

ORACLE RAC DBA COURSE CONTENT

Course Objectives

- Understand Oracle Clusterware architecture
- Describe how Grid Plug and Play affects Clusterware
- Describe Automatic Storage Management (ASM) architecture
- Perform Grid Infrastructure installation and create RAC database
- Demonstrate Clusterware management proficiency
- Manage application resources
- Troubleshoot Oracle Clusterware
- Administer ASM Instances and disk groups
- Administer ASM Cluster File Systems
- Install Oracle Database 11gR2 software and create RAC database
- Manage RAC databases
- Manage backup and recovery for RAC
- Determine RAC-specific tuning components
- Configure and manage services in a RAC environment
- Describe high availability architectures

Course Topics

Oracle Grid Infrastructure Concepts

- Oracle Grid Infrastructure
- Oracle Clusterware Architecture and Services
- Goals for Oracle Clusterware
- Oracle Clusterware Networking
- Grid Naming Service, Single-Client Access Name
- Grid Plug and Play
- GPnP Domain, Components, Profile
- Oracle Automatic Storage Management (ASM) and Grid Infrastructure

Oracle Clusterware Architecture

- Oracle Grid Infrastructure for a Cluster
- Oracle Cluster Registry (OCR)
- CSS Voting Disk Function
- Oracle Local Registry and High Availability
- Oracle Clusterware Initialization, Controlling Oracle Clusterware
- Verifying the Status of Oracle Clusterware, Viewing the High Availability Services Stack
- GPnP Architecture: Overview

- Automatic Storage Management

Grid Infrastructure Pre-installation Tasks

- Pre-installation Planning
- Shared Storage Planning for Grid Infrastructure
- Sizing Shared Storage for Oracle Clusterware
- Storing the OCR in ASM
- Managing Voting Disks in ASM
- Installing & Preparing ASMLib
- Grid Infrastructure Pre-installation Tasks
- Oracle Grid Infrastructure 11g

Grid Infrastructure Installation

- Choosing an Installation Type
- Grid Plug and Play Support
- Cluster Node Information
- Specify Network Interface Usage
- Storage Option Information
- Specify Cluster Configuration: Typical Installation
- Verifying the Grid Infrastructure Installation
- Modifying Oracle Clusterware Binaries after Installation

Adding and Removing Cluster Nodes

- Adding Oracle Clusterware
- Prerequisite Steps for running addNode.sh
- Adding a Node with addNode.sh
- Completing OUI Node Addition
- Removing a Node from the Cluster
- Deleting a Node from the Cluster
- Deleting a Node from a Cluster (GNS in Use)
- Deleting a Node from the Cluster

Administering Oracle Clusterware

- Managing Oracle Clusterware
- Managing Clusterware with Enterprise Manager
- Controlling Oracle High Availability Services
- Determining the Location of Oracle Clusterware Configuration Files
- Checking the Integrity of Oracle Clusterware Configuration Files
- Backing Up and Recovering the Voting Disk



- Adding, Deleting, or Migrating Voting Disks
- Locating the OCR Automatic Backups

Upgrading and Patching Grid Infrastructure

- Out-of-Place Oracle Clusterware Upgrade
- Oracle Clusterware Upgrade
- Types of Patches, Patch Properties
- Configuring the Software Library
- Setting Up Patching, Starting the Provisioning Daemon
- Obtaining Oracle Clusterware Patches
- Rolling Patches, Checking Software Versions
- Installing a Rolling Patchset with OUI, Installing a Rolling Patch with OPatch

Troubleshooting Oracle Clusterware

- Golden Rule in Debugging Oracle Clusterware
- Monitoring Oracle Clusterware
- Cluster Health Monitor (CHM)
- oclumon Utility
- oclumon debug Command
- clumon dumpnodeview Command
- oclumon dumpnodeview Command
- oclumon manage Command

Making Applications Highly Available with Oracle Clusterware

- Oracle Clusterware High Availability (HA)
- Resource Management Options
- Server Pools
- GENERIC and FREE Server Pools
- Assignment of Servers to Server Pools
- Server Attributes and States
- Creating Server Pools with srvctl and crsctl
- Managing Server Pools with srvctl and crsctl

ASM: Overview

- ASM and ASM Cluster File System
- ASM Key Features and Benefits
- ASM Instance Designs: Nonclustered ASM and Oracle Databases
- ASM Instance Designs: Clustered ASM for Clustered Databases
- ASM Instance Designs: Clustered ASM for Mixed Databases



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- ASM System Privileges
- ASM OS Groups with Role Separation
- Authentication for Accessing ASM Instances

