

Oracle Certification Preparation (OCP) / Hidden Treasures

Presented by Howard Horowitz

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Objective

Attendees will learn:

- *Strategies for preparing for the exam*
- *Resources used to prepare for each exam*
- *Format of the exams*
- *Overview of each exam including a few of the less known, least used Oracle 8i/9i features that are likely to be part of the exam*

Part 1 – OCP Format, Structure, and Strategies

- **What is OCP?**
- *How is it measured in the industry?*
- *What are the benefits from being certified?*
- *What are the required steps for getting certified?*
- *What's the exam content / structure?*
- *How are the exams scored?*
- *Miscellaneous issues?*

What Is OCP ?

Oracle Certification was developed by Oracle and Sylvan Prometric. OCP is a valuable industry-recognized credential that signifies a proven level of knowledge and ability. An Oracle Certified Professional establishes a standard of competence in a specific job role.

*“Taking the time to get certified creates several positive career benefits and gives you a balance between **doing** and **learning** that is so desperately needed in information technology.” / By Rich Niemiec - March/April 2002 Oracle Magazine “Getting Good At What You Do”*

OCP Format, Structure, and Strategies

- *What is OCP?*
- **How is OCP measured in the industry?**
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How is OCP measured in the industry ?

- *Oracle Certified Professionals were found to earn the highest average salaries as compared to any other DBA or Developer professionals. Certification Magazine – <http://www.certmag.com>*
- *Hiring certified professionals has a direct impact on a company's bottom line, as these conclusions from a research study by International Data Corporation** suggest - http://www.oracle.com/education/certification/index.html?whycert_employer.html*
- *The results from the 2001 CRN Certification Study show Oracle certifications offer the best ROI for larger solution providers - <http://crn.channelsupersearch.com/news/CRN/30947.asp>*

OCP Format, Structure, and Strategies

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What are the benefits from being Certified?

- *Valuable to hiring managers*
- *Added credibility (**Excellent for contractors who sell narrow skill sets and must claim to be immediately productive.**)*
- *Increased job opportunities (OCP members site and other job sites). **Depends on economy (job market).***
- *Use of Oracle certification program logo for endorsement of your proven skill by Oracle corporation.*
- ***Invaluable experience as a result of preparing***
- *New tricks and skills to add to your arsenal*
- *Looks good on resume*
- *Special discounts and offers*
- ***Exposure to features you haven't used***

OCP Format, Structure, and Strategies

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What are the required steps for getting certified?

- **Select a track**
- *Prepare for the test*
- *Schedule the test*
- *Take each test in the track*

<http://www.oracle.com/education/certification/index.html?starthere.html>

Tracks

(FOCUS ON)



Oracle Database Administrator:

- *Oracle 8i DBA*
- *Oracle 9i DBA (OCA, OCP, OCM)*

Oracle Application Developer:

- *Application Developer, Oracle Developer Rel. 2*
- *Internet Application Developer, Oracle Forms Developer Rel. 6/6i Oracle 9i Database*

Oracle Database Operator:

- *Internet Database Operator*

Oracle Java Developer:

- *Oracle Java Developer*

What are the required steps for getting certified?

- Select a track*
- Prepare for the test**
- Schedule the test*
- Take each test in the track*

Prepare for the test

(Cost less /
More experience)



- Self-Test Software (250-300 questions).
<http://www.selftestsoftware.com>. Software simulates actual exam. Might get lucky and find 1-2 questions on the actual exam.
Cost: \$99 per practice exam, \$125 to take the exam
<http://www.2test.com>. **Quickest route with 2-3+ years exp**

(Recommended)



- TBT's and Self-Test Software. Oracle Technical Based Training
<http://www.oracle.com/education>. Cost: \$3000+ for the OCP bundle, add'l \$340 for the 9I bundle. Test voucher's included for each exam. **1-2 years exp**

(Cost more /
Less experience)



- Instructor based training and Self-Test Software.
<http://www.oracle.com/education> Cost: \$3000 for each class. **0-1 years exp**
- Bottom line: depends on individual, experience, and availability

