

Maximo Archiving and ITM for Maximo Solution Health



Colleen McCretton – Designer & Architect, Maximo

Session Overview

- **Archive Business Need**
 - Technology Overview
 - Demo

- **Monitoring business need**
 - Overview of Maximo/ITM integration
 - Agent Overview
 - System requirements
 - Agent Usage Scenarios
 - Setup and Configuration

- **Questions?**

Customer Pain Point

- Production database growth
 - Example, 65000 work orders per month (supply chain development partner); 1 million+ work orders in a year
- Maximo impact:
 - Performance degradation in production
 - Costly hardware upgrades
 - Costly, long running upgrade process
- Customer need:
 - Archive historical data
 - Preserve application performance in production
 - Smoother, faster upgrade to newer product release

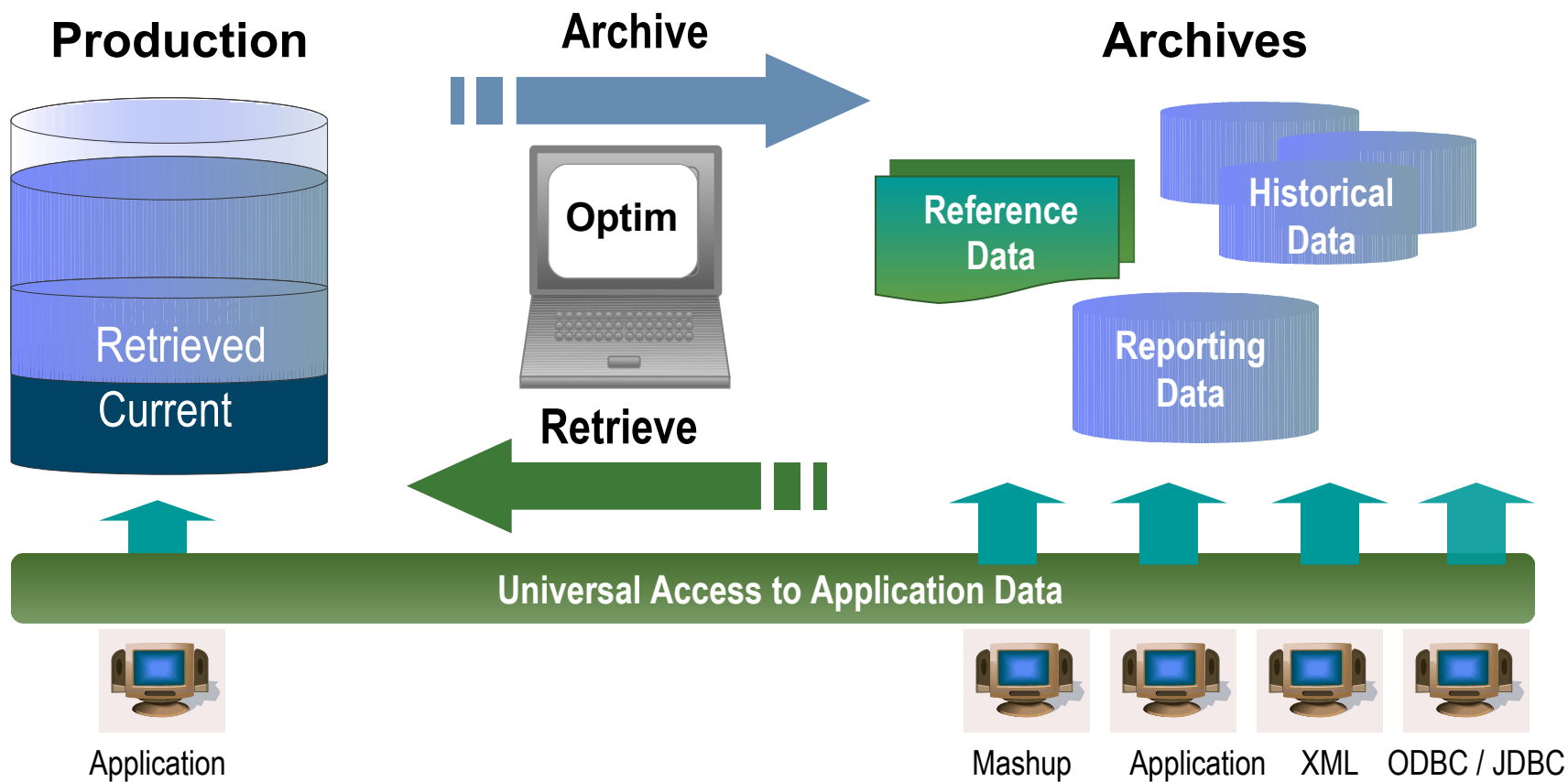
Archiving needs

- Customer feedback, Maximo Advisory Council round tables
- Offline storage of application data
 - Data that is currently historical and does not change
 - Data usually deleted from source tables
- Application data context should be preserved
 - Complete business object data
- Application data should remain available for reporting/auditing
 - Offline storage should behave as data source
- Benefit
 - Production environment runs optimally
 - Faster upgrades
 - Hardware costs reduced

IBM Optim™

- Selected Optim to enable Maximo archiving
 - IBM acquired Princeton Softech in 2007
 - Part of Information Management brand
 - Optim is key data growth solution from Princeton Softech
 - Best of Breed: Competitors include Applimation, HP-OuterBay, Solix, Compuware
 - Optim offers archiving solutions for packaged applications
 - Oracle E-Business
 - PeopleSoft
 - Siebel
 - JD Edwards
 - Current IBM Optim release 7.x
 - Mature product line

Optim Data Growth Solution: Archiving



- Complete Business Object provides historical reference snapshot of business activity
- Storage device independence reduces storage costs
- Immutable file format enables data retention compliance

Enterprise Environments

IBM Integrated Data Management

Database Design, Development & Administration, Data Growth, Data Privacy, Test Data Management, Application Upgrades & Retirements, Data Retention & E-Discovery