Administering ASM

- Managing ASM with ASMCA
- Starting and Stopping ASM Instances by Using ASMCA and ASMCMD
- Starting and Stopping ASM Instances by Using srvctl
- Starting and Stopping ASM Instances by Using SQL*Plus
- Starting and Stopping ASM Instances Containing Cluster Files
- ASM Initialization Parameters
- AASM_DISKGROUPS
- Disk Groups Mounted at Startup

Administering ASM Disk Groups

- Disk Group: Overview
- Creating a New Disk Group
- Creating a New Disk Group with ASMCMD
- Creating an ASM Disk Group with ASMCA
- Creating an ASM Disk Group: Advanced Options
- Creating a Disk Group with Enterprise Manager
- Disk Group Attributes
- V\$ASM_ATTRIBUTE

Administering ASM Files, Directories, and Templates

- ASM Clients
- Interaction between Database Instances and ASM
- Accessing ASM Files by Using RMAN
- Accessing ASM Files by Using XML DB
- Accessing ASM Files by Using DBMS_FILE_TRANSFER
- Accessing ASM Files by Using ASMCMD
- Fully Qualified ASM File Names
- Other ASM File Names

Administering ASM Cluster File Systems

- ASM Files and Volumes
- ACFS and ADVM Architecture: Overview
- ASM Cluster File System
- Striping Inside the Volume

- Creating an ACFS Volume
- Creating an ASM Dynamic Volume with Enterprise Manager
- Managing ADVM Dynamic Volumes
- Creating an ASM Cluster File System with Enterprise Manager

RAC Concepts

- Overview of Oracle RAC
- RAC One Node Single-Instance High Availability
- Oracle RAC One Node and Oracle Clusterware
- Cluster-Aware Storage Solutions
- Oracle Cluster File System
- Benefits of Using RAC
- Clusters and Scalability
- Levels of Scalability

Installing and Configuring Oracle RAC

- Installing the Oracle Database Software, Creating the Cluster Database
- Database Type Selection, Database Identification
- Cluster Database Management Options
- Database File Locations, Recovery Configuration, Database Content
- Create the Database
- Background Processes Specific to Oracle RAC
- Considerations for Converting Single-Instance Databases to Oracle RAC
- Single-Instance Conversion Using the DBCA and rconfig

Oracle RAC Administration

- Configuration Section, Topology Viewer
- Enterprise Manager Alerts and RAC, Metrics and RAC
- Enterprise Manager Alert History and RAC, Enterprise Manager Blackouts and RAC
- Redo Log Files and RAC, Automatic Undo Management and RAC
- Starting and Stopping RAC Instances
- Switch Between Automatic and Manual Policies
- RAC Initialization Parameter Files

Managing Backup and Recovery for RAC

- RAC and Instance Recovery
- Instance Recovery and Database Availability
- Instance Recovery and RAC
- Protecting Against Media Failure



- Media Recovery in Oracle RAC
- Parallel Recovery in RAC
- Archived Log File Configurations
- RAC and the Fast Recovery Area, RAC Backup and Recovery Using EM

RAC Database Monitoring and Tuning

- CPU and Wait Time Tuning Dimensions, RAC-Specific Tuning
- Analyzing Cache Fusion Impact in RAC
- Typical Latencies for RAC Operations
- Wait Events for RAC, Wait Event Views
- Global Cache Wait Events: Overview, Global Enqueue Waits
- Session and System Statistics
- Most Common RAC Tuning Tips
- AWR Reports and RAC: Overview

Oracle RAC One Node

- Verifying an Existing RAC One Node Database
- Oracle RAC One Node Online Migration, Online Migration Considerations
- Performing an Online Migration
- Online Migration Illustration, Online Maintenance: Rolling Patches
- Adding an Oracle RAC One Node Database to an Existing Cluster
- Converting a RAC One Node Database to RAC
- Converting a Single Instance Database to RAC One Node
- Converting a RAC Database to RAC One Node

Quality of Service Management

- QoS Management Overview
- QoS Management and Exadata Database Machine
- QoS Management Focus, Benefits, Functional Overview and Policy Sets
- Server Pools, Performance Classes
- Classification and Tagging
- Performance Policies, Performance Class Ranks, Performance Objectives
- Server Pool Directive Overrides, Overview of Metrics
- QoS Management Architecture

Design for High Availability

- Causes of Unplanned Down Time, Causes of Planned Down Time
- Oracle's Solution to Down Time
- RAC and Data Guard Complementarity



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- Maximum Availability Architecture
- RAC and Data Guard Topologies, RAC and Data Guard Architecture
- Data Guard Broker (DGB) and Oracle Clusterware (OC) Integration
- Hardware RAID–Striped LUNs, Hardware RAID–Striped LUNs HA
- Extended RAC: Overview, Connectivity and Disk Mirroring



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