ORACLE UNIVERSITY

Integrated Cloud Applications & Platform Services

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

# Oracle Database 12*c*: Admin, Install and Upgrade Accelerated

Student Guide – Volume 1
D79027GC10
Edition 1.0 | December 2016 | D84978

Learn more from Oracle University at **education.oracle.com**

ORACLE

Serviço Nacional de Aprendizagem Comercial-SENAC


## Authors

Donna K. Keesling
Dominique Jeunot
James L. Spiller

## Technical Contributors and Reviewers

Darryl Balaski
Rainer Bien
Maria Billings
Andy Fortunak
Gerlinde Frenzen
Mark Fuller
Joel Goodman
Daniela Hansell
Pat Huey
Prakash Jashnani
Gwen Lazenby
Ira Singer
Roy Swonger
Carol Tagliaferri
Lori Tritz
Branislav Valny
Harald Van Breederode

## Editors

Daniel Milne
Aju Kumar

## Publishers

Pavithran Adka
Veena Narasimhan



**Copyright © 2013, Oracle and/or it affiliates. All rights reserved.**

**Disclaimer**

This document contains proprietary information and is protected by copyright and other intellectual property laws. You may copy and print this document solely for your own use in an Oracle training course. The document may not be modified or altered in any way. Except where your use constitutes "fair use" under copyright law, you may not use, share, download, upload, copy, print, display, perform, reproduce, publish, license, post, transmit, or distribute this document in whole or in part without the express authorization of Oracle.

The information contained in this document is subject to change without notice. If you find any problems in the document, please report them in writing to: Oracle University, 500 Oracle Parkway, Redwood Shores, California 94065 USA. This document is not warranted to be error-free.

**Restricted Rights Notice**

If this documentation is delivered to the United States Government or anyone using the documentation on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS
The U.S. Government's rights to use, modify, reproduce, release, perform, display, or disclose these training materials are restricted by the terms of the applicable Oracle license agreement and/or the applicable U.S. Government contract.

**Trademark Notice**

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

# Contents

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

**1 Introduction**
Objectives 1-2
Course Objectives 1-3
Suggested Schedule 1-4
Oracle Database Innovation 1-6
Enterprise Cloud Computing 1-7
Course Examples: HR Sample Schema 1-8
Summary 1-9

**2 Exploring the Oracle Database Architecture**
Objectives 2-2
Oracle Database Server Architecture: Overview 2-3
Oracle Database Instance Configurations 2-4
Connecting to the Database Instance 2-5
Oracle Database Memory Structures 2-6
Shared Pool 2-8
Database Buffer Cache 2-10
Redo Log Buffer 2-11
Large Pool 2-12
Java Pool 2-13
Streams Pool 2-14
Program Global Area (PGA) 2-15
Quiz 2-16
Process Architecture 2-18
Process Structures 2-20
Database Writer Process (DBWn) 2-22
Log Writer Process (LGWR) 2-24
Checkpoint Process (CKPT) 2-26
System Monitor Process (SMON) 2-27
Process Monitor Process (PMON) 2-28
Recoverer Process (RECO) 2-29
Listener Registration Process (LREG) 2-30
Archiver Processes (ARCn) 2-31
Database Storage Architecture 2-32
Logical and Physical Database Structures 2-34

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Segments, Extents, and Blocks 2-36
Tablespaces and Data Files 2-37
SYSTEM and SYSAUX Tablespaces 2-38
Oracle Container Database: Introduction 2-39
Multitenant Architecture 2-40
Automatic Storage Management 2-41
ASM Storage Components 2-42
Interacting with an Oracle Database: Memory, Processes, and Storage 2-43
Quiz 2-45
Summary 2-47
Practice 2 2-48

**3 Oracle Software Installation Basics**
Objectives 3-2
Planning Your Installation 3-3
Configuring Oracle Linux with Oracle RDBMS Pre-Install RPM 3-5
Operating System Groups and Users 3-7
Environment Variables 3-8
Configuring the Oracle Software Owner Environment 3-9
Using Oracle Universal Installer (OUI) 3-10
Installation Option: Silent Mode 3-11
Quiz 3-12
Summary 3-14

**4 Installing Oracle Database Software**
Objectives 4-2
Oracle Database Installation: System Requirements 4-3
Creating Operating System Groups and Users 4-4
Types of Installations 4-6
Quiz 4-7
Summary 4-8
Practice 4 4-9

