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

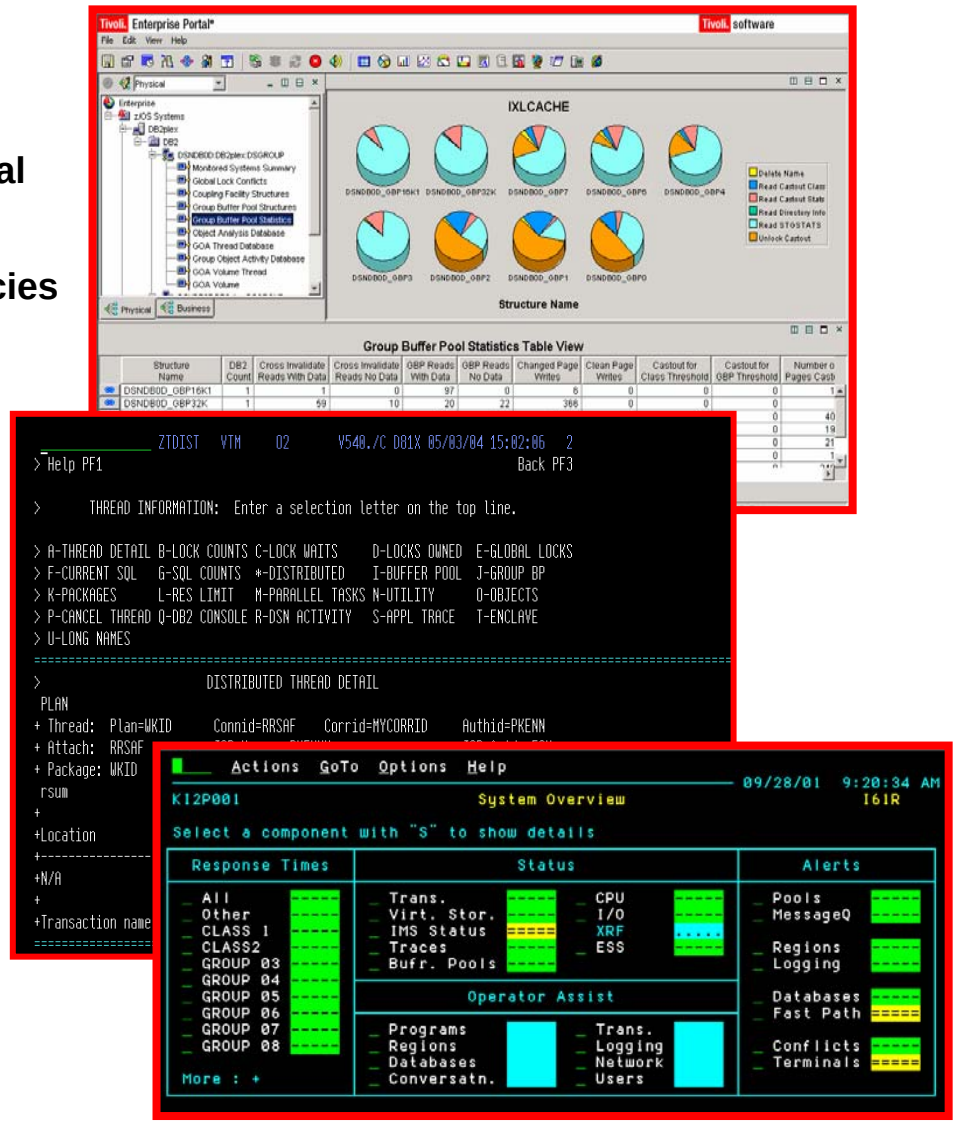
OMEGAMON DB2 Options & Interfaces

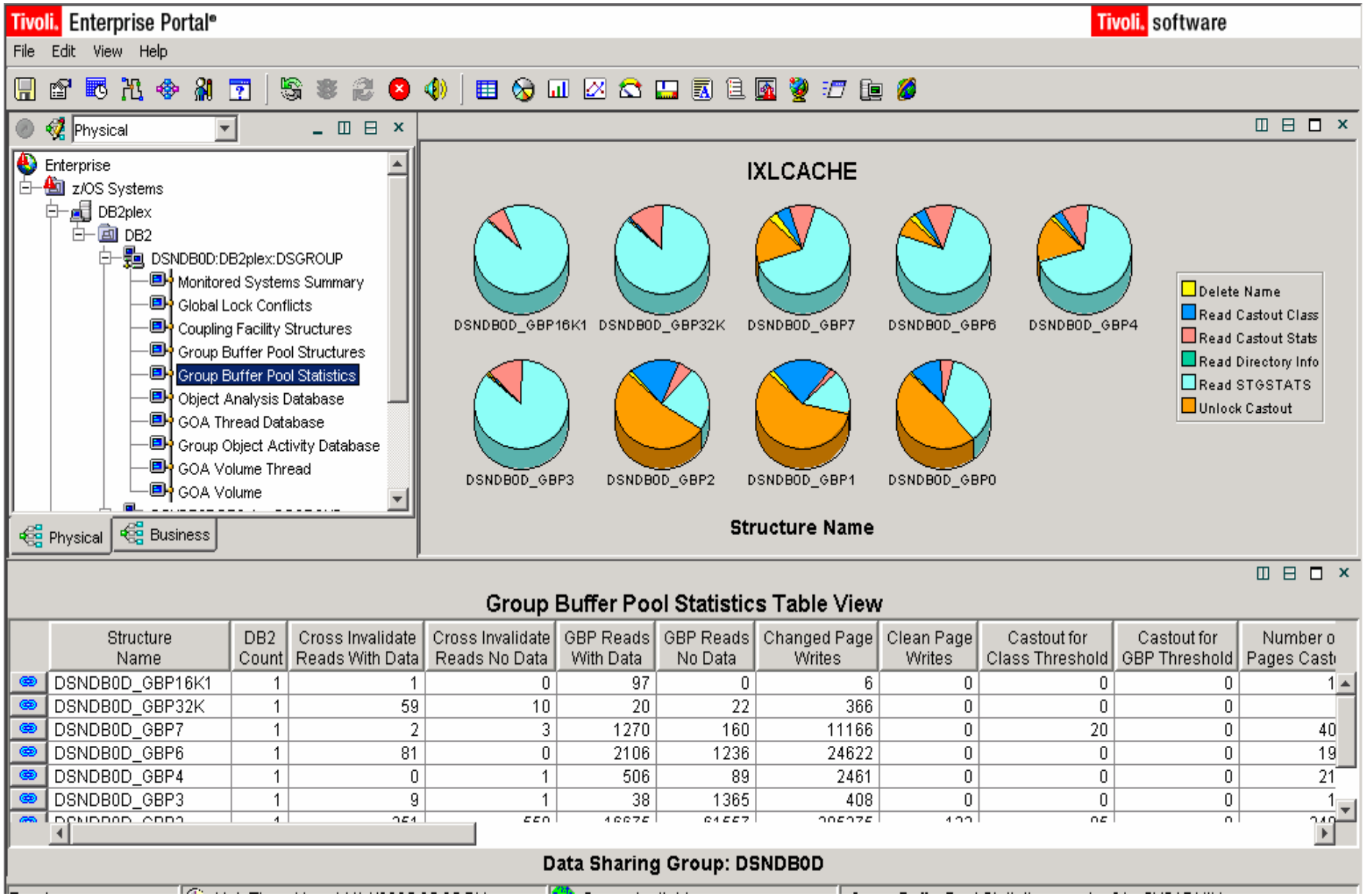
- **OMEGAMON XE GUI Interface**
  - **Java client or web browser – Tivoli Portal**
  - **Real time and historical**
  - **Automation & alerts – Situations & Policies**
  - **Plex level information (CF, n-way)**

OMEGAMON Classic

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

- **OMEGAMON CUA**
  - **3270 interface**
  - **Different views from Classic**
  - **Real Time & Historical**
  - **Warning & Critical exception alerts**




Tivoli. Enterprise Portal®
Tivoli. software
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
IXLCACHE
DSNDB0D_GBP16K1
DSNDB0D_GBP32K
DSNDB0D_GBP7
DSNDB0D_GBP6
DSNDB0D_GBP4
DSNDB0D_GBP3
DSNDB0D_GBP2
DSNDB0D_GBP1
DSNDB0D_GBP0
Delete Name
Read Castout Class
Read Castout Stats
Read Directory Info
Read STGSTATS
Unlock Castout
Structure Name
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 o Pages Casti
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