Enterprise Environments

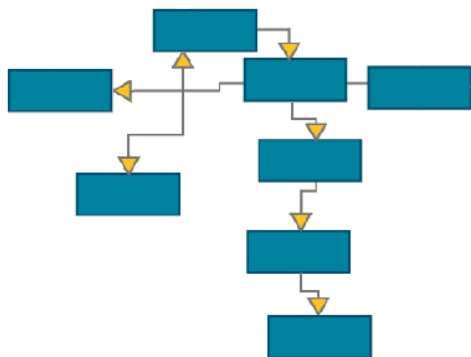


Windows XP/2000 Solaris HP/UX Linux AIX OS/390 Linux z/OS i-series

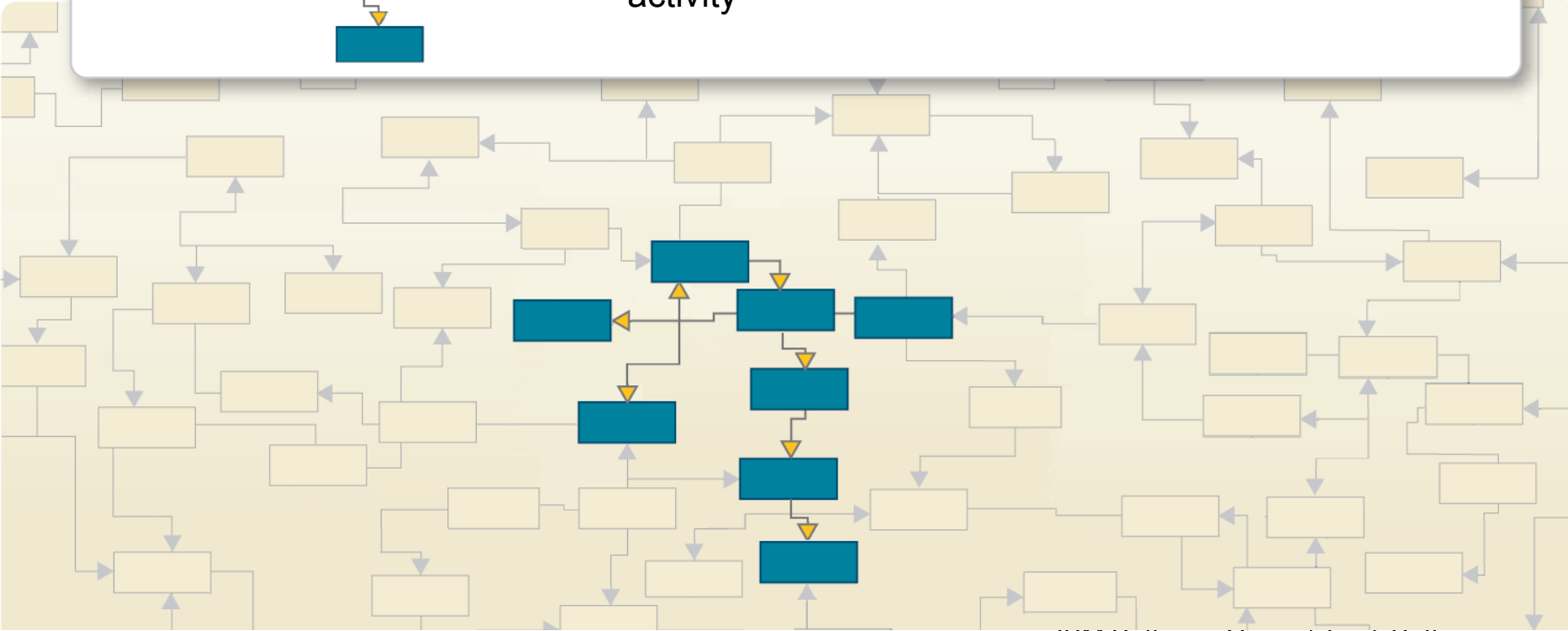
NAS SAN ATA CAS Optical Tape

Archive the Right Set of Data

Referential Integrity – the Complete Business Object



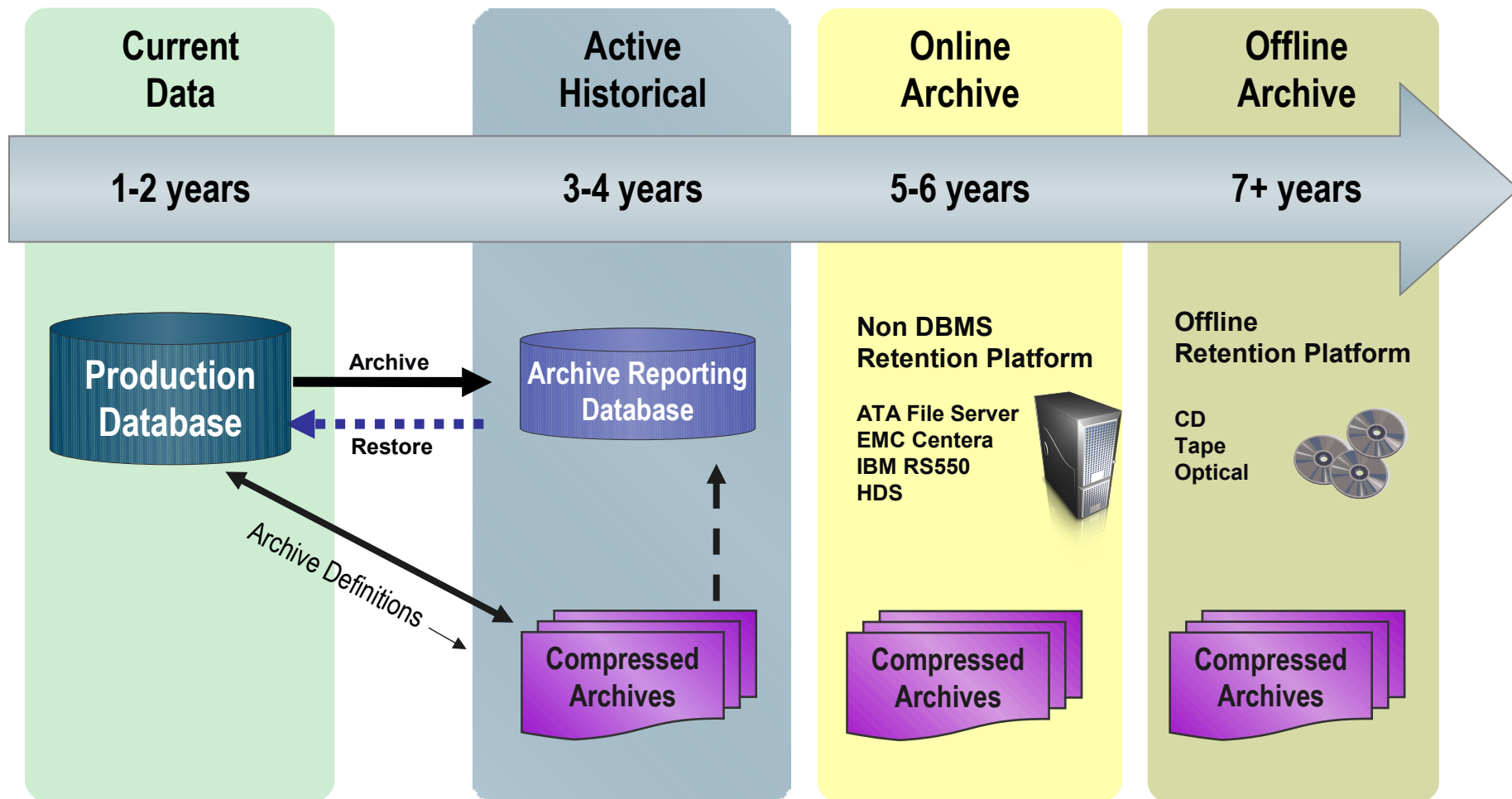
- Represents application data record – payment, invoice, customer
 - Referentially-intact subset of data across related tables and applications; includes metadata
- Provides “historical reference snapshot” of business activity



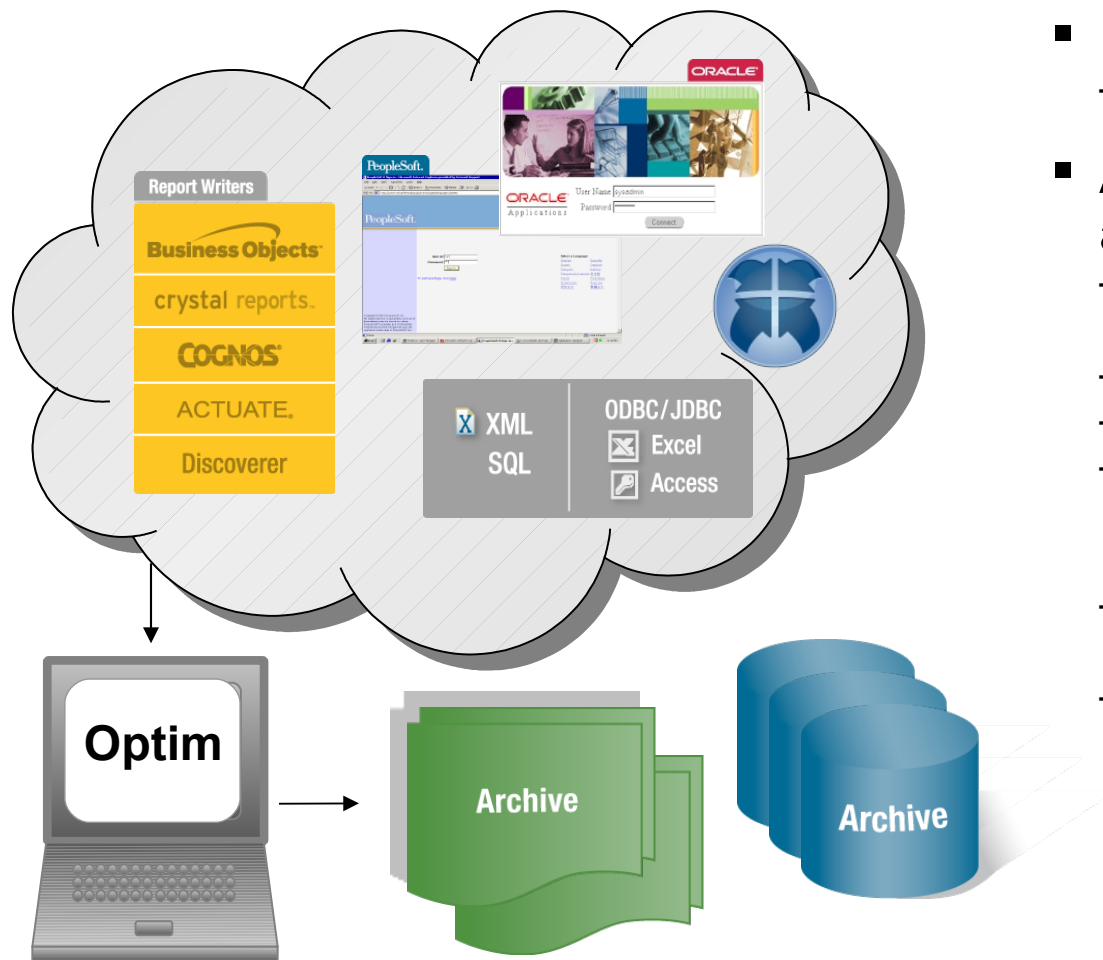
Extract, Store and Restore

- **Extract:** Identify and extract business objects across multiple related applications, databases and platforms
- **Store:** Store immutable business objects independent of infrastructure – any hardware device or platform
- **Restore:** Restore business objects to any other database or application for reporting or native application access. Choose precisely which items to restore – a single transaction record, a year's worth of data, or any other range or parameter you specify.

Extract, Store and Restore Store in Any Environment



Universal Access



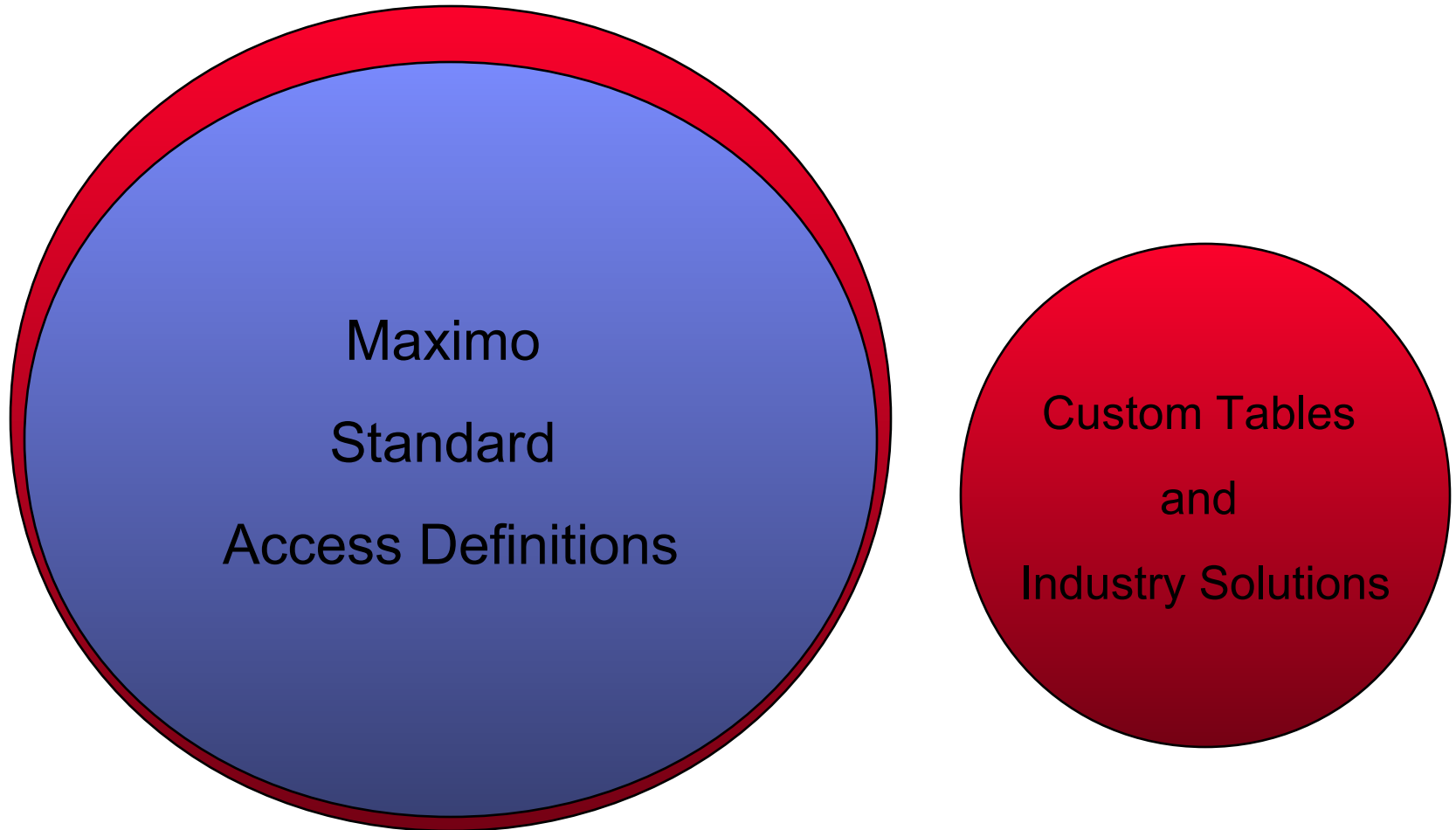
- Native application access
 - Familiar screens and processes
- Application independent access
 - Industry standard methods: SQL, ODBC/JDBC, XML
 - IBM Mashups
 - Portals
 - Report writers: Crystal Reports, Cognos, Business Objects, Discoverer, Actuate
 - Desktop formats: Excel, CSV, MS Access
 - Database formats

