

# Oracle Enterprise Manager 13c

Microsoft SQL Server Plug-in version 12.1.0.6

April, 2016

# Heterogeneous Datacenter Management

## Oracle's Philosophy

- Productize our deep understanding of the Oracle stack to provide integrated management
- Provide generic Oracle solutions for managing non-Oracle technology
  - User Experience Management, Middleware Management, Business Transaction Management, Testing & Test Data Management , ...
- Incent and promote others to provide optimized management for non-Oracle technology
- Provide product extensibility wherever possible  
(today's focus: Plug-In for SQL Server)



# Enterprise Manager 13c Heterogeneous Management

## Making The Complex Simple In 3 Steps

1. Use or create **plug-ins** using Enterprise Ready Extensible Framework

2. Leverage **common functions** through plug-ins

- Performance & Availability Monitoring
- Configuration Management
- Compliance Management
- Job System
- Alerting & Notifications
- Custom UI
- Reporting

3. Manage **like any other target**



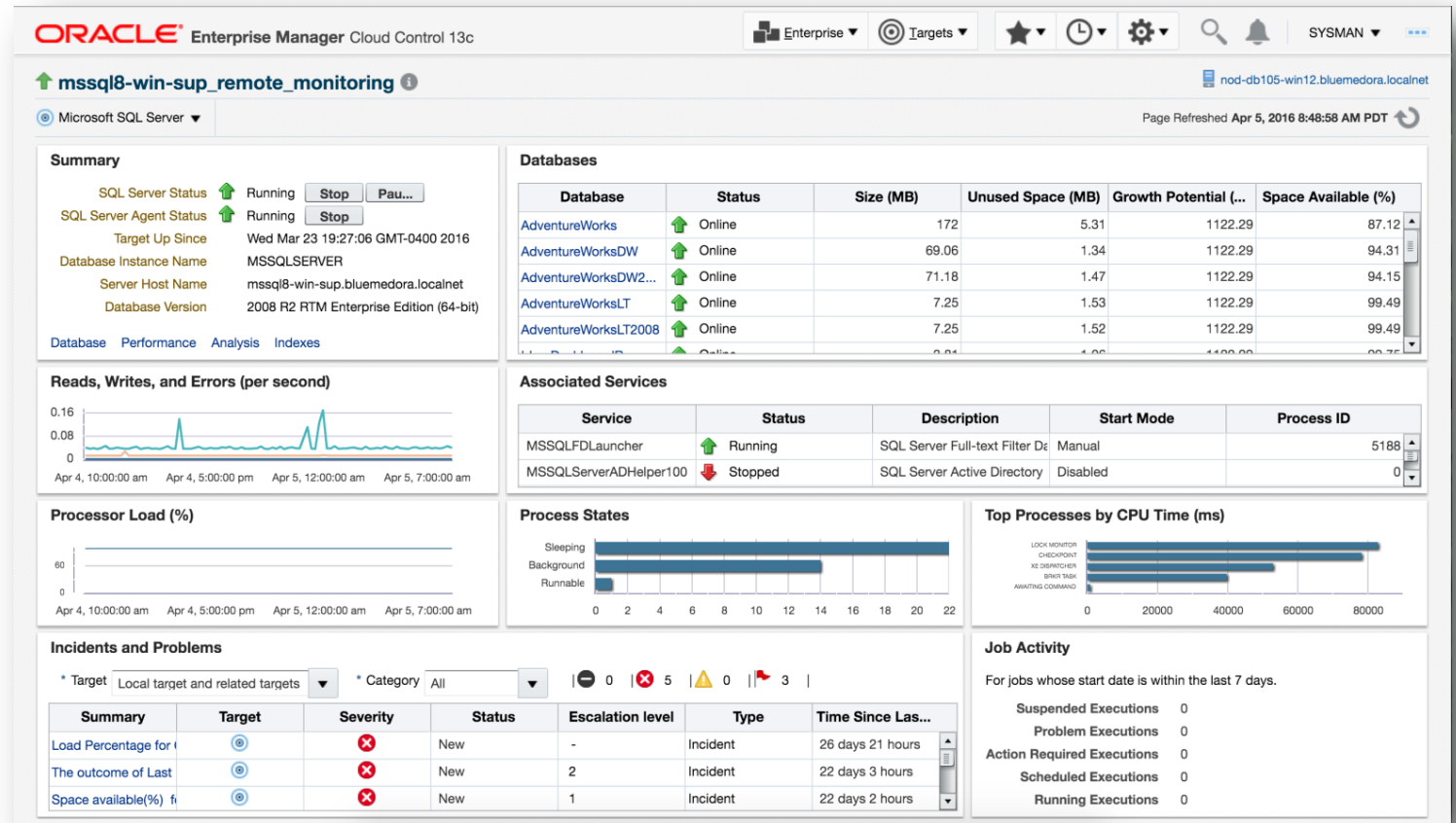
# Microsoft SQL Server Plug-in

## Revamped for Better Analysis and Management



### New! features

- Indexes Page
- “Backup all Databases” and “Differential Backup” Jobs
- Migrated Information Publisher Reports to Business Intelligence Publisher Reports
- Added **Chargeback** Functionality
- Enabled more Metric Thresholds
- Out of the Box, SQL Server Compliance Standard Template
- “Mirroring Statistics” Metrics and more!



# Plug-ins: Where do you get them?

## Self Update: Oracle Provided Content

- Self Update
- Download MS SQL Server plug-in directly from Self Update
- Delivers new features and updates
- Single console to search, download and manage target plug-ins
- Proactive notification for Oracle supplied updates if running in connected mode
- Supports Online & Offline modes

**Self Update**  
Self Update > Plug-in

**Plug-in Updates**

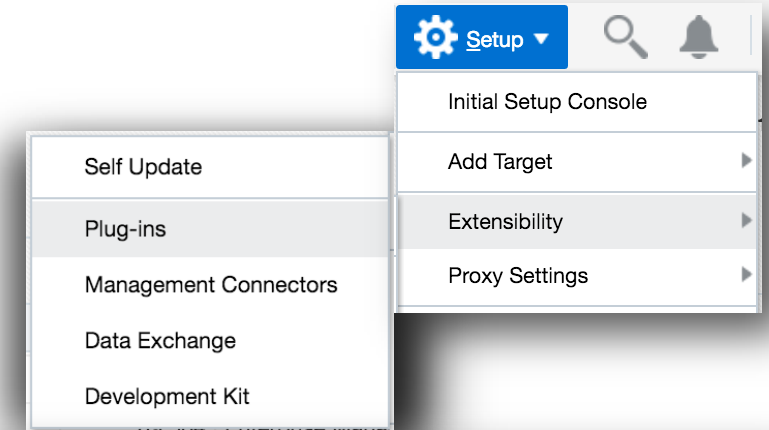
Actions ▼ Download Apply Plug-in Search Description

Status	OS Platform	Plug-in Name	Re	Version	Vendor	Size(MB)	Description
Available	Generic Platform	Oracle Axiom	0	12.1.0.1.0	ORACLE	0.919	Enterprise Manager f
Available	Generic Platform	Oracle PeopleSoft	0	13.1.1.1.0	ORACLE	89.564	Enterprise Manager f
Available	Generic Platform	Oracle Jdedwards EnterpriseO...	0	13.1.1.1.0	ORACLE	16.732	Enterprise Manager f
Available	Generic Platform	Oracle ZFS Storage Appliances	0	12.1.0.7.0	ORACLE	7.520	Enterprise Manager f
Applied	Generic Platform	PostgreSQL	0	12.1.0.2.0	BM	35.773	PostgreSQL Monitori
Applied	Generic Platform	VMware vSphere	0	12.1.0.9.0	BM	42.804	VMware virtualization
Applied	Generic Platform	Microsoft SQLServer Database	0	12.1.0.6.0	ORACLE	8.644	Enterprise Manager f
Applied	Generic Platform	IBM DB2 Database	0	12.1.0.4.0	ORACLE	1.822	Enterprise Manager f
Available	Generic Platform	Oracle Database Appliance	0	13.1.1.1.0	ORACLE	6.927	Enterprise Manager f

# Plug-In Manager

Single window Solution for all (Un)Deployment

- Integrated with Self Update
- Plug-ins must be deployed to OMS before agents
- Download, Deploy and Upgrade Plug-Ins across OMS and agent



ORACLE® Enterprise Manager Cloud Control 13c

Enterprise Targets Favorites History Setup SYSMAN

### Plug-ins

This page lists the plug-ins available, downloaded, and deployed to the Enterprise Manager system. Use this page to deploy or undeploy plug-ins.

Page Refreshed Apr 5, 2016 3:54:15 PM EDT

Actions View Deploy On Undeploy From Check Updates Deployment Activities

Name	Version			Management Agent with Plug-in	Description
	Latest Available	Latest Downloaded	On Management Server		
Applications					
Cloud					
Databases					
IBM DB2 Database	12.1.0.4.0	12.1.0.4.0	12.1.0.4.0	3	Enterprise Manager for DB2. Plugin provides comprehensive monitoring of DB2 environments.
Microsoft SQLServer Dat	12.1.0.6.0	12.1.0.6.0	12.1.0.6.0	2	Enterprise Manager for Microsoft SQL Server
MySQL Database	12.1.0.3.0			0	Enterprise Manager for MySQL Database
Oracle Database	13.1.1.0.0	13.1.1.0.0	13.1.1.0.0	0	Enterprise Manager for Oracle Database provides comprehensive management for Oracle Database and related targets such as Real Application Cluster, Automatic Storage Management (ASM) etc.
Oracle TimesTen In-Mem	13.1.1.0.0			0	Enterprise Manager for Oracle TimesTen In-Memory Database
PostgreSQL	12.1.0.2.0	12.1.0.2.0	12.1.0.2.0	1	PostgreSQL Monitoring
Sybase ASE Database	12.1.0.4.0	12.1.0.4.0	12.1.0.4.0	1	Enterprise Manager for Sybase ASE. Plugin provides comprehensive monitoring Sybase ASE Environments.
Engineered Systems					
Middleware					
Servers, Storage and Network					
Oracle Audit Vault	12.1.0.4.0	12.1.0.4.0		0	Enterprise Manager for Oracle Audit Vault provides monitoring and management of Oracle Audit Vault Server and its components.
Oracle Audit Vault and Databe	13.1.1.0.0	13.1.1.0.0		0	Enterprise Manager for Oracle Audit Vault and Database Firewall (AVDF) provides monitoring and management of AVDF system.
Oracle Beacon	13.1.0.0.0	13.1.0.0.0	13.1.0.0.0	1	Oracle Beacon plugin is required on the Managed Hosts to support beacon test monitoring capability
Oracle Consolidation Planning	13.1.1.0.0	13.1.1.0.0	13.1.1.0.0	N/A	Enterprise Manager for Oracle Consolidation Planning and Chargeback provides metering, chargeback and consolidation planning for various Enterprise Manager targets.
Oracle ORAchk Healthchecks	13.1.1.0.0	13.1.1.0.0		N/A	Enterprise Manager for Oracle ORAchk Health Checks provides proactive health check alerts for Engineered and Non-Engineered Systems.