Additional resources used to prepare for the exams

- Oracle doc set – <http://technet.oracle.com/docs/content.html>
- <http://technet.oracle.com/training/content.html>
- <http://metalink.oracle.com>
- Jason Couchman Certification books
- Mike Alt Exam Cram books
- Reveal Net Knowledge Base questions
- Oracle Learning Network
- Sybex flash cards (Palm V)
- <http://www.dbdomain.com>
- <http://www.examcram.com>
- <http://www.oraknowledge.com>
- University Certificate programs (Columbia, NYU, Hofstra – includes student kit, ...etc)

(Comes out of a separate budget) →

Bottom line: OCP is a money making opportunity for Oracle and everyone wants a piece of the action.

What are the required steps for getting certified?

- *Select a track*
- *Prepare for the test*
- **Schedule the test**
1800-891-exam or
<http://www.2test.com>
(Need 2 days notice)
- *Take each test in the track*

What are the required steps for getting certified?

- Select a track*
- Prepare for the test*
- Schedule the test*
- Take each test in the track**

Database Administrator Exams

Oracle 8i DBA

(Recommended -
Used by most companies)

- 1Z0-023 Oracle 8i: Architecture and Administration
- 1Z0-025 Oracle 8i: Backup and Recovery
- 1Z0-024 Oracle 8i: Performance and Tuning
- 1Z0-020 Oracle 8i: Network Administration (EASIEST)
- 1Z0-001 Intro to Oracle: SQL and PL/SQL (HARDEST)

Oracle 9i upgrade exam

- 1Z0-030 Oracle 9i Database: New features for Administrators

Oracle 9i DBA

- 1Z0-007 Oracle 9i: SQL (online exam) – OCA
- 1Z0-031 Oracle 9i: Fundamentals I - OCA
- 1Z0-032 Oracle 9i: Fundamentals II
- 1Z0-033 Oracle 9i: Performance and Tuning (<http://ocpbeta-ww@oracle.com>)

(Mo Money!)

Oracle 9i DBA - (OCM) Oracle Certified Master 2-3 classes + OCM practicum exam. Select courses from the following website:

http://www.oracle.com/education/certification/index.html?dba9i_ocm.html

9 courses to choose from only 2 PL/SQL courses available right now.

Highest honor, **“Bow Down To The Master”**

OCP Format, Structure, and Strategies

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- *How are the exams scored?*
- *Miscellaneous issues?*

Exam Content / Structure

- *Tests knowledge of Oracle concepts, practical experience, and training.*
- *Each exam consists of 60-80 multiple choice questions.*
- *Allowed at least 90 minutes per exam.*
- *Incorrect answers are not subtracted from score. Guess if you don't know the answer*
- *Receive your grade back as soon as the exam is finished.*
- *Beware of trick questions: Recommended vs Required*

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- **How are the exams scored?**
- *Miscellaneous issues?*

How are the exams scored ?

On average, allowed up to 17 questions wrong to pass

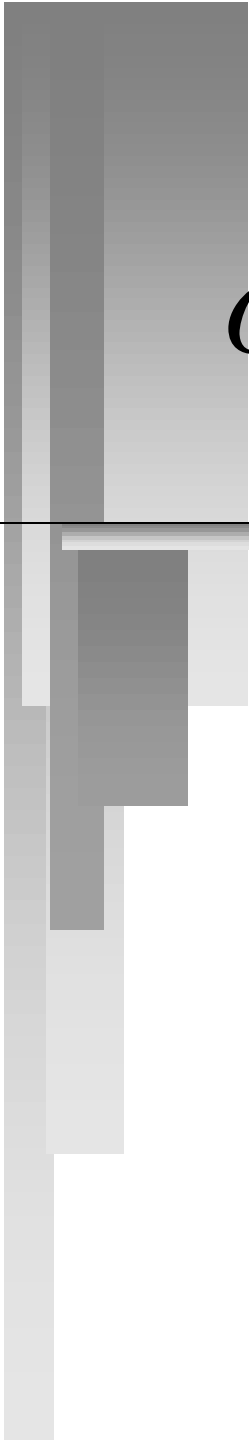
Certification Track	Exam Number	Exam	Questions Correct	Total Questions	Passing %
8i	1Z0-001	Intro to Oracle: SQL and PL/SQL	39	57	68%
9i	1Z0-007	Intro to Oracle 9i: SQL	45	60	75%
8i	1Z0-023	Architecture and Administration	42	65	65%
8i	1Z0-025	Backup and Recovery	42	60	70%
8i	1Z0-024	Performance and Tuning	38	57	67%
8i	1Z0-026	Network Administration	41	59	71%
9i	1Z0-030	New Features for Administrators	38	56	67%
9i	1Z0-031	Fundamentals I Basic	25	35	71%
9i	1Z0-031	Fundamentals I Mastery	14	25	56%
9i	1Z0-032	Fundamentals II	N/A	N/A	N/A
9i	1Z0-033	Performance and Tuning	N/A	N/A	N/A

