '\*CPIRA\_MGR' and '\*CUSTOM\_UAGENT00'. The 'Take action: OMEGA01 - Te...' button is visible on the right side of the dialog box.

**Policy distribution**

**Assigned**

- DEMOMVS:CMS

**Available Managed Systems**

- CELL1.BB0C001.BBOS0:DEMOMVS:KWWV5
- CELL1.BB0C002.BBOS0:DEMOMVS:KWWV5
- CXEGA01:MVSA:STORAGE
- CXEGA18:MVSA:KN3AGENT
- DB2:HQDNT2:UD
- DEMOMVS:RCACFG
- DEMOMVS:KWWVA
- DEMOMVS:KWWV5:CVSPLX

**Available Managed System Lists**

- \*CPIRA\_MGR
- \*CUSTOM\_UAGENT00
- \*EIB
- \*GENERIC\_CONFIG
- \*HUB
- \*MGIRA\_MGR
- \*MQ\_AGENT
- \*MVS\_SCP

Take action: OMEGA01 - Te...

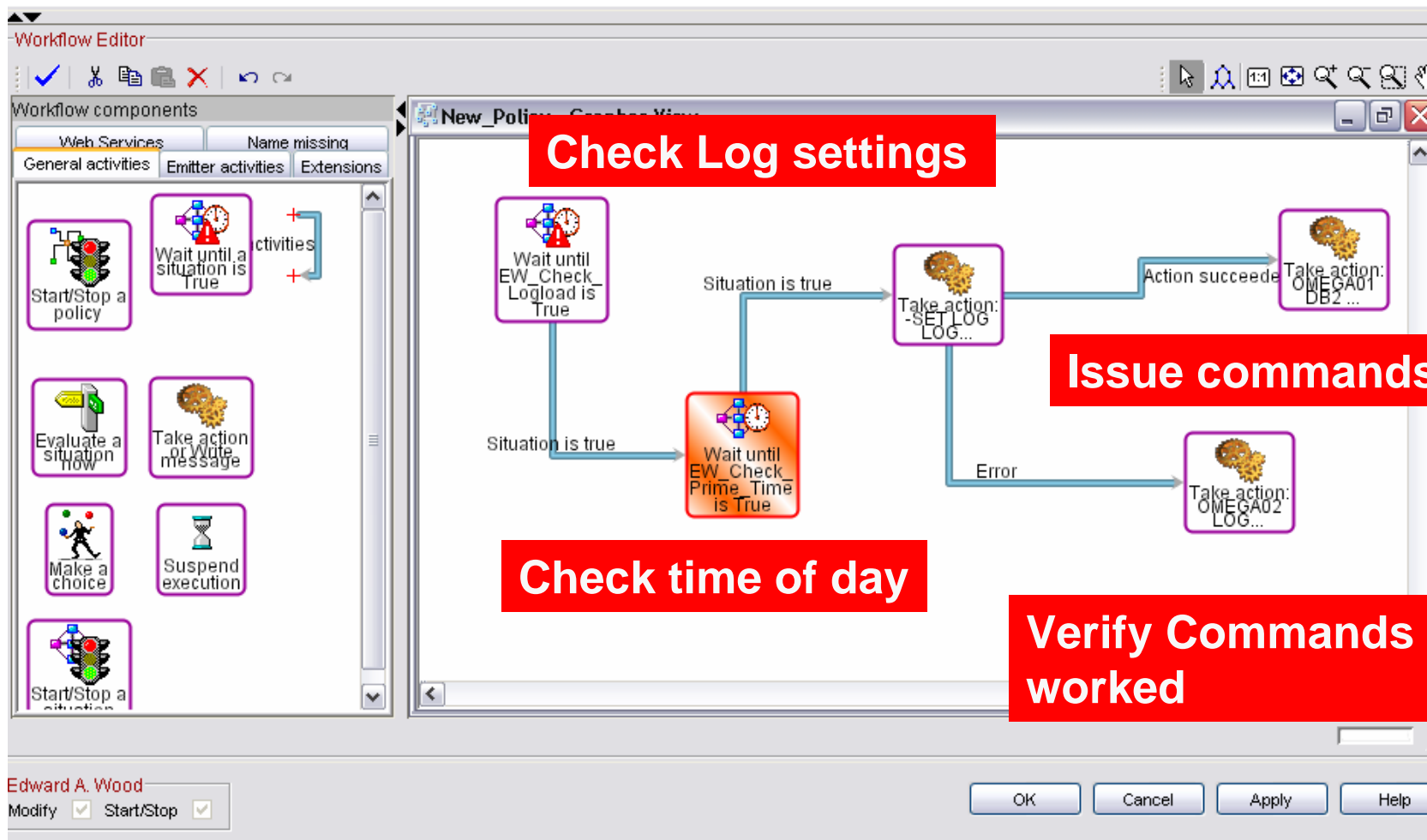
# Database Management Automation

- Automation of ongoing database management actions
- Utility status and management
- Management of ongoing functions
  - ▶ Example - logging