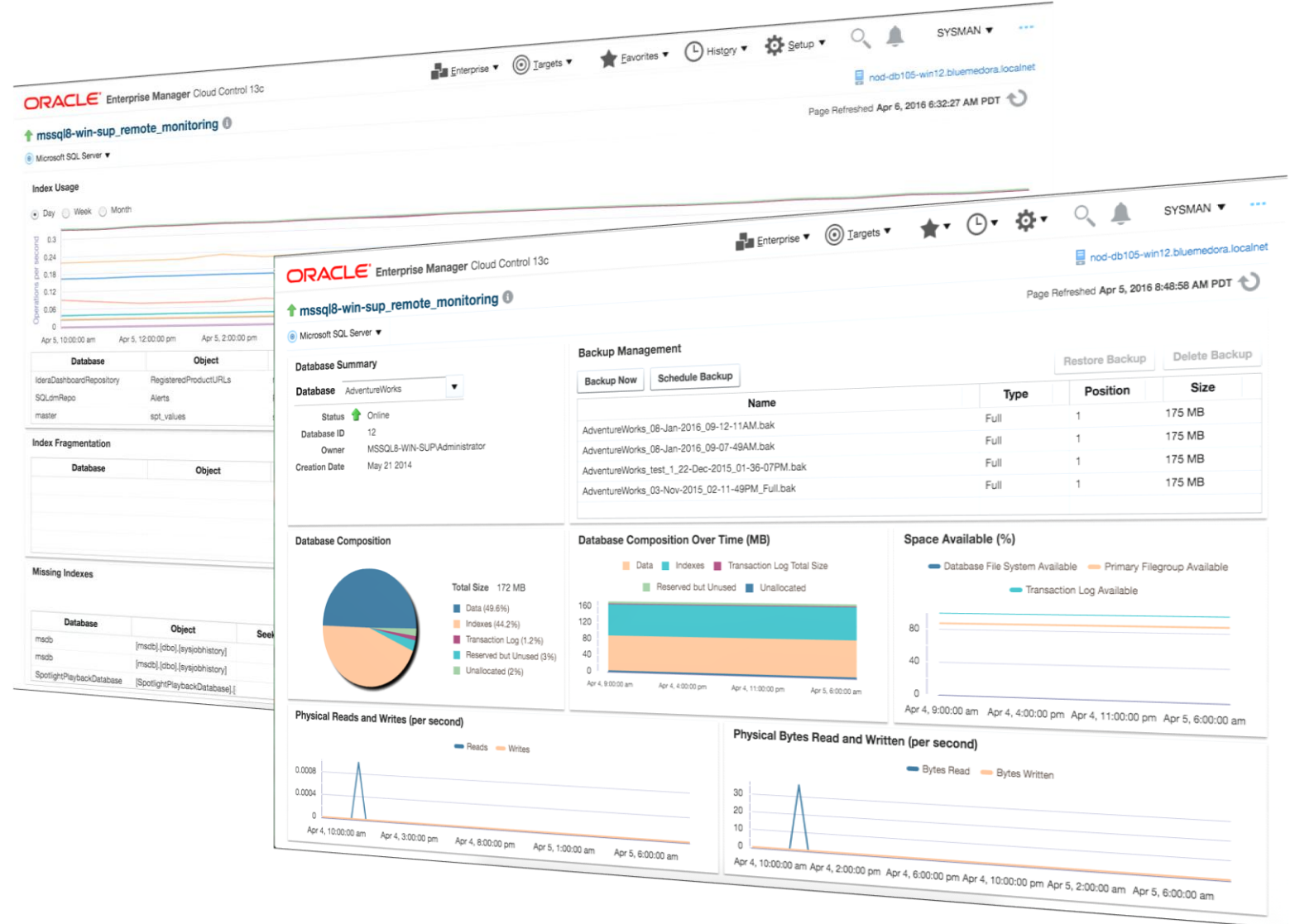
# Microsoft SQL Server Plug-in

## Features

- MS SQL Server as EM **Managed Target**
- Comprehensive collection of **monitoring Metrics** (~ 400)
  - Buffer Statistics, Memory Statistics, Cache Statistics
  - Locks, Processes, Space Usage
  - Users and Roles
  - Cluster and AlwaysOn performance and status
- Out-of-box **thresholds** on key metrics
- 12 Out of the box **Reports** summarize key configuration and performance data
- Comprehensive **configuration management**
  - Server Configuration, Database Settings, Registry and Security Settings
  - Ability to View, Search and Compare configurations
- Ability to schedule **Jobs**
- Ability to Start/Stop/Pause/Resume SQL Server Instances
- Jobs to create, schedule, delete, and restore database backups
- **Versions** supported:
  - SQL Server 2005, 2008, 2012, and 2014

# New Intuitive Dashboards

- Revamped for Better **Analysis** and Management
- Includes intuitive interface for creating and managing database backups
- Exposes even more key performance indicators, down to the individual database level
- Adds additional **Indexes** page with advanced investigative and management capabilities