Data Sharing Group: DSNDB0D

```
_____________ ZTDIST   VTM     02      V540./C D81X 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
================================================================================
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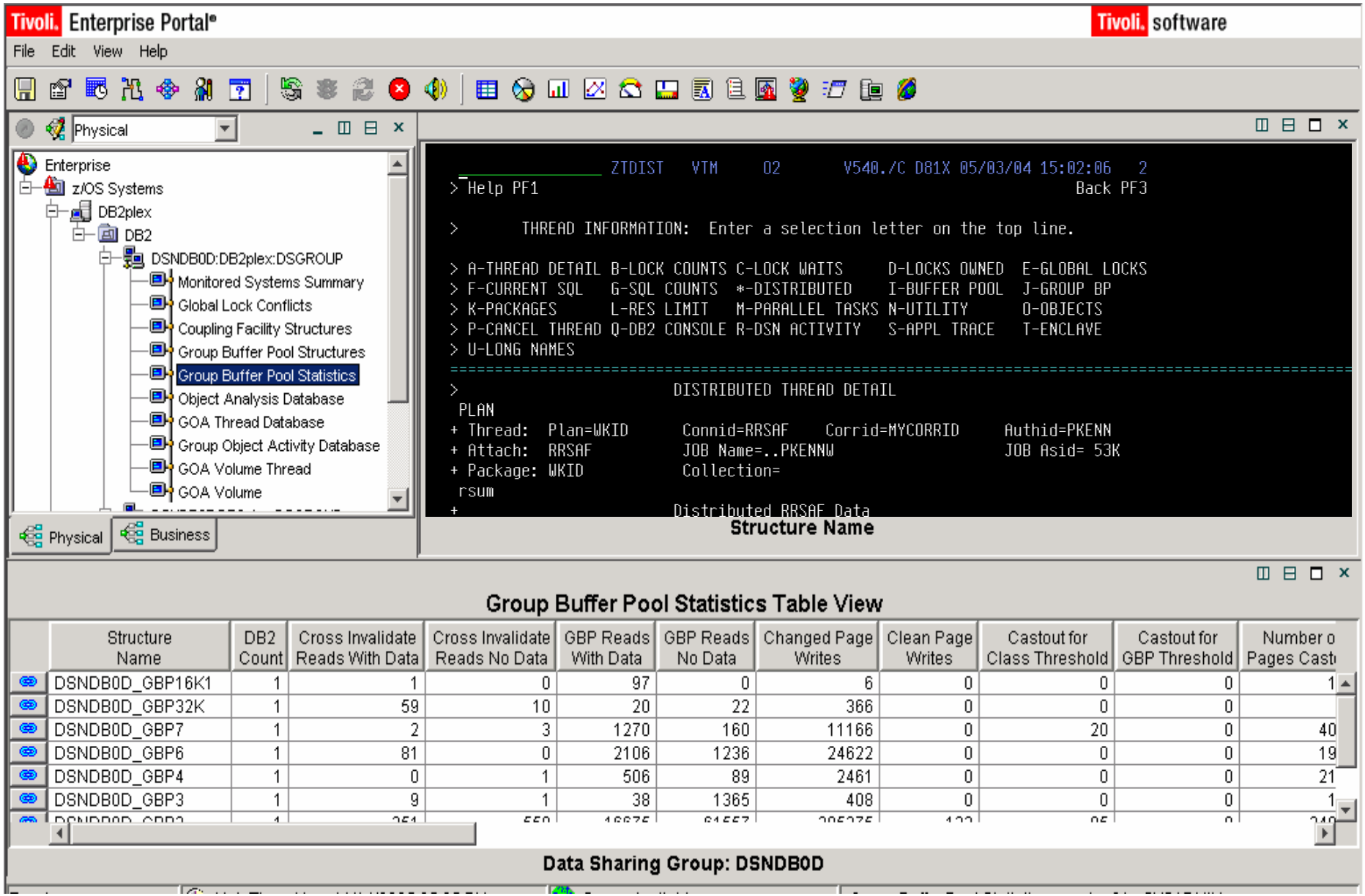
Tivoli. Enterprise Portal®
Tivoli. software
File Edit View Help
Physical
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z/OS Systems
DB2plex
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Monitored Systems Summary
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Group Buffer Pool Statistics
Object Analysis Database
GOA Thread Database
Group Object Activity Database
GOA Volume Thread
GOA Volume
Physical
Business
ZTDIST VTM 02 V540./C D81X 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
Structure Name
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 o Pages Cast
DSNDB0D_GBP16K1 1 1 0 97 0 6 0 0 0 1
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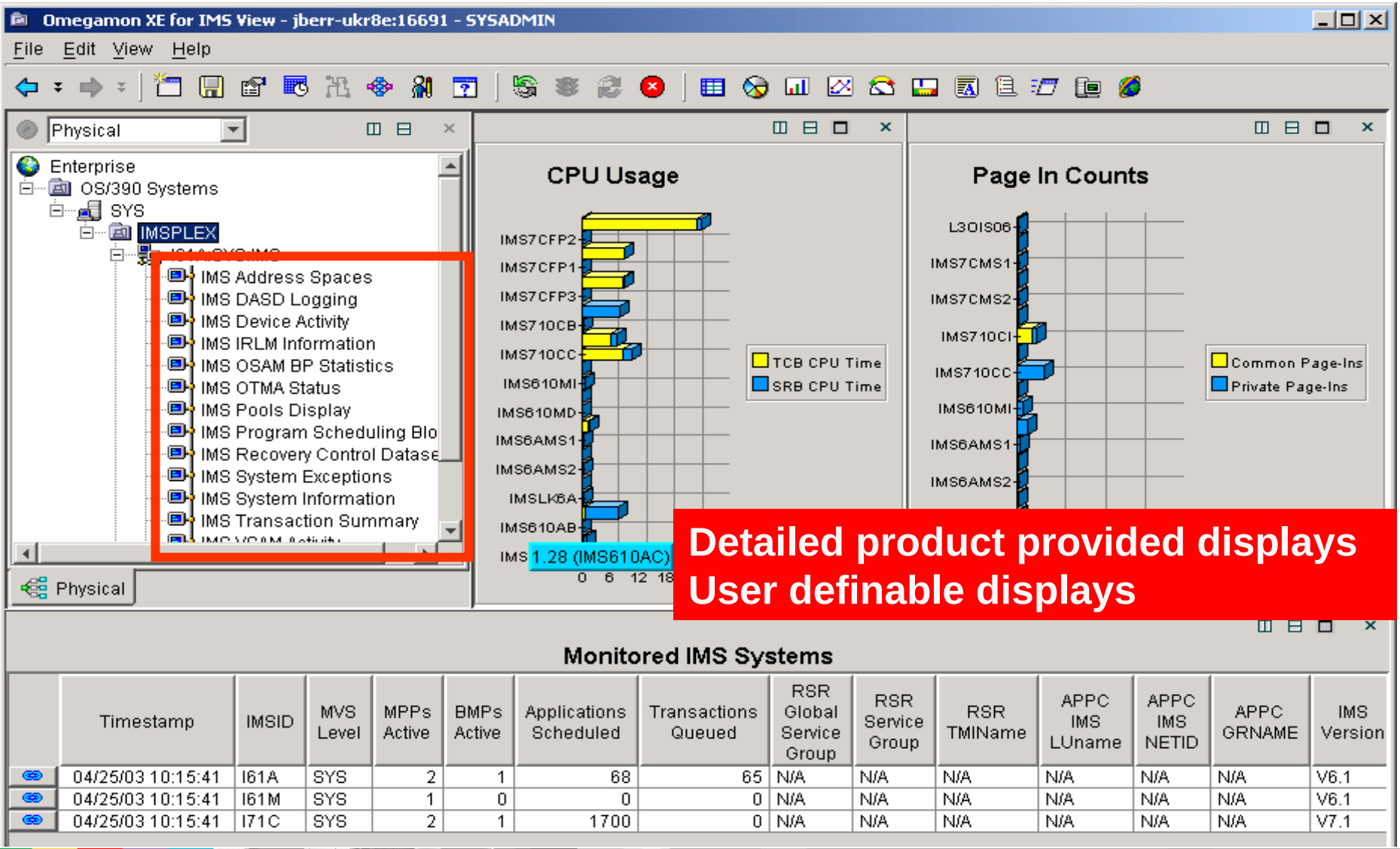
DSNDB0D_GBP4 1 0 1 506 89 2461 0 0 0 21