Access Any Record, Anytime, Anywhere!

Optim for Maximo

- Enabling Maximo archiving capability with Optim
- Out of the box archive access definitions (policies)
 - Policies can be changed to fit requirement
 - New policies can be created
 - Configuration – no coding
- Versions
 - 6.2.x
 - 7.1.x
 - 7.5 (leverages the integration framework to extend policies)
- Targeting high-growth applications:
 - Work Orders
 - Workflow Transactions
 - POs
 - PRs
 - Invoices
 - Assets
 - SR Tickets (7.x EAM only)
- No Maximo code – Adapter is for Optim to connect to a Maximo database
- Connects directly to the database – is not aware of Maximo business objects

Typical Customer Data



Archive Implementation

- Import Archive Definitions into Optim
- Copy definitions to make customizations
 - Modify selection criteria
 - Add tables to access definitions
 - Add relationships
- Schedule archive process
- Update restore process to restore archive files created

Demonstration

Access Definition

PSTDEMO.WODETAILNEW - Access Definition Editor

File Edit Tools Options Help

Description:
WODetail ArchTest 2 -No Views onlyWPITEM

Tables Relationships Variables Point and Shoot Group

Default Qualifier:
OPTIMDBALIAS.MAX7113B15

Start Table: (Grouping no)
WORKORDER

	Table/View	Type	DBMS	Table Specifications
1	WORKORDER	Table	Oracle	
2	WPLABOR	Table	Oracle	
3	WPITEM	Table	Oracle	
4	INVRESERVE	Table	Oracle	
5				

Ready

Table Specifications

File Edit Options Tools Help

Table:
WORKORDER

Columns Selection Criteria SQL Sort Archive Actions Archive Index File Attachments

Correlation Name: Variable Delimiter:

SELECT ... FROM WORKORDER WHERE
STATUS = 'CLOSE' and STATUSDATE > to_date('2008/09/24','yyyy/mm/dd')

Columns: WONUM PARENT STATUS Operators: < <= = Operators: AND OR IN

Ready

Archive-Purge

- Arc
- Pur
- S
- Def

Archive Process Report

Archive Process Report

Request Name OPTIM614.ARCHWOTEST1
Server Name (Local)
Archive File C:\optinstall\RT\BIN\scenario12.AF
Access Definition LOCAL
Storage Profile (None)
File Access Definition (None)
File Attachments Skipped
Client User ID MEAdmin
Server User ID MEAdmin
Time Started 10/7/2008 10:20:40
Time Finished 10/7/2008 10:20:46
Elapsed Time 00:00:06
Process Status no errors, 2 warnings
Backup Created for Archive File No

Archive Process Warnings:
Relationship 'OPTIMDBALIAS.MAX7113B15.INVRESERVE.INVRESERVE' is in NEW status and will be used.
Relationship 'OPTIMDBALIAS.MAX7113B15.WPITEM.WPITEM' is in NEW status and will be used.

Process Summary:

Tables Processed	4
Rows Archived	42
Rows with Errors	0
First Pass Table Rows	25

Object Details:

Tables	4
Primary Keys	4
Relationships	3
Indexes	38
Aliases/Synonyms	0
Functions	Not Selected
Packages	Not Selected
Procedures	0
Sequences	0
Triggers	Not Selected
Views	0
Defaults	0
Rules	0
UDTs	0
Assemblies	Not Selected
Partition Functions	0
Partition Schemes	0

Row Details:

<u>Archived</u>	<u>Failed</u>	<u>Table Name</u>
25	0	OPTIMDBALIAS.MAX7113B15.WORKORDER
6	0	OPTIMDBALIAS.MAX7113B15.WPLABOR
11	0	OPTIMDBALIAS.MAX7113B15.WPITEM

Ready

Restore

■
request

OPTIM614.WO2ARCHMAX - Restore Request Editor

File Edit Tools Options Help

Description: Restore Request for WO into ARCHMAX db

Automatically Generate Subset Extract Files
 Compress Subset Extract Files
 Delete Subset Extract File after
 Continue Processing if Errors

Global Selection Criteria Defined

Archive Files:

Archive File	Status	Server	Group	Created Date	Description
1 C:\optinstall\RT\BIN\scenar		(Local)		9/30/2008 4:16:38	Archive maximo

Restore Process: Insert Load

Insert Request Selection Mode: Data Model Date Description Group

Insert Requests:

Request Name	Data Model	Request Description
1 (Local)		restore request for WO into ARCHMAX db

Ready

Restore Process Report

File Options Help

Restore Process Report

Request Name: OPTIM614.WO2ARCHMAX
 Client User ID: MEAdmin
 Time Started: 10/7/2008 10:22:16
 Time Finished: 10/7/2008 10:22:33
 Elapsed Time: 00:00:17
 Process Status: no errors, no warnings

Process Summary:

Archive Files	1
Subset Files Created	0
Files Restored	1

File Details:

Status	Errors	Warnings	Archive File
Restore Complete	0	0	C:\optinstall\RT\BIN\scenario11.AF

Insert Process

Request Name: (Local)
 Server Name: (Local)
 Source File: C:\optinstall\RT\BIN\scenario11.AF
 Control File: C:\optinstall\RT\BIN\woarchiveintoarchmaxdb.cf
 Table Map: LOCAL
 Row Limit: (None)
 File Attachments: Skipped
 Client User ID: MEAdmin
 Server User ID: MEAdmin
 Time Started: 10/7/2008 10:22:17
 Time Finished: 10/7/2008 10:22:31
 Elapsed Time: 00:00:14
 Control File: Retained
 Process Status: no errors, no warnings

Process Summary:

Tables Processed	4
Rows Inserted	0
Rows Updated	0
Rows with Errors	42
Rows Skipped	0

Row Details:

Processed	Updated	Failed	Skipped	Table Name
-----------	---------	--------	---------	------------

Ready

Optim for Maximo time-frame

- Available today
 - Version 6.2, 7.1 and 7.5
- Offered as an add-on
- Two Packages
 - Maximo Archiving with Optim Data Growth Solution
 - IBM Optim Data Growth Solution
 - Maximo access definitions
 - Instructions to configure Optim for Maximo usage
 - Maximo Archiving for Optim Data Growth Solution
 - Maximo access definitions
 - Instructions to configure Optim for Maximo usage

Using ITM to Manage Maximo Solution Health

- Overview of Maximo/ITM integration
- Agent Overview
- System requirements
- Agent Usage Scenarios
- Setup and Configuration

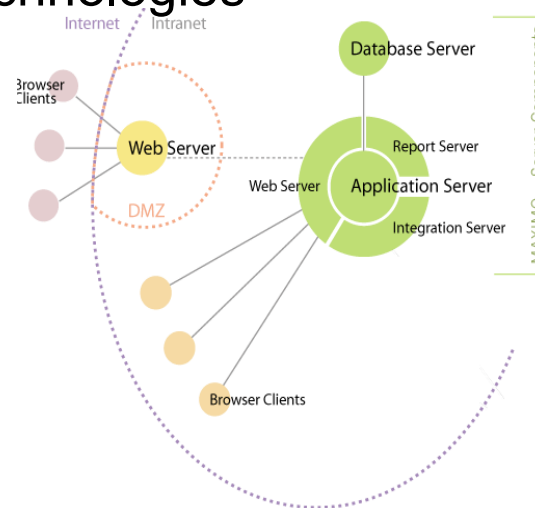
Maximo Technology Architecture

■ Web-based n-tier architecture

- Leverages the latest Internet standards and technologies
 - Web services
 - HTTP(S)
 - J2EE
 - HTML
 - XML

■ Highly Scalable Architecture

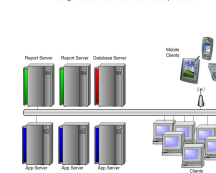
- Horizontal and vertical scaling
- Clustering, load-balancing and failover support
- Scales from small, single-site deployments to large, multi-site global deployments
- Offers performance and resiliency



