

## Exadata Database Machine: 12c Administration Workshop Ed 2

**Duration:** 5 Days

### What you will learn

This Exadata Database Machine: 12c Administration Workshop training introduces you to Oracle Exadata Database Machine, covering the features and capabilities of the Exadata Database Machine X6 product family. Explore the various Exadata Database Machine features and configurations, with emphasis on the unique capabilities delivered by Exadata Storage Server. This course uses a virtualized environment for the hands-on component.

### Learn To:

Describe Exadata Storage Server and how it's different from traditional database storage.

List the key capabilities and features of Exadata Database Machine and Exadata Storage Server.

Initially configure Exadata Database Machine and make appropriate up-front configuration decisions.

Implement Exadata Storage Server security.

Use query execution plans, statistics and wait events to examine Exadata Smart Scan.

Describe various options and best-practice recommendations for consolidation on Exadata Database Machine.

Describe various options for migrating to Database Machine and how to select the best approach.

Perform various maintenance tasks on Exadata Database Machine.

Configure Enterprise Manager Cloud Control 12c in conjunction with Exadata Database Machine.

Monitor Exadata Database Machine using the monitoring infrastructure inherently within Exadata Database Machine, along with the monitoring capabilities exposed through Enterprise Manager Cloud Control 12c.

Use other utilities for monitoring Exadata Database Machine which are supplied by Oracle.

### Benefits to You

Maximize the efficiency and effectiveness of your Exadata Database Machines. Develop an understanding of implementing the best practices taught in the course.

### Hands-On Experience

Best-practice recommendations are highlighted throughout; and, where possible, the topics are reinforced through participation in structured hands-on lab exercises.

### Audience

Database Administrators

Sales Consultants

System Administrator

Technical Administrator

Technical Consultant

## Related Training

### *Required Prerequisites*

A working knowledge of Unix/Linux along with an understand of general networking, storage and system administration concepts.

Prior knowledge and understanding of Oracle Database 11g Release 2 or 12c, including Oracle Clusterware and Automatic Storage Management (ASM).

### *Suggested Prerequisites*

Oracle Database 12c: Administration Workshop Ed 2

Oracle Database 12c: Backup and Recovery Workshop Ed 2

Prior knowledge of Oracle Database 11g R2 or 12c RAC

UNIX and Linux Essentials

## Course Objectives

Monitor Exadata Database Machine health and optimize performance

Describe the key capabilities of Exadata Database Machine

Identify the benefits of using Exadata Database Machine for different application classes

Describe the architecture of Exadata Database Machine and its integration with Oracle Database, Clusterware and ASM

Configure I/O Resource Management

Complete the initial configuration of Exadata Database Machine

Describe various recommended approaches for migrating to Exadata Database Machine

## Course Topics

### **Introduction**

Course Objectives

Audience and Prerequisites

Course Contents

Terminology

Additional Resources

Introducing the Laboratory Environment

### **Exadata Database Machine Overview**

Introducing Database Machine

Introducing Exadata Storage Server

Exadata Storage Server Architecture: Overview

Exadata Storage Server Features: Overview  
Exadata Storage Expansion Racks  
InfiniBand Network  
Database Machine Support: Overview

### **Exadata Database Machine Architecture**

Database Machine Architecture: Overview  
Database Machine Network Architecture  
InfiniBand Network Architecture  
InfiniBand Network Topology  
Interconnecting Multiple Racks  
Database Machine Software Architecture: Overview  
Disk Storage Entities and Relationships

### **Key Capabilities of Exadata Database Machine**

Classic Database I/O and SQL Processing Model  
Exadata Smart Scan Model  
Exadata Smart Storage Capabilities  
Exadata Hybrid Columnar Compression  
Exadata Smart Flash Cache  
Exadata Storage Index  
Database File System  
I/O Resource Management

### **Exadata Database Machine Initial Configuration**

Database Machine Implementation: Overview  
Database Machine Site Preparation  
Using Oracle Exadata Deployment Assistant  
Choosing the Right Disk Redundancy Setting  
Configuring Oracle Exadata Database Machine  
The Result After Installation and Configuration  
Supported Additional Configuration Activities

### **Exadata Storage Server Configuration**

Exadata Storage Server Administration: Overview  
Testing Storage Server Performance Using CALIBRATE  
Configuring the Exadata Cell Server Software  
Starting and Stopping Exadata Cell Server Software  
Configuring Cell Disks and Grid Disks  
Configuring ASM and Database Instances to Access Exadata Cells  
Reconfiguring Exadata Storage  
Exadata Storage Security Implementation

### **I/O Resource Management**

I/O Resource Management Concepts  
IORM Architecture  
Getting Started with IORM  
Enabling Intradatabase Resource Management  
Setting Database I/O Utilization Limits  
Interdatabase Plans and Database Roles  
Using Database I/O Metrics  
IORM and Exadata Storage Server Flash Memory