DSNDB0D_GBP3 1 9 1 38 1365 408 0 0 0 1
Data Sharing Group: DSNDB0D

OMEGAMON XE For IMS on z/OS
Major Functions & Components

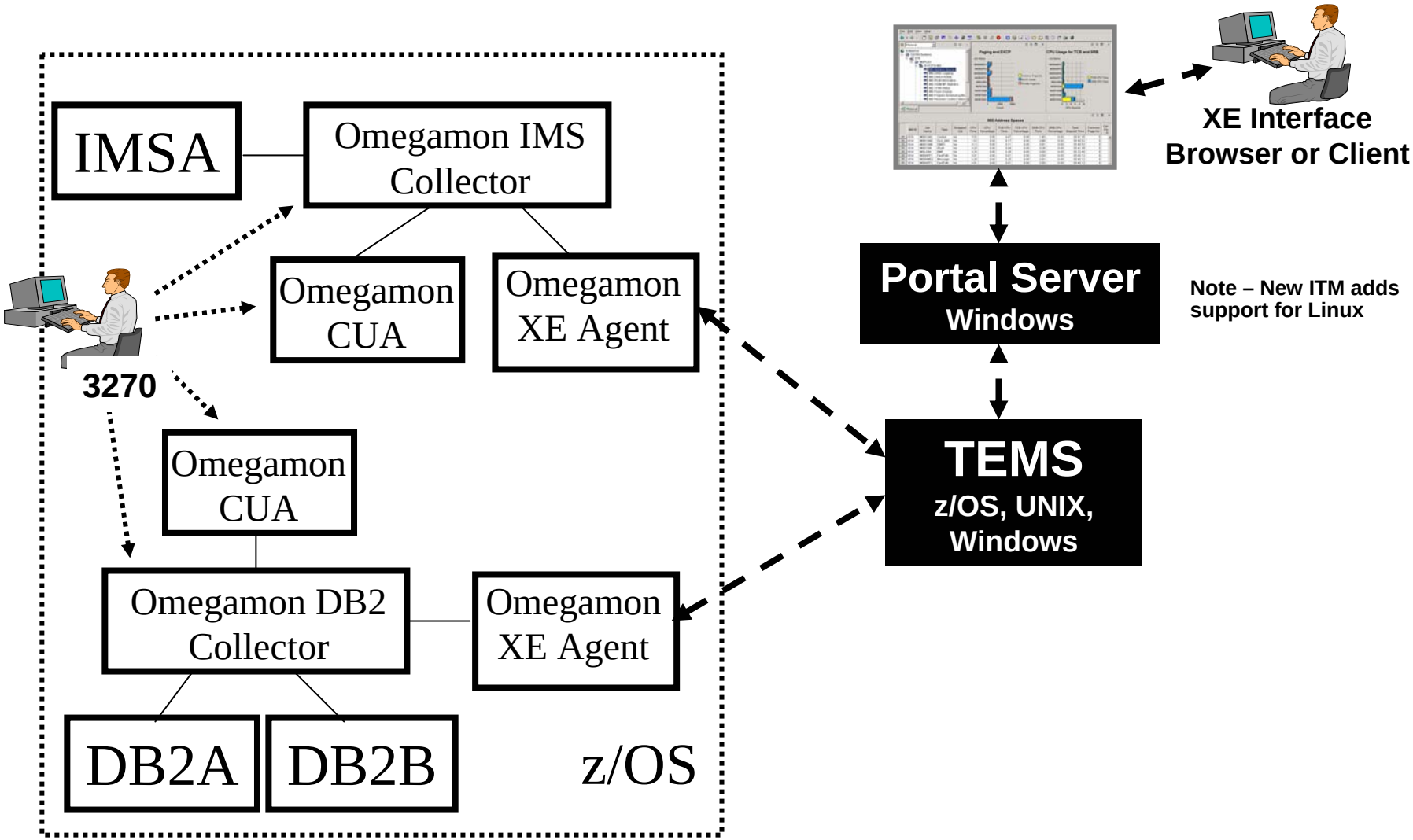
- **Real Time Monitor**
  - Monitor subsystems, regions, resources, pools
- **Response Time Analysis**
  - Transaction Response time by user defined groups
- **Bottleneck Analysis**
  - Workload performance and task analysis by user defined groups
- **Operator Assist & Integrated Console Facility**
  - 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

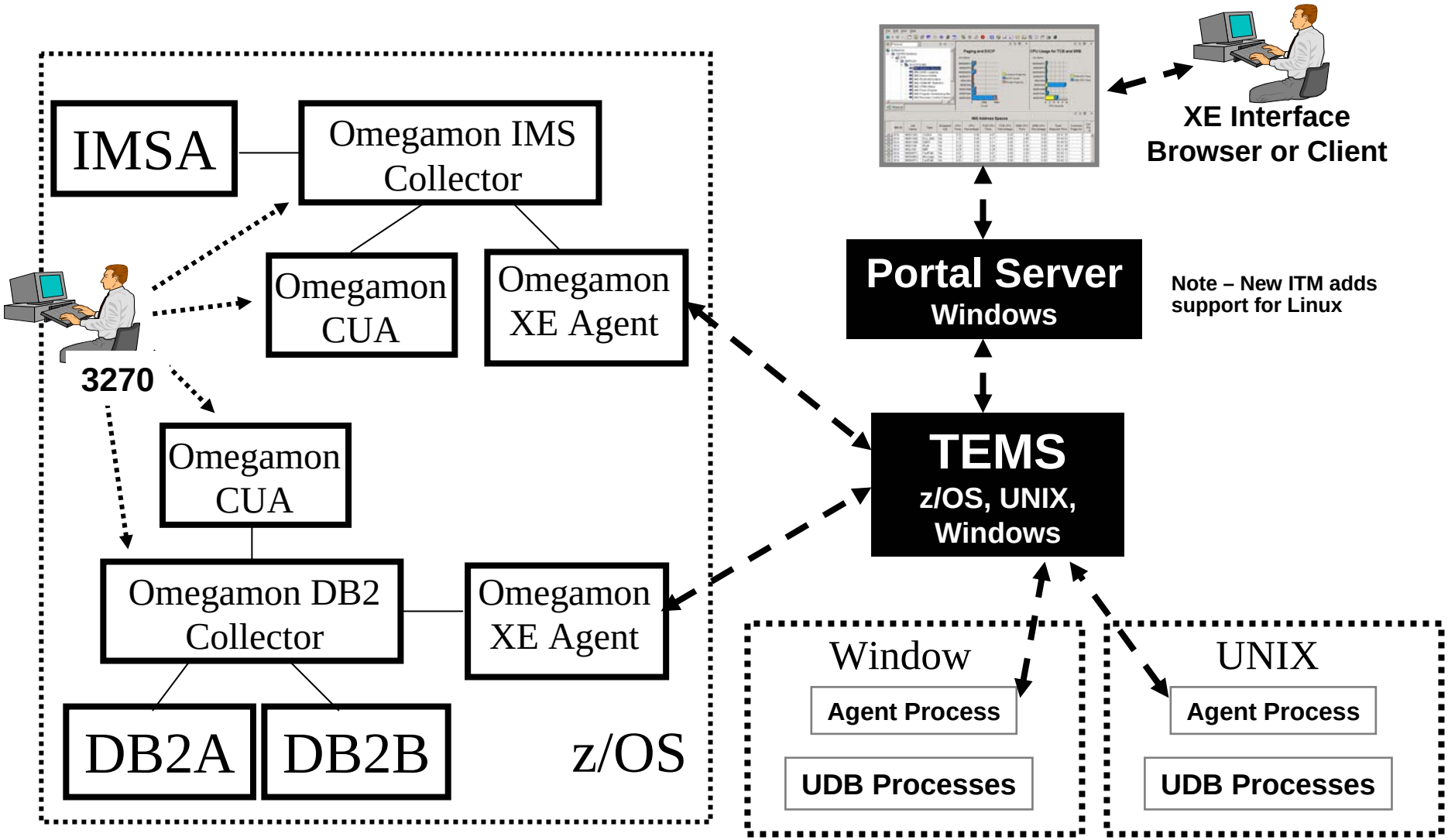


	Timestamp	IMSID	MVS Level	MPPs Active	BMPs Active	Applications Scheduled	Transactions Queued	RSR Global Service Group	RSR Service Group	RSR TMIName	APPC IMS LUname	APPC IMS NETID	APPC GRNAME	IMS Version
	04/25/03 10:15:41	I61A	SYS	2	1	68	65	N/A	N/A	N/A	N/A	N/A	N/A	V6.1
	04/25/03 10:15:41	I61M	SYS	1	0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

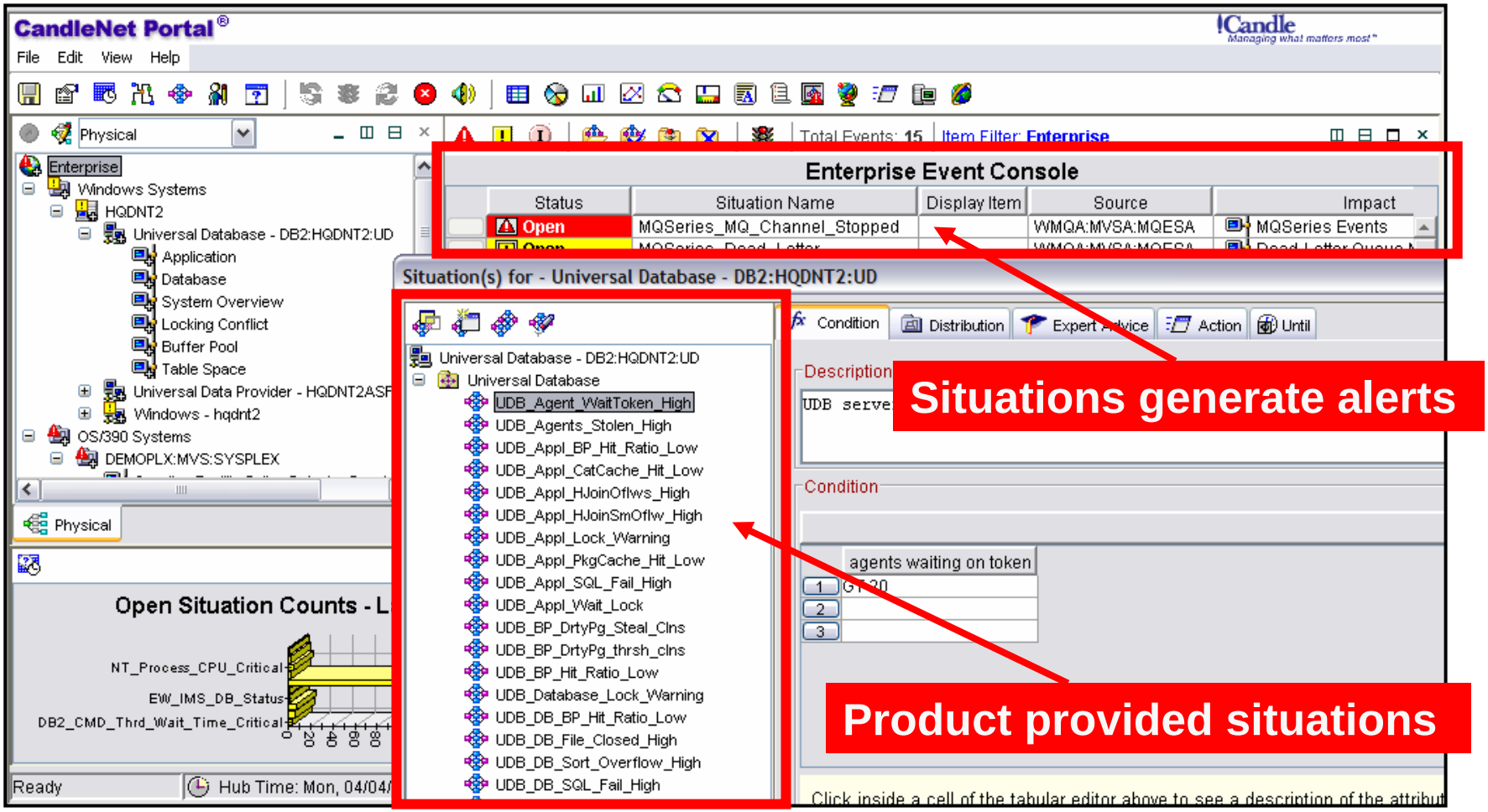


OMEGAMON Automation And Alert Capabilities

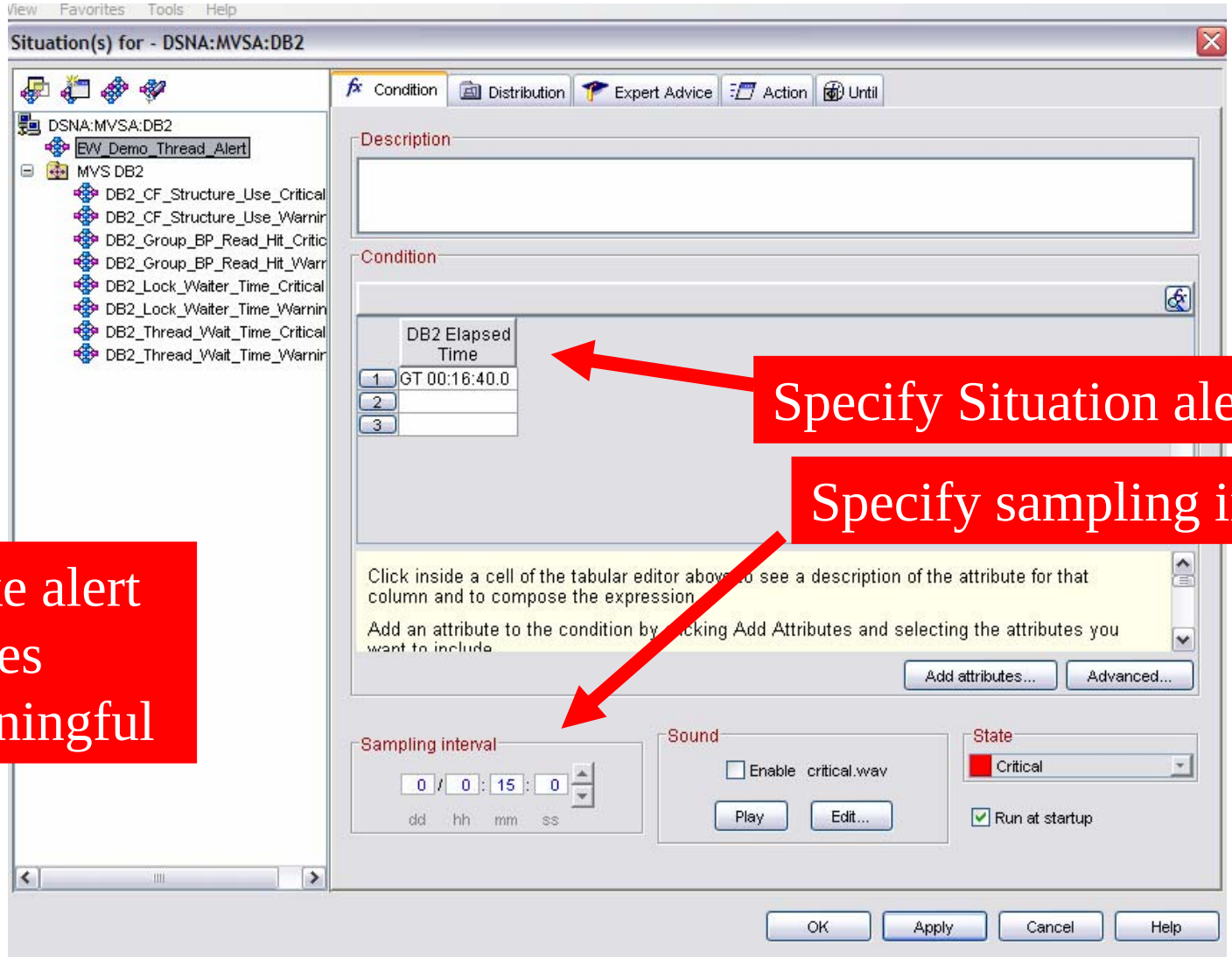
- Situations
  - The basis of Omegamon XE alerts