**5 Creating an Oracle Database by Using DBCA**
Objectives 5-2
Planning the Database 5-3
Types of Databases 5-4
Choosing the Appropriate Character Set 5-5
Understanding How Character Sets Are Used 5-7
Setting the NLS_LANG Initialization Parameter 5-8
Using the DBCA to Create a Database 5-9

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Santos (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Creating a Container Database by Using DBCA 5-10
Creating a Database Design Template 5-11
Using the DBCA to Delete a Database 5-12
Using the DBCA for Additional Tasks 5-14
Summary 5-15
Practice 5 5-16

**6 Oracle Database Management Tools**
Objectives 6-2
Oracle Database Management Tools: Introduction 6-3
Using SQL*Plus 6-4
Calling SQL*Plus from a Shell Script 6-5
Calling a SQL Script from SQL*Plus 6-6
Oracle SQL Developer: Connections 6-7
Oracle SQL Developer: DBA Actions 6-8
Oracle Enterprise Manager Database Express Architecture 6-9
Configuring Enterprise Manager Database Express 6-10
Logging In to Oracle Enterprise Manager Database Express 6-11
Using the Database Home Page 6-12
Using Enterprise Manager Database Express Menus 6-13
Oracle Enterprise Manager Cloud Control Components 6-14
Controlling the Enterprise Manager Cloud Control Framework 6-15
Starting the Enterprise Manager Cloud Control Framework 6-16
Stopping the Enterprise Manager Cloud Control Framework 6-17
Types of Enterprise Manager Cloud Control Targets 6-18
Enterprise Manager Cloud Control 6-19
Using Enterprise Manager Cloud Control 6-20
Quiz 6-21
Summary 6-22
Practice 6 6-23

**7 Managing the Database Instance**
Objectives 7-2
Initialization Parameter Files 7-3
Types of Initialization Parameters 7-5
Initialization Parameters: Examples 7-6
Using SQL*Plus to View Parameters 7-10
Changing Initialization Parameter Values 7-13
Changing Parameter Values: Examples 7-15
Quiz 7-16
Starting Up an Oracle Database Instance: NOMOUNT 7-17

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glauberssantos@live.com) has a non-transferable license to use this Student Guide.

Starting Up an Oracle Database Instance: MOUNT 7-18
Starting Up an Oracle Database Instance: OPEN 7-19
Startup Options: Examples 7-20
Shutdown Modes 7-21
Shutdown Options 7-22
Shutdown Options: Examples 7-25
Viewing the Alert Log 7-26
Using Trace Files 7-28
Administering the DDL Log File 7-30
Understanding the Debug Log File 7-31
Using Dynamic Performance Views 7-32
Dynamic Performance Views: Usage Examples 7-33
Dynamic Performance Views: Considerations 7-34
Data Dictionary: Overview 7-35
Data Dictionary Views 7-36
Data Dictionary: Usage Examples 7-39
Quiz 7-40
Summary 7-41
Practice 7 7-42

**8 Configuring the Oracle Network Environment**
Objectives 8-2
Oracle Net Services: Overview 8-3
Oracle Net Listener: Overview 8-4
Establishing Oracle Network Connections 8-5
Connecting to an Oracle Database 8-6
Name Resolution 8-7
Establishing a Connection 8-8
User Sessions 8-9
Naming Methods 8-11
Easy Connect 8-12
Local Naming 8-13
Directory Naming 8-14
External Naming Method 8-15
Tools for Configuring and Managing Oracle Net Services 8-16
Defining Oracle Net Services Components 8-17
Using Enterprise Manager Cloud Control 8-18
Using Oracle Net Manager 8-19
Using Oracle Net Configuration Assistant 8-20
Using the Listener Control Utility 8-21
Listener Control Utility Syntax 8-22

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Advanced Connection Options 8-24
Testing Oracle Net Connectivity 8-26
Comparing Dedicated Server and Shared Server Configurations 8-27
User Sessions: Dedicated Server Process 8-28
User Sessions: Shared Server Processes 8-29
SGA and PGA Usage 8-30
Shared Server Configuration Considerations 8-31
Configuring Communication Between Databases 8-32
Connecting to Another Database 8-33
Quiz 8-34
Summary 8-36
Practice 8 8-37