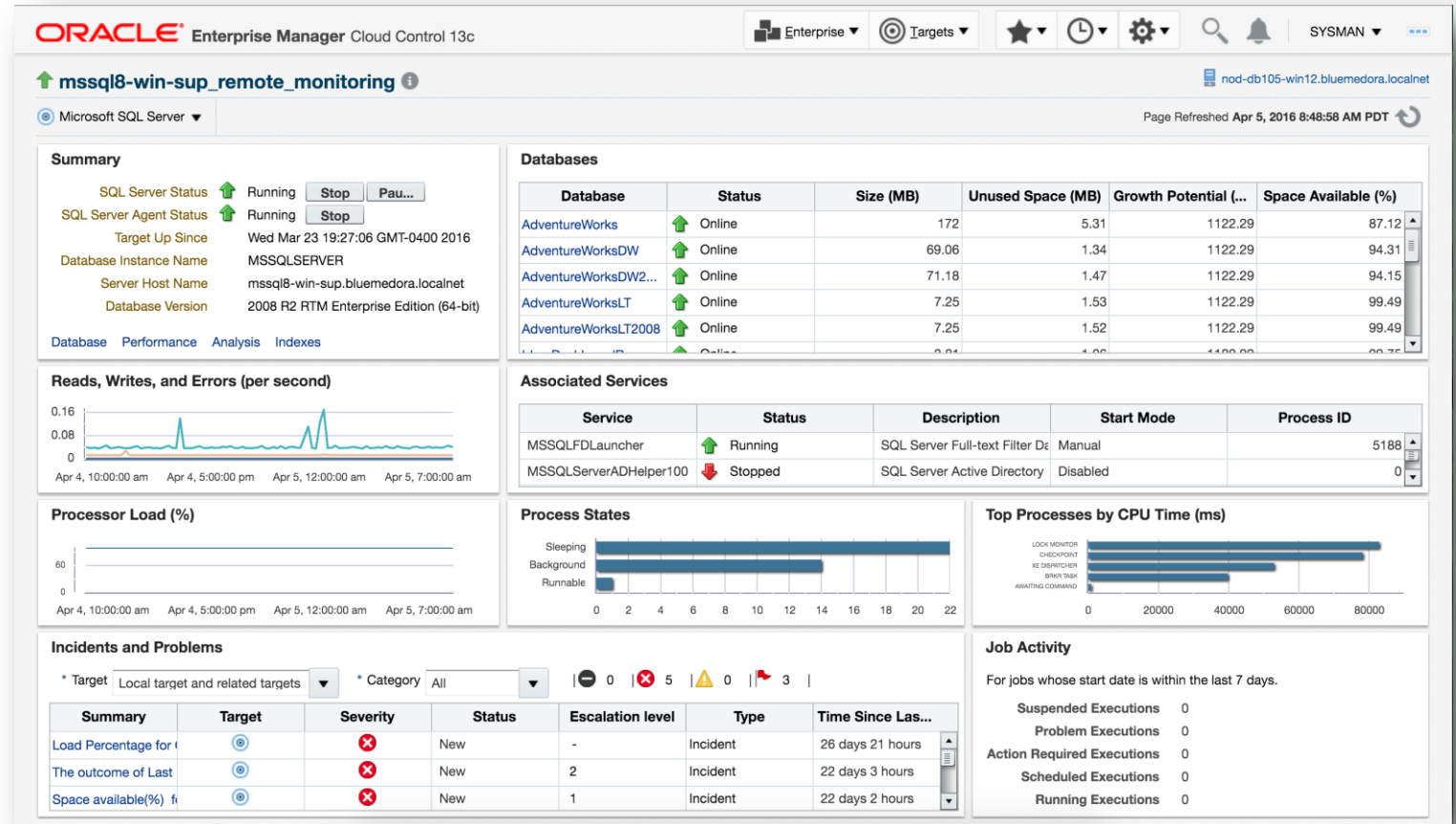




# SQL Server Focused Dashboard Views



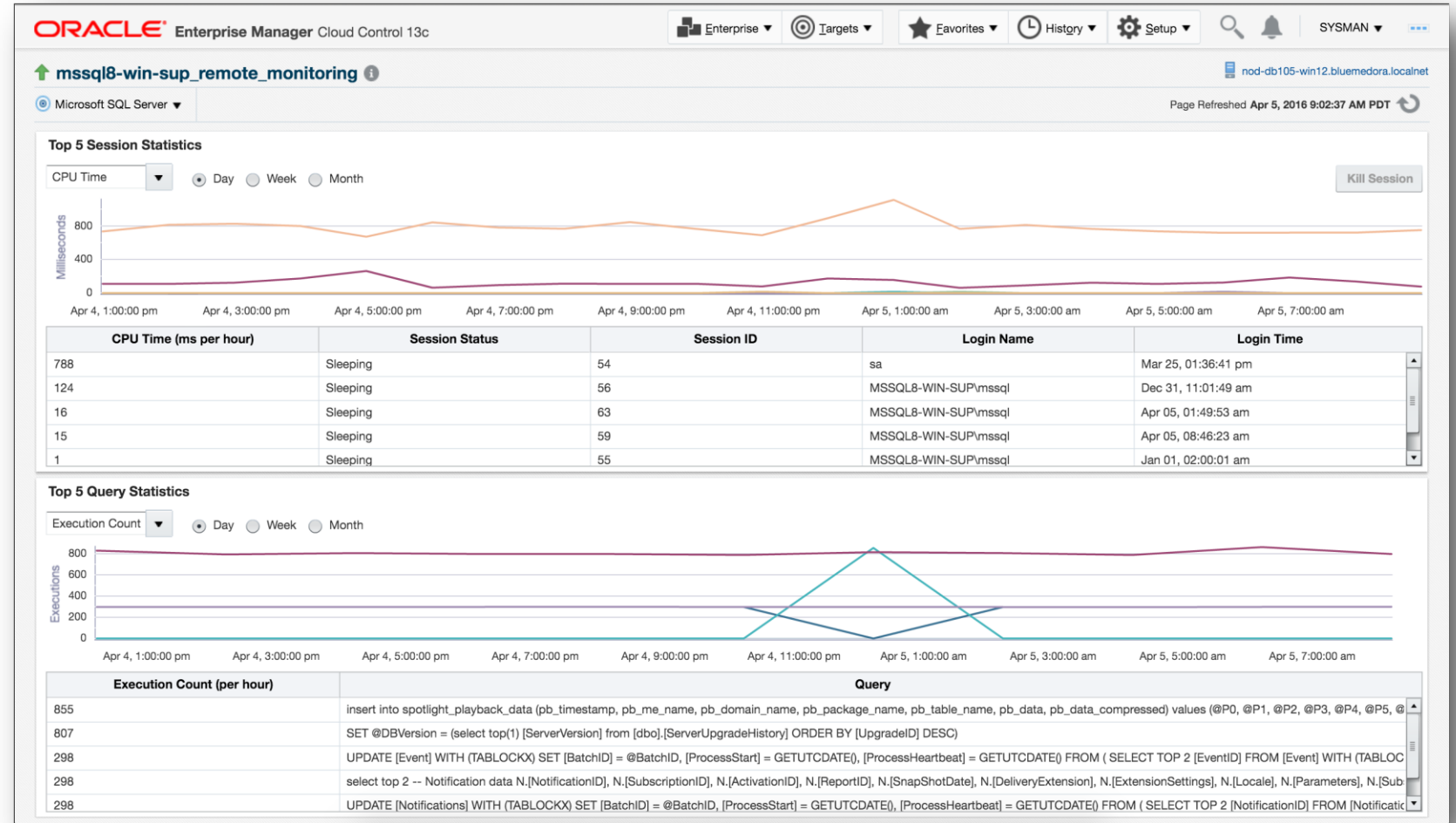
- View Database server as well as individual database instance health and availability
- Individual database status and statistics with linking to additional details and management
- Key health, performance, and availability views
- Cluster and AlwaysOn availability and health





# Drill into SQL Server Session and Query Statistics

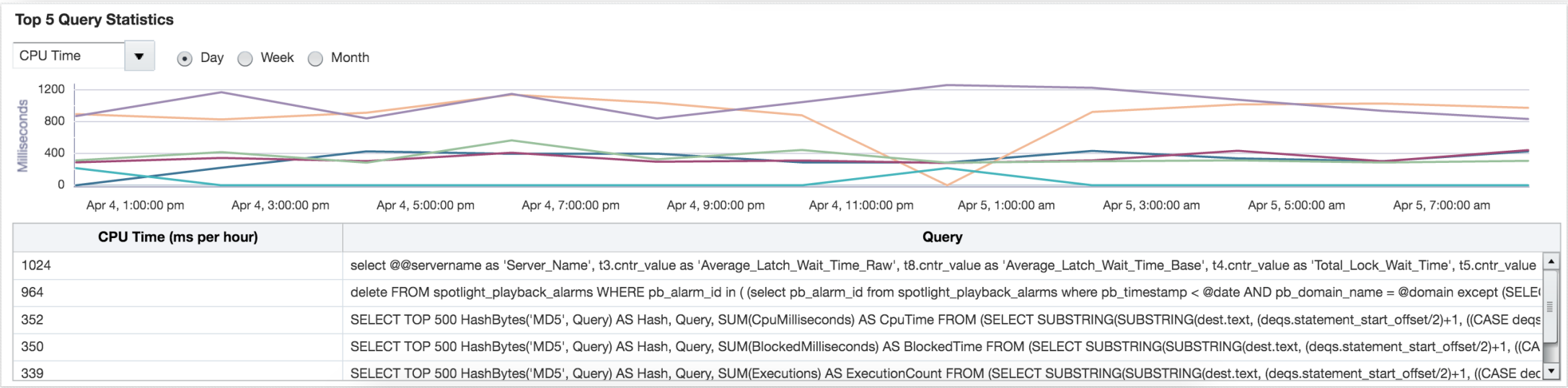
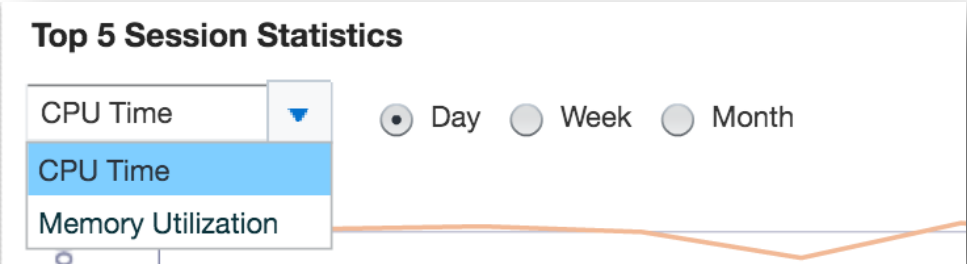
- View session statistics by memory utilization and CPU time
- Break down query statistics by execution count, CPU time, & blocked time



# Identify TOP SQL activity

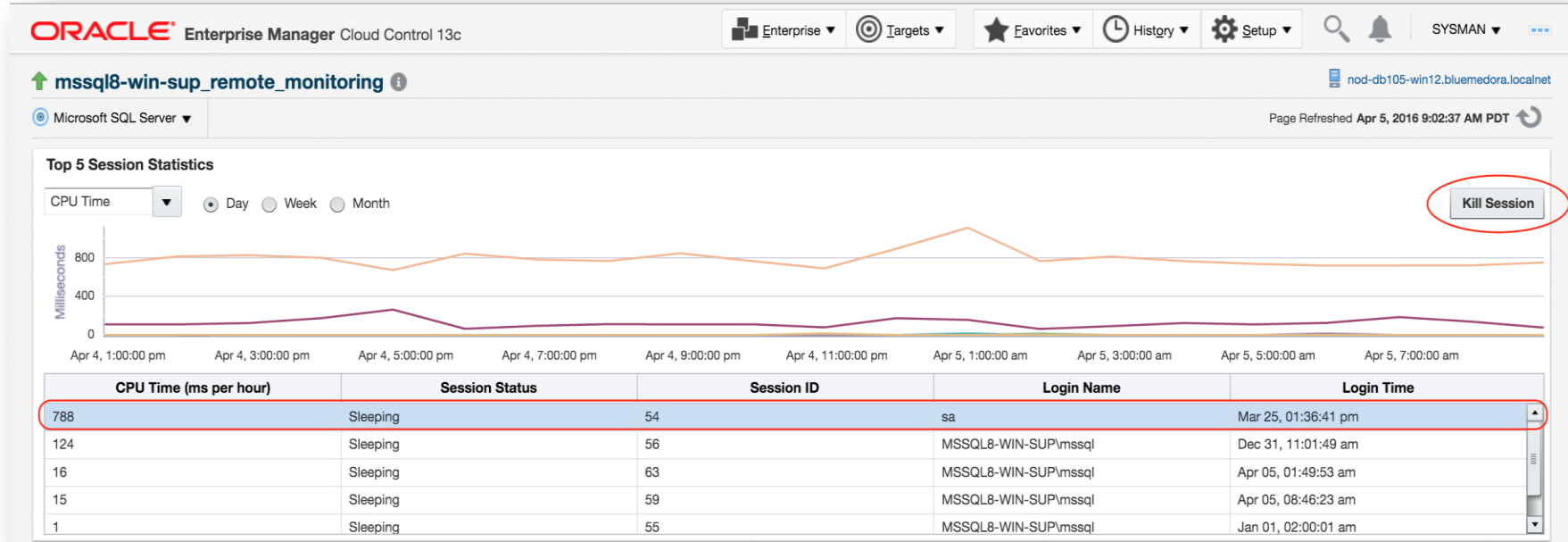


- Identify “Top” SQL queries
- View by CPU Time or Memory Utilization
- Limit to last Day, Week or Month



# Managing MS-SQL Session

- Identify “Top” consumers by CPU or memory utilization
- **Kill** runaway session from within the UI



# Manage Database Backups

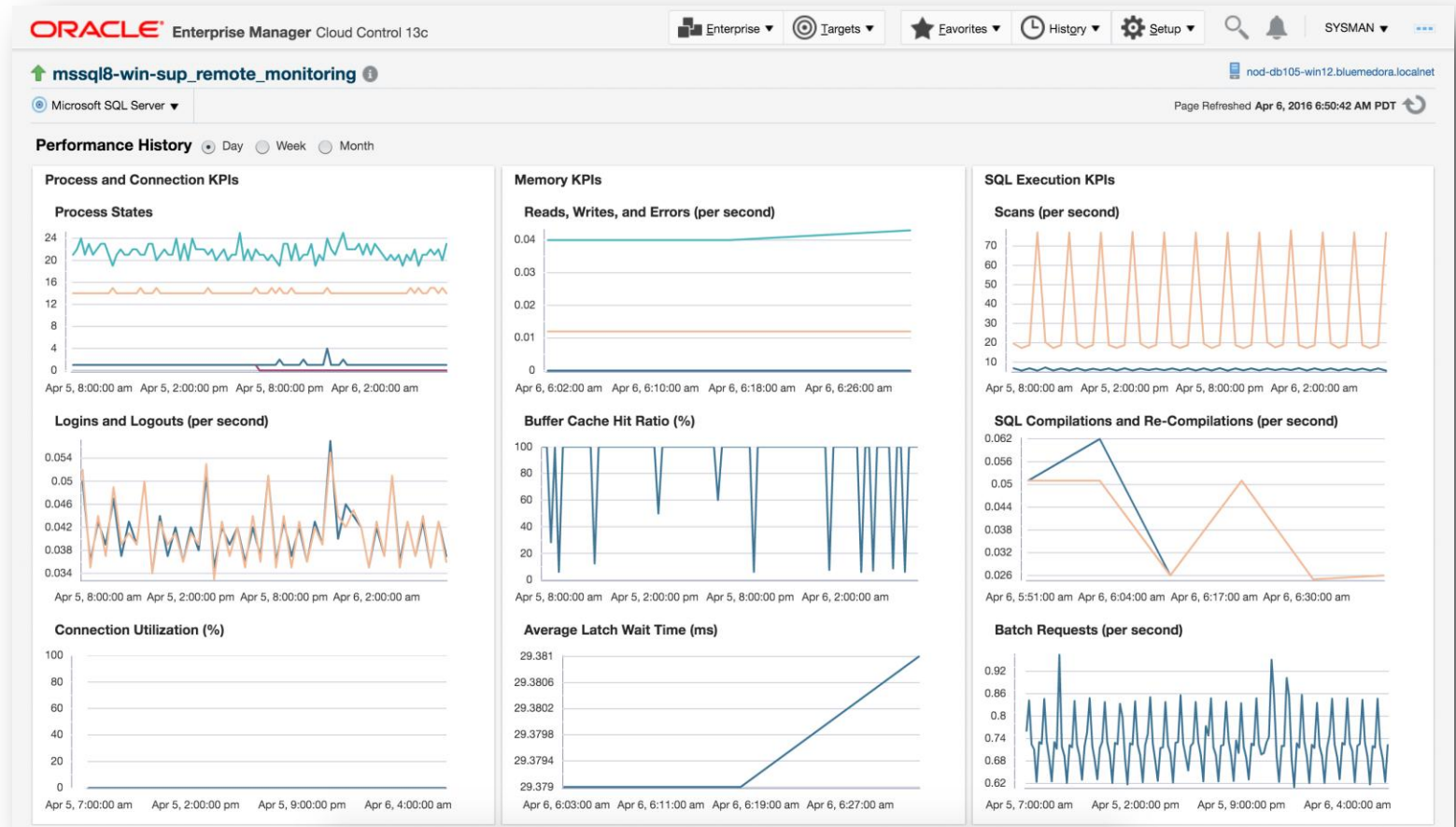
- Name and create unique backups for any of your Microsoft SQL Server Databases
- Schedule jobs to create new backups
- Restore a selected backup
- Delete old or unwanted backups from the list