Small Scale Asset and Service Operations



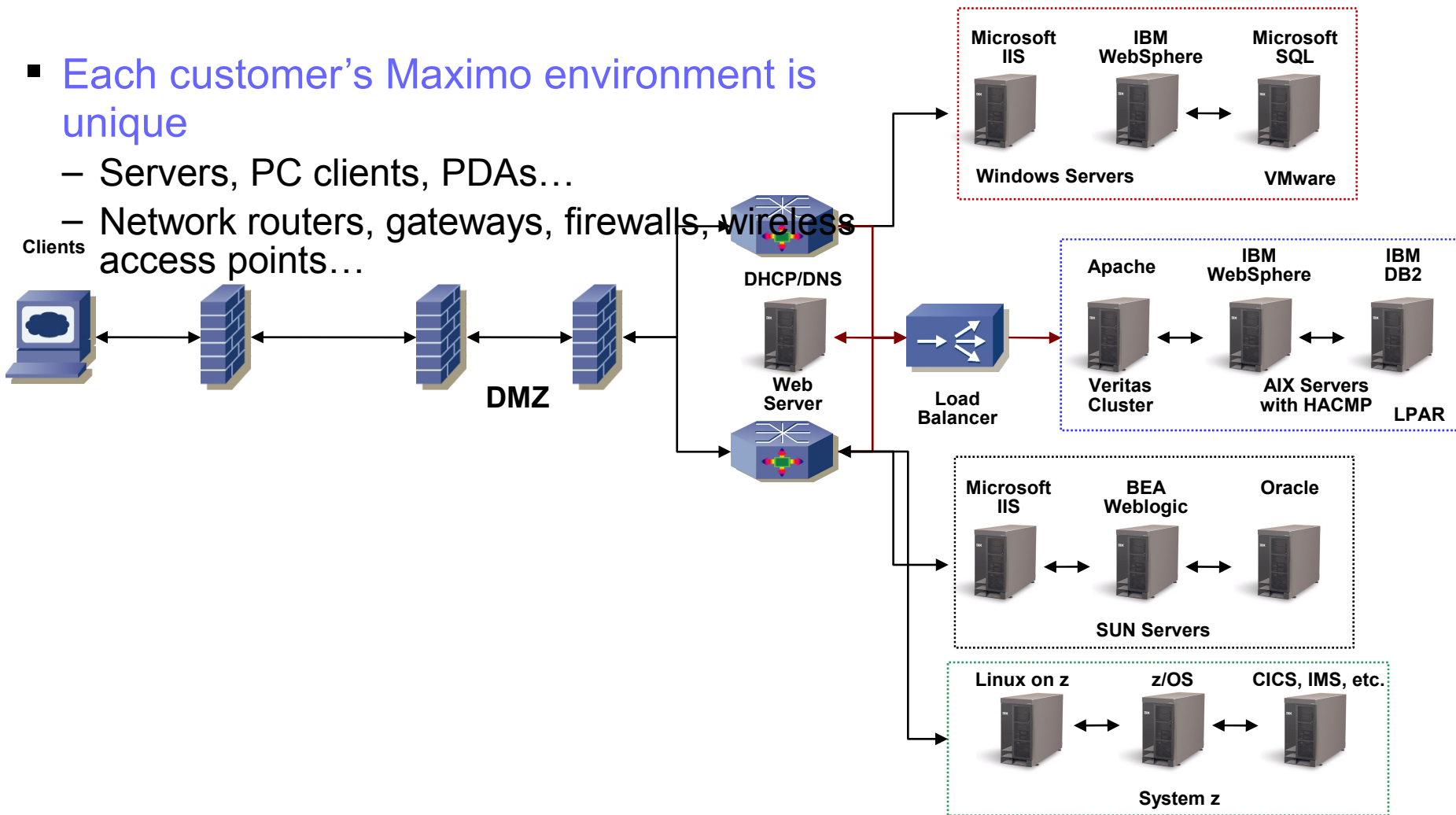
Large Scale Asset and Service Operations



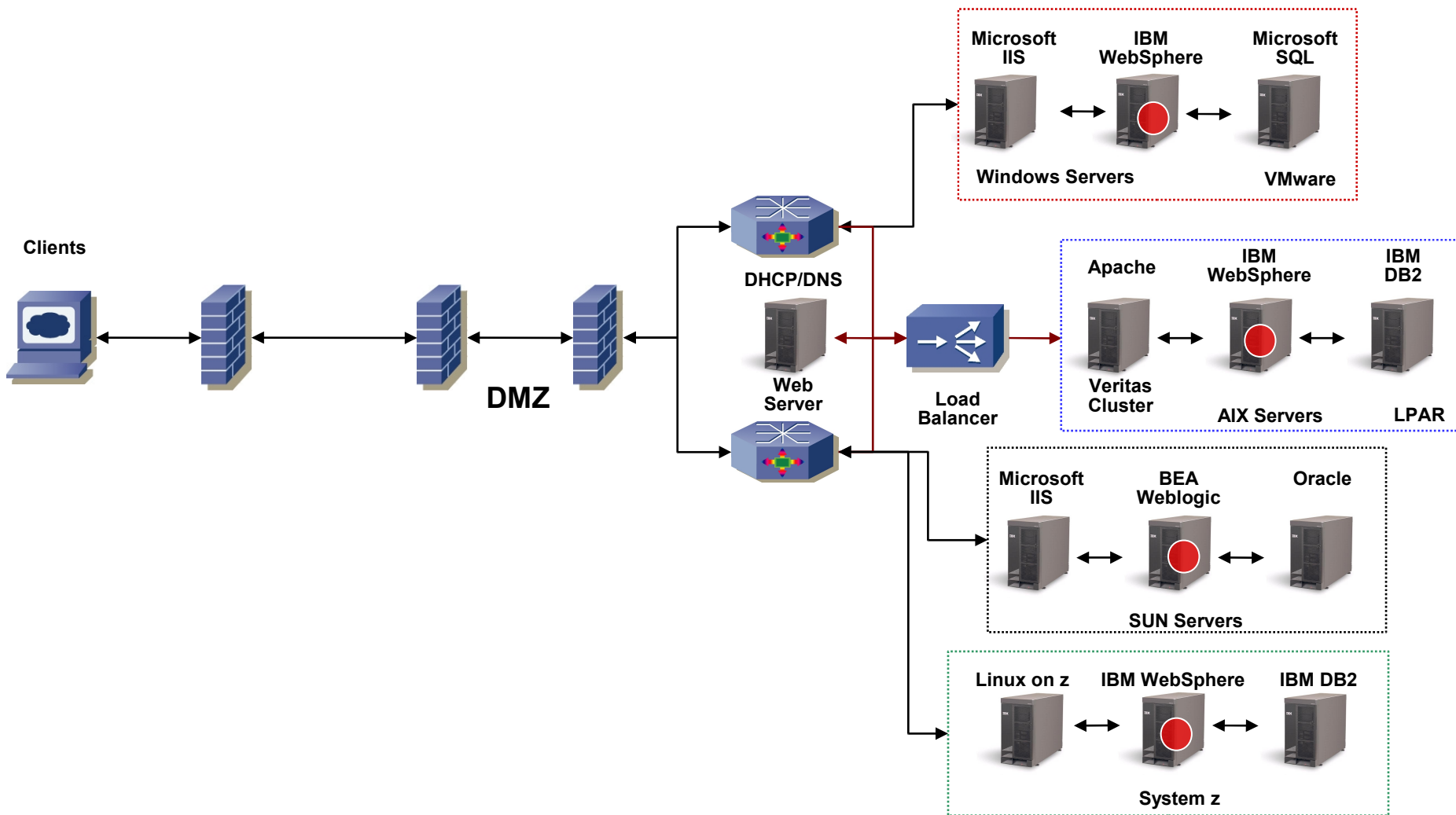
Customer Environment

■ Each customer's Maximo environment is unique

- Servers, PC clients, PDAs...
- Network routers, gateways, firewalls, wireless access points...