**9 Administering User Security**
Objectives 9-2
Database User Accounts 9-3
Predefined Administrative Accounts 9-5
Administrative Privileges 9-6
Protecting Privileged Accounts 9-7
Authenticating Users 9-8
Administrator Authentication 9-10
OS Authentication and OS Groups 9-11
Managing Users 9-13
Creating a User 9-14
Unlocking a User Account and Resetting the Password 9-15
Privileges 9-16
System Privileges 9-17
Revoking System Privileges with ADMIN OPTION 9-19
Granting Object Privileges 9-20
Object Privileges 9-21
Revoking Object Privileges with GRANT OPTION 9-22
Using Roles to Manage Privileges 9-23
Assigning Privileges to Roles and Assigning Roles to Users 9-24
Predefined Roles 9-25
Creating a Role 9-26
Secure Roles 9-27
Assigning Roles to Users 9-28
Privilege Analysis 9-29
Privilege Analysis Flow 9-30
Profiles and Users 9-31
Implementing Password Security Features 9-33

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Creating a Password Profile 9-35
Supplied Password Verification Functions 9-36
Modifications to the Default Profile 9-37
Assigning Quotas to Users 9-38
Applying the Principle of Least Privilege 9-40
Quiz 9-42
Summary 9-46
Practice 9 9-47

**10 Managing Database Storage Structures**
Objectives 10-2
How Table Data Is Stored 10-3
Database Block: Contents 10-4
Exploring the Storage Structure 10-5
Creating a New Tablespace 10-6
Overview of Tablespaces Created by Default 10-12
Altering a Tablespace 10-14
Adding a Data File to a Tablespace 10-16
Making Changes to a Data File 10-17
Dropping Tablespaces 10-18
Viewing Tablespace Information 10-19
Oracle Managed Files (OMF) 10-20
Quiz 10-22
Enlarging the Database 10-23
Moving or Renaming an Online Data File 10-24
Summary 10-26
Practice 10 10-27

**11 Managing Space**
Objectives 11-2
Space Management: Overview 11-3
Block Space Management 11-4
Row Chaining and Migration 11-5
Quiz 11-7
Free Space Management Within Segments 11-8
Types of Segments 11-9
Allocating Extents 11-10
Understanding Deferred Segment Creation 11-11
Viewing Deferred Segment Information 11-12
Controlling Deferred Segment Creation 11-13
Restrictions and Exceptions 11-14

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Additional Automatic Functionality 11-15
Quiz 11-16
Table Compression: Overview 11-17
Compression for Direct-Path Insert Operations 11-18
Advanced Row Compression for DML Operations 11-20
Specifying Table Compression 11-21
Using the Compression Advisor 11-22
Using the DBMS_COMPRESSION Package 11-23
Proactive Tablespace Monitoring 11-24
Thresholds and Resolving Space Problems 11-25
Monitoring Tablespace Space Usage 11-26
Shrinking Segments 11-27
Results of Shrink Operation 11-28
Reclaiming Space Within ASSM Segments 11-29
Using the Segment Advisor 11-30
Automatic Segment Advisor 11-31
Shrinking Segments by Using SQL 11-32
Shrinking Segments by Using Enterprise Manager 11-33
Managing Resumable Space Allocation 11-34
Using Resumable Space Allocation 11-35
Resuming Suspended Statements 11-37
What Operations Are Resumable? 11-39
Quiz 11-40
Summary 11-41
Practice 11 11-42

**12 Managing Undo Data**
Objectives 12-2
Undo Data: Overview 12-3
Transactions and Undo Data 12-5
Storing Undo Information 12-6
Comparing Undo Data and Redo Data 12-7
Managing Undo 12-8
Configuring Undo Retention 12-9
Categories of Undo 12-10
Guaranteeing Undo Retention 12-11
Changing an Undo Tablespace to a Fixed Size 12-12
Temporary Undo: Overview 12-13
Temporary Undo: Benefits 12-14
Enabling Temporary Undo 12-15
Monitoring Temporary Undo 12-16

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Viewing Undo Information 12-17
Viewing Undo Activity 12-18
Using the Undo Advisor 12-19
Quiz 12-20
Summary 12-21
Practice 12 12-22