  - Any monitored attribute may be used in a situation
  - Combines ‘reflex’ automation with alerting in easy to use GUI interface
  - Typically run in the agent address space (Intelligent Remote Agents – IRAs)
- Policies
  - Combines multiple events (situations, commands, etc) in a single automation policy
  - Use for correlated alerts and automation
  - Run in the Management Server

Situations – An Example

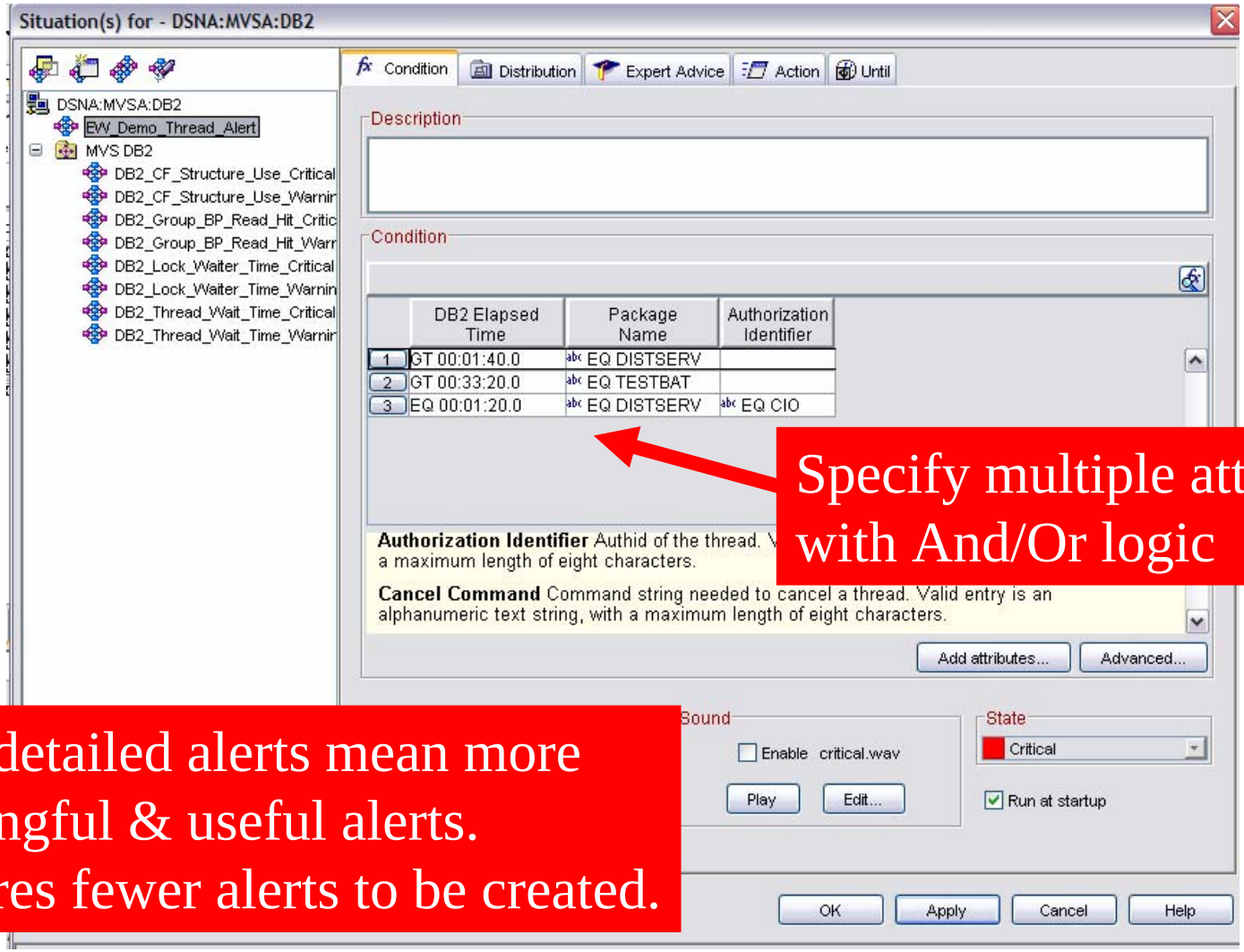
The Starting Point For Systems Automation



Using Situations To Build Alerts



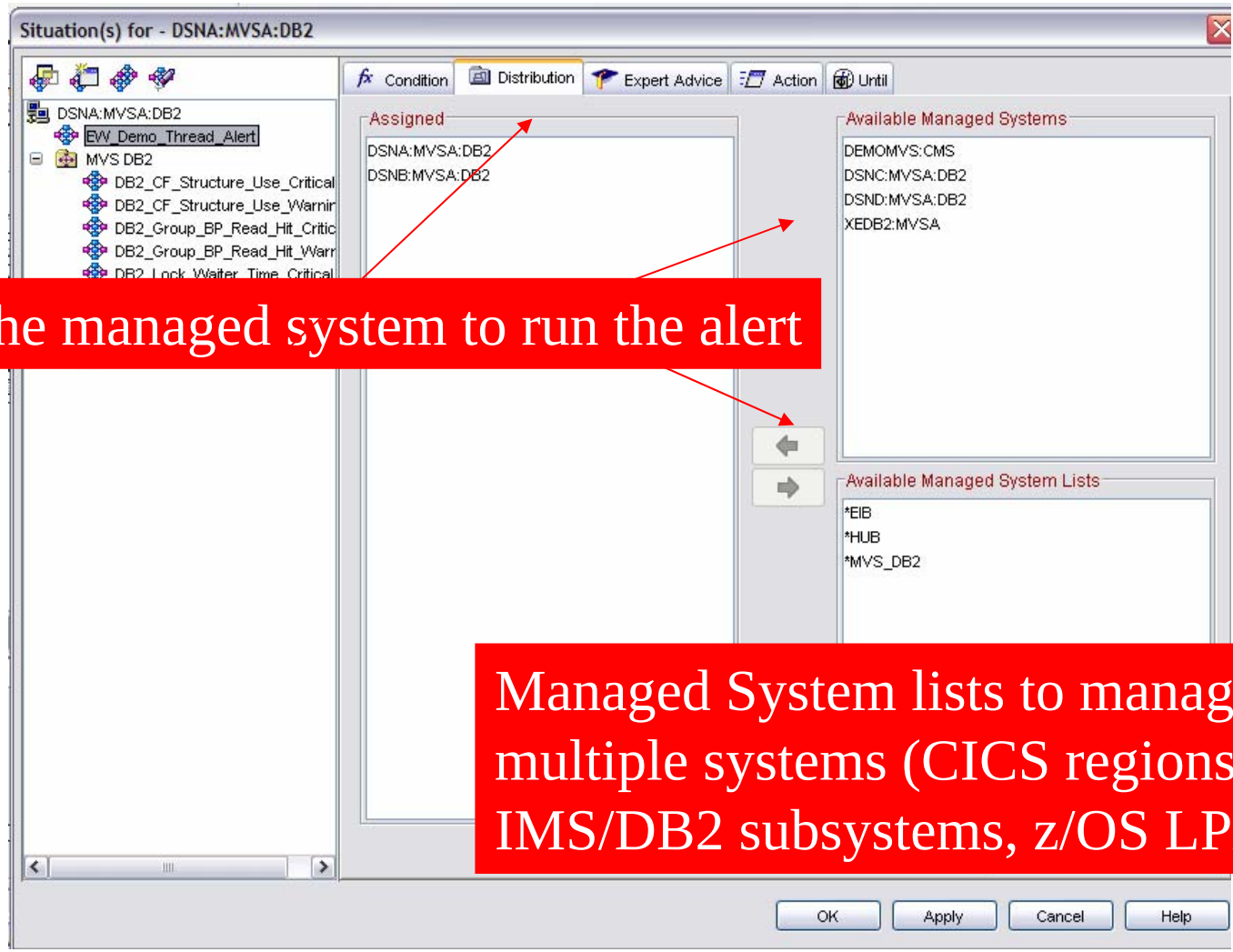
Making Alerts Meaningful



Specify multiple attributes with And/Or logic

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

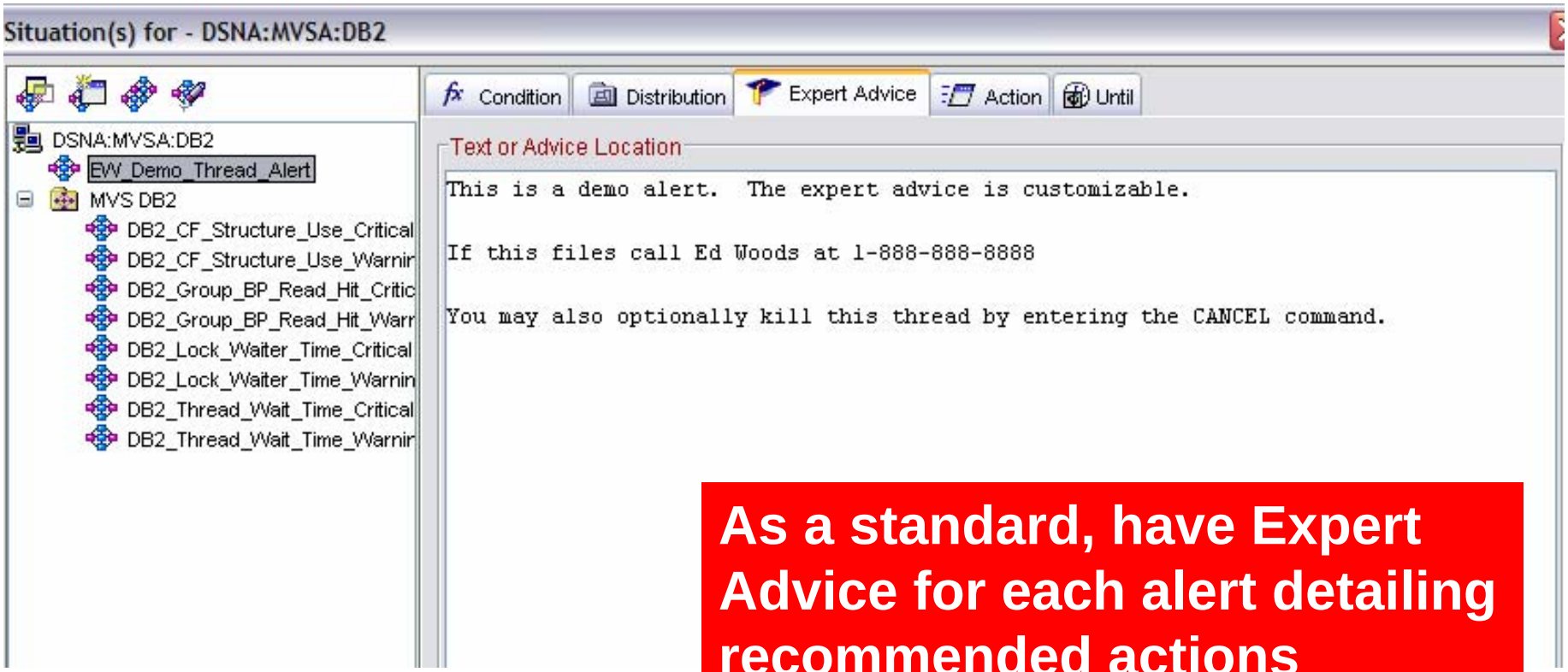
Distribution & Managed System Lists



Select the managed system to run the alert

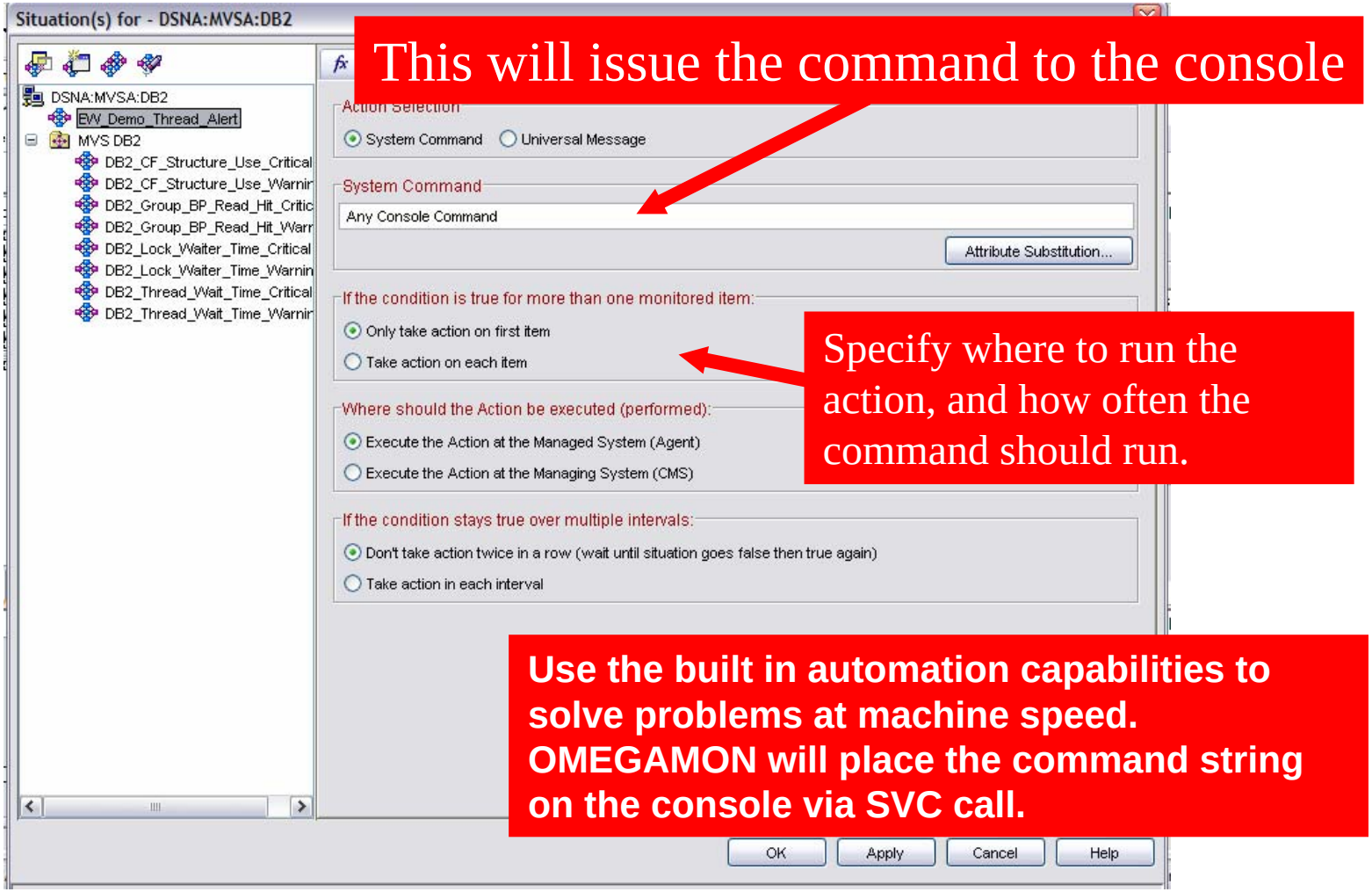
Managed System lists to manage multiple systems (CICS regions, IMS/DB2 subsystems, z/OS LPARs)

Use Expert Advice for Alerts

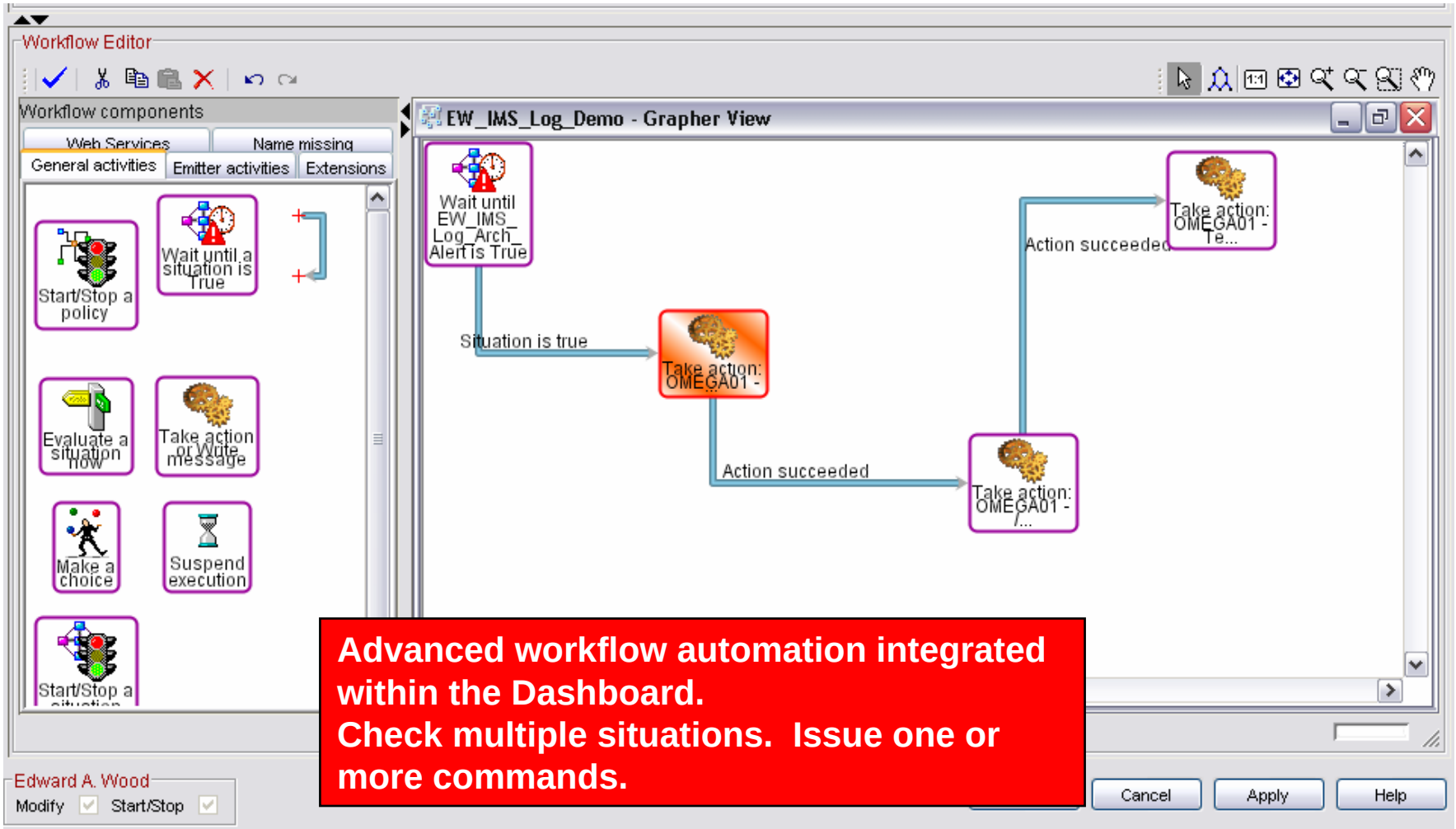