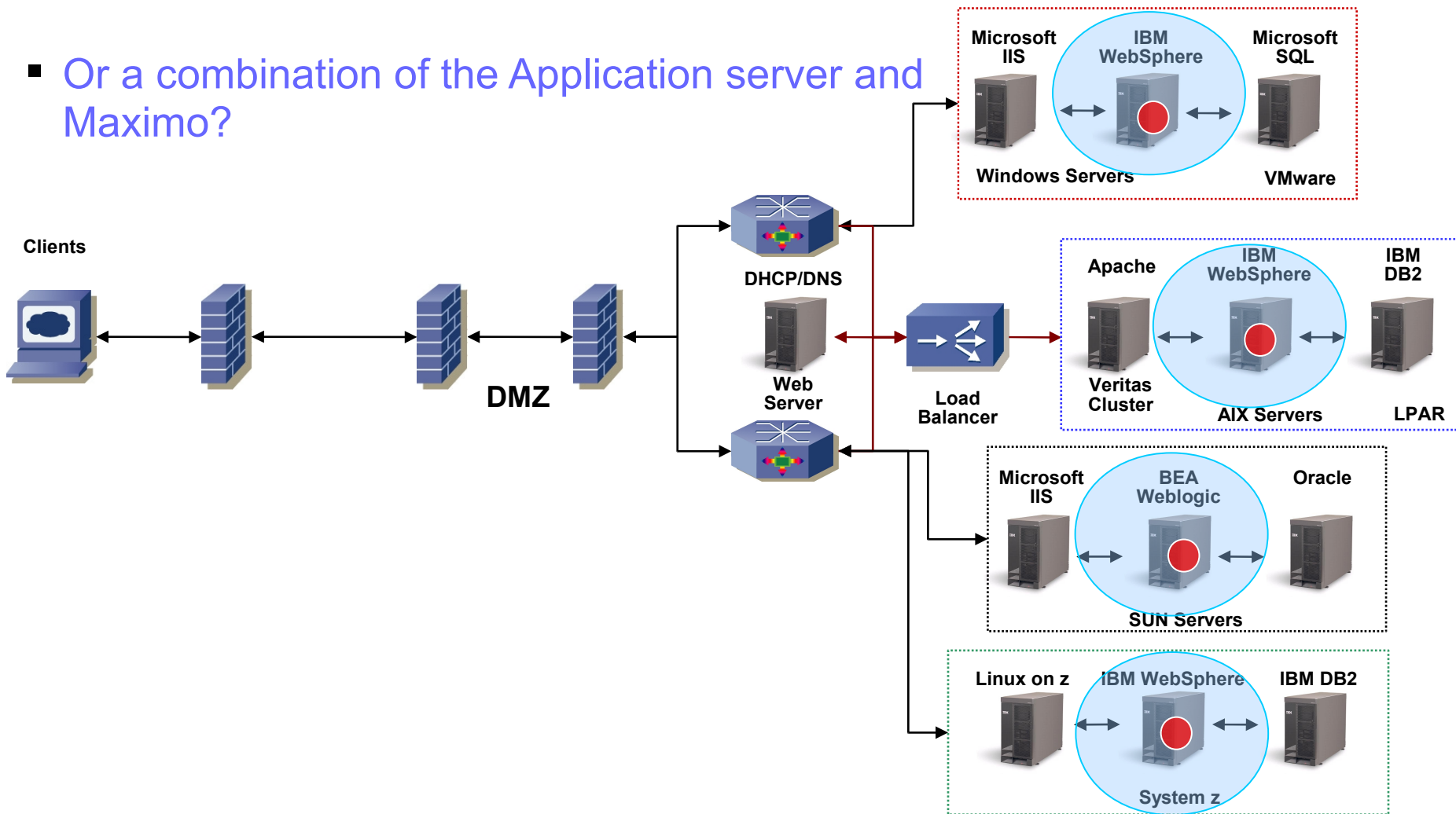


Is it Maximo?

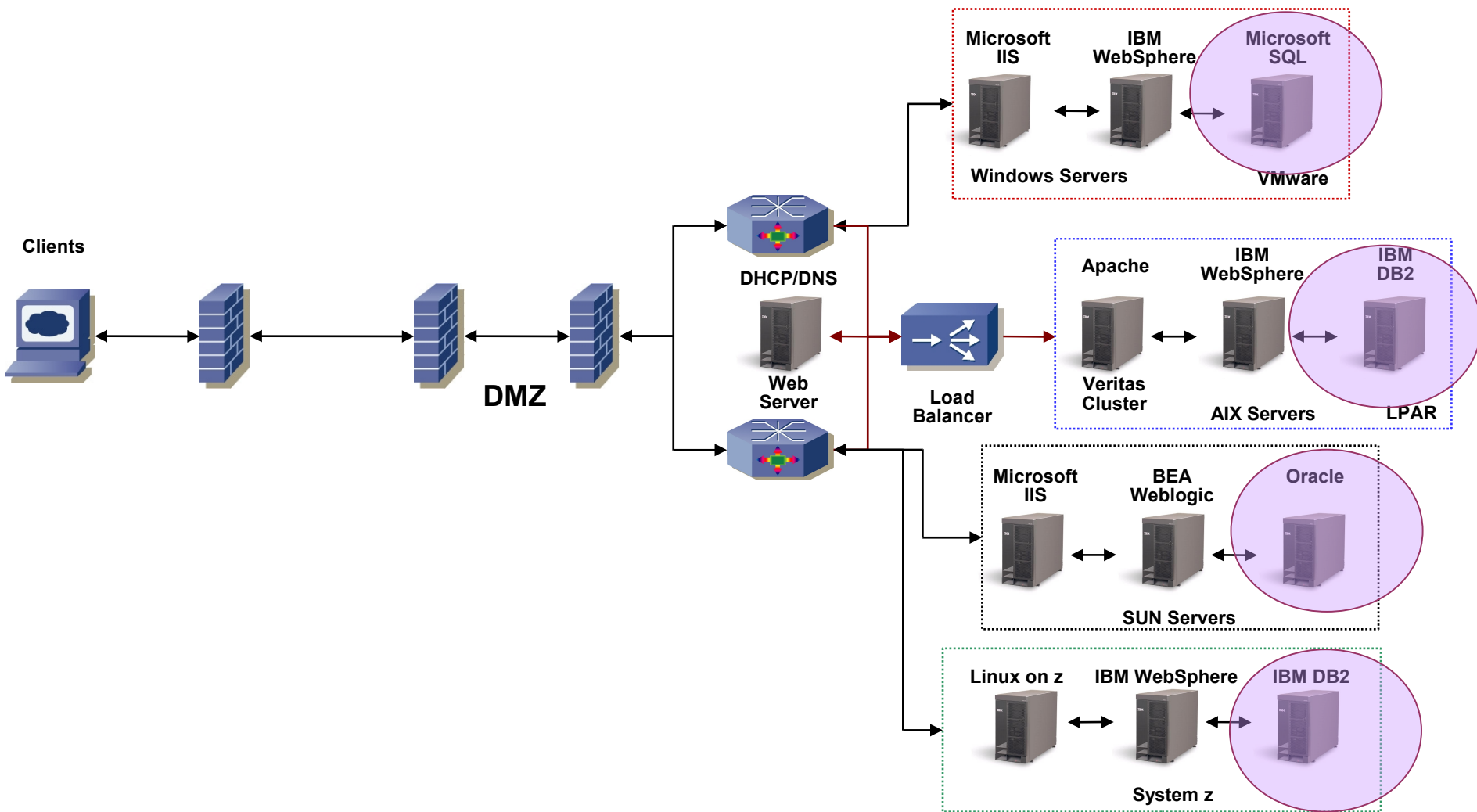


Is it the Application Server?

- Or a combination of the Application server and Maximo?

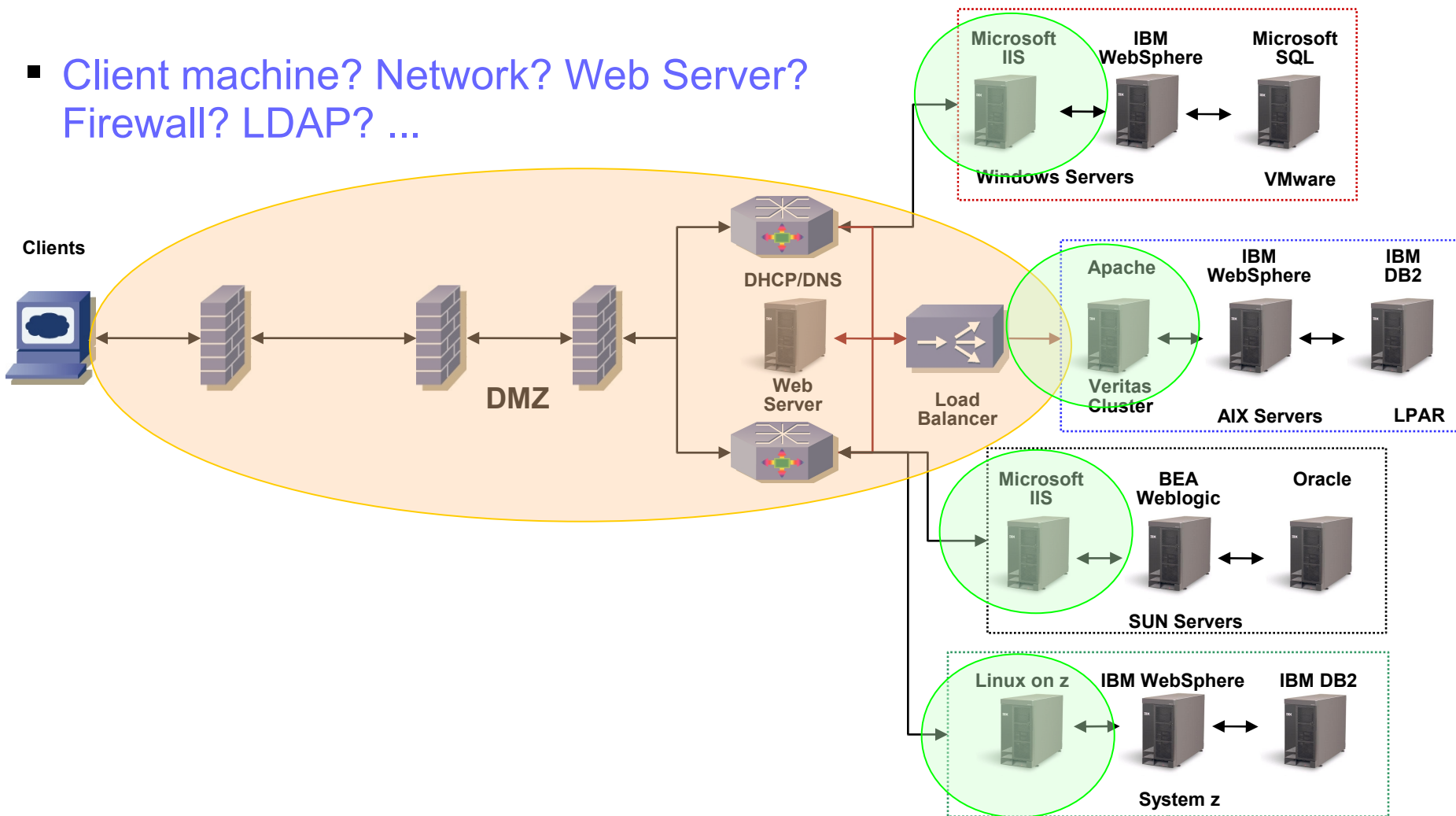


Is it the Database Server?