Backup Management			
<div>Backup Now</div> <div>Schedule Backup</div>		<div>Restore Backup</div> <div>Delete Backup</div>	
Name	Type	Position	Size
AdventureWorks_08-Jan-2016_09-12-11AM.bak	Full	1	175 MB
AdventureWorks_08-Jan-2016_09-07-49AM.bak	Full	1	175 MB
AdventureWorks_test_1_22-Dec-2015_01-36-07PM.bak	Full	1	175 MB
AdventureWorks_03-Nov-2015_02-11-49PM_Full.bak	Full	1	175 MB



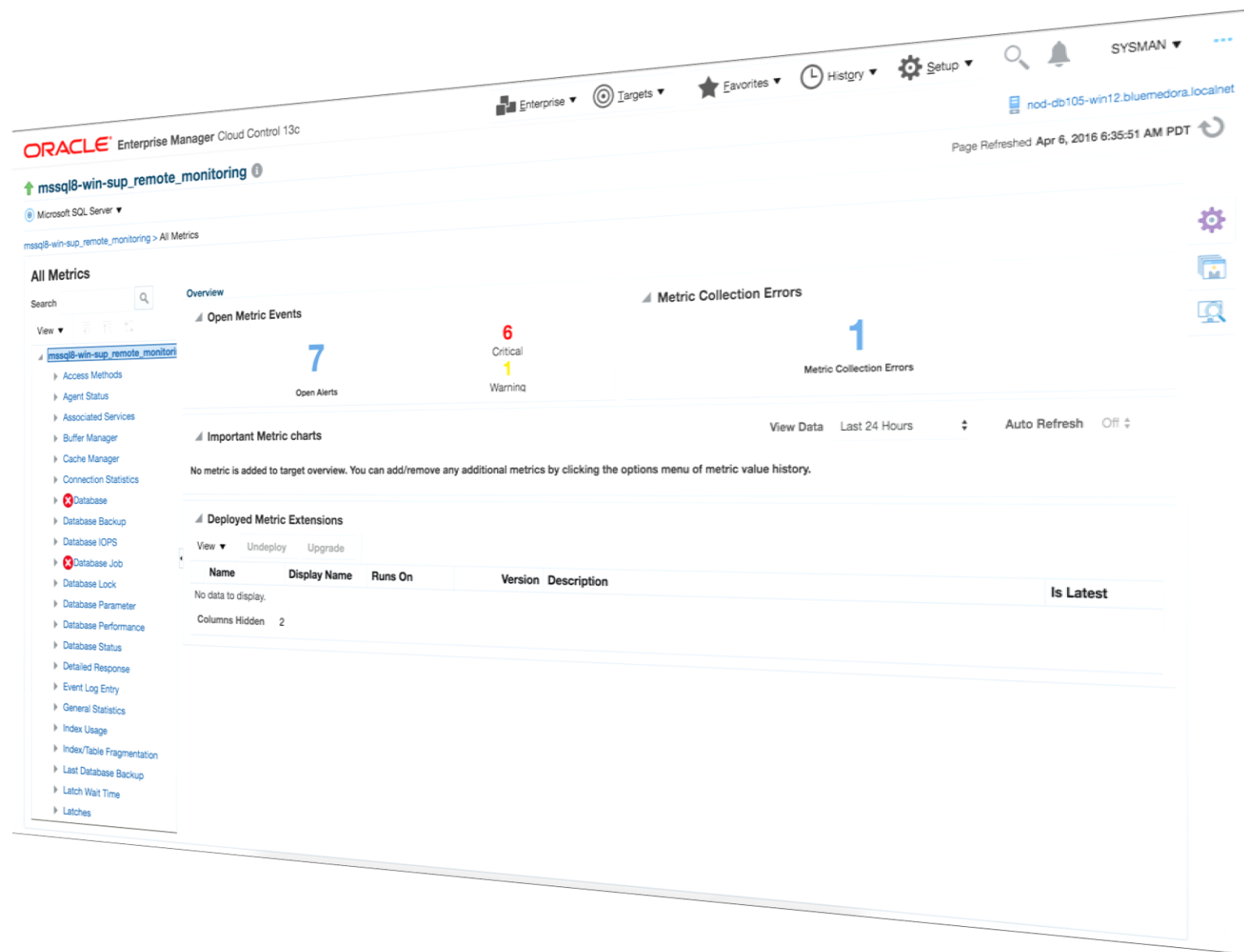
# View **Historical** Key Performance Indicators

- Process and Connection KPIs
- Memory KPIs
- SQL Execution KPIs
- View the performance history by Day, Week, or Month



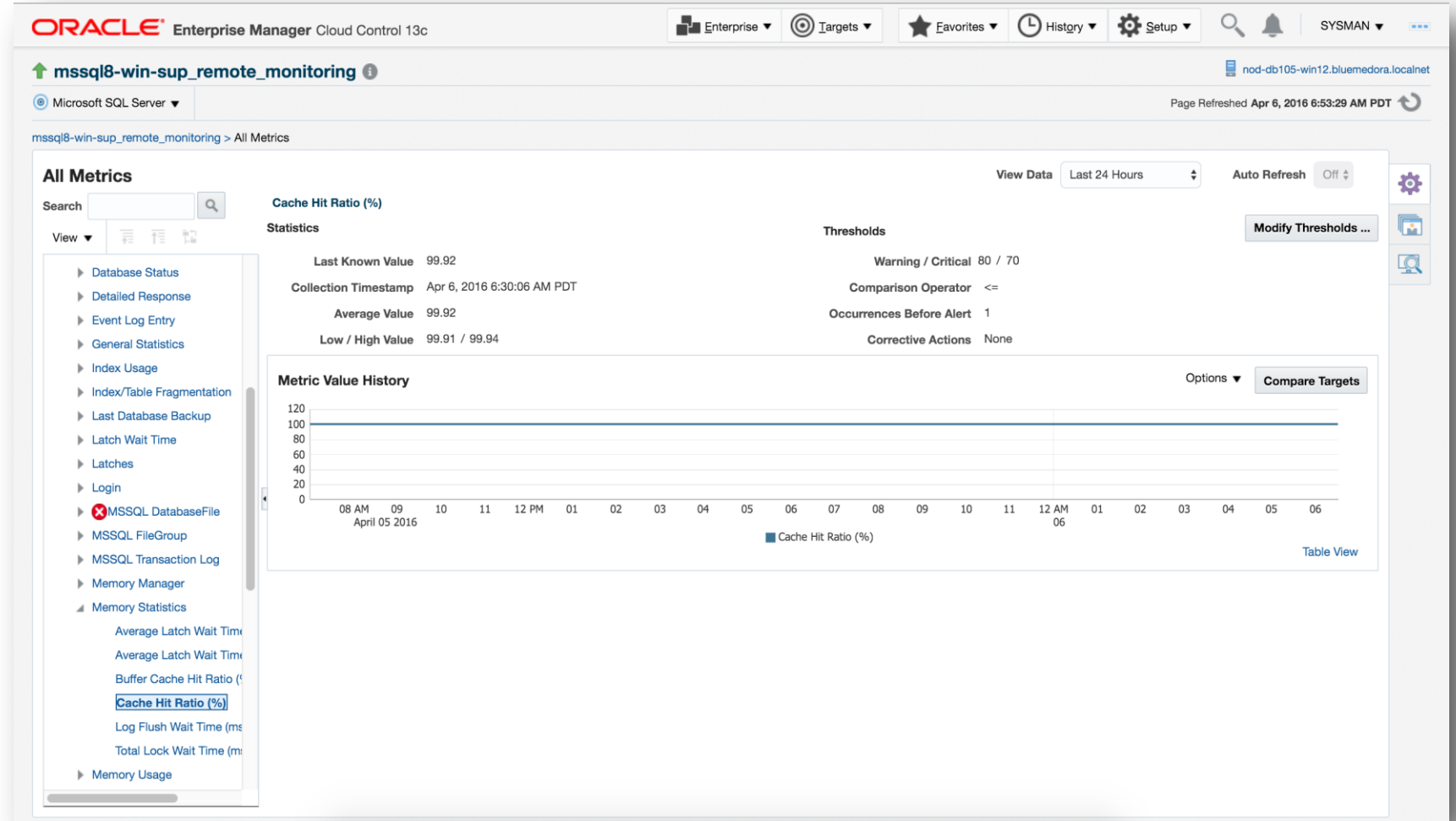
# Metrics

**100s** of performance and configuration metrics available for incident thresholds, reports, analysis and comparison.



# Drill down into individual MS-SQL statistics

- Drill into hundreds of MS-SQL metrics
- Compare multiple MS-SQL server instances to one-another for a specific metric
- View associated alerts for particular metrics
- Choose to view the metric in real-time or customized historical views



# Comprehensive MS-SQL Thresholds

ORACLE Enterprise Manager Cloud Control 13c

Enterprise

Targets

Favorites

History

Setup

SYSMAN

↑ mssql8-win-sup\_remote\_monitoring

nod-db105-win12.bluedora.localnet

Microsoft SQL Server

Microsoft SQL Server: mssql8-win-sup\_remote\_monitoring > Metric and Collection Settings

Metric and Collection Settings

CancelOK

MetricsOther Collected Items

TIP Consider using Adaptive Thresholds for performance metrics or Time-based Static Thresholds for metrics whose thresholds vary based on target workload. Configure these thresholds in the "Advanced Threshold Management" page.