As a standard, have Expert Advice for each alert detailing recommended actions

Integrated Automation
Solve Problems At Machine Speed

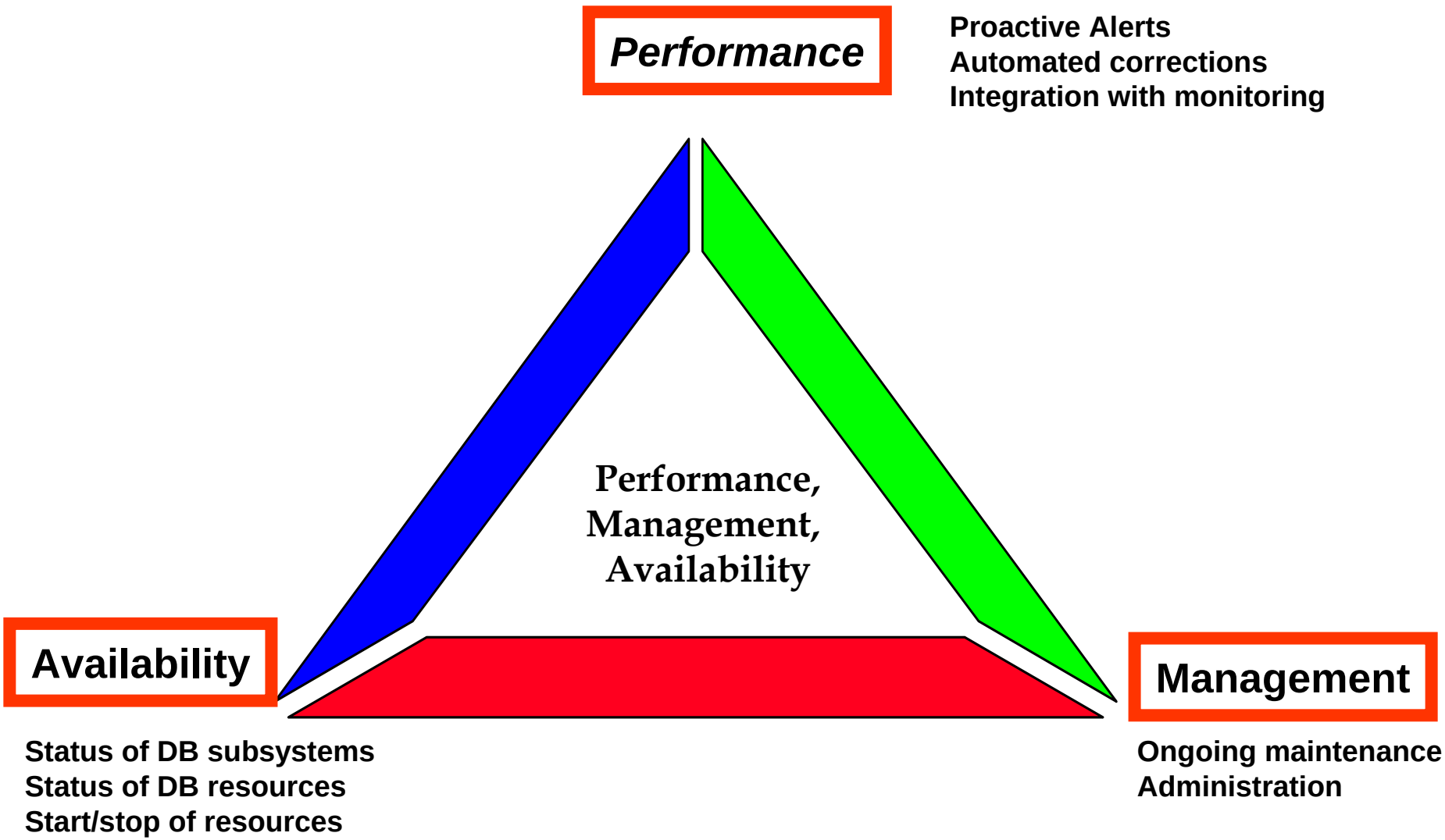


Advanced Automation Capabilities
OMEGAMON DE Provides Policy Automation



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

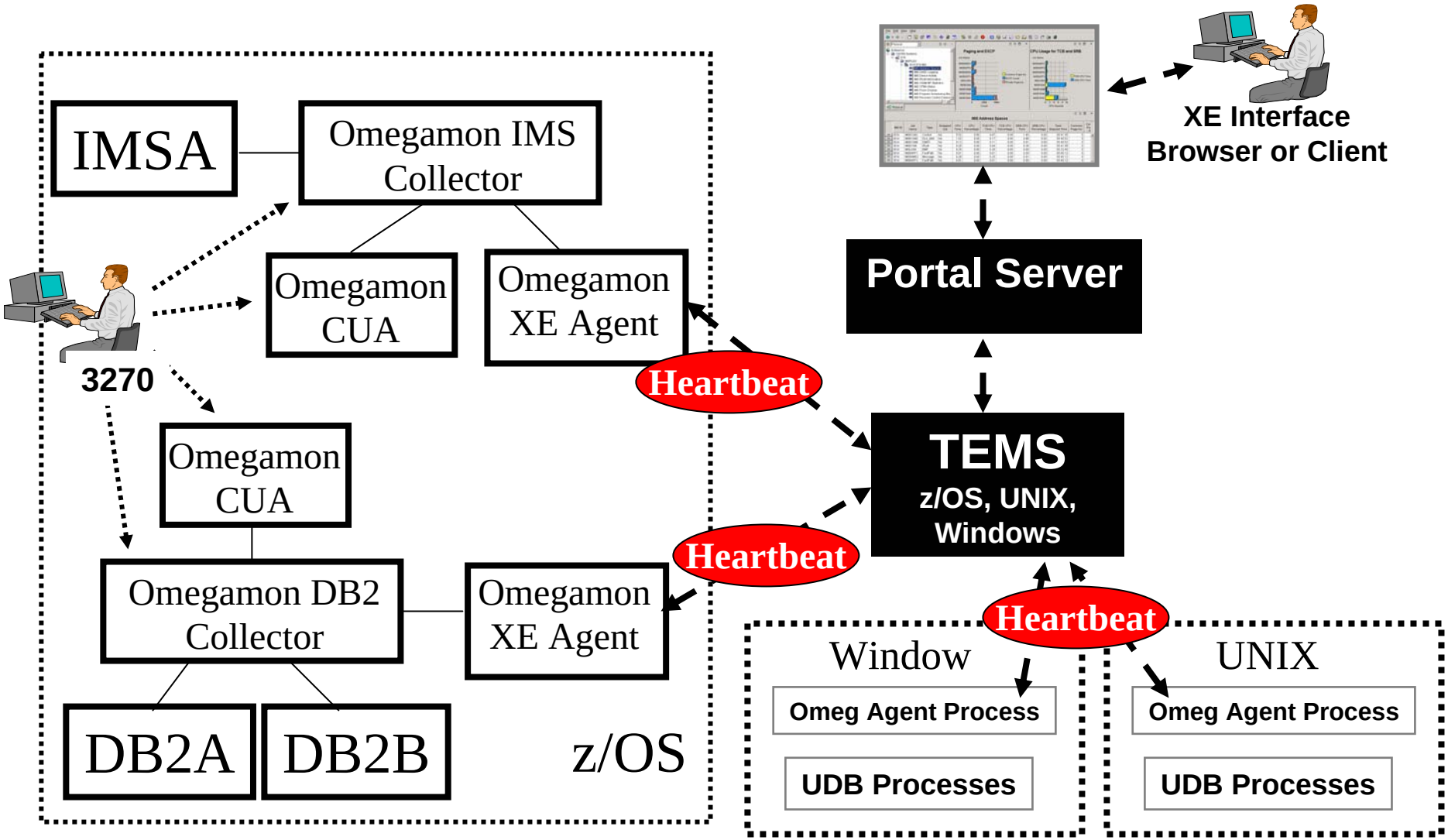
Database Automation Triangle



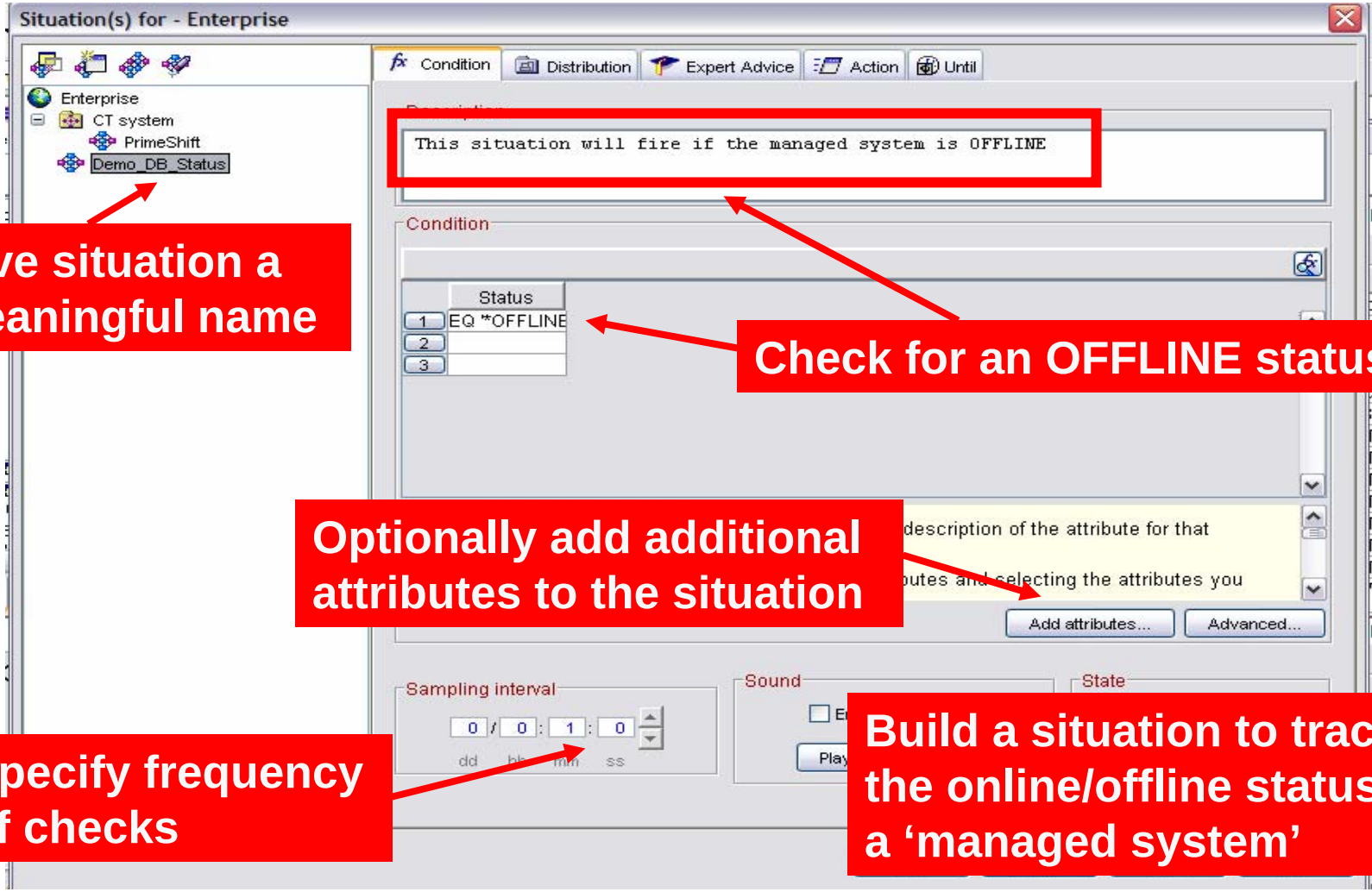
Availability Automation Examples

- 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

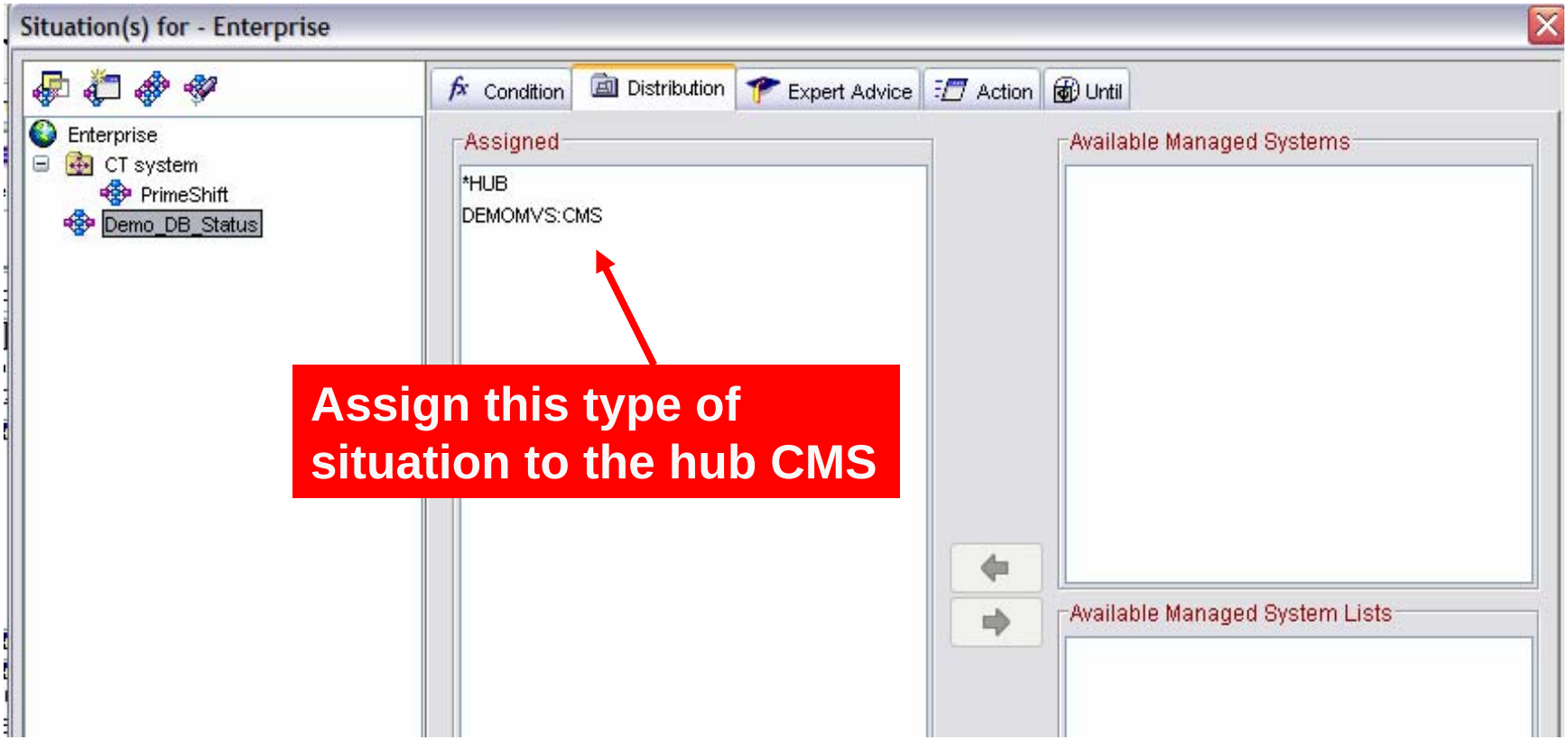
Monitoring Database Availability
Monitor Subsystem Online/Offline Status



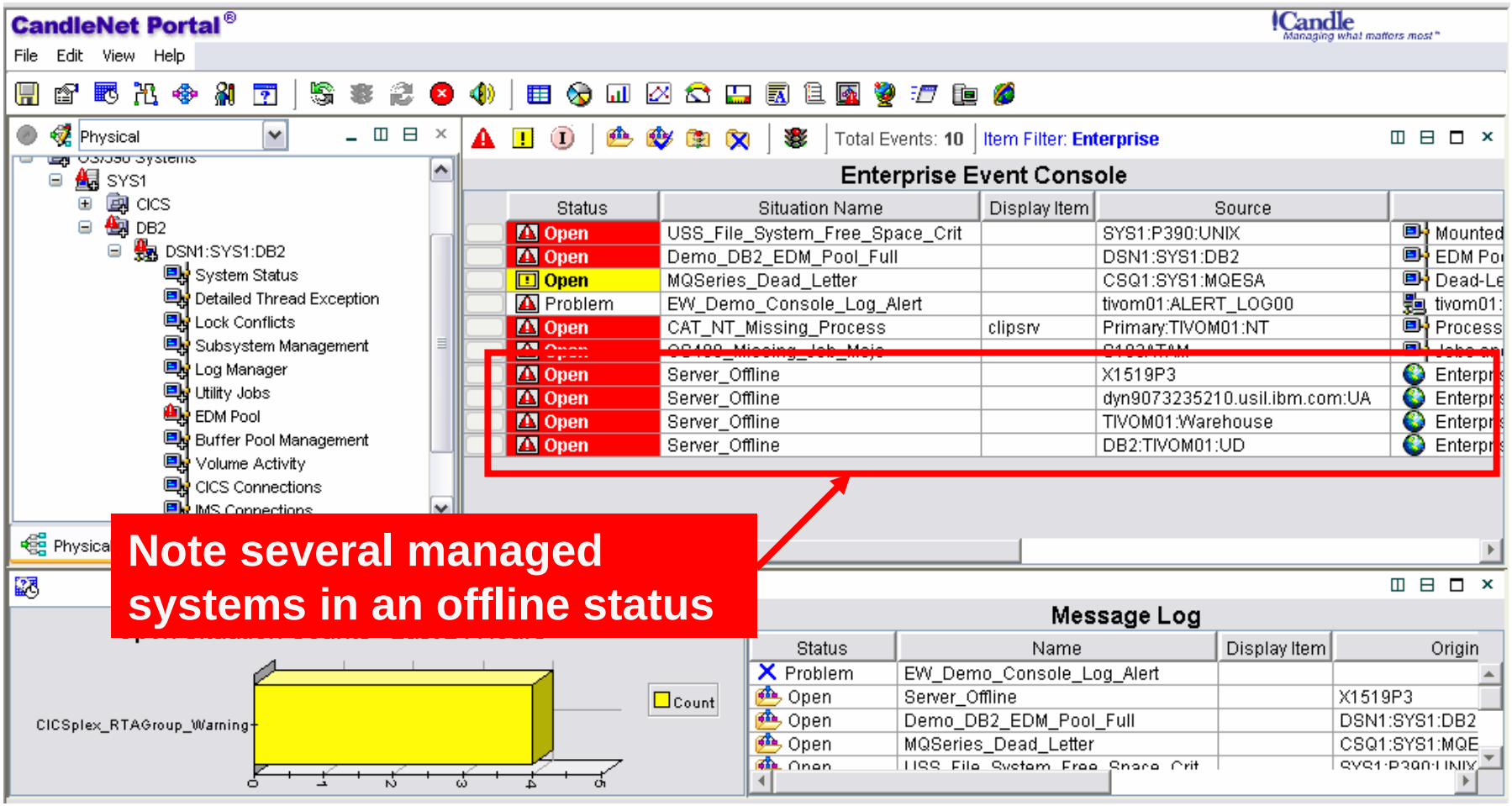
Availability Situation Condition Tab



Availability Situation Distribution Tab

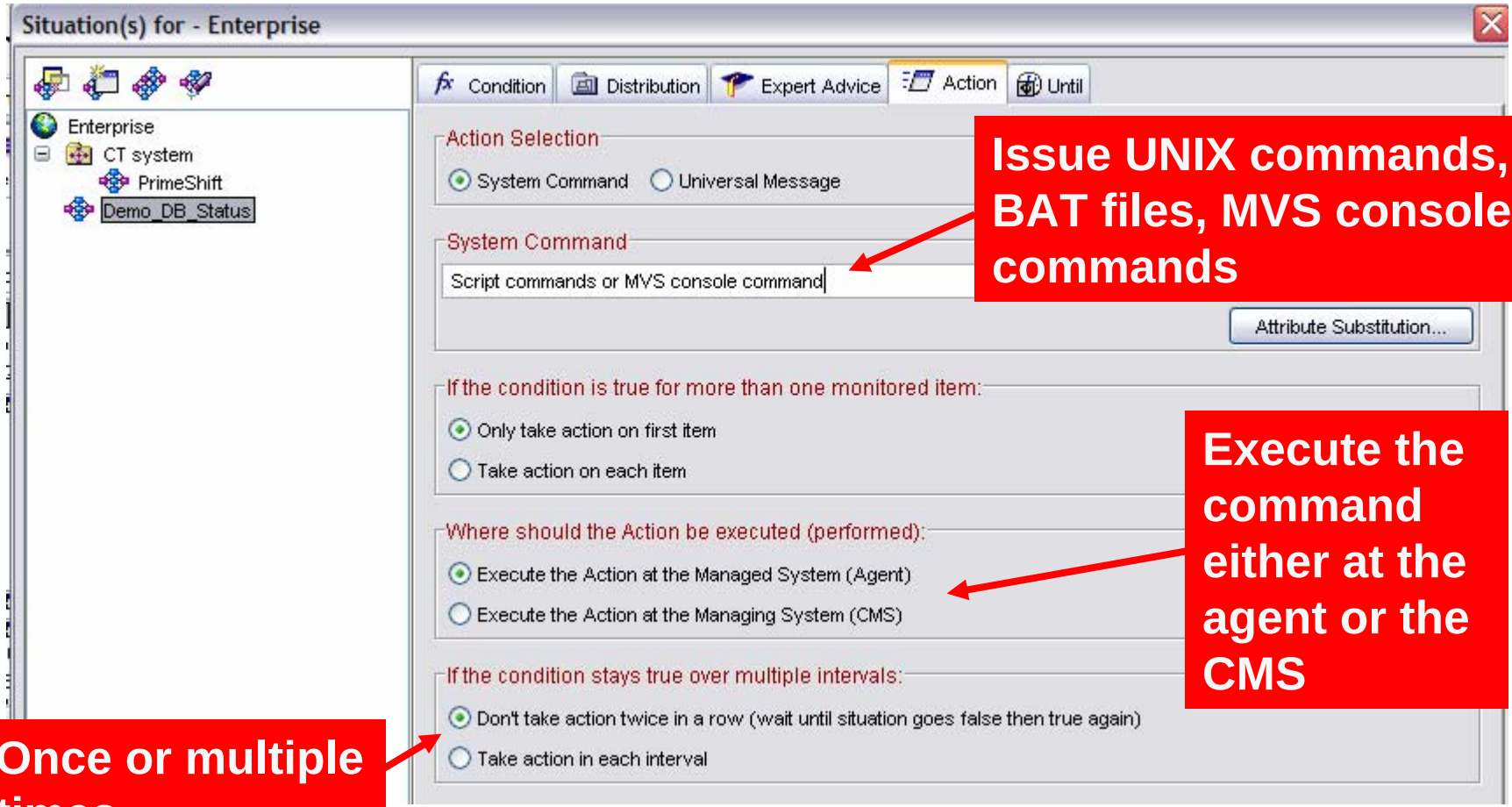


When The Situation Is 'True' An Alert Will Appear



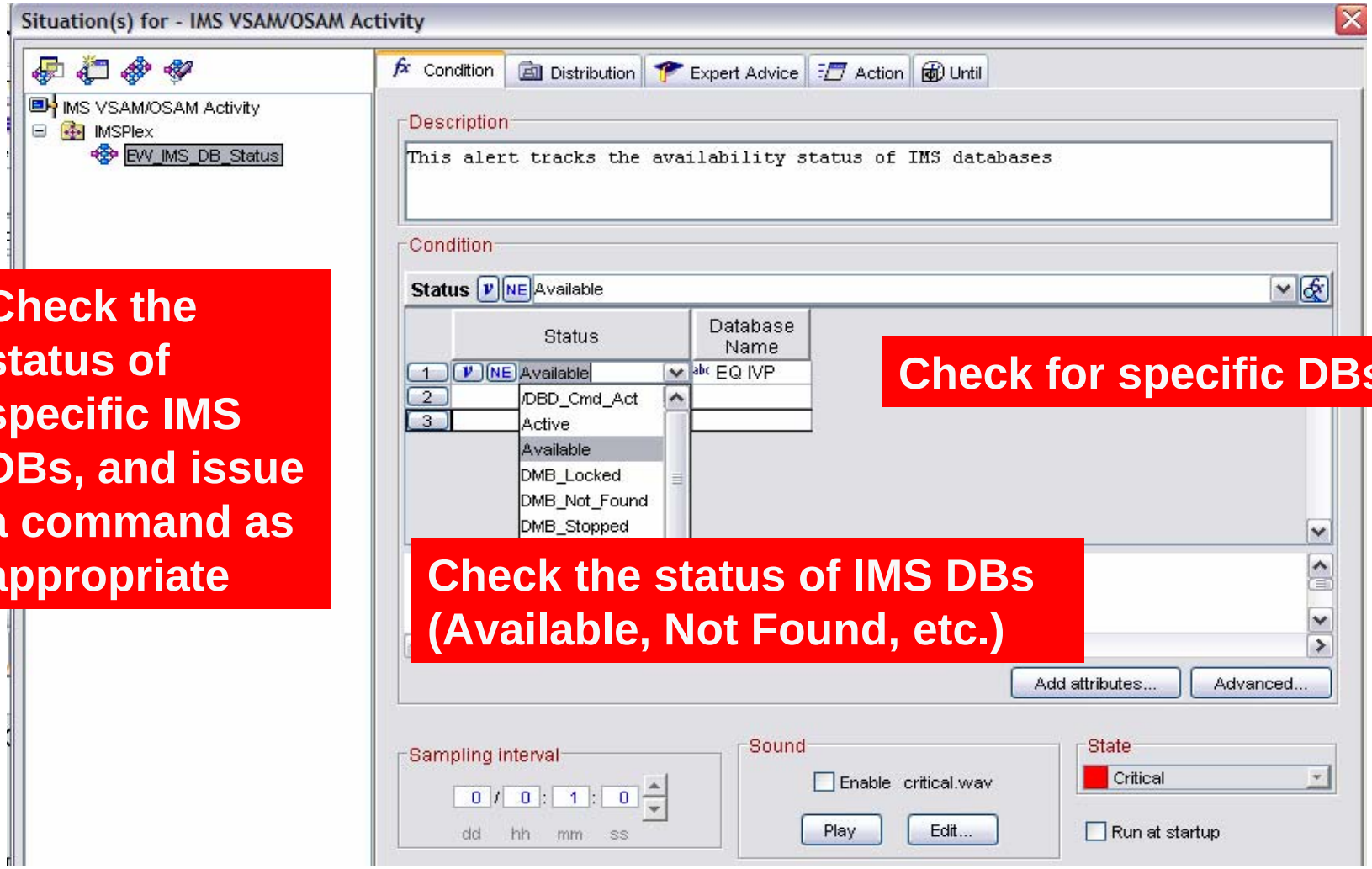
Availability Situation - Action Tab

Issue Commands When The Situation Is True



Availability Example

Monitor The Status Of An IMS Database

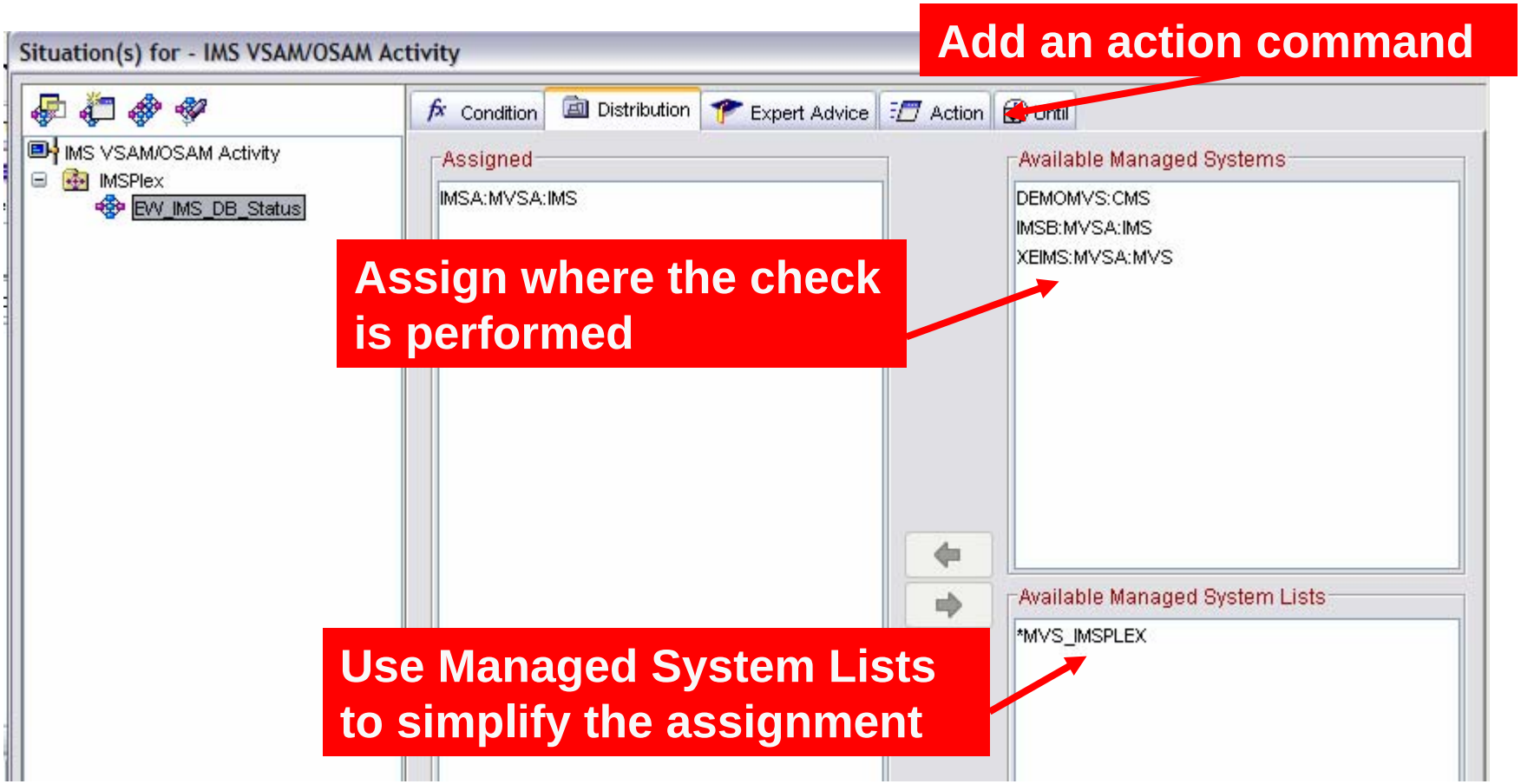


Check the status of specific IMS DBs, and issue a command as appropriate