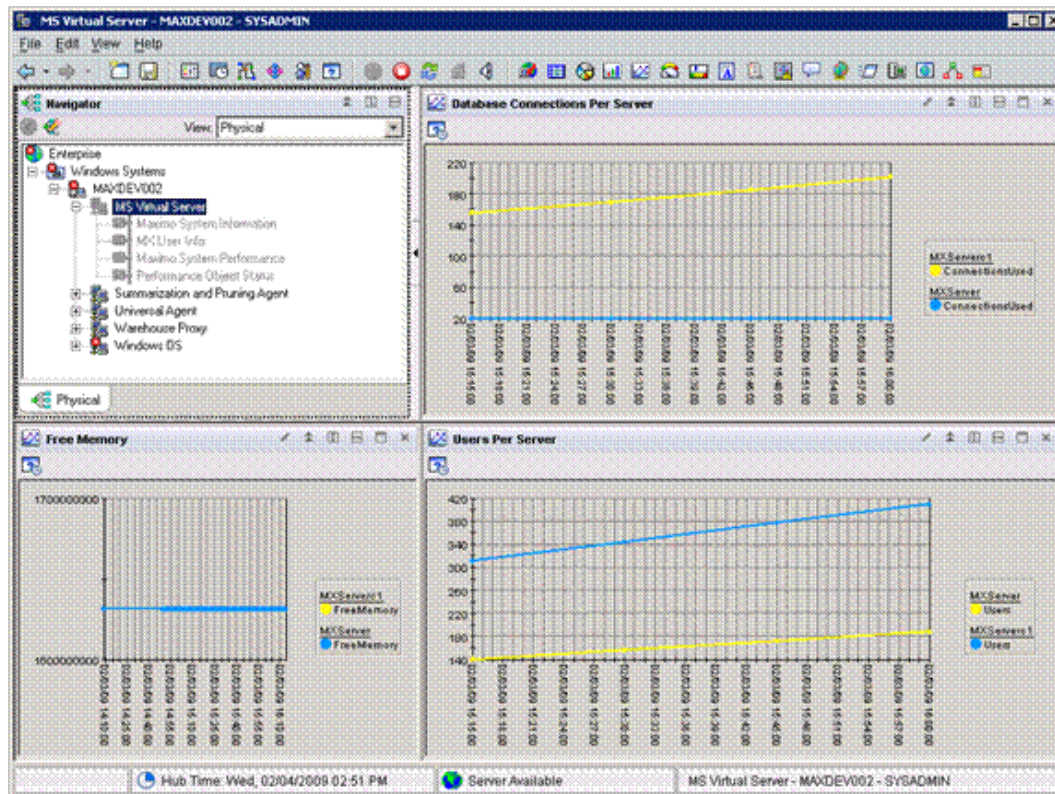
Or something else?

- Client machine? Network? Web Server? Firewall? LDAP? ...



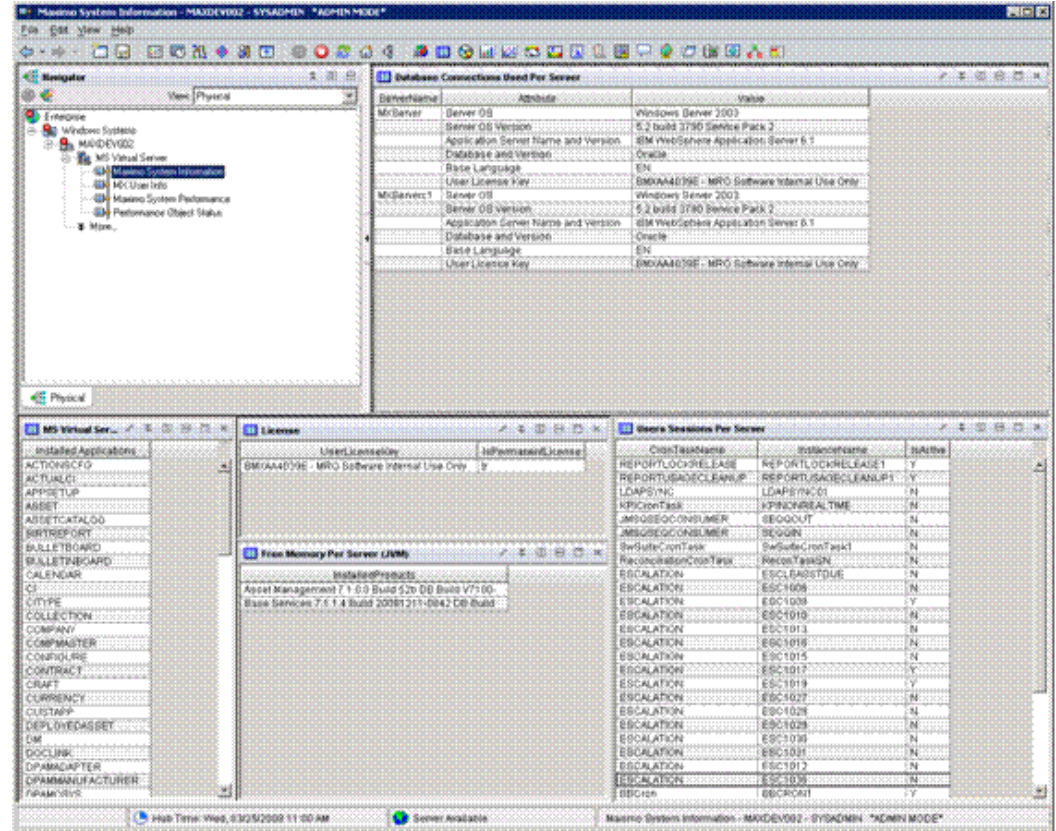
Maximo Agent

- Metrics monitored
 - System Information
 - User Sessions



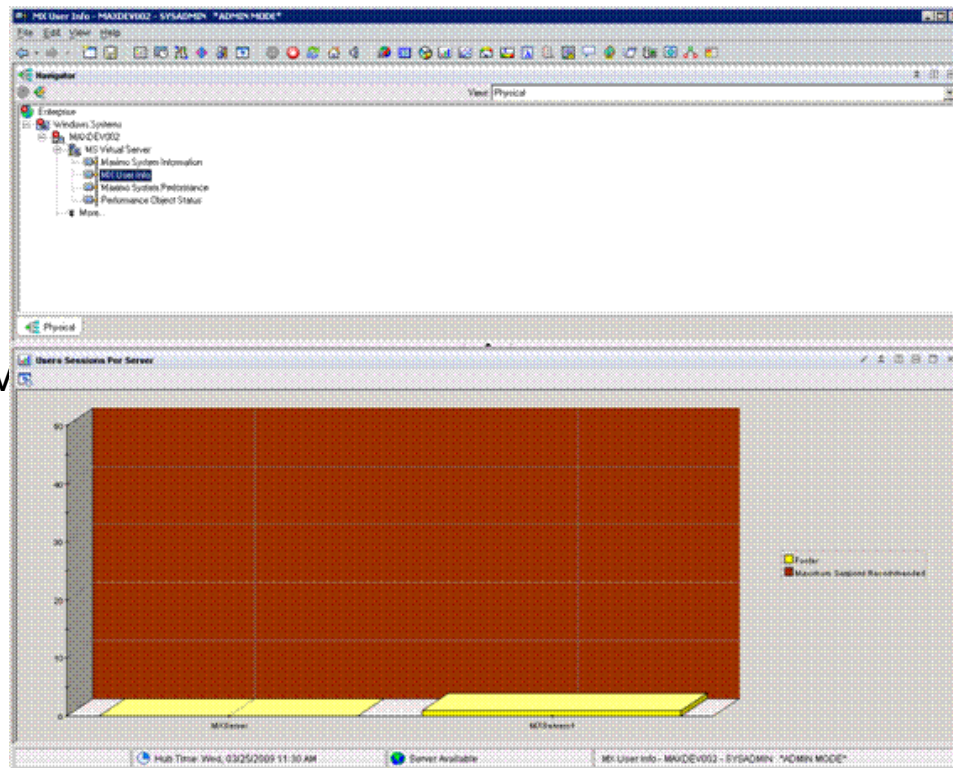
Maximo Agent System Information

- Metrics monitored
 - Server Information
 - Installed Applications
 - License
 - Licensed products list
 - Type of license
 - Installed Products
 - Installed products list
 - Version information
 - Cron Tasks
 - Cron tasks list
 - Active cron tasks



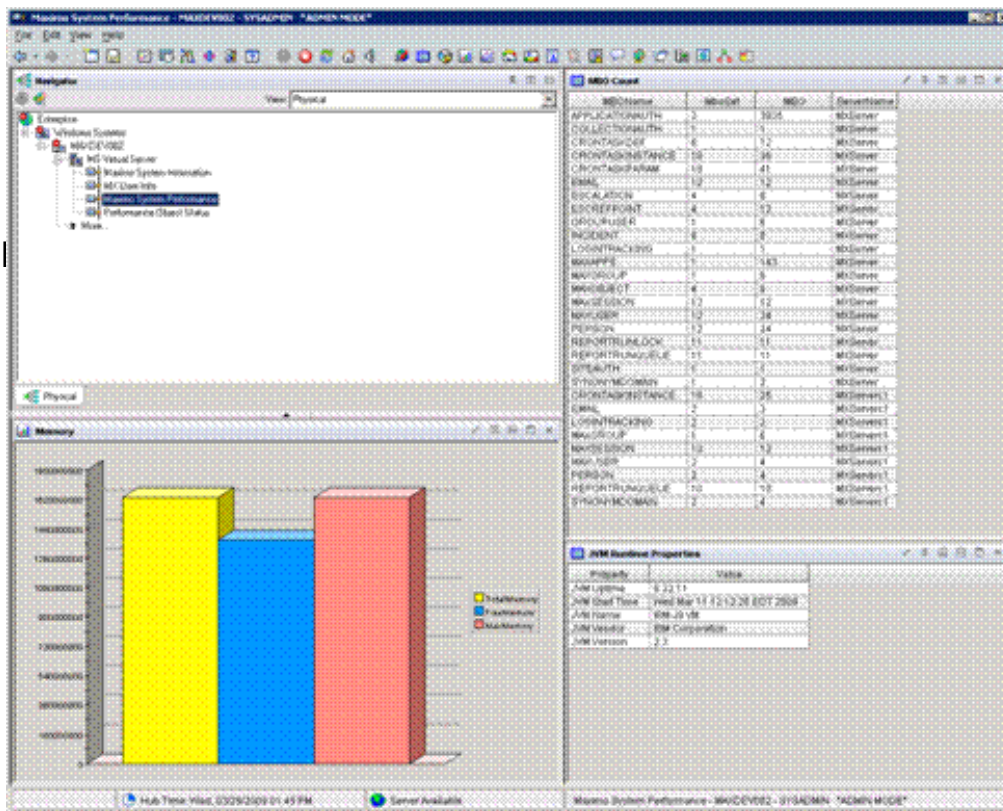
Maximo Agent User Node

- Metrics monitored
 - Current number of users vs recommended number
 - Yellow bars = number of users
 - Red background = threshold per server