**13 Managing Data Concurrency**
Objectives 13-2
Locks 13-3
Locking Mechanism 13-4
Data Concurrency 13-5
DML Locks 13-7
Enqueue Mechanism 13-8
Lock Conflicts 13-9
Possible Causes of Lock Conflicts 13-10
Detecting Lock Conflicts 13-11
Resolving Lock Conflicts 13-12
Resolving Lock Conflicts by Using SQL 13-13
Deadlocks 13-14
Quiz 13-15
Summary 13-17
Practice 13 13-18

**14 Implementing Oracle Database Auditing**
Objectives 14-2
Database Security 14-3
Monitoring for Compliance 14-5
Types of Activities to be Audited 14-6
Mandatorily Audited Activities 14-7
Understanding Auditing Implementation 14-8
Administering the Roles Required for Auditing 14-9
Database Auditing: Overview 14-10
Understanding the Audit Architecture 14-11
Enabling Unified Auditing 14-12
Configuring Auditing 14-13
Using Enterprise Manager Cloud Control 14-14
Creating a Unified Audit Policy 14-15
Creating an Audit Policy: System-Wide Audit Options 14-16
Creating an Audit Policy: Object-Specific Actions 14-17
Creating an Audit Policy: Specifying Conditions 14-18

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Enabling and Disabling Audit Policies 14-19
Altering a Unified Audit Policy 14-20
Viewing Audit Policy Information 14-21
Setting the Write Mode for Audit Trail Records 14-22
Value-Based Auditing 14-23
Fine-Grained Auditing 14-25
FGA Policy 14-26
Audited DML Statement: Considerations 14-28
FGA Guidelines 14-29
Archiving and Purging the Audit Trail 14-30
Purging Audit Trail Records 14-31
Quiz 14-32
Summary 14-33
Practice 14 14-34

**15 Backup and Recovery: Concepts**
Objectives 15-2
DBA Responsibilities 15-3
Categories of Failure 15-5
Statement Failure 15-6
User Process Failure 15-7
Network Failure 15-8
User Error 15-9
Flashback Technology 15-10
Instance Failure 15-12
Understanding Instance Recovery: Checkpoint (CKPT) Process 15-13
Understanding Instance Recovery: Redo Log Files and Log Writer 15-14
Understanding Instance Recovery 15-15
Phases of Instance Recovery 15-16
Tuning Instance Recovery 15-17
Using the MTTR Advisor 15-18
Media Failure 15-19
Comparing Complete and Incomplete Recovery 15-20
Complete Recovery Process 15-21
Point-in-Time Recovery Process 15-22
Oracle Data Protection Solutions 15-24
Quiz 15-25
Summary 15-26

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

**16 Backup and Recovery: Configuration**
Objectives 16-2
Configuring for Recoverability 16-3
Configuring the Fast Recovery Area 16-4
Monitoring the Fast Recovery Area 16-5
Multiplexing Control Files 16-6
Redo Log Files 16-8
Multiplexing the Redo Log 16-9
Creating Archived Redo Log Files 16-10
Archiver (ARCn) Process 16-11
Archived Redo Log Files: Naming and Destinations 16-12
Configuring ARCHIVELOG Mode 16-14
Quiz 16-15
Summary 16-16
Practice 16 16-17

**17 Performing Database Backups**
Objectives 17-2
Backup Solutions: Overview 17-3
Oracle Secure Backup 17-4
User-Managed Backup 17-5
Understanding Backup Terminology 17-6
Understanding Types of Backups 17-7
RMAN Backup Types 17-8
Using Recovery Manager (RMAN) 17-10
Configuring Backup Settings 17-11
Oracle-Suggested Backup 17-13
Selecting a Backup Strategy 17-14
Backing Up the Control File to a Trace File 17-15
Managing Backups 17-16
Using RMAN Commands to Create Backups 17-17
Quiz 17-18
Summary 17-19
Practice 17 17-20

**18 Performing Database Recovery**
Objectives 18-2
Opening a Database 18-3
Keeping a Database Open 18-5
Data Recovery Advisor 18-6
Loss of a Control File 18-8

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Loss of a Redo Log File 18-9
Loss of a Data File in NOARCHIVELOG Mode 18-11
Loss of a Noncritical Data File in ARCHIVELOG Mode 18-12
Loss of a System-Critical Data File in ARCHIVELOG Mode 18-13
Quiz 18-14
Summary 18-15
Practice 18 18-16