## **Recommendations for Optimizing Database Performance**

- Flash Memory Usage
- Influencing Caching Priorities
- Choosing the Flash Cache Mode
- Compression Usage
- Index Usage
- ASM Allocation Unit Size
- Minimum Extent Size
- Exadata Specific System Statistics

## **Using Smart Scan**

- Exadata Smart Scan: Overview
- Smart Scan Requirements
- Monitoring Smart Scan in SQL Execution Plans
- Smart Scan Join Processing with Bloom Filters
- Other Situations Affecting Smart Scan
- Exadata Storage Server Statistics: Overview
- Exadata Storage Server Wait Events: Overview

## **Consolidation Options and Recommendation**

- Consolidation: Overview
- Different Consolidation Types
- Recommended Storage Configuration for Consolidation
- Alternative Storage Configurations
- Cluster Configuration Options
- Isolating Management Roles
- Schema Consolidation Recommendations
- Maintenance Considerations

## **Migrating Databases to Exadata Database Machine**

- Migration Best Practices: Overview
- Performing Capacity Planning
- Database Machine Migration Considerations
- Choosing the Right Migration Path
- Logical Migration Approaches
- Physical Migration Approaches
- Post-Migration Best Practices
- Migrating to Database Machine Using Transportable Tablespaces

## **Bulk Data Loading using Oracle DBFS**

- Bulk Data Loading Using Oracle DBFS: Overview
- Preparing the Data Files
- Staging the Data Files
- Configuring the Staging Area
- Configuring the Target Database
- Loading the Target Database

## **Exadata Database Machine Platform Monitoring Introduction**

- Monitoring Technologies and Standards
- Simple Network Management Protocol (SNMP)
- Intelligent Platform Management Interface (IPMI)
- Integrated Lights Out Manager (ILOM)

Exadata Storage Server Metrics, Thresholds, and Alerts  
Automatic Diagnostic Repository (ADR)  
Enterprise Manager Cloud Control 12c  
Enterprise Manager Database Control

## **Configuring Enterprise Manager Cloud Control 12c to Monitor Exadata Database Machine**

Enterprise Manager Cloud Control 12c Architecture: Overview  
Cloud Control Monitoring Architecture for Exadata Database Machine  
Configuring Cloud Control to Monitor Exadata Database Machine  
Pre-discovery Configuration and Verification  
Deploying the Oracle Management Agent  
Discovering Exadata Database Machine  
Discovering Additional Targets  
Post-discovery Configuration and Verification

## **Monitoring Exadata Storage Servers**

Exadata Metrics and Alerts Architecture  
Monitoring Exadata Storage Server with Metrics and Alerts  
Isolating Faults with  
Monitoring Exadata Storage Server with Enterprise Manager: Overview  
Monitoring Hardware Failure and Sensor State  
Monitoring Exadata Storage Server Availability  
Comparing Metrics Across Multiple Storage Servers

## **Monitoring Exadata Database Machine Database Servers**

Monitoring Database Servers: Overview  
Monitoring Hardware  
Monitoring the Operating System  
Monitoring Oracle Grid Infrastructure  
Monitoring Oracle Database  
Monitoring Oracle Management Agent  
Database Monitoring with Enterprise Manager Cloud Control 12c

## **Monitoring the InfiniBand Network**

InfiniBand Network Monitoring: Overview  
InfiniBand Network Monitoring with  
Monitoring the InfiniBand Switches  
Monitoring the InfiniBand Switch Ports  
Monitoring the InfiniBand Ports  
Monitoring the InfiniBand Fabric:  
Monitoring the InfiniBand Fabric:

## **Monitoring Other Exadata Database Machine Components**

Monitoring the Cisco Ethernet Switch  
Monitoring the Sun Power Distribution Units  
Monitoring the KVM Switch

## **Other Useful Monitoring Tools**

Exachk: Overview  
Running Exachk  
Exachk Daemon  
DiagTools: Overview

Using ADRCI on Exadata Storage Servers

Imageinfo: Overview

Imagehistory: Overview

OSWatcher: Overview

## **Backup and Recovery**

Using RMAN with Database Machine

General Recommendations for RMAN

Disk-Based Backup Strategy

Disk-Based Backup Recommendations

Disk-Based Backup on

Tape-Based Backup Strategy

Tape-Based Backup Architecture and Recommendations

Backup and Recovery of Database Machine Software

## **Exadata Database Machine Maintenance Tasks**

Database Machine Maintenance: Overview

Powering Database Machine Off and On

Safely Shutting Down a Single Exadata Storage Server

Replacing a Damaged Physical Disk

Replacing a Damaged Flash Card

Moving All Disks from One Cell to Another

Using the Exadata Cell Software Rescue Procedure

## **Patching Exadata Database Machine**

Patching and Updating: Overview

Maintaining Exadata Storage Server Software

Maintaining Database Server Software

Assisted Patching Using OPlan

Assisted Patching Using

Maintaining Other Software

Recommended Patching Process

Test System Recommendations