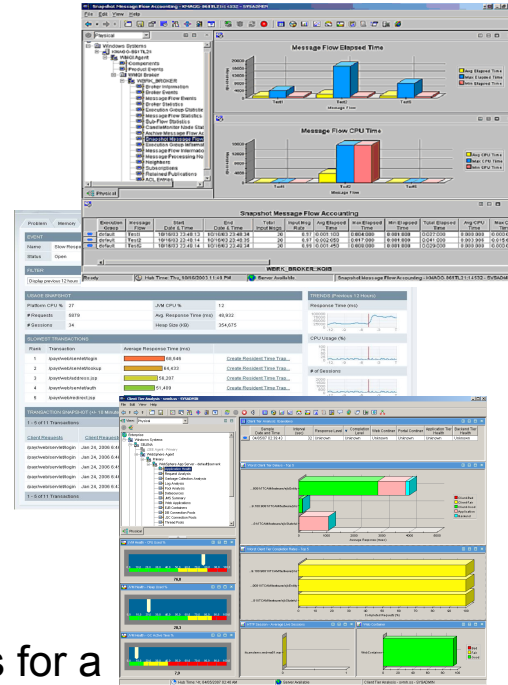
Maximo Agent System Performance Node

- Metrics monitored
 - Memory statistics for each server
 - MBO Count
 - Name of each MBO
 - Number of instances
 - JVM Runtime properties
 - JVM information
 - Version
 - Uptime



J2EE Application Performance Diagnosis

- Monitor high-level application health status
 - Tier by tier analysis
 - Correlation to remote EJB containers
- Identify J2EE/J2SE performance problems
 - Slow or Hung requests
 - Intermittent application slow downs
- Monitor essential application resources
 - Throughput
 - Heap Usage
 - CPU usage
 - Garbage Collection
- Real time deep dive diagnosis
 - Display all in-flight requests, as well as details for a single request
 - Memory leak analysis
 - Method and stack “traces” to display the detailed execution flow of a request
 - Lock Contention Analysis on serialized methods



- Throughput
- Health
- Resources
- Alerts & Take Actions
- Problem Determination
- Memory Analysis
- Application Trace

Maximo Monitoring Agent Prerequisites

- **IBM Tivoli Monitoring (ITM)**
 - Version 6.2.1 or higher
 - Tivoli Enterprise Monitoring Server (TEMS)
 - Tivoli Enterprise Portal (TEP)
 - Tivoli Enterprise Monitoring Agents (OS Agent)
 - Tivoli Data Warehouse
 - Tivoli Enterprise Portal Server (TEPS)

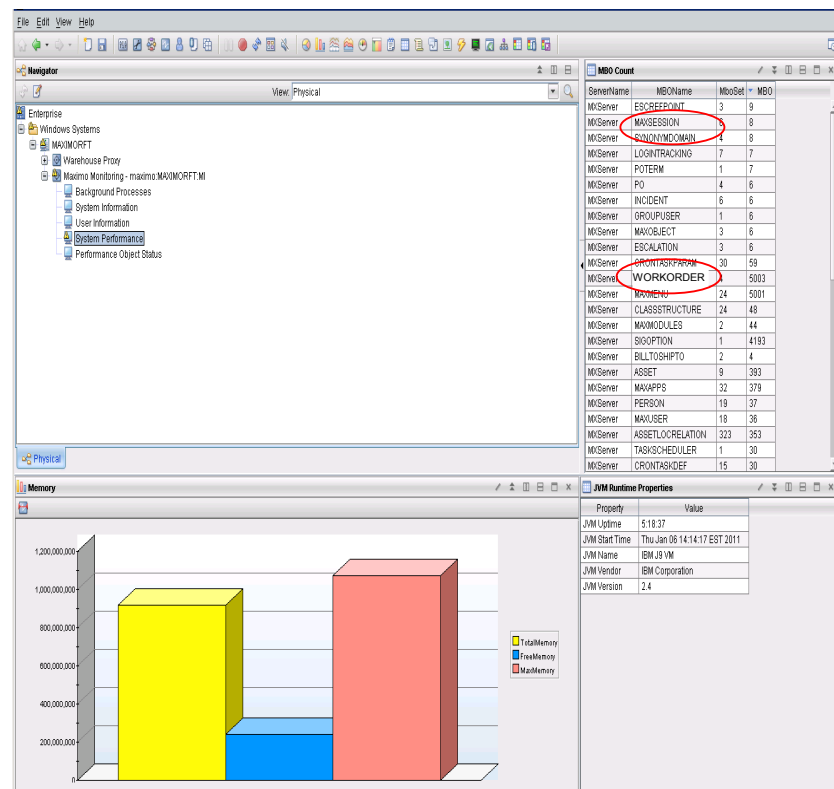
- **Supported OS Platforms**
 - Currently Windows only
 - Maximo on all supported platforms

- **Available in Maximo 7.5**
 - Can download only this portion – don't need to upgrade to use it
 - Bundle consisting of:
 - Tivoli ITM console, framework and data warehouse
 - OS agents
 - Database agents
 - J2EE or WAS agents
 - Maximo agent – supports versions 6.2.5 or 7.1.1.6 and higher
 - Licensed for use to monitor Maximo environment only
 - No additional charge for entitled customers
 - Also available as a 'Feature Pack' on Fix Central for version 6.2

Agent Usage Scenarios

Poor performance scenario #1

- Users are complaining WorkOrder App is slow
- Though there are only 6 user sessions there are over 5,000 instances of the WORKORDER object
- Resolution – provide this information with your PMR for guidance on app server tuning (garbage collection) or development



Situation and Expert Advice

The screenshot displays the Tivoli Monitoring console interface. The top-left pane shows a tree view of the system hierarchy, with 'KMI_MBOCount' selected under 'System Performance'. The main area is divided into two tables: 'Initial Situation Values' and 'Current Situation Values'. The 'Current Situation Values' table shows a warning icon next to the 'MBO' row, indicating a problem. Below the tables, the 'Command View' shows a 'Take Action' dialog with a dropdown menu. The 'Expert Advice' pane on the right provides detailed information about the 'KMI_MBOCount' situation, including a description and suggested actions.

Initial Situation Values						
MBO	Node	Timestamp	ServerName	MBOName	MboSet	
393	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	ASSET	9	
353	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	ASSETLOCRELATION	323	
48	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	CLASBSTRUCTURE	24	
32	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	CRONTASKDEF	16	
72	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	CRONTASKPARAM	34	
6	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	ESCALATION	3	
9	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	ESCREFPPOINT	3	
6	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	INCIDENT	6	
6	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	LOGINBLOCK	6	
707	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	MAXAPPS	36	
5001	maximo:MAXIMORFT.MI	01/18/11 16:57:24	MXServer	MAXMENUL	24	

Current Situation Values						
MBO	Node	Timestamp	ServerName	MBOName	MboSet	
9672	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	APPLICATIONAUTH	4	
4	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	CHARTOFACCOUNTS	2	
4	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	COMMTTEMPLATE	2	
9	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	COMMTPLTSENDTO	8	
48	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	CRONTASKINSTANCE	23	
42	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	CRONTASKPARAM	24	
9	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	EMAIL	9	
5	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	ESCALATION	3	
4	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	ESCNOTIFICATION	2	
4	maximo:MAXIMORFT.MI	01/18/11 17:57:25	MXServer	ESCREFPPOINT	2	

Expert Advice

KMI_MBOCount

[Situation Description](#) **Situation Description**
The MBO count is greater than 30,000.

[Suggested Actions](#)

Suggested Actions

When the MBO count is greater than the threshold, a JRE configuration issue might be causing the garbage collector to fail to clean out unused objects in a timely manner. Another possibility is that there might be a problem within the object itself and the MBO set might not be closing, in which case a developer should review the code.