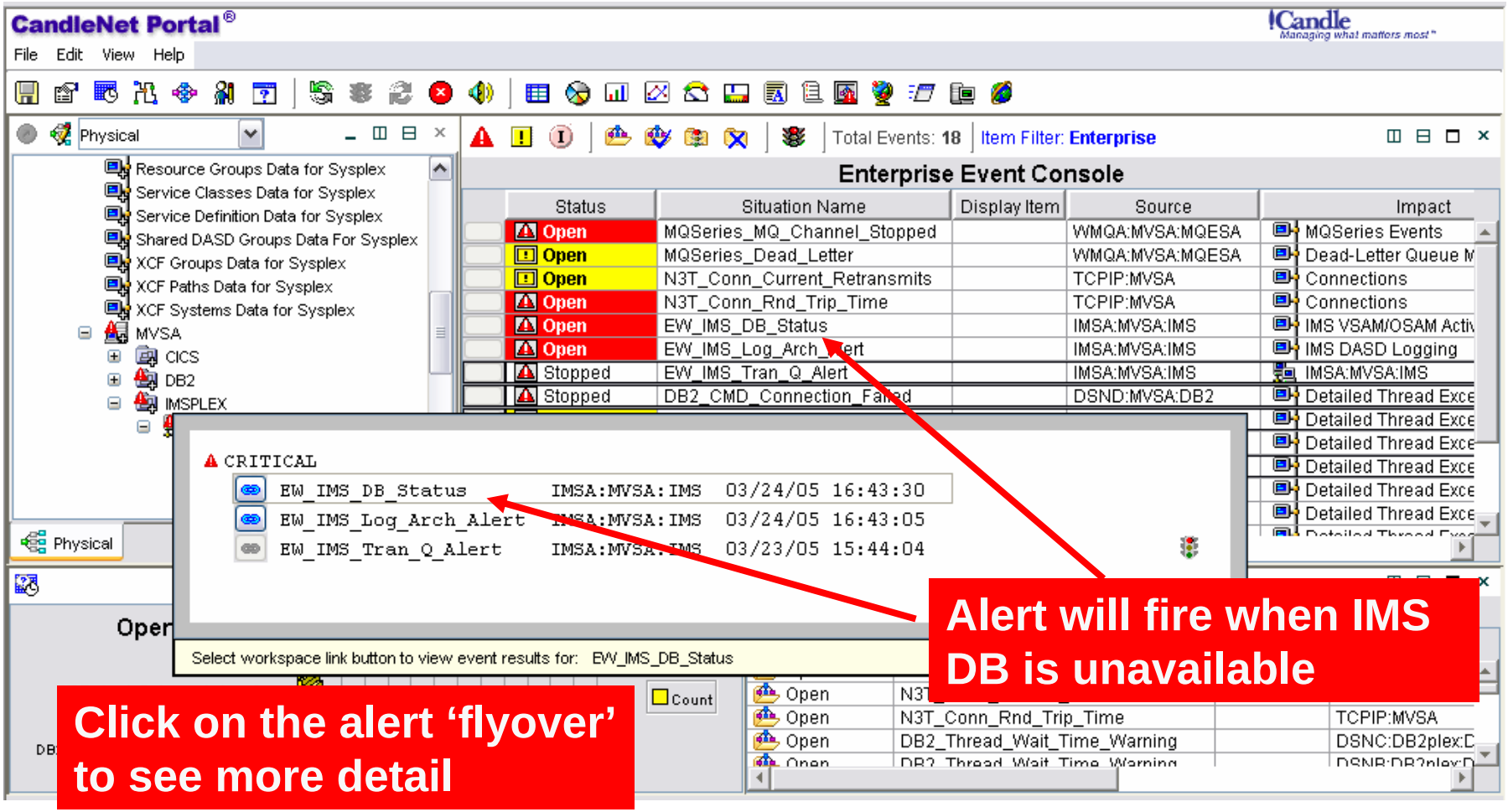
Check for specific DBs

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

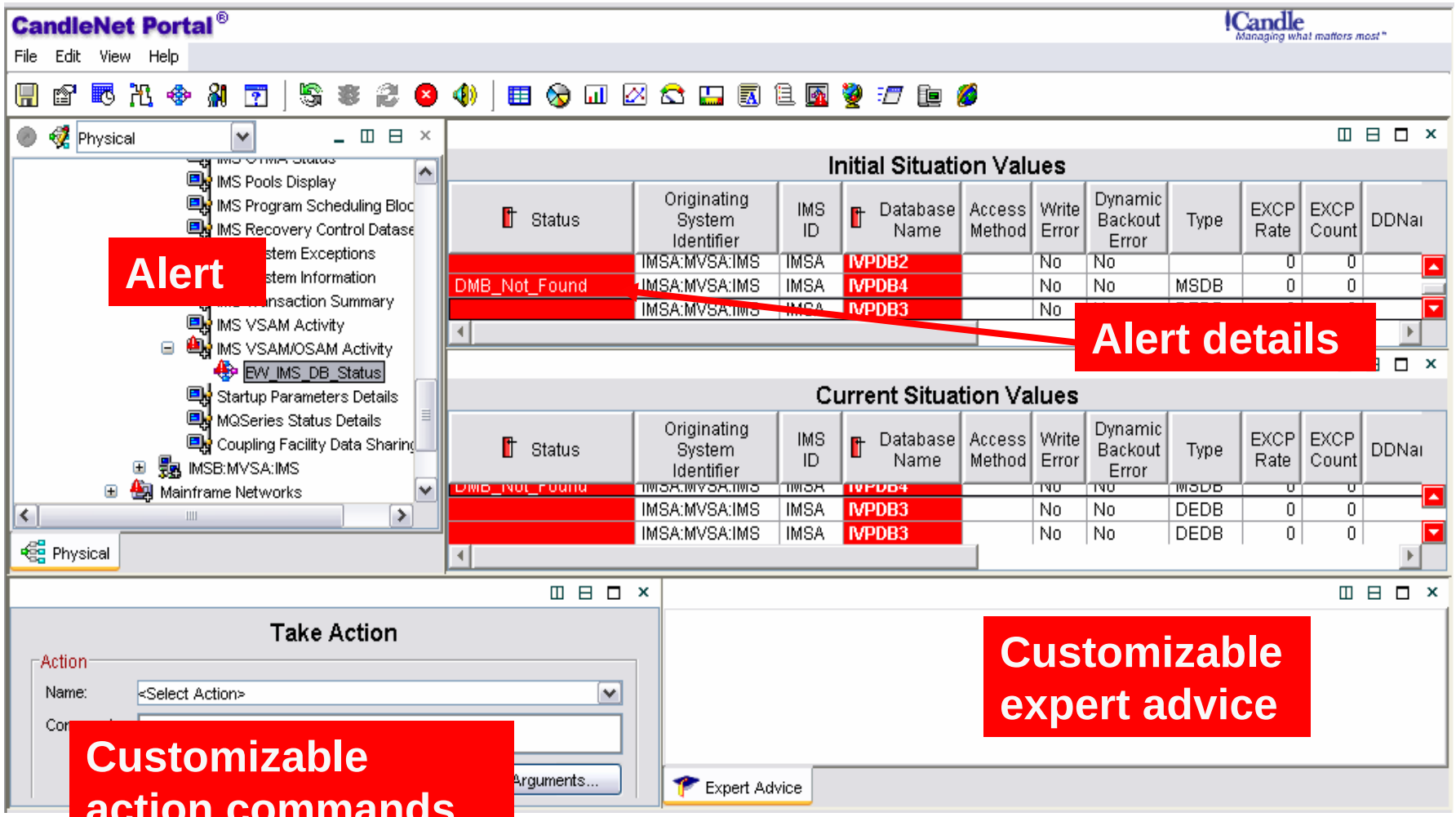
Assign The Availability Check To Various Subsystems



IMS DB Availability Alert



Situation Detail View

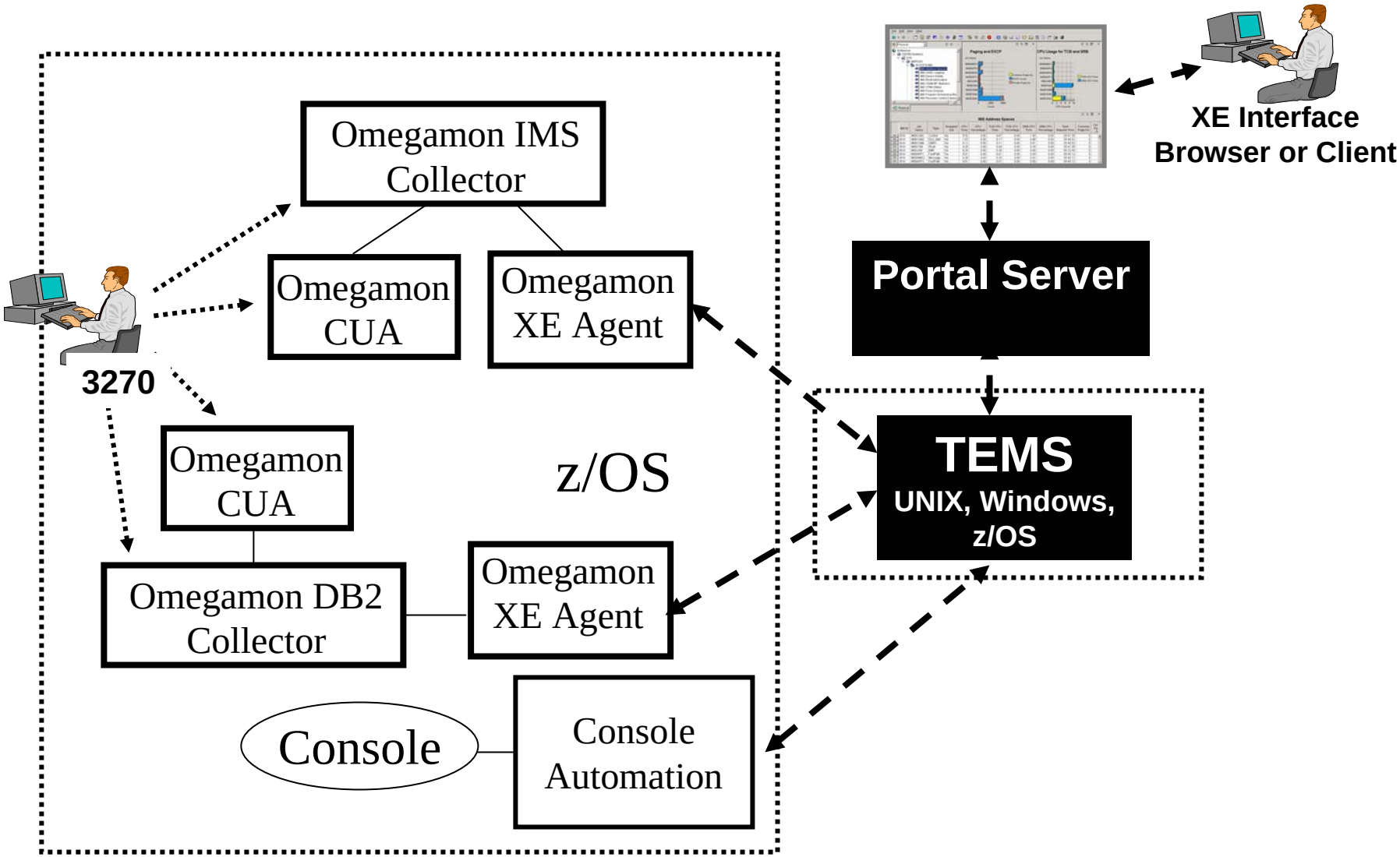


Availability Automation
Tracking Messages & Consoles

- 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’

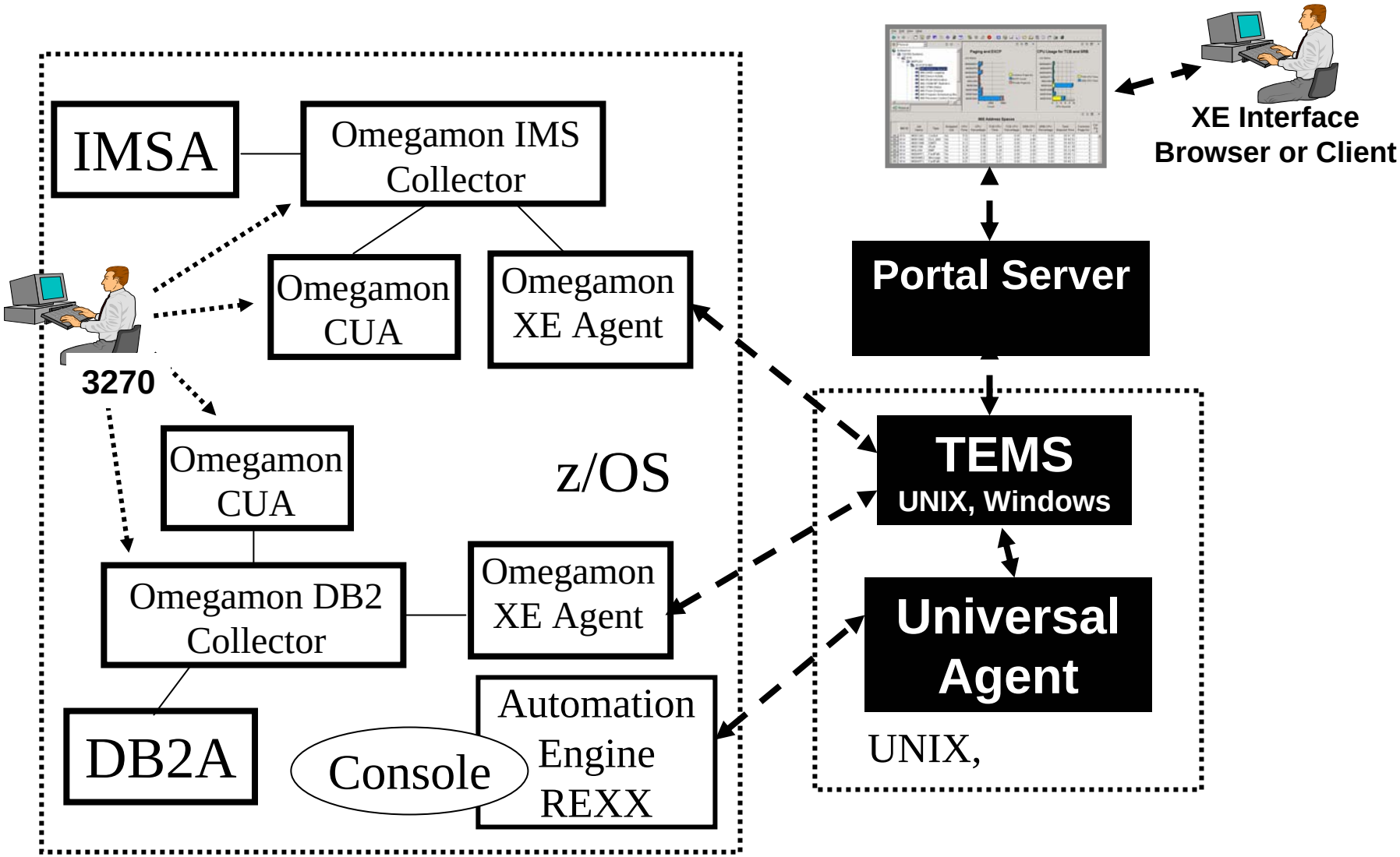
Console Interfaces

Using Console Automation To Interface To XE/DE

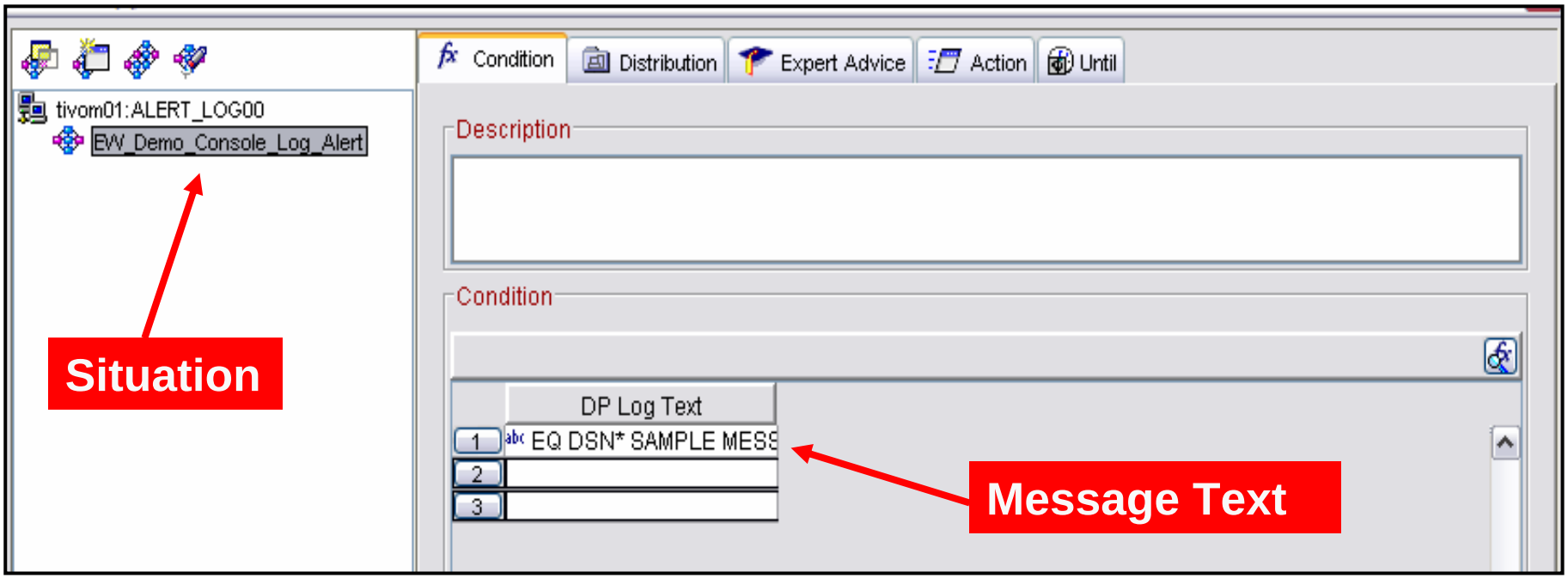


Console Interfaces

Forwarding Important Availability Messages To OMEGAMON XE/DE

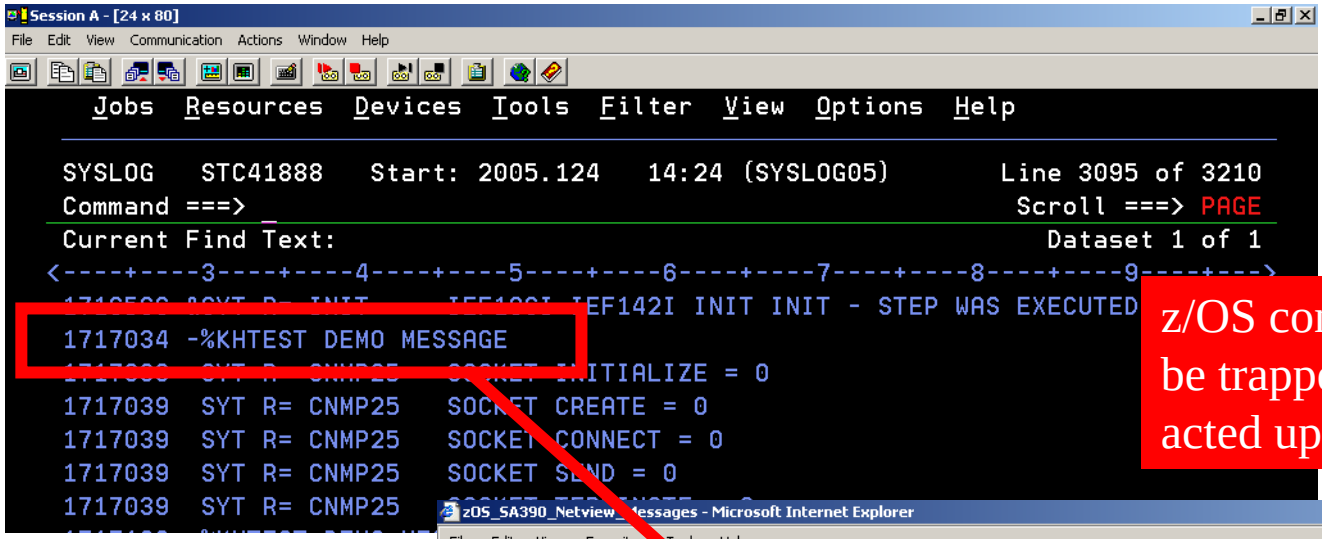


Build A Situation To Check For The Message

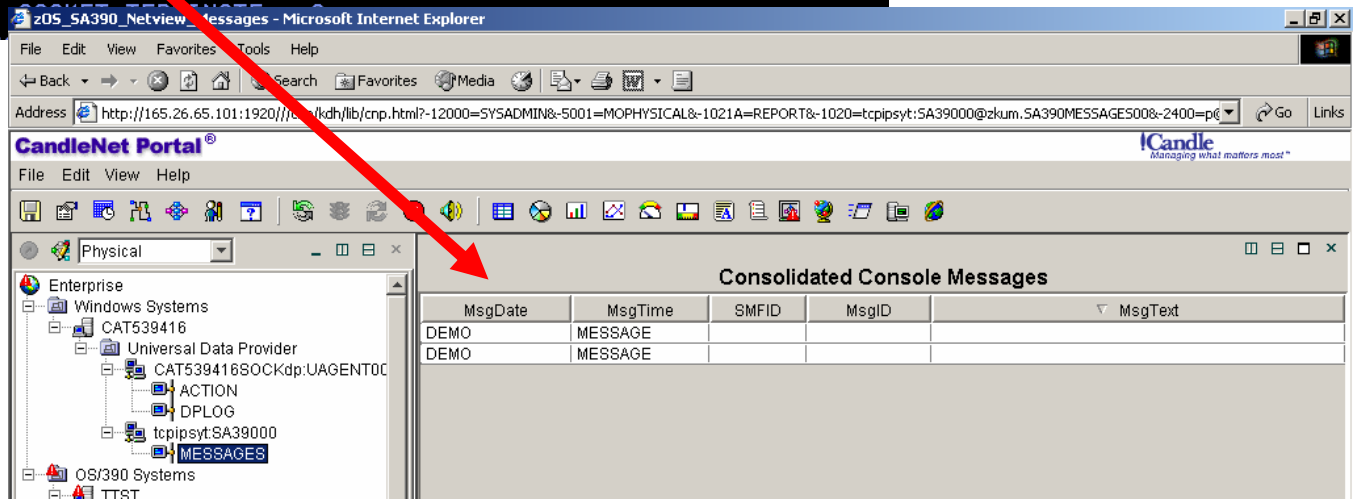


For a good example of messages to check for refer to "Health Check Your DB2 System" by John Campbell, IBM Corporation

Using Universal Agent For Console Interface



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



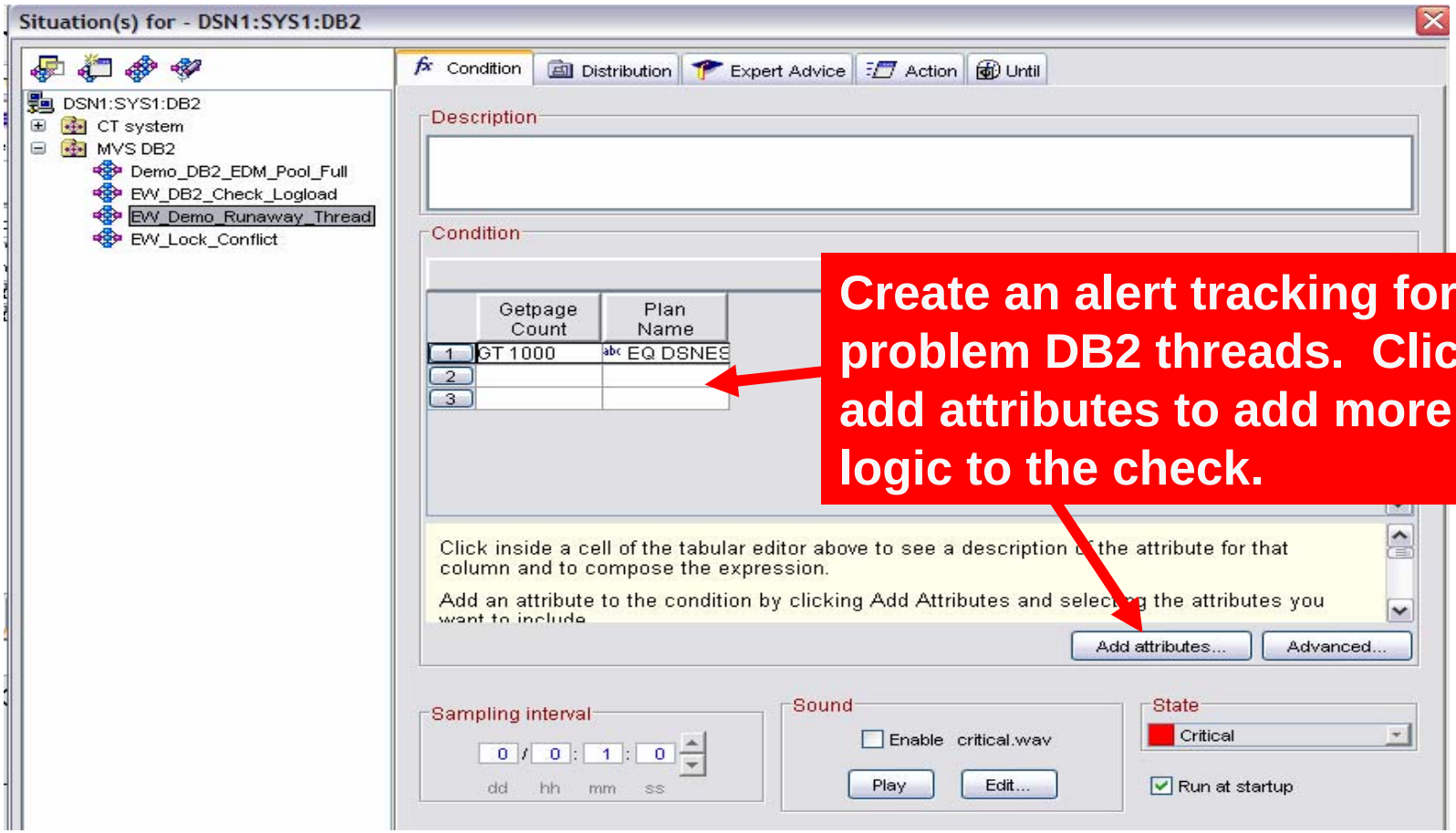