OCP Format, Structure, and Strategies

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- *What's the exam content / structure?*
- *How are the exams scored?*
- **Miscellaneous issues?**

Miscellaneous Issues

- *Takes approx 1.5 – 3 months to get certified. (approx 15 hours preparation time per exam)*
- *30 days to retake exams*
- *Exams can be taken in any order within a track*
- *No time limit between passing first and last exam. (Take your time or get it over with)*
- *Beta exams offer discounts*
- *Certification is valid for 6 months following a general announcement of re-certification. (Valid for approx 1 year) usually follows a new release, 8, 8i, 9i,...etc*



Oracle Certification Preparation (OCP) / Hidden Treasures

ANY QUESTIONS ?

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Part 2 – What will I be expected to know for each exam?

- **9i New Features for Administrators**
 - *Architecture and Administration*
 - *Backup and Recovery*
 - *Tuning*
 - *Networking*
 - *SQL-PL/SQL*

9i New Features for Administrators

Online Table Reorgs

Definition

- *Old way resulted in exclusive table locks, preventing DML while table was being re-organized (DDL actions). Not good for OLTP applications. 9i allows you to do the following online: convert non-partitioned tables to partitioned tables, drop non-primary key columns, add columns, modify storage parameters, and convert heap tables to Index Organized Tables.*

Understand the 5 steps used to redefine a table

- *Execute `dbms_redefinition.can_redef_table()` (Verify table can be rebuilt online)*
- *Create an interim table to hold desired attributes (Create indexes, grants, trigg..)*
- *Execute `dbms_redefinition.start_redef_table()`*
- *Execute `dbms_redefinition.sync_interim_table()` (Periodically keep up-to-date)*
- *Execute `dbms_redefinition.finish_redef_table()`*

Understand the online table reorg limitations

- *Can't reorg on primary key columns or tables without primary key constraints.*
- *Can't reorg on user defined data types, bfiles or long columns, clustered tables, sys and system tables, materialized views....etc;*
- *Rename indexes on interim table and add not nulls when finished*

Food for thought

- *In 9i you can partition a table to a tablespace with a different block size while doing a reorg on it. 9i supports multiple block size support. (`alter system set db_nk_cache_size = nk`)*

9i New Features for Administrators

Memory Management

Definition

- *Automated SQL Execution Memory Management – provides automatic and dynamic memory tuning. Controls the maximum amount of memory a query can use. (Replacement for `sort_area_size`).*

Understand `init.ora` parameters and performance views

- *`WORKAREA_SIZE_POLICY` – manual or auto, automation is set when this value is set to auto. Memory's allotted to work areas to optimize both throughput and response time.*
- *`PGA_AGGREGATE_TARGET` – Controls maximum amount of memory of PGA which can be used by queries when `WORKAREA_SIZE_POLICY` is set to `AUTO`. (Say goodbye to `sort_area_size`, `sort_area_retained_size`, `db_block_buffers`, and `db_buffer_keep/recycle_pool`. Hello `pga_aggregate_target`, `work_area_size_policy`, `db_keep/recycle_cache_size`)*