Copyright IBM Corp. 2005 All Rights Reserved US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp. [Contact IBM](#)

- Warning
- Click in for details on problem
- Expert Advice on how to fix
- Can modify settings

Poor performance scenario #2

- System has 100 users logged on from 9 to 5
- There are 200 cron tasks configured to run every 60 seconds 24 hours a day
- Resolution – Look at your cron task scheduling and see what modifications may be possible

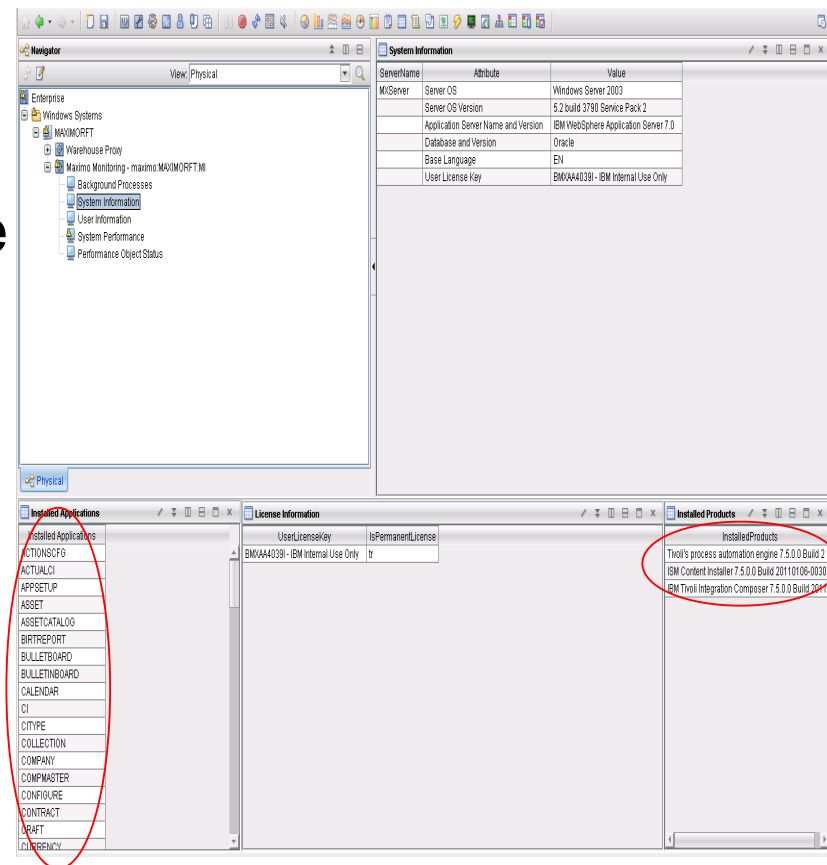
The screenshot displays the Tivoli Enterprise Console interface. The main window shows a tree view on the left with 'Background Processes' selected. The central pane displays a table of cron tasks. A red oval highlights a large portion of this table, indicating a high density of tasks. Below the main table, an 'Escalation Failure Log' window is visible, showing a list of failed escalations.

ObjectName	StatusName	Escalation	StatusDate
WCRKORDER	Email Not Sent	1037	1/18/11 5
WCRKORDER	Email Not Sent	1037	1/18/11 5
WCRKORDER	Email Not Sent	1037	1/18/11 5
WCRKORDER	Email Not Sent	1037	1/18/11 5

CronTaskName	InstanceName	IsActive
ESCALATION	ESCC107	N
REPORTUSAGECLEANUP	REPORTUSAGECLEANUP	Y
REPORTUSAGECLEANUP	REPORTUSAGECLEANUP1	Y
LDAPSYNC	LDAPSYNC01	N
KPICronTask	KPINOWREALTIME	N
JMSBEOCONSUMER	SEDDOOUT	N
JMSBEOCONSUMER	SEDDOIN	N
SwSuiteCronTask	SwSuiteCronTask1	N
ReconciliationCronTask	ReconTaskSN	N
ESCALATION	ESCCLEASSTDU	N
ESCALATION	ESCC1006	N
ESCALATION	ESCC1008	Y
ESCALATION	ESCC1010	N
ESCALATION	ESCC1013	N
ESCALATION	ESCC1016	N
ESCALATION	ESCC1015	N
ESCALATION	ESCC1017	Y
ESCALATION	ESCC1019	Y
ESCALATION	ESCC1027	N
ESCALATION	ESCC1028	N
ESCALATION	ESCC1029	N
ESCALATION	ESCC1030	N
ESCALATION	ESCC1031	N
ESCALATION	ESCC1012	N
ESCALATION	ESCC1036	N
BBConn	BBCONN1	Y
ReconciliationCronTask	ReconRAMCompliance	N
ReconciliationCronTask	RAMMonCompliance	N
ReconciliationCronTask	Bedrecon	N
ReconciliationCronTask	ReconDiskSize	N
ReconciliationCronTask	ReconDirEntry	N
ReconciliationCronTask	ReconDirShell	N
VMINSYNC	VMINSYNC01	N
ESCALATION	ESCCESBLNEP	Y
ReconciliationCronTask	ReconCPALink	N
ReconciliationCronTask	ReconciliationCronTask1	N
AsynchMediatedJobCron	AsynchMediated	Y
AsynchScheduledJobCron	AsynchScheduled	Y
AsynchCleanupCron	AsynchCleanup	Y
WOWMaterialStatusUpdateCronTask	WOWMaterialStatusUpdate	Y
AssetSelfOpCacheCron	AssetSelfOpCacheCron01	Y
InvResResTypeUpdateCronTask	ResenatorResTypeUpdate	Y
REPORTOUTPUTCLEANUP	REPORTOUTPUTCLEANUP	Y
ConsignmentInvoiceCronTask	Create consignment invoices	Y
ESCALATION	ESCCPRMOTECOMP	Y
ESCALATION	ESCCPRMOTENETD	Y
ESCALATION	ESCCPRMOTENETP	Y
SYNCFATALSUPPORT	SNWBT	N
TACAZREPORT	TACAZCATALOG	N

Applications are not showing up

- System Information node shows
 - all products licensed
 - all applications enabled
- Resolution – Verify the applications and re-install license packs, if necessary.



Escalations not firing as expected

- Background Process node shows escalation failures and reason codes
- Resolution – Review the logs and re-configure the escalations or provide them to support with your PMR.

The screenshot shows the Tivoli Enterprise Console interface. The 'Background Processes' node is expanded, showing a list of processes. The 'Escalation Failure Log' window is open, displaying a table of escalation failures. A red circle highlights the first four rows of the log, which all show 'Email Not Sent' status for 'WORKORDER' objects.

ObjectName	StatusMemo	Escalation	StatusDate
WORKORDER	Email Not Sent	1037	1/18/11 5
WORKORDER	Email Not Sent	1037	1/18/11 5
WORKORDER	Email Not Sent	1037	1/18/11 5
WORKORDER	Email Not Sent	1037	1/18/11 5

The 'Cron Tasks' window is also visible, showing a list of tasks with columns for CronTaskName, InstanceName, and IsActive.

Install and Configuration Considerations

Confirm ITM Setup

- Can you connect via TEMS?
- Can you deploy agents?
- Is your version of ITM supported?

Configuring Maximo Monitoring Agent

- Can run over HTTP or HTTPS
- User needs to be able to log in to read data, not write
- Java Home Directory can be anywhere spaces are not supported in the name
 - c:\Program Files\Java60 – not supported
 - c:\Progra~1\Java60 - supported

The screenshot shows a dialog box titled "Agent Configuration" with two tabs: "Log Configuration" and "Maximo Configuration". The "Maximo Configuration" tab is active. Below the tabs, there is a message: "You must specify several configuration parameters." The dialog contains several input fields:

- *Protocol: A dropdown menu with "http" selected.
- *Host: A text box containing "qawin04.swg.usma.ibm.com".
- *Port: A text box containing "9995".
- *User: A text box containing "maxadmin".
- *Password: A text box containing "*****".
- *Confirm Password: A text box containing "*****".
- *Java Home Directory: A text box containing "C:\IBM\Java60".

At the bottom right of the dialog, there are "OK" and "Cancel" buttons.

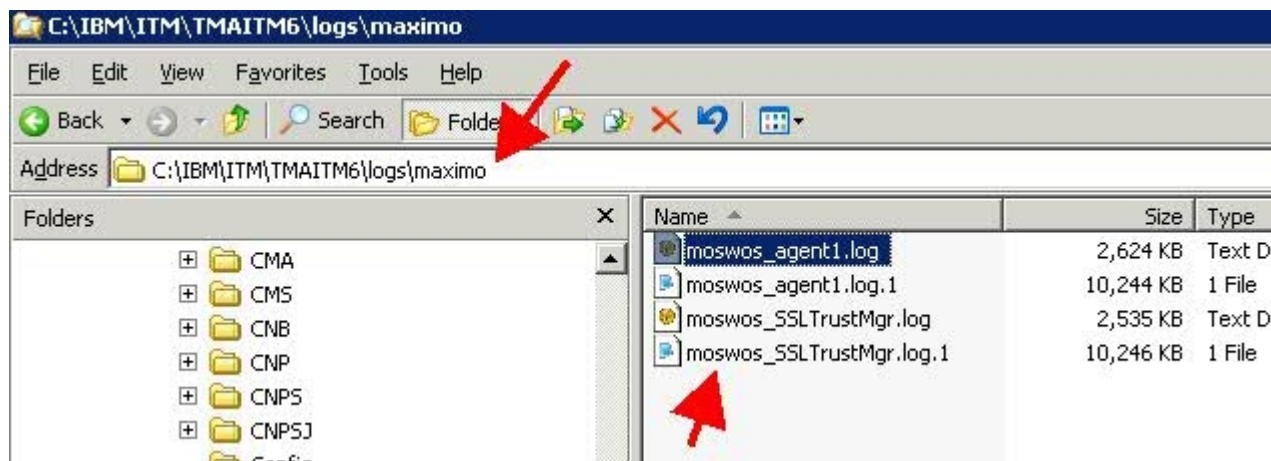
LDAP (Lightweight Directory Access Protocol) Support

- LDAP and Secure LDAP are supported but need additional configuration
- The deployment descriptor (mboweb/web.xml) file needs to be edited

```
<security-constraint>
  <web-resource-collection>
    <web-resource-name>MAXIMO Report Tool</web-resource-name>
    <description>pages accessible by authorised users</description>
    <url-pattern>/reporttool/*</url-pattern>
    <http-method>GET</http-method>
    <http-method>POST</http-method>
  </web-resource-collection>
  <web-resource-collection>
    <web-resource-name>MAXIMO MOSWOS</web-resource-name>
    <description>pages accessible by authorised users</description>
    <url-pattern>/toolclient/*</url-pattern>
    <http-method>GET</http-method>
    <http-method>POST</http-method>
  </web-resource-collection>
  <auth-constraint>
    <description>Roles that have access to MAXIMO Report Tool</description>
    <role-name>maximouser</role-name>
  </auth-constraint>
  <user-data-constraint>
    <description>data transmission gaurantee</description>
    <transport-guarantee>NONE</transport-guarantee>
  </user-data-constraint>
</security-constraint>
```

Troubleshooting and Logging

- Maximo Monitoring Agent is logger enabled
 - Specific to the agent
- All exceptions and errors are logged
- Logs are located under
 - <ITM_HOME>\TMAITM6\logs\maximo



Questions?