Performance Automation

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

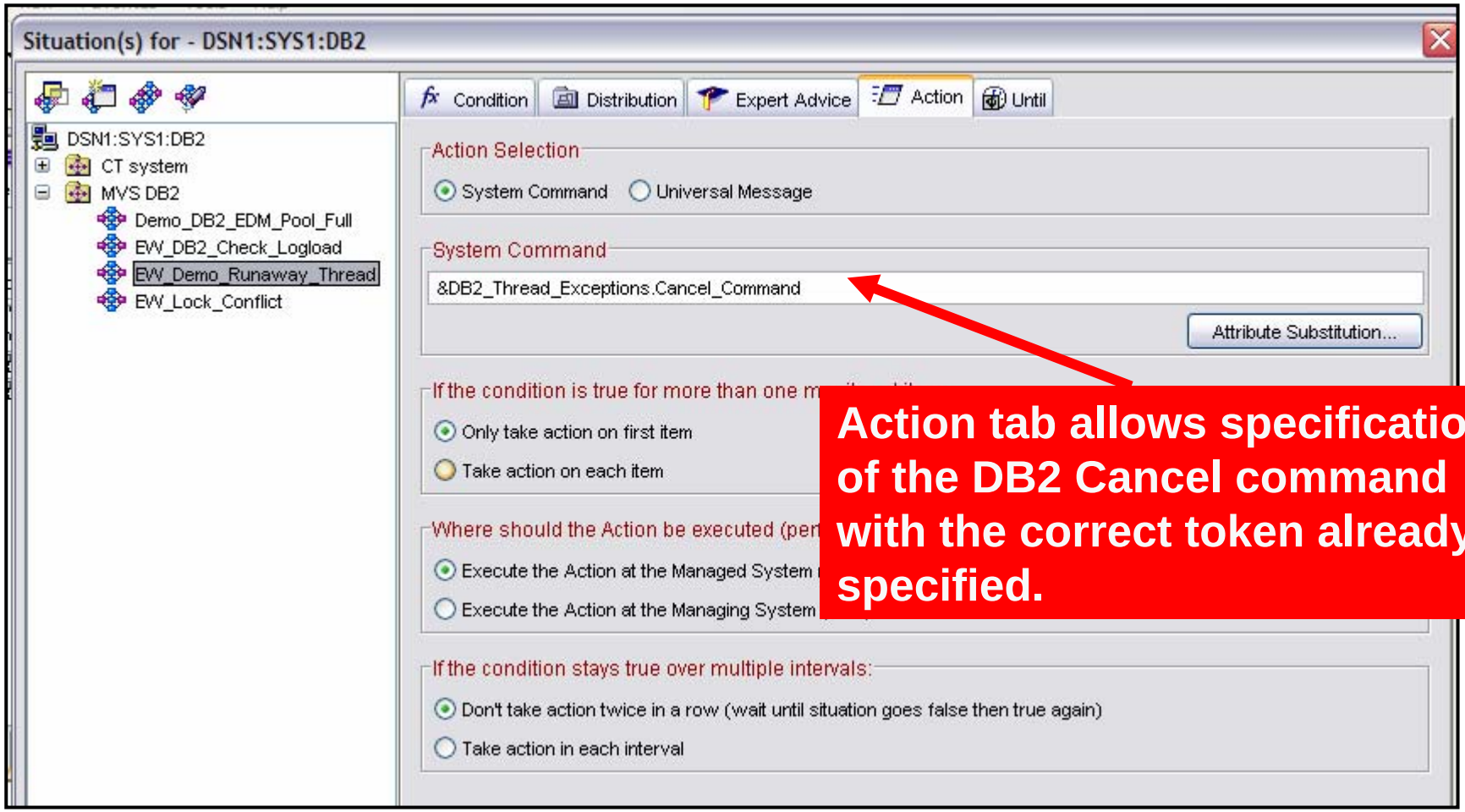
Performance Automation
Automated Corrections

- 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

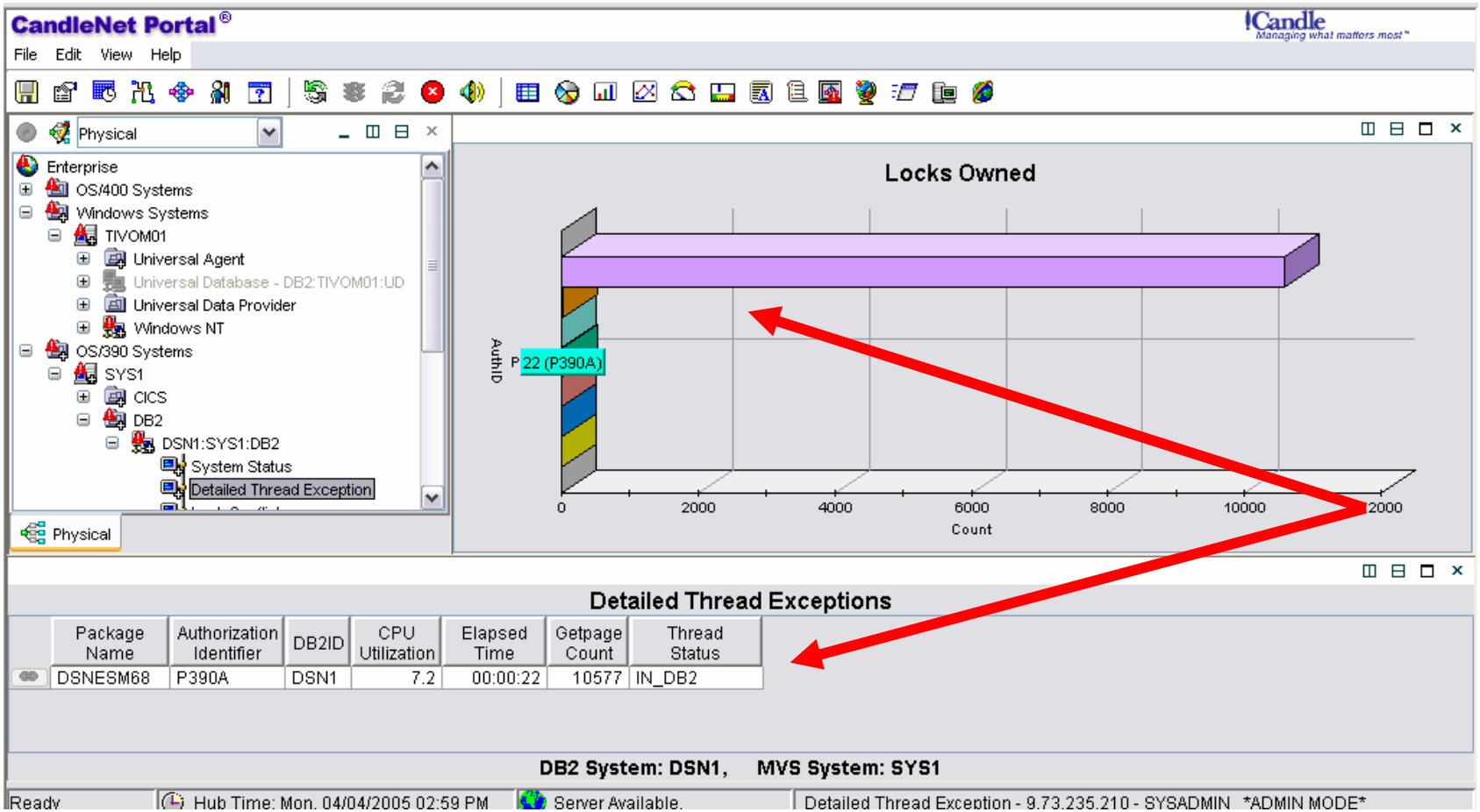
Automated Corrections
Runaway Thread Scenario



Automated Corrections
Specifying The Cancel Command



Monitoring The Problem Thread



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
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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

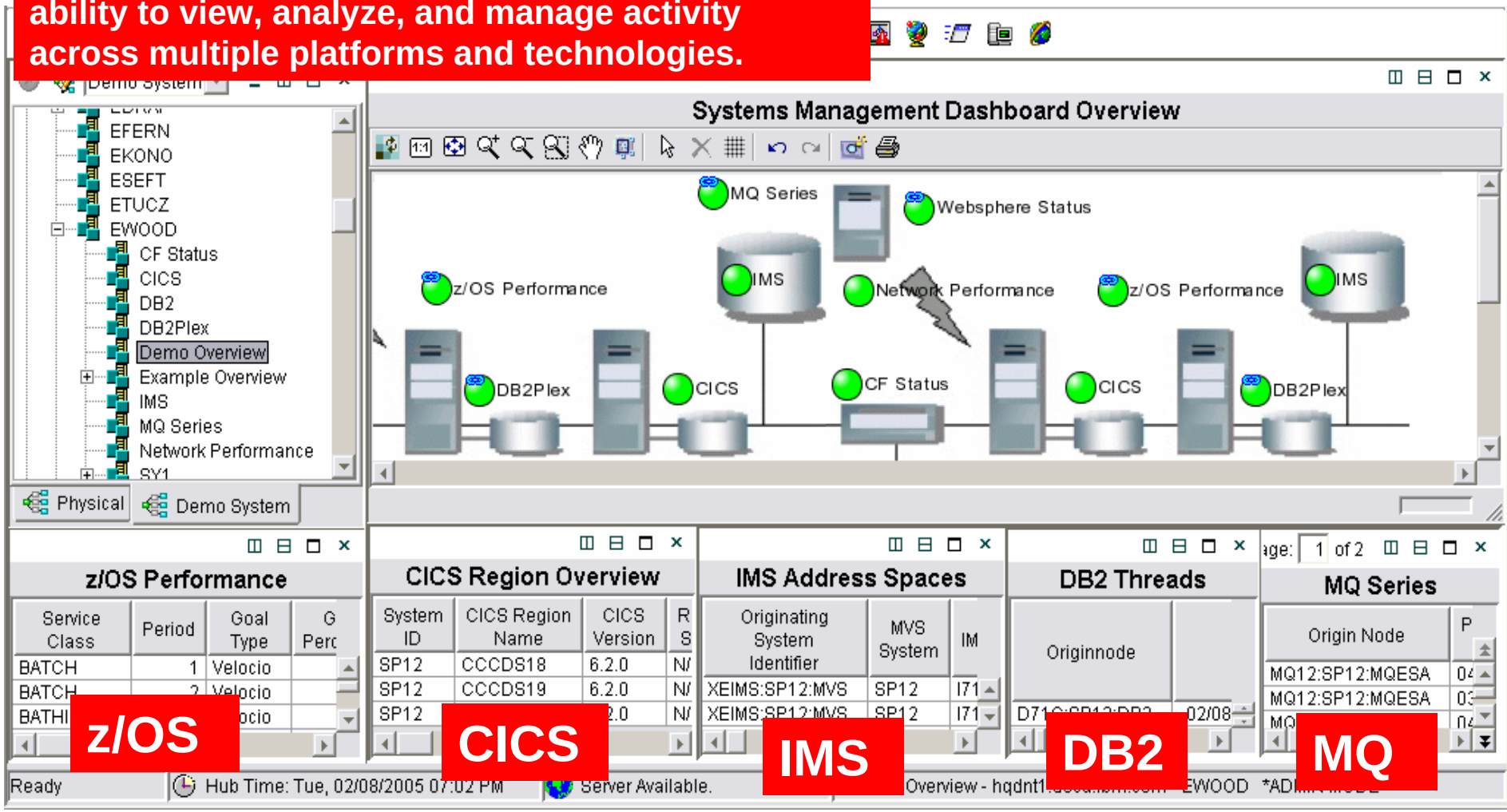
- Policies allow for more sophisticated automation
  - Issue multiple commands and check if commands worked
  - Situations are single command functions
- Situations typically run in the agent
- Policies run in the TEMS

Performance Automation And Policies

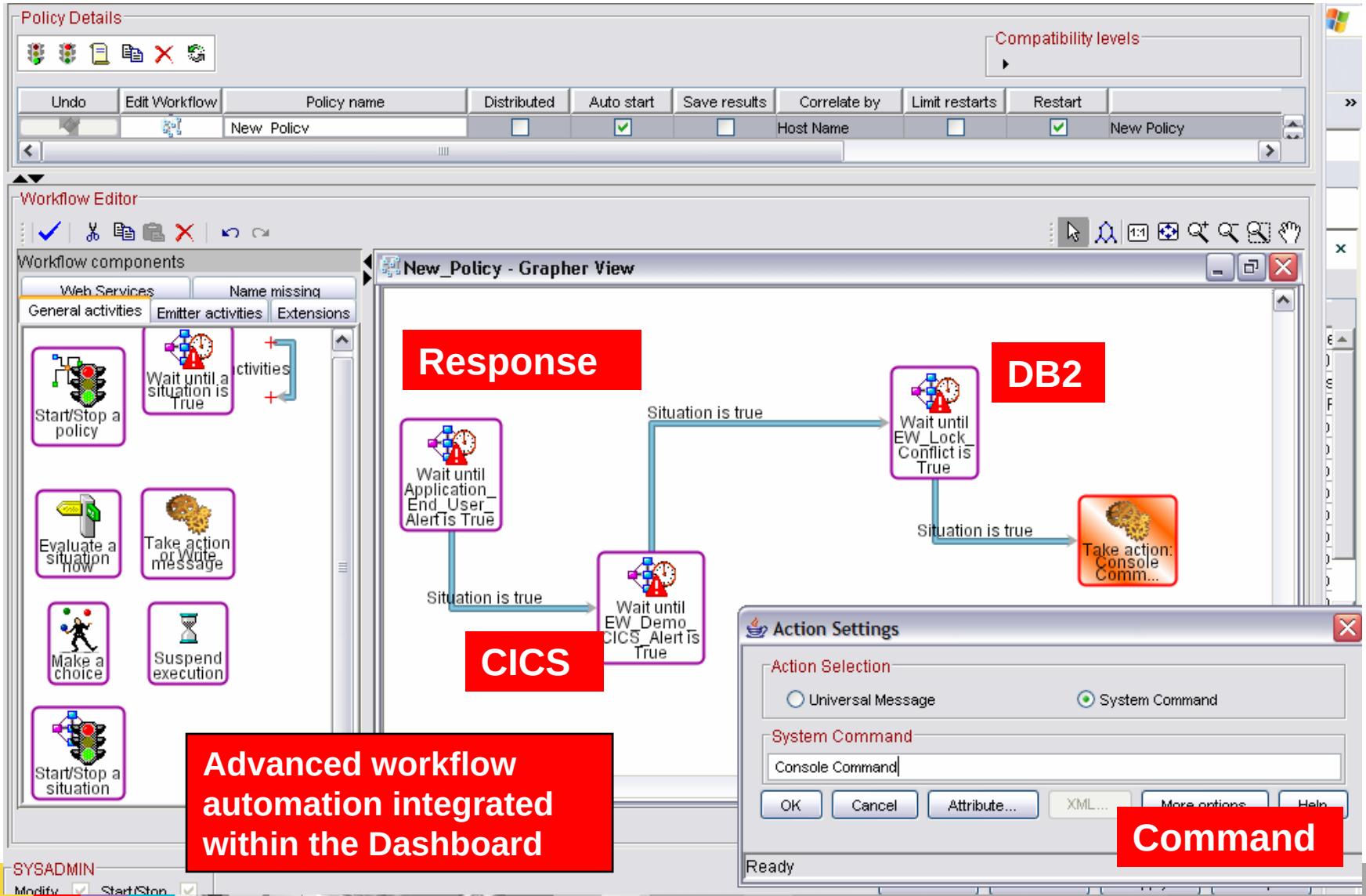
- Use Policies for more sophisticated performance automation scenarios
- Automate corrections
- Implement machine speed corrective actions, issue alerts, and allow for later human intervention