Useful views

- *`V$sql_workarea`, `v$sql_workarea_active`, `v$sqlprocess` (`pga_used_mem`, `pga_alloc_mem`, `pga_max_mem`), `v$sysstat` and `v$sesstat` contains 'work area' statistics for monitoring single-pass, multi-pass and optimal executions. `V$sql_plan` shows execution plan of currently executing sql.*

Side Note

- *Future releases of 9i include enhancements to `db_cache_advice=on` (enables and disables stats on `buffer_cache`) for estimates on sizing `PGA` and `Large_Pool_Size`*

Examine this SELECT statement:

```
SELECT name, value  
FROM v$sysstat  
WHERE name LIKE '%work area%';
```

Click the Exhibit button to examine the output of this statement.

Which statement is true?

- A. The PGA_AGGREGATE_TARGET parameter should be increased.
- B. The PGA_AGGREGATE_TARGET parameter should be decreased.
- C. The PGA_AGGREGATE_TARGET parameter should be eliminated and the WORKAREA_SIZE_POLICY set to MANUAL.
- D. You should do nothing. The PGA_AGGREGATE_TARGET parameter is acceptable.

NAME	VALUE
work area memory allocated	0
work area executions - optimal	2544
work area executions - onepass	45
work area executions - multipass	4

Reference

Question:
Examine this SELECT statement:

```
SELECT name, value  
FROM v$sysstat  
WHERE name LIKE '%work area%';
```

Click the Exhibit button to examine the output of this statement.

Which statement is true?

Answer:
(D) You should do nothing. The PGA_AGGREGATE_TARGET parameter is acceptable.

Reference:
In this scenario, the work area executions - multipass value is low and the work area executions - optimal value is high, indicating that the most executions are optimized. You should do nothing. The PGA_AGGREGATE_TARGET parameter is acceptable.

The options stating that you should increase or decrease the PGA_AGGREGATE_TARGET parameter are both incorrect. Increasing the PGA_AGGREGATE_TARGET would use additional memory that is unnecessary, and decreasing the value might cause some executions to spill to disk. The option stating that the PGA_AGGREGATE_TARGET parameter should be eliminated and the WORKAREA_SIZE_POLICY parameter set to MANUAL is also incorrect. Doing so would prevent automatic tuning completely.

9i New Features for Administrators

External Tables

Definition

- *Structure is defined inside the database even though it's data resides externally as one or more files in the Operating System.*

Know the syntax for creating an external table.

- *Organization external clause*
- *Name of the external table*
- *Directory location of the external table*
- *Defaults to oracle_loader*
- *External tables are not contained within a database. Type and parallel are optional*

Dictionary Views used for External Tables

- *Dbc_tables, dbc_external_tables, and dbc_external_locations view*

Side Note

- *Nice alternative to SQL-Loader. Data's stored outside the database. Able to work on data file with Unix / Shell Scripting commands. Use with CTAS to load external data into a database.*

9i New Features for Administrators

External Tables

SAMPLE SCRIPT TO MONITOR ALERT_LOG

Create directory BDUMP as 'd:\oracle9i\admin\prod\bdump';

```
Create table alert_log (text varchar2(200))
  Organization EXTERNAL (
    Type oracle_loader
    Default directory BDUMP
    Access parameters
    (
      Records delimited by newline
      Badfile 'dave.bad'
      Logfile 'dave.log'
      Fields terminated by '
    )
    Location ('prodalrt.log')
  )
  Reject limit unlimited;
```

Source: Oracle Professional Feb 2002 – Dave Moore

9i New Features for Administrators

Data Guard

Definition

- *Protects critical data through automation of the creation, management and monitoring aspects of a Physical Standby Database environment. Data Guard automates the tasks involved in setting up and managing the production database, Physical Standby Database (new name), log transport and related applications.*

Data Guard Broker (DMON Process)

- *Management interface, automates managed process for log transport and standby. Monitors activity, health, and availability. Data Broker helps you connect a collection of objects into a complete fail over group. You can configure up to 9 standby server sites.*

