

# ORACLE 12c RAC ADMINISTRATION

## INFORMACION

### FORMATO

Presencial

En Sitio

A partir de 3 participantes

### DURACIÓN:

60 Horas

10 días

Lunes a Viernes

### DIRIGIDO A

Usuarios de servidor de Bases de Datos Oracle que requieren realizar tareas administrativas

### REQUISITOS:

xxxxxxxxxxxxxxxxxxx

### MATERIAL:

Manual Oficial

DVD de la distribución

Linux más reciente

### DOCUMENTO

Diploma expedido por

PLCT S.A. DE C.V.

## DESCRIPCION GENERAL

Curso orientado a usuarios de servidor de bases de datos Oracle que requiere aprender y dominar los procesos de instalación, configuración, puesta a punto, respaldo y recuperación de cluster de servidores Oracle.

## OBJETIVOS

Que el estudiante adquiera los conocimientos y habilidades necesaria para instalar, configurar y mantener un cluster de servidores Oracle con la tecnología RAC.



**Chapter 1: Overview of Oracle RAC**

High Availability and Scalability

What Is High Availability?

Database Scalability

Oracle RAC

Database Clustering Architecture

RAC Architecture

Hardware Requirements for RAC

RAC Components

Oracle RAC: Cache Fusion

RAC Background Processes

Achieving the Benefits of Oracle RAC

High Availability Against Unplanned Downtime

High Availability Against Planned Downtime

Oracle RAC One Node to Achieve HA

RAC Scalability

Consolidating Database Services with Oracle RAC

Considerations for Deploying RAC

Cost of Ownership

High Availability Considerations

Scalability Considerations

RAC or Not

**Chapter 2: Clusterware Stack Management and Troubleshooting**

Clusterware 12cR1 and Its Components

Storage Components of Oracle Clusterware

Clusterware Software Stack

Clusterware Startup Sequence

ASM and Clusterware: Which One is Started First?

Clusterware Management

Clusterware Management Tools and Utilities

Start Up and Stop Clusterware

Managing Oracle Clusterware

Managing OCR and the Voting Disk

Managing CRS Resources

Adding and Removing Cluster Nodes

Troubleshooting common Clusterware Stack Start-Up Failures

Diagnose, Debug, Trace Clusterware and RAC Issues

Debugging Clusterware Components and Resources

Grid Infrastructure Component Directory Structure

Oracle Clusterware Troubleshooting - Tools and Utilities

CHM

**Chapter 3: RAC Operational Practices**

Workload Management

Services

Service Metrics

Load Balancing Goals

Runtime Failover

Service in Second Network

Guidelines for Services

SCAN and SCAN Listeners

SCAN Listener in Second Network (12c)

Guidelines for SCAN Listeners

Global Database Services (12c)

Failover in RAC

TAF	What-If Command Evaluation
Fast Connection Failover	PDBs on Oracle RAC
WebLogic Active GridLink	PDB Architecture Overview
Transaction Guard (12c)	PDBs on Oracle RAC
Application Continuity (12c)	12cR1: Miscellaneous New Features for RAC
Policy-Managed Databases	Public Networks for RAC: IPv6 Support Added
Temporary Tablespaces	Global Data Services
Massive Data Changes	Online Resource Attribute Modification
Performance Metrics Collection	RAC 12cR1: Policy-Based Management and Administration
Parameter File Management	ASM Disk Group: Shared ASM Password File
Password File Management	Valid Node Checking: Restricting Service Registration
Managing Databases and Instances	12cR1: Shared GNS
Managing VIPs, Listeners	RAC 12cR1: Restricting Service Registration
Miscellaneous Topics	Oracle ASM, ACFS, and ADVM: Improvements and New Features
Process Priority	NFS High Availability
Memory Starvation	12cR1: CHM Enhancements
SGA size	Windows: Support for Oracle Home User
Filesystem Caching	OUI: Enhancements and Improvements
<b>Chapter 4: New Features in RAC 12c</b>	12cR1: Installations/Upgrades—Running Scripts Automatically
Oracle Flex Clusters	12cR1: Introducing Application Continuity
Oracle Flex Cluster Architecture	Transaction Idempotence and Java Transaction Guard
Scalability and Availability of Flex Clusters	Deprecated and Desupported Features
Configuring Flex Clusters	<b>Chapter 5: Storage and ASM Practices</b>
Flex ASM Architecture	Storage Architecture and Configuration for Oracle RAC
Oracle Flex ASM Architecture	Storage Architecture and I/O for RAC
Flex ASM and Flex Clusters	RAID Configuration
Configuring Flex ASM	Storage Protocols
ASM Clients and Relocating	Multipath Device Configuration
New ASM Storage Limits	Set Ownership of the Devices
Replacing ASM Disk in Disk Group	ASM
Scrubbing ASM Disk Groups and Files	
Reading Data Evenly in ASM Disk Group	
Measure and Tune Rebalance Operation	