- Use for dynamic subsystem management and ‘tweaks’ as the workload changes
  - Not permanent fixes, but to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

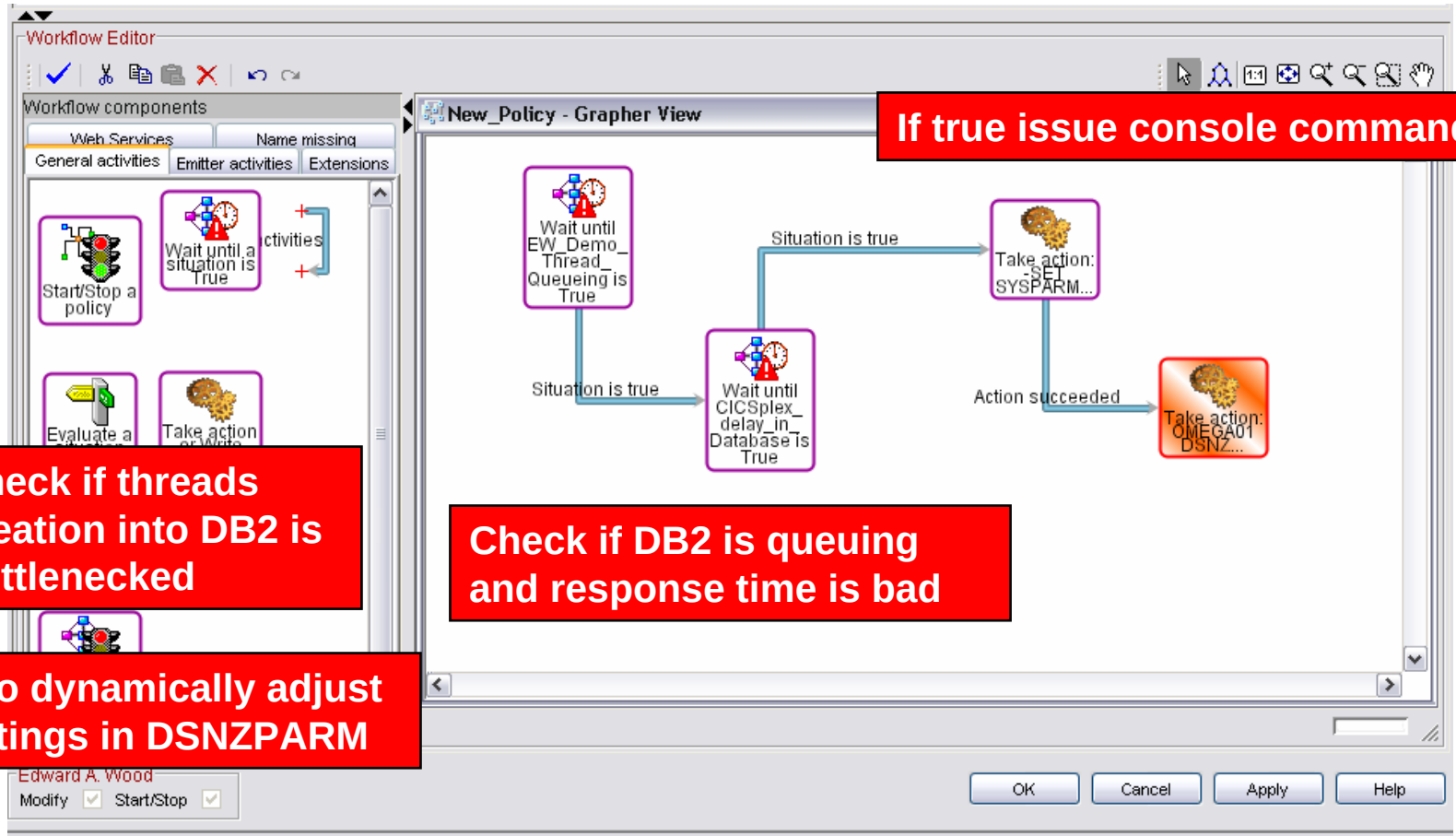


Policies Support The Ability To Do Correlated Alerts And Commands

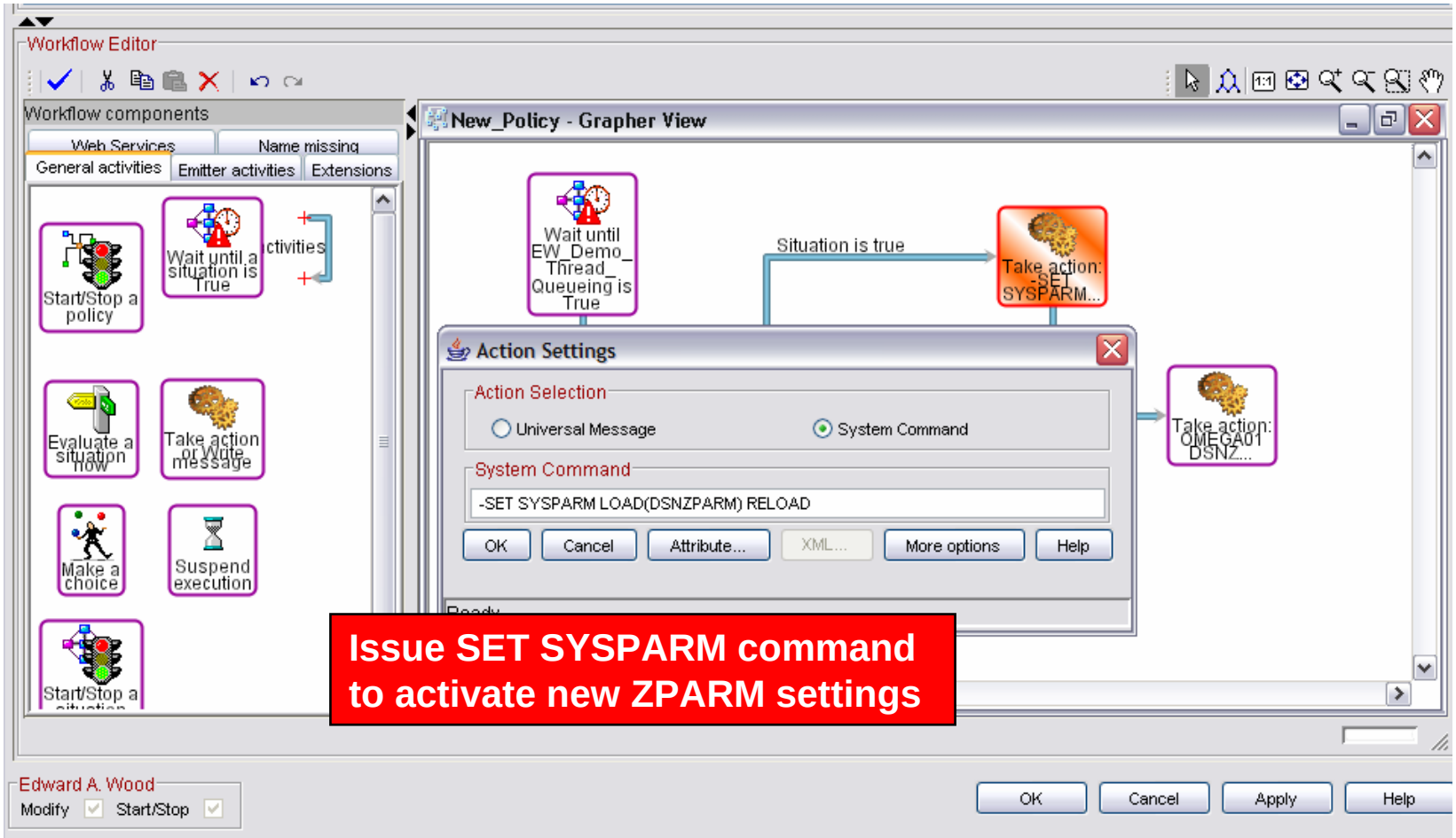


Advanced workflow automation integrated within the Dashboard

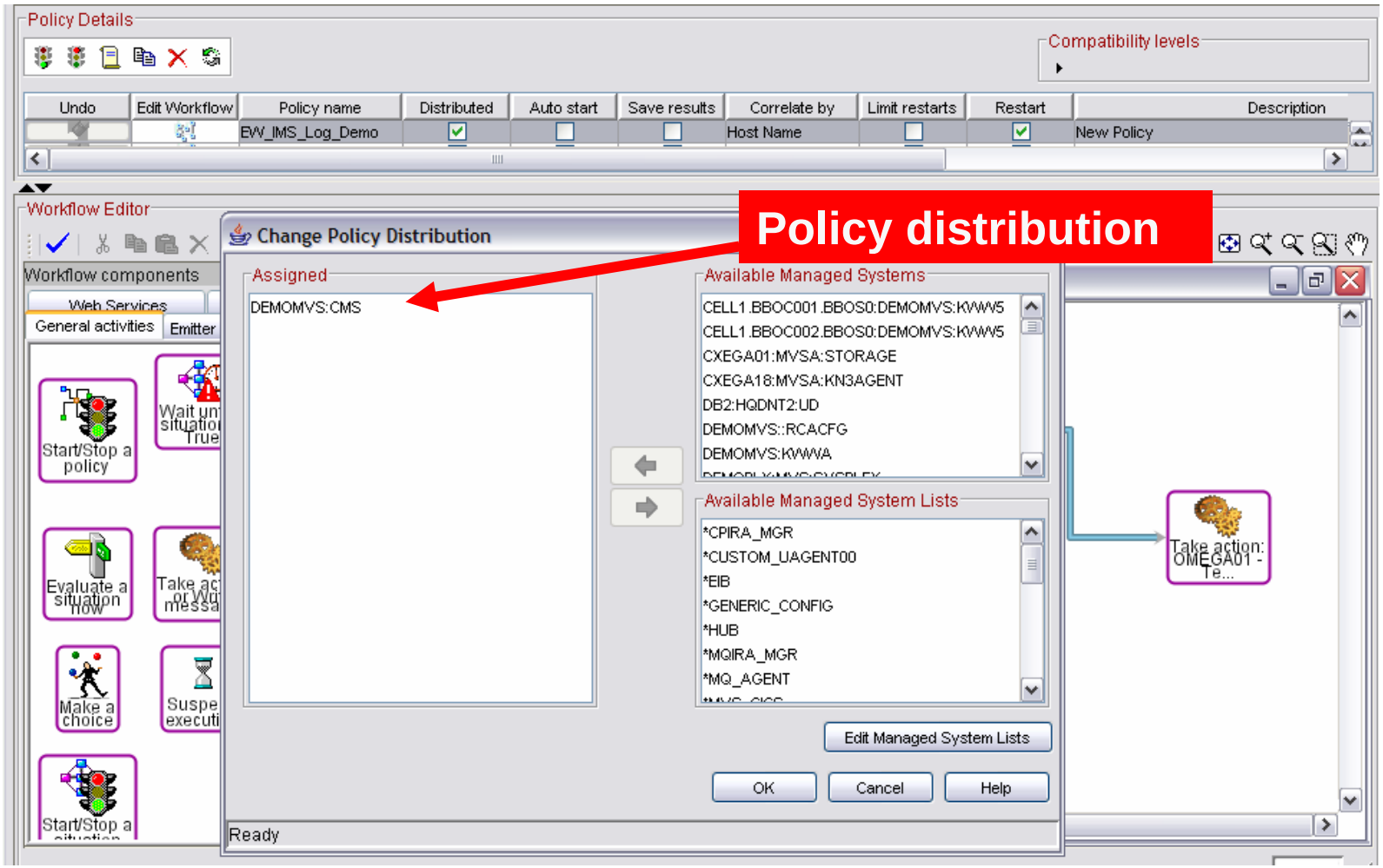
Using Policies For Dynamic Performance Management



Using Policies For Dynamic Performance Management



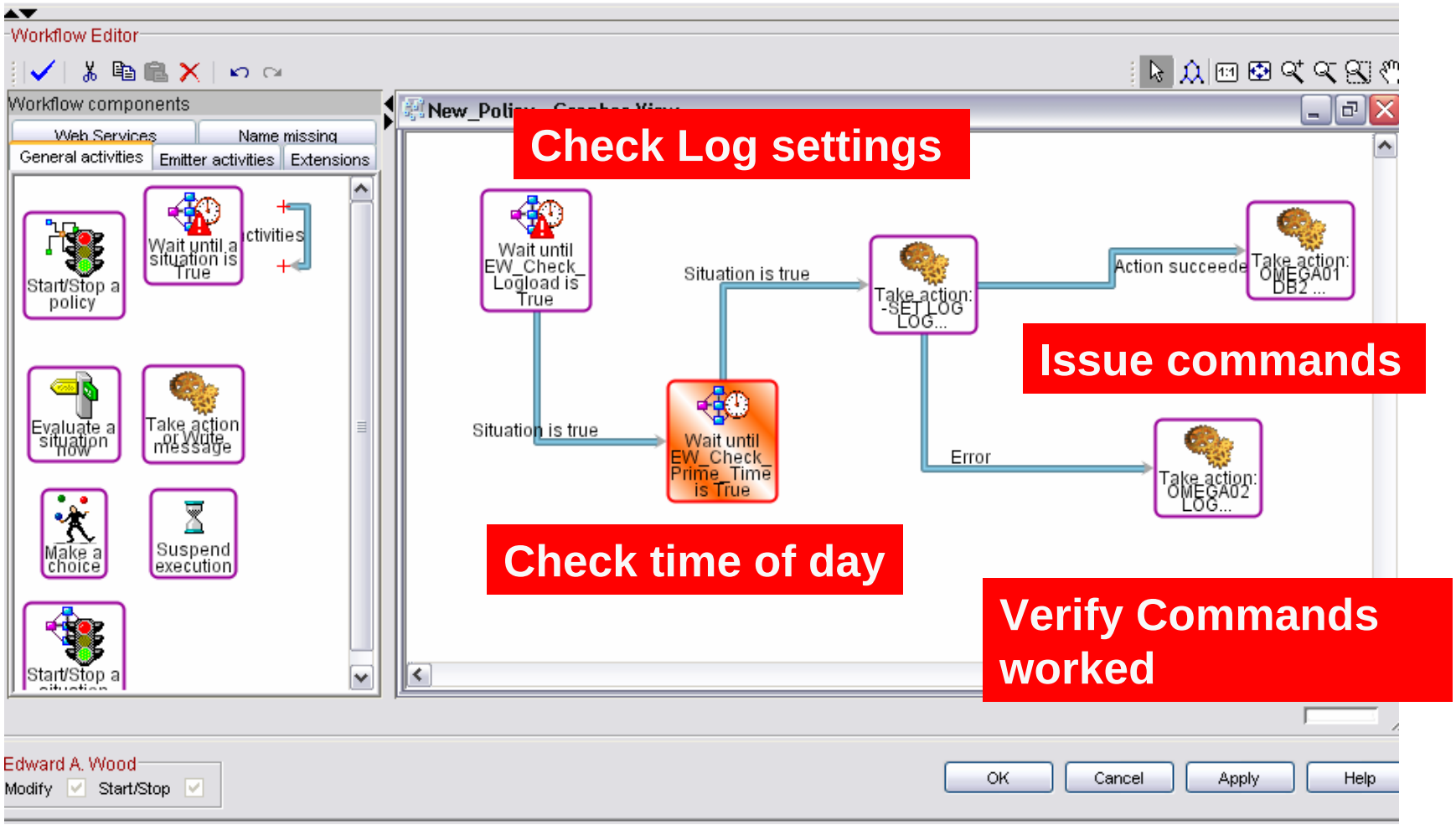
Policies Are Distributed To The TEMS



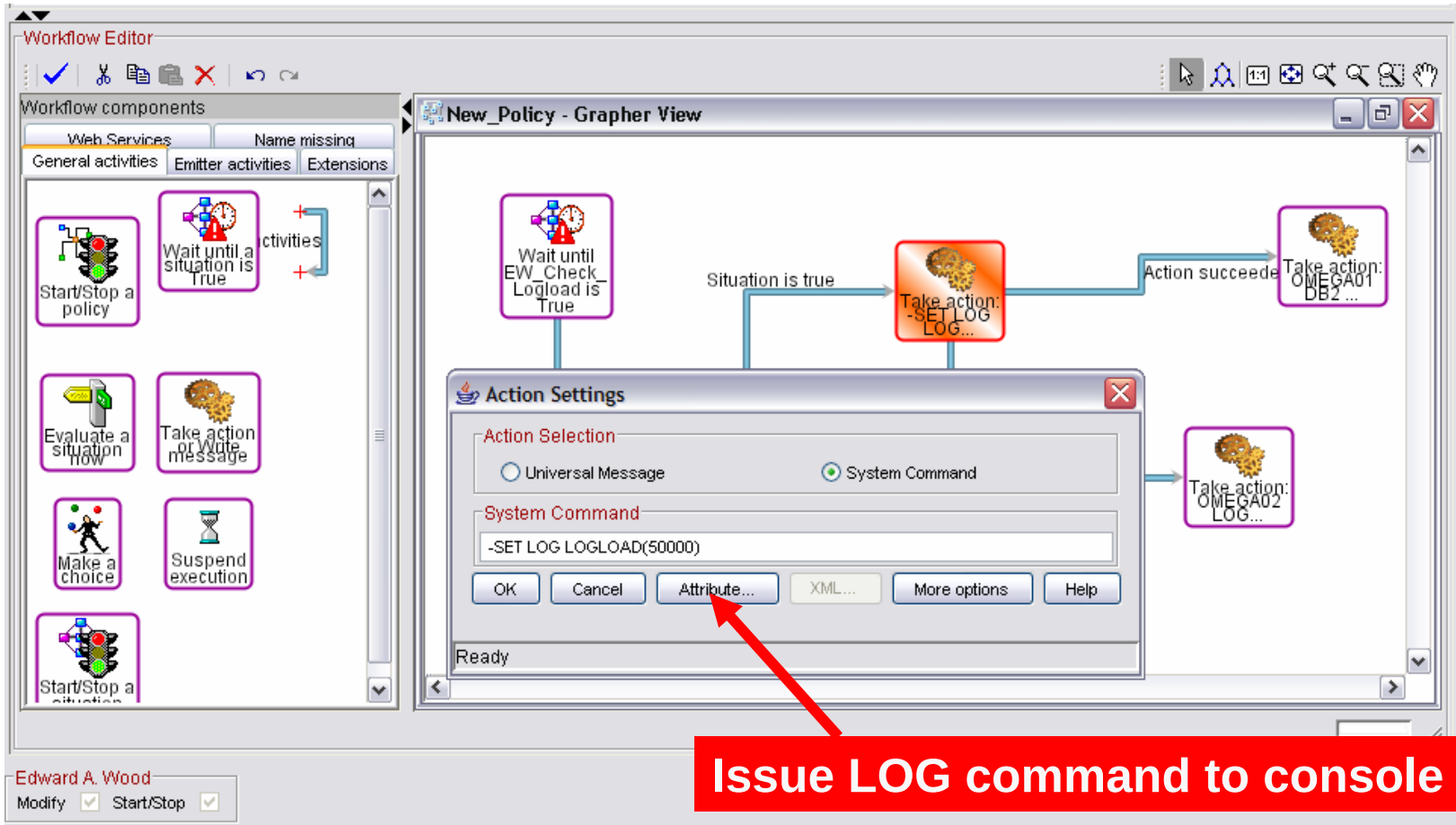
Database Management Automation

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

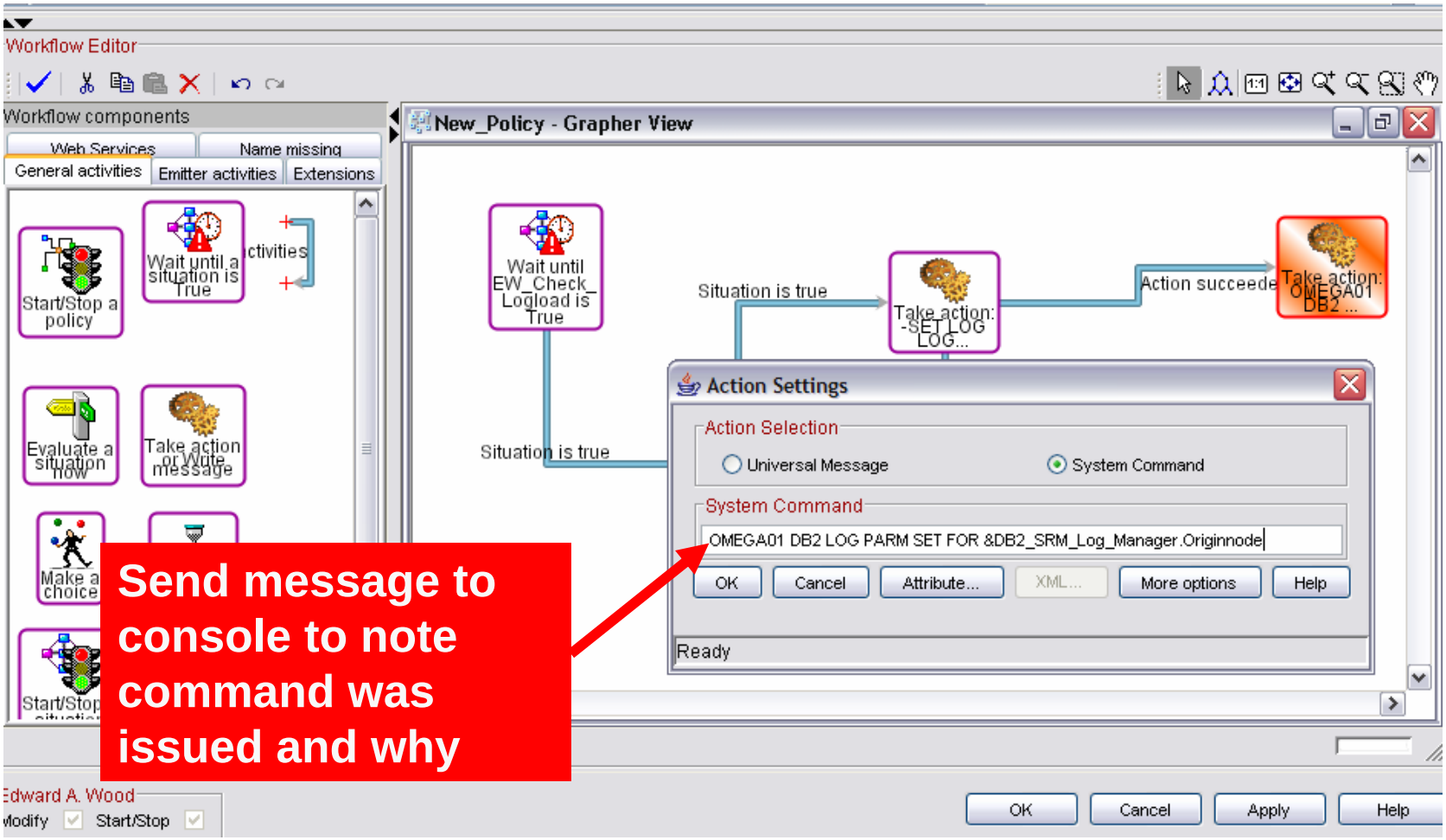
Database Management
Dynamically Managing Logging



Using Policies To Automate Log Settings

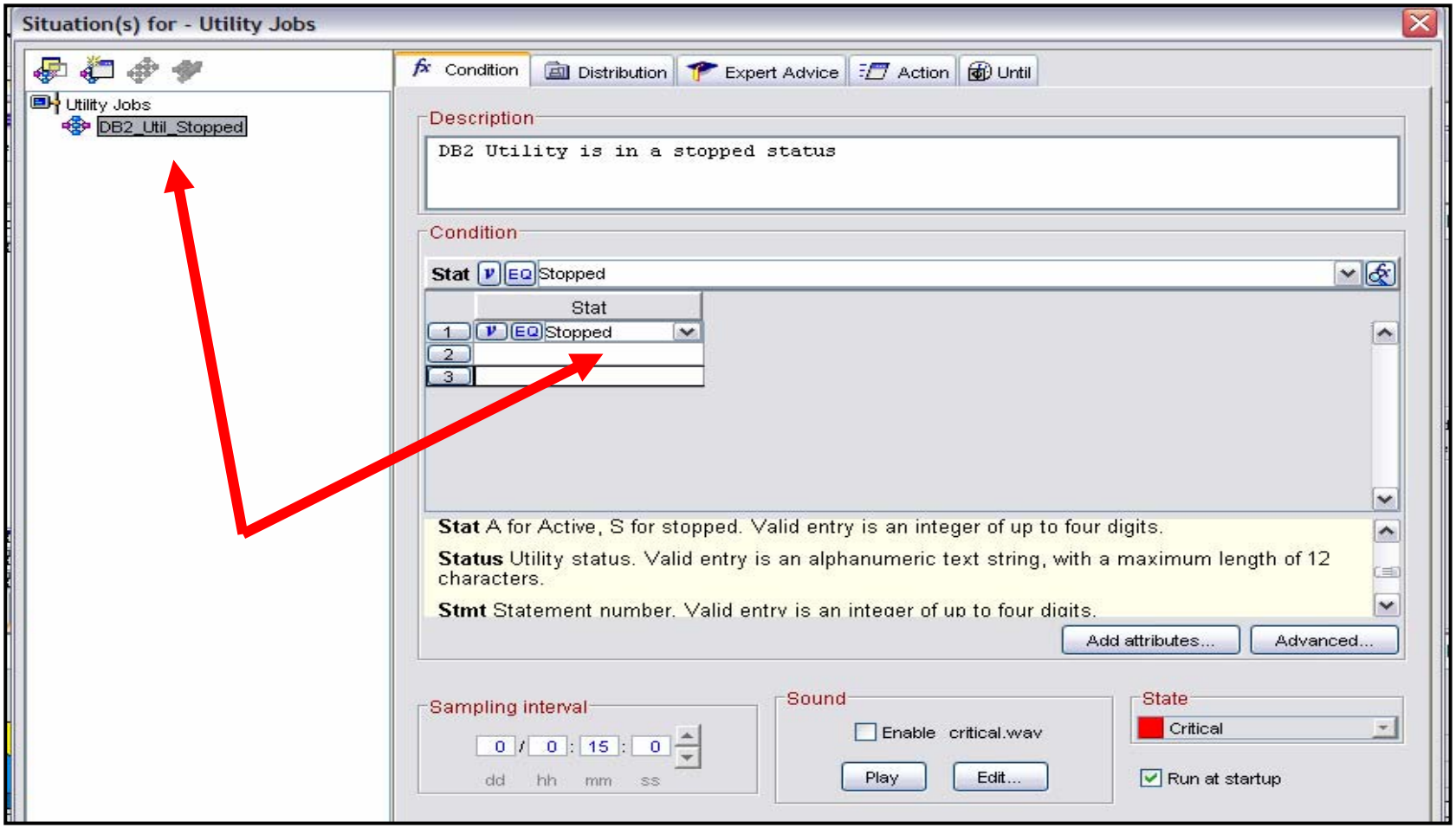


Using Policies To Automate Log Settings



DB2 Utility Management

Monitor For Utilities In A Stopped Status



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