View Metrics with thresholds

Expand AllCollapse All

Metric	Comparison Operator	Warning Threshold	Critical Threshold	Corrective Actions	Collection Schedule	Edit
▼ mssql8-win-sup_remote_monitoring						
▼ Agent Status					Every 5 Minutes	
Sqlserver Agent Status	!=		Running	None		
▼ Database					Every 15 Minutes	
Space Available (%)	<=	20	10	None		
Status	!=	ONLINE		None		
▼ Database Job					Every 2 Hours	
Last Run Outcome	=		Failed	None		
▼ Event Log Entry					Disabled	
▼ Event Severity						
System;	=		Error	None		
Security;	=		Error	None		
Application;	=		Error	None		
▼ Memory Statistics					Every 15 Minutes	
Buffer Cache Hit Ratio (%)	<=	90	80	None		
Cache Hit Ratio (%)	<=	80	70	None		
▼ MSSQL DatabaseFile					Every 1 Hour	
Database File Space Available (%)	<=	20	10	None		
▼ MSSQL Transaction Log					Every 30 Minutes	
Transactionlog Space Available (%)	<=	20	10	None		
▼ Processor					Every 15 Minutes	
Load Percentage	>=	80	90	None		

# Incident Manager for MS SQL Server

ORACLE Enterprise Manager Cloud Control 13c

Enterprise Targets Favorites History Setup Search Bell SYSMAN

mssql8-win-sup\_remote\_monitoring

Microsoft SQL Server

nod-db105-win12.bluedora.localnet

Page Refreshed Apr 5, 2016 9:16:41 AM PDT

Incident Manager: All open incidents

Incident Dashboard

Views Search Actions View View search criteria Acknowledge Clear ...

Out-of-box

My open incidents and problems

Unassigned incidents

Unacknowledged incidents

Escalated incidents

All open incidents

Unassigned problems

All open problems

Events without incidents

Events recorded during blackout

Severity	Summary	Target	Priority	Status	Age	Time Since Last Update	Owner	Acknowledged	Escalated	Type
✖	The outcome of Last Run for Job Name Test Failure Job is Failed....	mssql8-win-su...	None	New	38 days 20 ho...	19 days 22 hours	-	No	No	Incident
✖	The outcome of Last Run for Job Name Groom SQLdmRepository...	mssql8-win-su...	High	Work in p...	38 days 20 ho...	22 days 1 hours	SYSMAN	Yes	Lev...	Incident

Columns Hidden 23 Row count

✖ The outcome of Last Run for Job Name Test Failure Job is Failed. The job is of category Full-Text and is owned by MSSQL8... Open in new tab

Unassigned, Not acknowledged

General Events Notifications My Oracle Support Knowledge All Updates Related Events Related Metrics

Incident Details

ID 247

Metric Last\_Run\_Outcome

Metric Group MSSQL\_DatabaseJob

Job\_Id 9144734F-38CA-4091-9041-0A61F91937D8

Target mssql8-win-sup\_remote\_monitoring (Microsoft SQL Server)

Incident Created Feb 26, 2016 11:39:43 AM PST

Last Updated Mar 16, 2016 11:03:43 AM PDT

Summary The outcome of Last Run for Job Name Test Failure Job is Failed. The job is of category Full-Text and is owned by MSSQL8-WIN-SUP\Administrator. The job had executed at 23:55:1 hours on 2-21-2016. Current Status of job is Idle.

Internal Event Name MSSQL\_DatabaseJob:Last\_Run\_Outcome

Event Type Metric Alert

Category Load

Tracking

Acknowledge Add Comment ... Manage ... More

Escalated No Owner -

Priority None Acknowledged No

Status New

Last (Failed to create a ticket on the external system through connector ServiceNow Geneva Comment Testing.) SYSMAN on Mar 16, 2016 11:03:43 AM PDT

This incident will be automatically cleared when the underlying issue is resolved.

Guided Resolution

Diagnostics Problem Analysis View Metric Help

Actions Reevaluate Alert Edit Thresholds

Corrective Actions No corrective action defined. Add corrective action

# Metric Extensions

- Missing a metric your team depends on?
- Want to integrate custom scripts?
- Use Oracle Enterprise Manager's **Metric Extension** capabilities to easily expand and customize the MS SQL solution with a convenient UI-based development workflow.

The screenshot shows the Oracle Enterprise Manager Cloud Control 13c interface for creating a new metric extension. The page is titled "Metric Extensions" and has a progress bar with steps: General Properties, Adapter, Columns, Credentials, Test, and Review. The "General Properties" step is currently active.

**Create New: General Properties** [Back] Step 1 of 6 [Next] [Finish] [Cancel]

Specify the basic properties for the metric extension.  
The default collection can be overridden on a target instance basis in the target's Metric and Collection Settings page.

**General Properties**

- \* Target Type: Microsoft SQL Server
- \* Name MES: SQL\_New\_Metric  
A Metric Extension Name can only contain alpha-numeric characters and the following non leading special characters : ( '\_' , '-' , '.' , ':' )
- \* Display Name: My New SQL Server Metric
- \* Adapter: OS Command - Multiple Columns  
Tokenizes OS command output using user-specified delimiter
- Description:

**Collection Schedule**

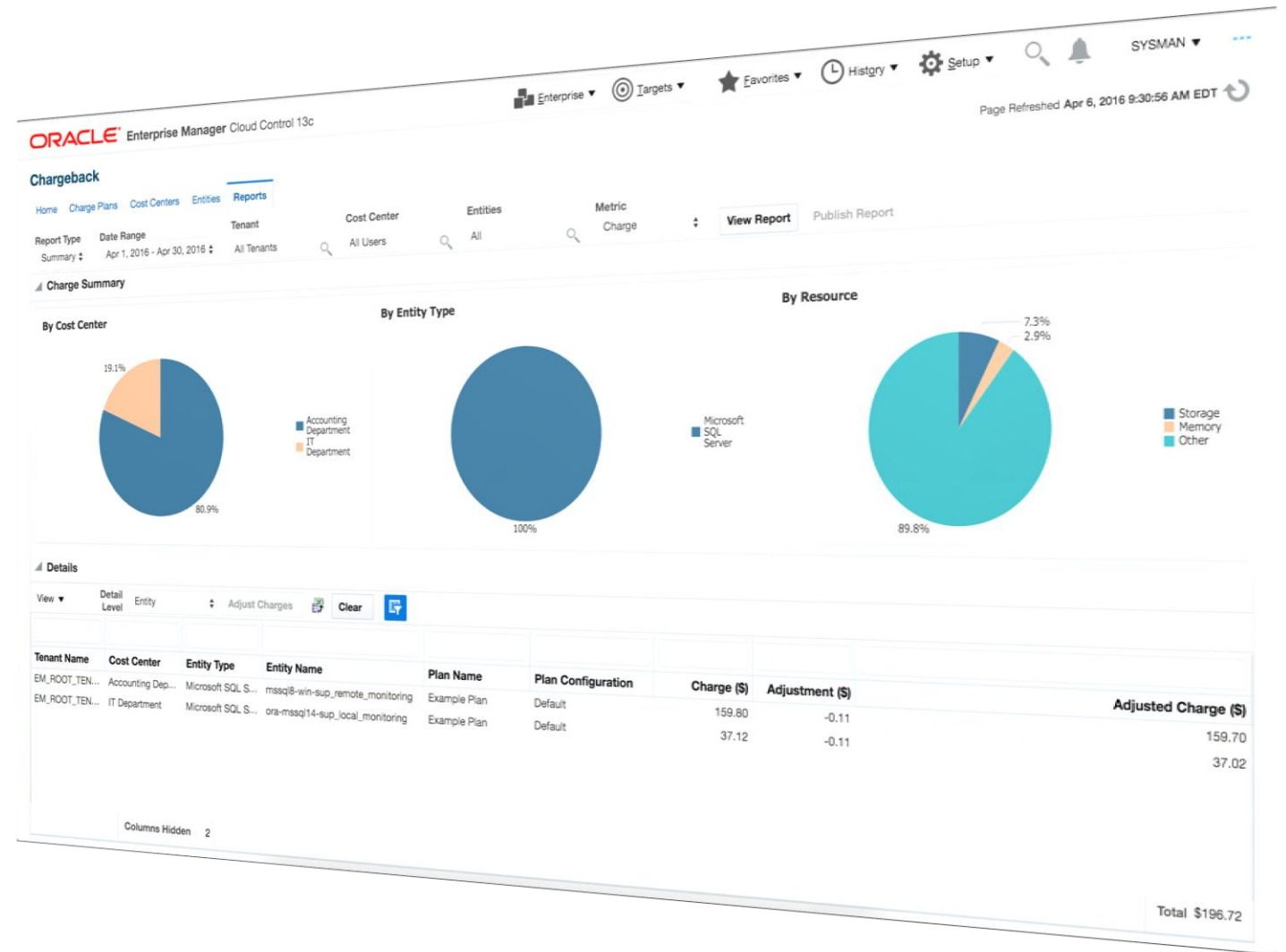
- Data Collection: ☐ Disabled ☒ Enabled
- Data Upload: ☒ Yes ☐ No
- Use of Metric Data: ☐ Alerting Only ☒ Alerting and Historical Trending
- Upload Interval: 1 Collections
- Frequency:  
Collection Frequency: By Minutes  
Repeat Every: 15 Minutes

**Advanced**



# Chargeback Functionality

- Monitor and control IT costs by gathering data on resource use, and allocating charges accordingly.