**19 Moving Data**
Objectives 19-2
Moving Data: General Architecture 19-3
Oracle Data Pump: Overview 19-4
Oracle Data Pump: Benefits 19-5
Directory Objects for Data Pump 19-7
Creating Directory Objects 19-8
Data Pump Export and Import Clients: Overview 19-9
Data Pump Utility: Interfaces and Modes 19-10
Performing a Data Pump Export by Using Enterprise Manager Cloud Control 19-11
Performing a Data Pump Import 19-12
Data Pump Import: Transformations 19-13
Using Enterprise Manager Cloud Control to Monitor Data Pump Jobs 19-14
SQL*Loader: Overview 19-15
SQL*Loader Control File 19-17
Loading Methods 19-19
Loading Data by Using Enterprise Manager Cloud Control 19-20
SQL*Loader Express Mode 19-21
External Tables 19-23
External Table: Benefits 19-24
Defining an External Tables with ORACLE_LOADER 19-25
External Table Population with ORACLE_DATAPUMP 19-26
Using External Tables 19-27
Data Dictionary 19-28
Quiz 19-29
Summary 19-31
Practice 19 19-32

**20 Performing Database Maintenance**
Objectives 20-2
Database Maintenance 20-3
Viewing the Alert History 20-4
Terminology 20-5

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Automatic Workload Repository (AWR): Overview 20-6
AWR Infrastructure 20-7
Automatic Workload Repository 20-8
AWR Baselines 20-10
Accessing the AWR Page 20-11
Managing the AWR 20-12
Statistic Levels 20-13
Automatic Database Diagnostic Monitor (ADDM) 20-14
ADDM Findings in Enterprise Manager Cloud Control 20-15
ADDM Findings in Enterprise Manager Database Express 20-16
Advisory Framework 20-17
Viewing the Advisor Central Page in Enterprise Manager Cloud Control 20-19
Using Packages to Invoke the Advisors 20-20
Automated Maintenance Tasks 20-21
Automated Maintenance Tasks Configuration 20-23
Server-Generated Alerts 20-24
Setting Metrics Thresholds 20-25
Reacting to Alerts 20-26
Alert Types and Clearing Alerts 20-27
Quiz 20-28
Summary 20-29
Practice 20 20-30

**21 Managing Performance**
Objectives 21-2
Performance Monitoring 21-3
Tuning Activities 21-5
Performance Planning 21-6
Instance Tuning 21-8
Performance Tuning Methodology 21-9
Performance Tuning Data 21-10
Using the Enterprise Manager Database Express Performance Hub Page 21-11
Using the Enterprise Manager Cloud Control Performance Home Page 21-13
Monitoring Session Performance 21-14
Performance Monitoring: Top Sessions 21-15
Displaying Session-Related Statistics 21-16
Performance Monitoring: Top Services 21-17
Displaying Service-Related Statistics 21-18
Viewing Wait Events 21-19
Oracle Wait Events 21-20
Memory Management: Overview 21-21

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Managing Memory Components 21-22
Efficient Memory Usage: Guidelines 21-23
Automatic Memory Management: Overview 21-25
Oracle Database Memory Parameters 21-26
Enabling Automatic Memory Management (AMM) by Using Enterprise Manager Cloud Control 21-27
Monitoring Automatic Memory Management 21-28
Automatic Shared Memory Management: Overview 21-30
Enabling Automatic Shared Memory Management (ASMM) 21-31
Understanding Automatic Shared Memory Management 21-32
Automatic Shared Memory Advisor 21-33
Enabling Automatic Shared Memory Management 21-34
Disabling Automatic Shared Memory Management 21-35
Using V$PARAMETER to View Memory Component Sizes 21-36
Managing the Program Global Area (PGA) 21-37
Dynamic Performance Statistics 21-39
Troubleshooting and Tuning Views 21-41
Quiz 21-42
Summary 21-44
Practice 21 21-45

**22 Managing Performance: SQL Tuning**
Objectives 22-2
SQL Tuning 22-3
Oracle Optimizer: Overview 22-4
Optimizer Statistics 22-5
Optimizer Statistics Collection 22-6
Using the Manage Optimizer Statistics Page 22-8
Setting Global Preferences by Using Enterprise Manager Cloud Control 22-9
Gathering Optimizer Statistics Manually 22-10
Setting Optimizer Statistics Preferences 22-12
Concurrent Statistics Gathering 22-14
Viewing Statistics Information 22-15
SQL Plan Directives 22-17
Adaptive Execution Plans 22-18
Using the SQL Advisors 22-19
Automatic SQL Tuning Results 22-20
Implementing Automatic Tuning Recommendations 22-21
SQL Tuning Advisor: Overview 22-22
Using the SQL Tuning Advisor 22-23
SQL Tuning Advisor Recommendations 22-25