ASM Instance	System-Defined Server Pools
ASM Storage Structure	User-Defined Server Pools
Manage ASM Using SQL Command and V\$ASM Views	Creating and Managing Server Pools
Store OCR and Voting Disk in ASM	Planning and Designing RAC Databases
Choose ASM for OCR and Voting Disk at GI Installation	Policy-Managed Databases
Move OCR and Voting Disk Files to a New ASM Diskgroup	Instance Caging
ACFS	Small- vs. Large-Scale Cluster Setups
Create ACFS	Split-Brain Scenarios and How to Avoid Them
Create ACFS for Oracle RAC Home with ASMCA	Understanding, Debugging, and Preventing Node Evictions
<b>Chapter 6: Application Design Issues</b>	Node Evictions—Synopsis and Overview
Localized Inserts	Extended Distance (Stretch) Clusters—Synopsis, Overview, and Best Practices
Excessive TRUNCATE or DROP Statements	Extended Distance (Stretch) Clusters: Setup/Configuration Best Practices
Sequence Cache	Setup and Configuration—Learning the New Way of Things
Freelists and ASSM	OUI
Excessive Commits	Oracle Enterprise Manager Cloud Control 12c
Long Pending Transactions	RAC Installation and Setup—Considerations and Tips for OS Families:
Localized Access	Linux, Solaris, and Windows
Small Table Updates	RAC Database Performance Tuning: A Quick n' Easy Approach
Index Design	The 3 A's of Performance Tuning
Inefficient Execution Plan	<b>Chapter 8: Backup and Recovery in RAC</b>
Excessive Parallel Scans	RMAN Synopsis
Full Table Scans	Media Management Layer
Application Affinity	Online Backup and Recovery Prerequisites
Pipes	Non-RAC vs. RAC Database
Application Change Deployment	Shared Location for Redo and Archive Logs
<b>Chapter 7: Managing and Optimizing a Complex RAC Environment</b>	Snapshot Control File Configuration
Shared vs. Non-Shared Oracle Homes	Multiple Channels Configuration for RAC
Server Pools	Parallelism in RAC
Types of Server Pools	Instance/Crash Recovery in RAC
	Real-World Examples
	Manage RMAN with OEM Cloud Control 12c
	OCR recovery

	GC CR Block Congested/GC Current Block Congested
OCR recovery	Placeholder Wait Events
<b>Chapter 9: Network Practices</b>	Sending-Side Analysis
Types of Network	Block Types Served
Network Layers	GCS Log Flush Sync
Protocols	Defending LMS Process
VIPs	GC Buffer Busy Acquire/Release
Subnetting	Unique Indexes
Cluster Interconnect	Table Blocks
Jumbo Frames	DRM
Load Balancing and Failover	Overview of DRM Processing
Kernel Parameters	DRM Stages
Network Measurement Tools	GRD Freeze
GC Lost Block Issue	Parameters
Configuring Network for Oracle RAC and Clusterware	Changes in 12c
Establishing IP Address and Name Resolution	DRM and Undo
Network Specification in Grid Infrastructure Installation	Troubleshooting DRM
Network Configuration in Clusterware	AWR Reports and ADDM
Network Failover	ASH Reports
Second Network	
<b>Chapter 10: RAC Database Optimization</b>	Resources and Locks
Introduction to Cache Fusion	SGA Memory Allocation
Cache Fusion Processing	Resource Types
GRD	Lock Modes
BL Resources and Locks	Lock-Related Views
Performance Analysis	Pluggable Databases (12c)
Analysis of the Receiving Side	Troubleshooting Locking Contention
RAC Wait Events	Enqueue Contention
GC Current Block 2-Way/3-Way	TX Enqueue Contention
GC CR Block 2-Way/3-Way	TM Enqueue Contention
GC CR Grant 2-Way/Gc Current Grant 2-Way	HW Enqueue Contention
GC CR Block Busy/GC Current Block Busy	

DFS Lock Handle

SV Resources

CI Resources

DFS Lock Handle Summary

Library Cache Locks/Pins

Troubleshooting Library Cache Lock Contention

Enqueue Statistics

v\$wait\_chains

Hanganalyze

Deadlocks

LMD Trace File Analysis

Chapter 12: Parallel Query in RAC

Overview

PX Execution in RAC

Placement of PX Servers

Measuring PX Traffic

PX and Cache Fusion

PEMS

Parallelism Features and RAC

Debugging PX Execution

Index Creation in RAC

Parallel DML in RAC

Concurrent Union Processing (12c)

Partition-Wise Join

**Chapter 13: Clusterware and Database Upgrades**

Configuration

Pre-Upgrade Checklist

Initiating an Oracle Clusterware Upgrade

The Importance of the Rootupgrade.sh Script

Post-Upgrade Tasks

Clusterware Downgrade

Database Upgrade

Deploying Manual Database Upgrade

Post-Database Upgrade Steps

Database Upgrade Using the DBUA

DBUA Advantages

Database Downgrade

**Chapter 14: RAC One Node**

The Big Picture

Upgrading to 11.2.0.2 or Higher

Deploying RAC One Node Binaries

Deploying a RAC One Node Database

Satisfying Prerequisites

Initiating DBCA's Creation Process

Parameters Specific to RAC One Node

Managing RAC One Node Database

Verifying Configuration Details

Verifying the Online Relocation Status

Stop and Start the Database

Performing Online Database Relocation

Handling Unplanned Node and Cluster Reboots

Converting Between RAC One Node and Standard RAC

Scaling Up to Standard RAC

Scaling Down to RAC One Node

Managing RAC One Node with Cloud Control 12c

Database Relocation with Cloud Control 12c

Third-Party Cold Failover vs. RAC One Node