# Latest Configuration of SQL Server

- SQL Server version and patch level
- Platform and OS details
- Relevant Windows registry settings
- Individual database details
- Microsoft SQL AlwaysOn (HADR) Availability Group details

The screenshot displays the Oracle Enterprise Manager Cloud Control 13c interface. The top navigation bar shows the Oracle logo and 'Enterprise Manager Cloud Control 13c'. A dropdown menu on the right indicates the user is logged in as 'Enterprise'. The main content area is titled 'mssql8-win-sup\_remote\_monitoring' with an upward arrow icon. Below this, a dropdown menu shows 'Microsoft SQL Server'. The 'Latest Configuration' section includes a 'Refresh' button and a 'Configuration Report' button. A sidebar on the left lists configuration categories: 'SQL Server Configuration', 'Registry Setting Configuration', and 'Database Setting Configuration'. The main panel shows the 'Configuration Properties' tab for 'mssql8-win-sup\_remote\_monitoring'. It indicates 'Configuration Changes 1' and provides options to 'View', 'Export', or 'Detach'. A table lists the following properties and values:

Property Name	Property Value
Operating System	Windows
Platform	x64 (AMD or Intel)
Target Version	10.50.1600.1
JDBC URL (Example : jdbc:sqlserver://...<port>)	jdbc:sqlserver://mssql8-win-sup.bluemedora.localnet:1433
JDBC Driver (Optional)	com.microsoft.sqlserver.jdbc.SQLServerDriver
Backup Path (Needed for Backup and Restore Jobs)	
Connect Using Windows Integrated Authentication (Yes/No)	No

# Compare SQL Server Configurations

ORACLE<sup>®</sup> Enterprise Manager Cloud Control 13c

Enterprise ▼Targets ▼Favorites ▼History ▼Setup ▼

Search 🔍

🔔

SYSMAN ▼

⋮

Comparison Results: SQL Server Configuration Comparison ⓘ

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Comparison & Drift Management > SQL Server Configuration Comparison

1

targets with differences

2 targets compared

233 total differences

Compared Targets (Differences)

ora-mssql14-sup\_local\_monitoring (233)

mssql8-win-s...

Show Only Differences ▾

Compared Targets (Differences) 🔍 Clear All

✓ mssql8-win-sup\_remote\_monitoring (Reference)

☑ ora-mssql14-sup\_local\_monitoring(233)

☐ mssql8-win-sup\_remote\_monitoring

Configuration Items (Differences) Clear All

☐ Target Properties(2)

☑ MGMT\_EMX\_MSSQL\_SQLSERVER(4)

☐ MGMT\_EMX\_MSSQL\_REGSETTING(3)

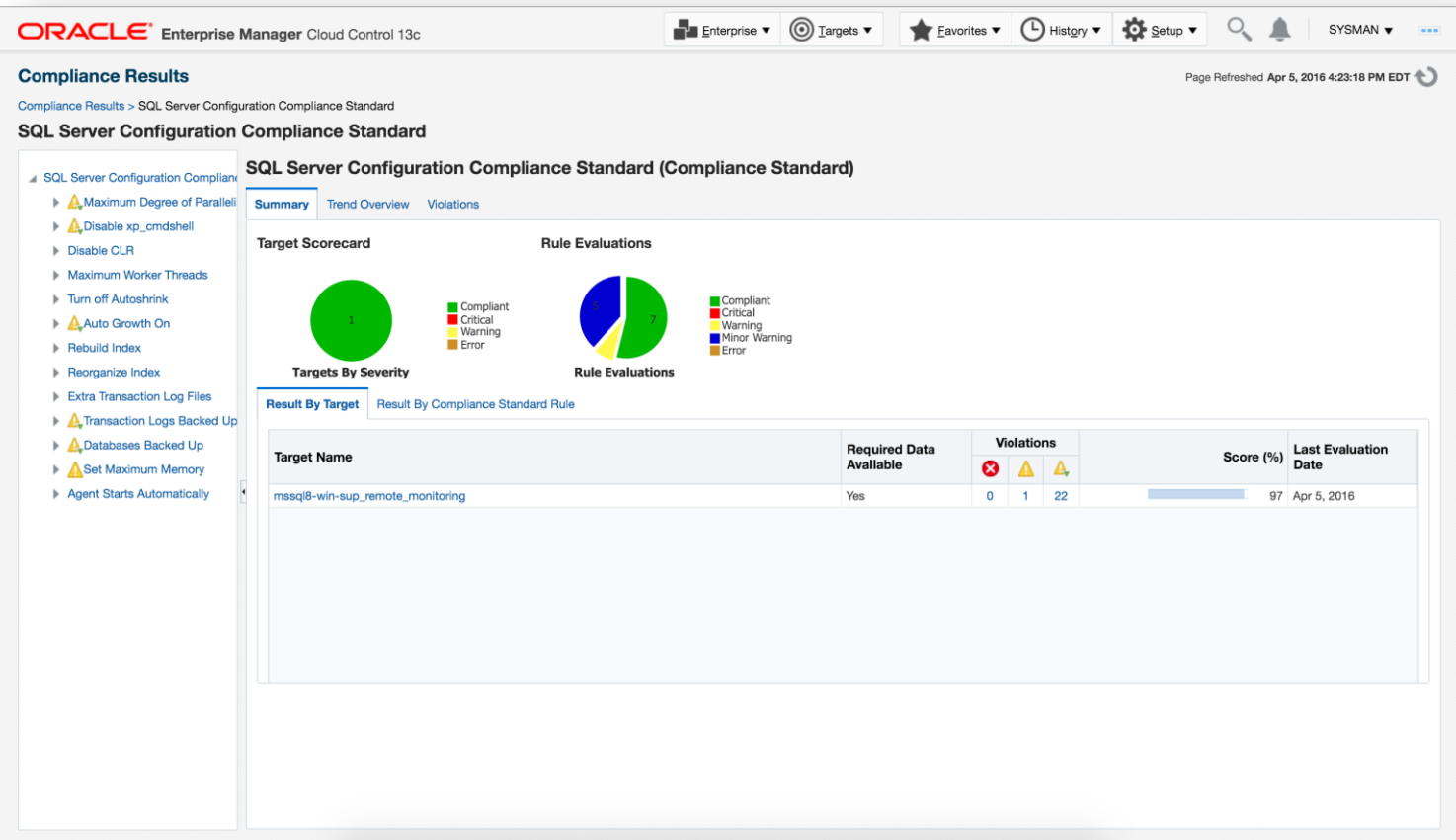
☐ MGMT\_EMX\_MSSQL\_DBSETTING(224)

Configuration Properties for Microsoft SQL Server View ● Side By Side ○ List

View ▼Search 🔍Export ⬆️Rotate View

Configuration Item	Identifier	Property Name	mssql8-win-sup	ora-mssql14-sup
MGMT_EMX_MSSQL_...		OPERINGSYSTEM	Windows NT 6.1 <X64> (Build 7601: Service Pack 1) (Hypervisor)	Windows NT 6.3 <X64> (Build 9600: ) (Hypervisor)
MGMT_EMX_MSSQL_...		PRODUCT	Microsoft SQL Server 2008 R2 (RTM) Enterprise Edition (64-bit)	Microsoft SQL Server 2014 Enterprise Edition (64-bit)
MGMT_EMX_MSSQL_...		VERSION	10.50.1600.1 (X64)	12.0.2000.8 (X64)
MGMT_EMX_MSSQL_...		VERSIONNAME	2008 R2	2014

# Microsoft SQL Server **Compliance** Standard



- Compliance management standard that tracks and reports conformance of managed targets to industry, Oracle, or internal standards.
- Track and manage the adherence of managed targets.

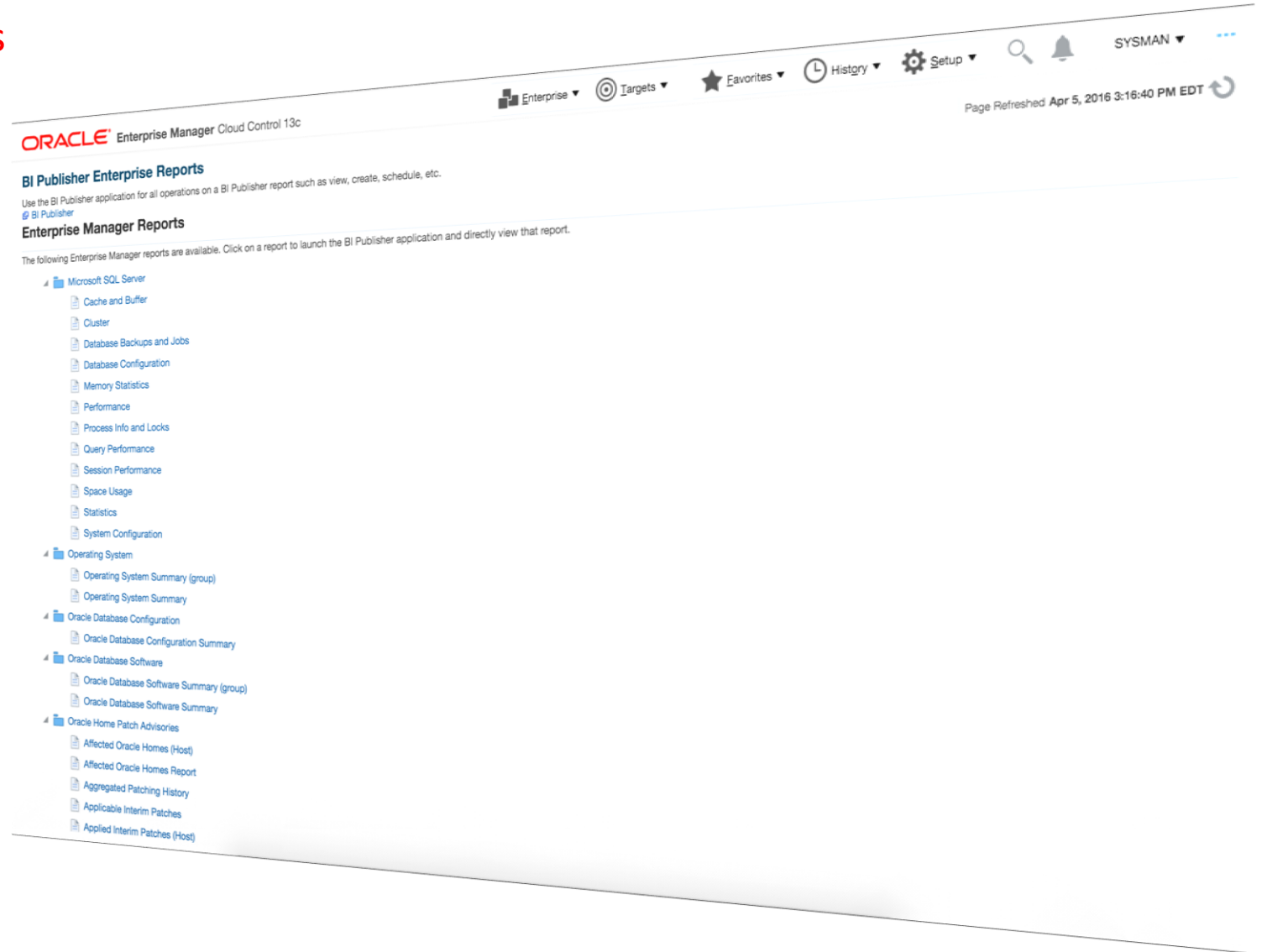


# BI Publisher Reports

Comprehensive out-of-the-box reports

Includes 12 MS SQL Server reports including reports focused on:

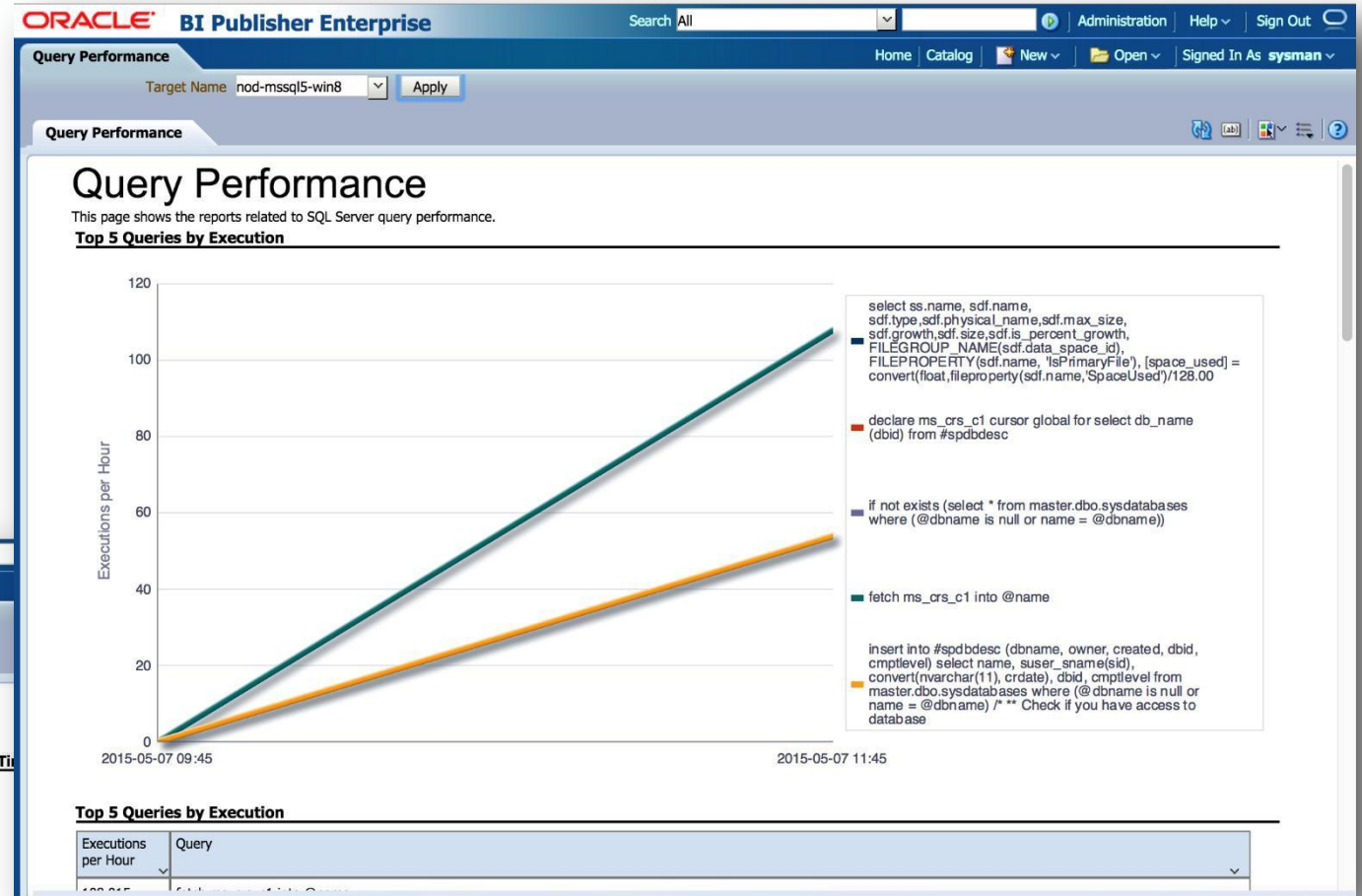
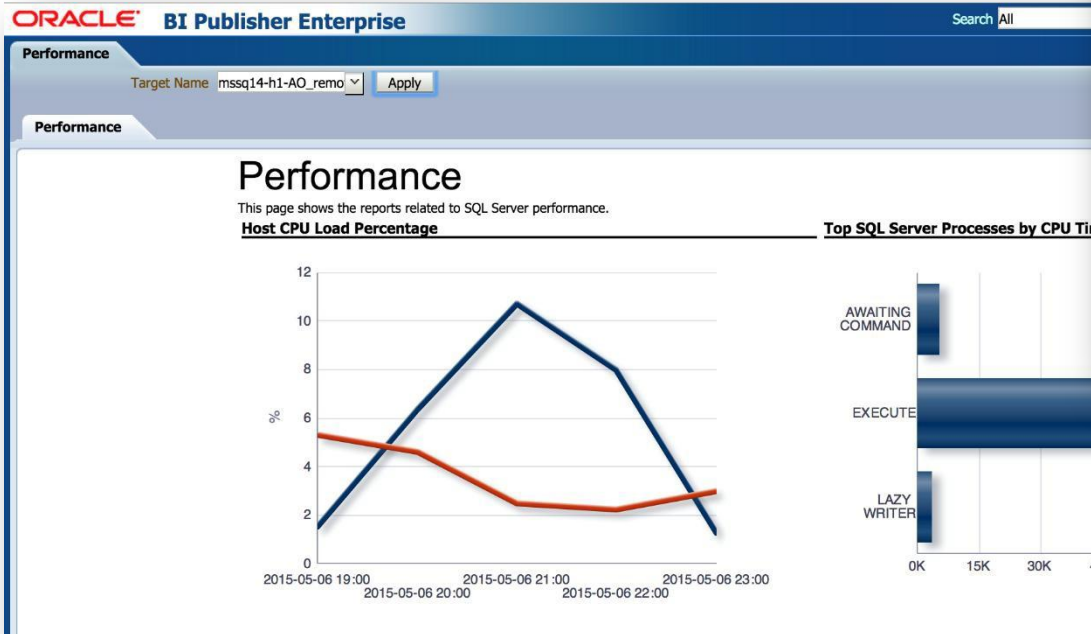
- Performance Monitoring
- Configuration
- Storage



# Reports - Sample

## Performance

- In-depth performance reports
- View the SQL query statements consuming the most resources or taking the longest to execute





# Reports

## Theme: Configuration

- In-depth configuration reports
- Reports for database and system configuration
- At-a-glance comparison of key database configuration values

The screenshot displays two reports from the Oracle BI Publisher Enterprise interface. The top report, 'System Configuration', provides details about the Microsoft SQL Server instance. The bottom report, 'Database Configuration', lists the configuration for various databases and their settings.

### System Configuration

This page shows the reports related to Microsoft SQL Server configurations including the databases it manages.

**Instance Information**

Name:	NOD-MSSQL14-H1A	Operating System:	Windows NT 6.2 <X64> (Build 9200: ) (Hypervisor)
Clustered:	False	Sqlserver Status:	1
Product:	Microsoft SQL Server 2014 Enterprise Edition (64-bit)	Sqlserver Agent Status:	Running
Version:	12.0.2000.8 (X64)		

**Registry**

Master DB:	C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\DATA\master.mdf	Error Log:	C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\Log\ERRORLOG
Replication Installed:	Not Defined		
SQL Data Root:	C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\DATA		
Backup Directory:	C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\BACKUP		
TCP Port:	1433		

**Server Parameters**

Parameter Name	Current Value	Running Value	Maximum Value
affinity I/O mask	0	0	0
affinity mask	0	0	0
affinity64 mask	0	0	0
allow updates	0	0	0
c2 audit mode	0	0	0
cost threshold for parallelism	5	5	5

### Database Configuration

This page displays configuration information related to various databases managed by Microsoft SQL Server

**Databases**

Name	Status	Database File Location
master	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\master.mdf
model	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\model.mdf
tempdb	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\tempdb.mdf
AdventureWorksDW2008BigOrig	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\AdventureWorksDW2008BigOrig.mdf
msdb	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\MSDBData.mdf
AdventureWorks2012	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\AdventureWorks2012_Data.mdf
AdventureWorks_BACKUP	ONLINE	E:\MSSQL12.MSSQLSERVER\MSSQL\DATA\AdventureWorks2012_BACKUP_Data.mdf