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Duplicate SQL 22-26
SQL Access Advisor: Overview 22-27
Using the SQL Access Advisor 22-28
Workload Source 22-29
Recommendation Options 22-30
Reviewing Recommendations 22-32
SQL Performance Analyzer: Overview 22-33
SQL Performance Analyzer: Use Cases 22-34
Using SQL Performance Analyzer 22-35
Quiz 22-36
Summary 22-40
Practice 22 22-41

**23 Introduction to Upgrading to Oracle Database 12*c***
Objectives 23-2
Defining Upgrade and Data Migration 23-3
Upgrade Methods 23-4
Database Upgrade Assistant: Advantages and Disadvantages 23-5
Manual Upgrade: Advantages and Disadvantages 23-6
Upgrade Paths 23-7
Upgrade Method Limitations 23-8
Upgrading to a New Release of Oracle Database 23-9
Migration Methods 23-10
Using the Export and Import Method 23-11
Summary 23-12
Practice 23 23-13

**24 Preparing to Upgrade to Oracle Database 12*c***
Objectives 24-2
Preparing to Upgrade 24-3
Planning the Upgrade 24-4
Developing a Test Plan 24-5
Performance Testing 24-6
Requirements for Databases Using Oracle Label Security or Oracle Database Vault 24-7
Requirement for Databases Using Oracle Warehouse Builder 24-8
Using the Pre-Upgrade Information Tool 24-9
Backing Up the Database 24-10
Summary 24-11
Practice 24 24-12

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glauberuniversal.fos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

**25 Upgrading to Oracle Database 12*c***
Objectives 25-2
Upgrading by Using the Database Upgrade Assistant (DBUA) 25-3
Key DBUA Features 25-4
Manually Upgrading to Oracle Database 12*c* 25-7
Migrating a Pre-12.1 or 12.1 Non-CDB to CDB 25-9
Plugging a Non-CDB Database into a CDB 25-10
Summary 25-11
Practice 25 25-12

**26 Performing Post-Upgrade Tasks**
Objectives 26-2
Required Tasks After Database Upgrade 26-3
Recommended Tasks After Database Upgrade 26-4
Understanding Auditing Implementation 26-6
Enabling Unified Auditing 26-7
Administering the Roles Required for Auditing 26-8
Summary 26-9
Practice 26 26-10

**27 Oracle Database Cloud Service: Overview**
Objectives 27-2
Database as a Service Architecture 27-3
Database as a Service: Features and Tooling 27-4
Software Editions: Included Database Options and Management Packs 27-5
Accessing the Oracle Database Cloud Service Console 27-6
Automated Database Provisioning 27-7
Accessing Tools from the Service Console 27-8
Managing the Compute Node Associated With a Database Deployment 27-9
Managing Network Access to Database as a Service 27-10
Enabling Access to a Compute Node Port 27-11
Scaling a Database Deployment 27-12
Patching Database as a Service 27-13
Using the Oracle Database Cloud Service Console to Manage Patches 27-14
Summary 27-15

**A Using Database Resource Manager**
Objectives A-2
Database Resource Manager: Overview A-3

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Database Resource Manager: Concepts A-4
Using the Resource Manager A-5
Default Plan for Maintenance Windows A-7
Default Plan A-8
Creating a Simple Resource Plan A-9
Creating a Complex Resource Plan A-10
Specifying Resource Plan Directives A-12
Resource Allocation Methods for Resource Plans A-13
Comparison of EMPHASIS and RATIO A-14
Active Session Pool Mechanism A-16
Specifying Thresholds A-17
Setting Idle Timeouts A-19
Limiting CPU Utilization at the Database Level A-20
Limiting CPU Utilization at the Server Level: Instance Caging A-22
Instance Caging Examples A-23
Monitoring Instance Caging A-24
Runaway Queries and Resource Manager A-25
Resource Consumer Group Mapping A-27
Activating a Resource Plan A-29
Database Resource Manager Information A-30
Viewing Resource Manager Statistics A-31
Monitoring the Resource Manager A-32
Quiz A-34
Summary A-35
Practice A A-36