# Database Management

## Dynamically Managing Logging



# Using Policies To Automate Log Settings

The screenshot displays the Workflow Editor interface. On the left, the 'Workflow components' pane shows various activity icons. The main workspace, titled 'New\_Policy - Grapher View', shows a workflow graph with the following steps:

- Start/Stop a policy
- Wait until a situation is true (Condition: EW\_Check\_Logload is True)
- Take action: -SET LOG LOG...
- Take action: OMEGA01 DB2...
- Take action: OMEGA02 LOG...

An 'Action Settings' dialog box is open over the second action node. It shows the 'System Command' field containing the text: `-SET LOG LOGLOAD(50000)`. A red arrow points to the 'Attribute...' button in the dialog. At the bottom of the screen, a red banner contains the text: **Issue LOG command to console**.

Edward A. Wood  
Modify  Start/Stop

# Using Policies To Automate Log Settings

The screenshot displays the IBM Workflow Editor interface. The main window, titled "New\_Policy - Grapher View", shows a workflow graph with three nodes: "Wait until EW\_Check Logload is True", "Take action: -SET LOG LOG...", and "Take action: OMEGA01 DB2...". The workflow is triggered when the situation "Situation is true" is met. The "Action Settings" dialog box is open, showing the "System Command" field with the text "OMEGA01 DB2 LOG PARM SET FOR &DB2\_SRM\_Log\_Manager.Originnode". A red callout box with white text points to the "System Command" field, stating: "Send message to console to note command was issued and why". The "Action Selection" section of the dialog has "System Command" selected. The "Ready" status is visible at the bottom of the dialog.

**Send message to console to note command was issued and why**

Workflow Editor  
Workflow components  
Web Services Name missing  
General activities Emitter activities Extensions  
Start/Stop a policy Wait until a situation is True  
Evaluate a situation now Take action on a message  
Make a choice  
Start/Stop situation  
Edward A. Wood  
Modify  Start/Stop

New\_Policy - Grapher View  
Situation is true  
Wait until EW\_Check Logload is True  
Take action: -SET LOG LOG...  
Action succeeds  
Take action: OMEGA01 DB2...  
Situation is true  
Action Selection  
 Universal Message  System Command  
System Command  
OMEGA01 DB2 LOG PARM SET FOR &DB2\_SRM\_Log\_Manager.Originnode  
OK Cancel Attribute... XML... More options Help  
Ready  
OK Cancel Apply Help

# DB2 Utility Management

## Monitor For Utilities In A Stopped Status

The screenshot displays the 'Situation(s) for - Utility Jobs' window. The left pane shows a tree view with 'Utility Jobs' expanded to 'DB2\_Util Stopped'. A red arrow points from this node to the main configuration area. The main area has tabs for 'Condition', 'Distribution', 'Expert Advice', 'Action', and 'Until'. The 'Condition' tab is active, showing a description: 'DB2 Utility is in a stopped status'. Below this is a 'Condition' section with a dropdown menu set to 'Stat EQ Stopped'. A table below the dropdown shows three rows for configuration:

	Stat
1	EQ Stopped
2	
3	

Below the table is a yellow-highlighted legend:

- Stat** A for Active, S for stopped. Valid entry is an integer of up to four digits.
- Status** Utility status. Valid entry is an alphanumeric text string, with a maximum length of 12 characters.
- Stmt** Statement number. Valid entry is an integer of up to four digits.

Buttons for 'Add attributes...' and 'Advanced...' are at the bottom right of the condition section. At the bottom of the window, there are sections for 'Sampling interval' (0 / 0 : 15 : 0), 'Sound' (Enable critical.wav, Play, Edit...), and 'State' (Critical, Run at startup checked).

## Summary

- OMEGAMON XE provides powerful GUI based monitoring, alerting, and automation capabilities
- Any monitored attribute may be used in an alert
- Any alert may be used to drive automation
- Two main types of automation
  - ▶ Situations – ‘reflex’ automation
  - ▶ Policies – more sophisticated automation scenarios
- Automation integrated directly into the OMEGAMON user interface
  - ▶ No REXX or other procedural code required