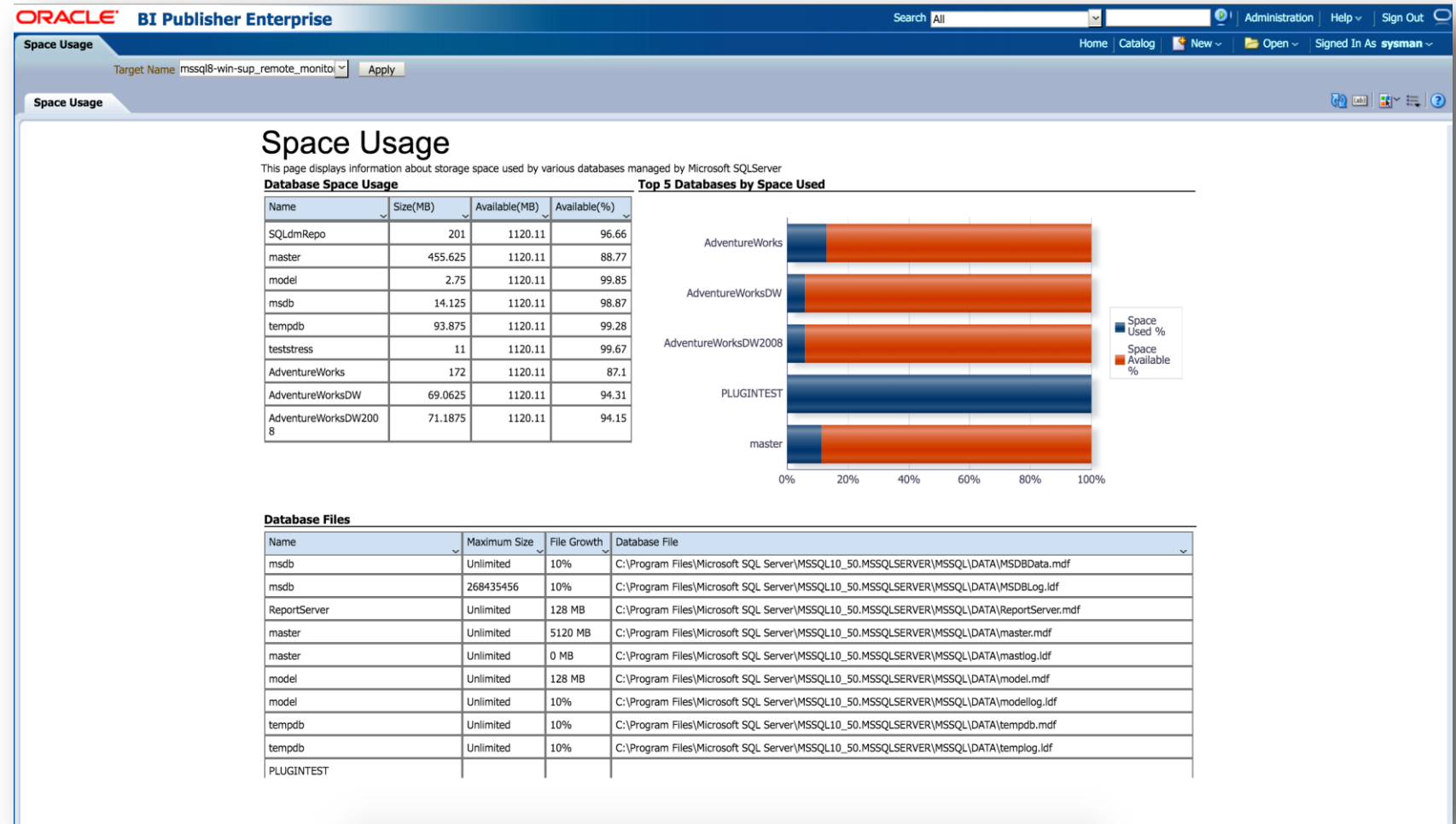
**Database Settings**

Setting ID	Recovery Type	Offline	Auto Close	Auto Create Statistics	Auto Shrink	Auto Update Statistics	Cursor Close On Commit
AdventureWorks2012	SIMPLE	False	False	True	False	True	False
AdventureWorksDW2008BigOrig	SIMPLE	False	False	True	False	True	False
AdventureWorks_BACKUP	SIMPLE	False	False	True	False	True	False
master	SIMPLE	False	False	True	False	True	False

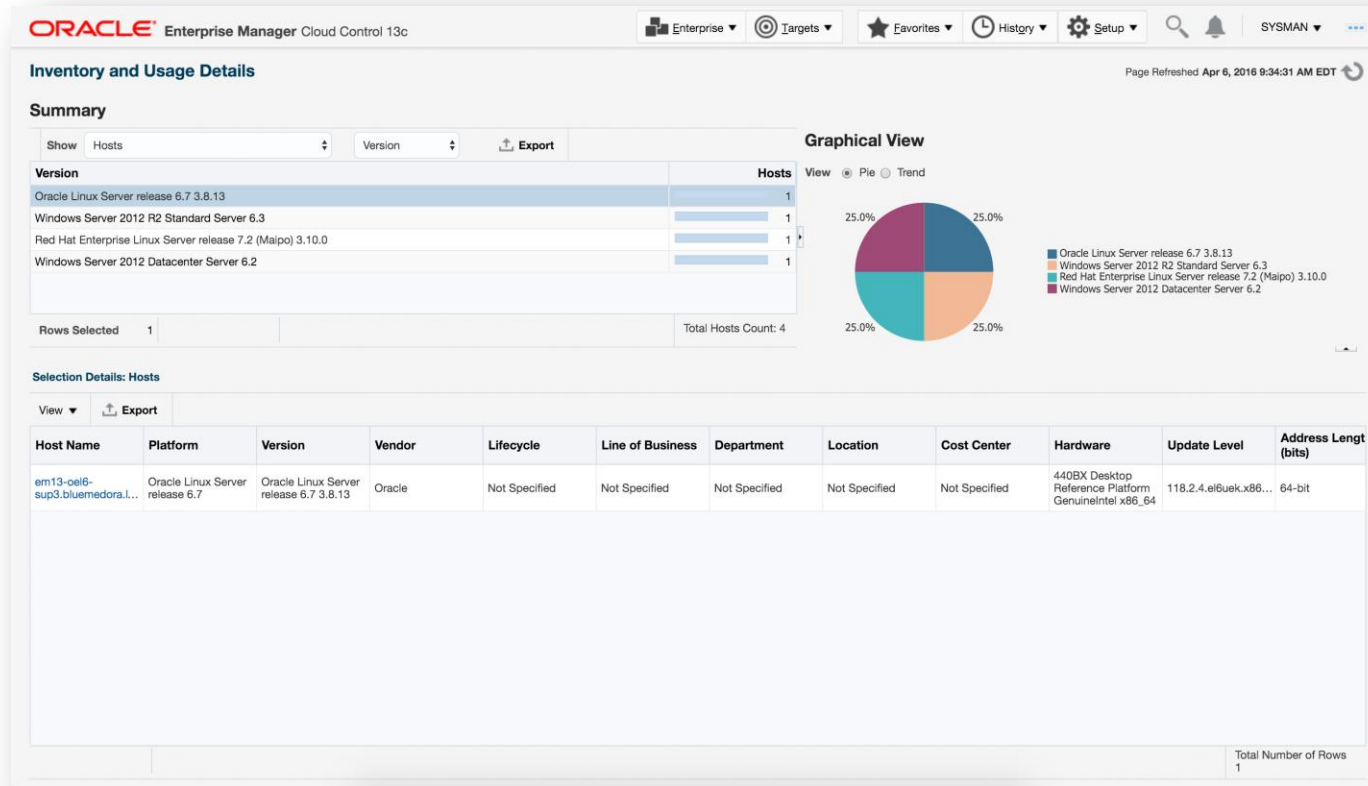
# Reports - Sample

## Theme: Storage

- Schedule a report to identify databases storage utilization
- Identify file growth and location



# Inventory and Usage Details

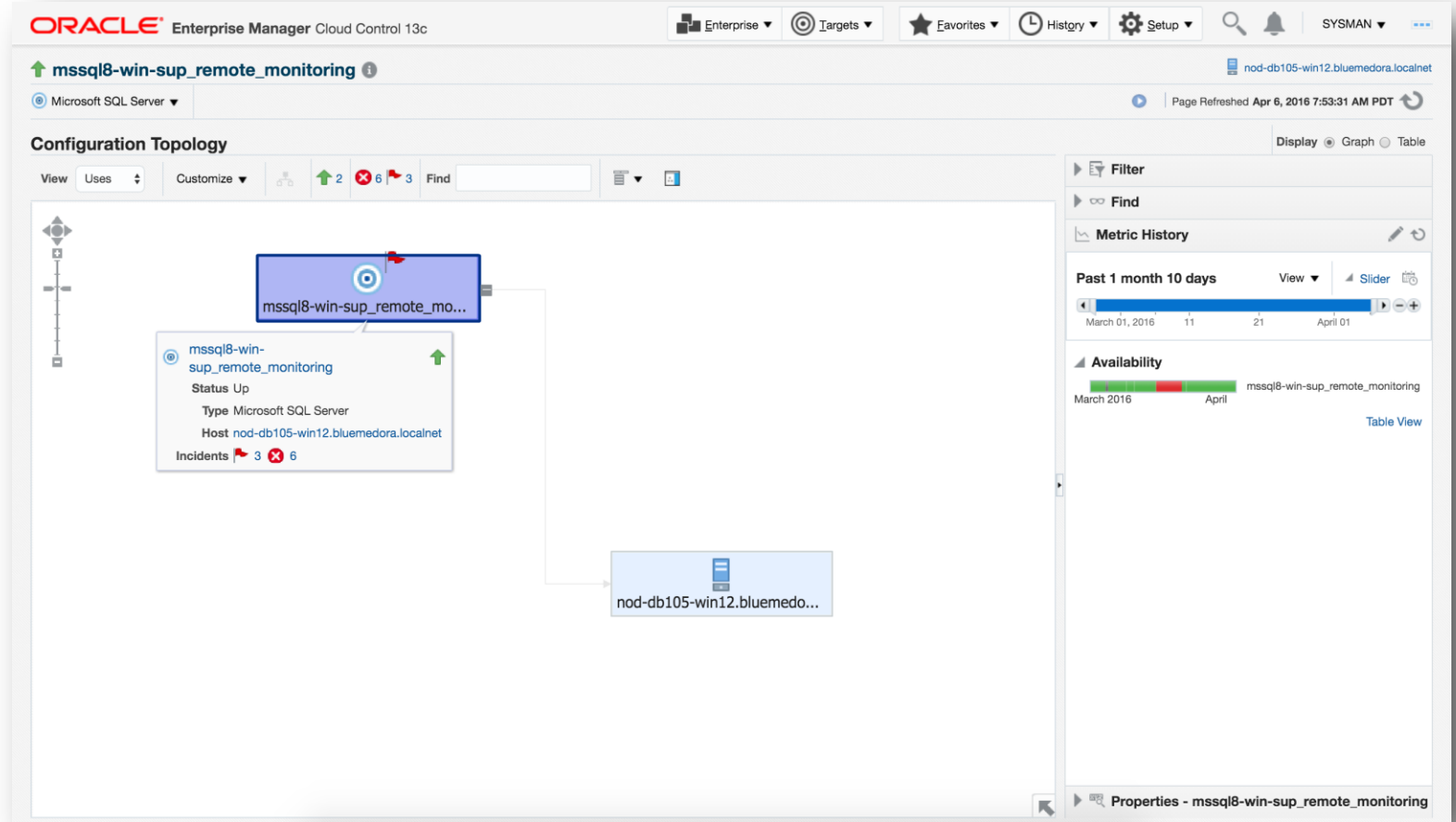


- Drill down multiple levels of inventory details
- View different trends in inventory counts charted

# Heterogeneous System Topology

Enterprise Manager helps you meet the challenges of managing the heterogeneous enterprise

- Comprehensive, top-down visibility into your infrastructure
- Rapid, accurate diagnosis & resolution of complex problems



# For More Information...

- The Microsoft SQL Server Plug-in is listed in the **Oracle Technology Global Price List** under:  
**System Monitoring Plug-in for Non Oracle Databases**
- The **Oracle Global Price List** can be found at:  
<http://www.oracle.com/us/corporate/pricing/technology-price-list-070617.pdf>
- Latest Microsoft SQL Server Plug-in documentation :  
[http://docs.oracle.com/cd/E63000\\_01/SQLPG/overview.htm#SQLPG110](http://docs.oracle.com/cd/E63000_01/SQLPG/overview.htm#SQLPG110)
- Comprehensive Metrics Reference Manual:  
[http://docs.oracle.com/cd/E63000\\_01/EMMDA/database\\_sql.htm#EMMDA116](http://docs.oracle.com/cd/E63000_01/EMMDA/database_sql.htm#EMMDA116)
- Watch the capabilities:  
<https://youtu.be/gz8JS43SS9E>