**B Using Oracle Scheduler to Automate Tasks**
Objectives B-2
Simplifying Management Tasks B-3
Understanding a Simple Job B-4
Oracle Scheduler Core Components B-5
Using Oracle Scheduler B-6
Quiz B-8
Persistent Lightweight Jobs B-9
Using a Time-Based or Event-Based Schedule B-10
Creating a Time-Based Job B-11
Creating an Event-Based Schedule B-13
Creating Event-Based Schedules by Using Enterprise Manager Cloud Control B-14
Creating an Event-Based Job B-15
Event-Based Scheduling B-16
Creating Complex Schedules B-18

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Quiz B-19
Using Email Notification B-20
Adding and Removing Email Notifications B-21
Creating Job Chains B-22
Example of a Chain B-24
Using Advanced Scheduler Features B-25
Job Classes B-26
Windows B-28
Prioritizing Jobs Within a Window B-29
Creating a Job Array B-30
Quiz B-32
Creating a File Watcher and an Event-Based Job B-33
Enabling File Arrival Events from Remote Systems B-35
Scheduling Remote Database Jobs B-36
Creating Remote Database Jobs B-37
Scheduling Multiple Destination Jobs B-38
Viewing Scheduler Meta Data B-39
Quiz B-41
Summary B-42
Practice B B-43

**C Migrating Data by Using Oracle Data Pump**
Objectives C-2
Oracle Data Pump: Overview C-3
Data Pump Export and Import Clients: Overview C-4
Data Pump Utility: Interfaces and Modes C-5
Migrating by Using Oracle Data Pump C-6
Importing by Using a Network Link C-7
Creating a Container Database by Using DBCA C-8
Creating a New PDB from PDB$SEED C-9
Exporting from a Non-CDB and Importing into a PDB C-10
Summary C-11
Practice C C-12

**D Installing Oracle Grid Infrastructure for a Standalone Server**
Objectives D-2
Overview of Oracle Grid Infrastructure for a Standalone Server D-3
Oracle Restart D-4
ASM Storage Components D-6
Configuring Storage for Oracle Automatic Storage Management (ASM) D-7
Oracle Grid Infrastructure Installation: System Requirements D-8

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Creating Operating System Groups and Users D-9
Types of Installations D-10
Installing the Oracle Grid Infrastructure for Standalone Server D-12
Upgrading Existing Oracle ASM Instances D-13
Summary D-14

**E Oracle Restart**
Objectives E-2
Oracle Restart E-3
Oracle Restart Process Startup E-5
Controlling Oracle Restart E-6
Choosing the Correct SRVCTL Utility E-8
Oracle Restart Configuration E-9
Using the SRVCTL Utility E-10
Obtaining Help for the SRVCTL Utility E-11
Starting Components by Using the SRVCTL Utility E-12
Stopping Components by Using the SRVCTL Utility E-13
Viewing Component Status E-14
Displaying the Oracle Restart Configuration for a Component E-15
Manually Adding Components to the Oracle Restart Configuration E-16
Quiz E-17
Summary E-18

**F Working with Oracle Support**
Objectives F-2
Working with Oracle Support F-3
Using My Oracle Support F-4
Researching an Issue F-6
Logging Service Requests F-8
Accessing My Oracle Support Community F-10
Managing Patches F-11
Applying a Patch Release F-12
Enterprise Manager Cloud Control: My Oracle Support Integration F-13
Using the Patch Advisor F-14
Online Patching: Overview F-15
Installing an Online Patch F-16
Benefits of Online Patching F-17
Conventional Patching and Online Patching F-18
Online Patching Considerations F-19
Quiz F-20
Using the Support Workbench F-21

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.

Serviço Nacional de Aprendizagem Comercial-SENAC

Accessing the Support Workbench F-22
Viewing Problem Details F-23
Viewing Incident Details F-24
Packaging and Uploading Diagnostic Data to Oracle Support F-25
Tracking the Service Request and Implementing Repairs F-26
Summary F-27

Unauthorized reproduction or distribution prohibited. Copyright© 2014, Oracle and/or its affiliates.

Glauber Soares (glaubersantos@live.com) has a non-transferable license to use this Student Guide.