Know the different log transport modes

- *Synchronous – Zero data loss, logs are concurrently written to redo logs and standby database*
- *Asynchronous – Immediate data copy mode. Log transport site is accepted by a local slave*

9i New Features for Administrators

Block Media Recovery (BMR)

Definition

- *Recovers blocks as opposed to data files. Block recovery only recovers blocks needing recovery. Lowers (MTTR, 9i feature/parameter) and allows part of the data file to be available during recovery. Reduces I/O*

Restrictions

- *Requires RMAN*
- *Only complete recovery is possible*
- *Only corrupt blocks get recovered*
- *No DML or select is allowed for block level recovery. Unlike data file recovery, files are online.*
- *BMR requires an unbroken set of redo changes for the blocks being recovered.*

Know syntax and views

- *Block recover command and views used to detect corrupt blocks*
 - *V\$backup_corruption, v\$copy, trace files and error messages*

What will I be expected to know for each exam?

- *9i New Features for Administrators*
- **Architecture and Administration**
- *Backup and Recovery*
- *Tuning*
- *Networking*
- *SQL – PL/SQL*

Architecture and Administration

Redo Log Performance Views

V\$log, v\$logfile, v\$thread

V\$log – group#, members (count of), status, sequence# and bytes.

Status values:

UNUSED – The group has never been written to

CURRENT – The group is the current redo log group

ACTIVE – The group is online and needed for instance recovery but not being written.

CLEARING – Log file being recreated as empty after an ALTER DATABASE CLEAR LOGFILE command has been issued.

CLEARING CURRENT – Current logfile is being cleared of a closed thread.

INACTIVE – Group is online but not needed for instance recovery.

V\$logfile – group#, status, member number

Status values:

INVALID – inaccessible

STALE – incomplete

DELETED – no longer being used

BLANK/NULL – file in use

V\$thread – for group info such as current_group and log sequence number.

Architecture and Administration

Direct – Load Insert

Definition

- *Used to copy data between tables living in the same database. Bypasses the buffer cache and writes data directly into the data file. Invoke using hints, append or parallel (multiple concurrent parallel inserts). Maintains indexes and all enabled constraints. Supports NOLOGGING clause to control redo generation.*

Syntax

- *Alter session enable parallel DML;*
- *INSERT /*+PARALLEL(items2,2) */ INTO items2 NOLOGGING
SELECT * FROM items;*

Restrictions

- *Rows can only be appended. To replace the table, truncate the table before starting the load.*

Distinguish between SQL *Loader and Direct - Load Insert

- *SQL *Loader Direct enforces PK, Not Null, and Unique. Disables FK, Check Constraints, and Insert Triggers. Conventional enforces all 35 constraints.*

Mark

6 of 10

ID:120-023e.14.01.001

Pause

13:24

Continue

For which two reasons would you use direct-load inserts when loading data into a table? (Choose two.)

- A. Enabled constraints are not enforced.
- B. Indexes are dropped to speed the data load.
- C. Loads data below the high water mark to reclaim disk space.
- D. Other rows in the same table can be concurrently modified by other users.
- E. Data can be quickly copied from one table into another within the same database because it bypasses the buffer cache.

Reference

Question:
For which two reasons would you use direct-load inserts when loading data into a table? (Choose two.)

Answer:
(D) Other rows in the same table can be concurrently modified by other users.
(E) Data can be quickly copied from one table into another within the same database because it bypasses the buffer cache.

Reference:
Enterprise DBA Part 1A: Architecture and Administration - Loading Data
Oracle8i Database Administration: Manage Data Storage TBT - Unit 3, Lesson 1, Topic 4: Parallel Direct Load Inserts
Oracle8i Database Administration: Manage Data Storage TBT - Unit 3, Lesson 1, Topic 2: Loading Data into Tables

Use the INSERT INTO SELECT command to perform a direct-load insert. This command can be used to copy data from one table to another table in the same database. The buffer cache is bypassed to speed up the insert. During a direct-load insert, users can be concurrently modifying existing data in the table. Data is loaded above the high water mark. During a direct-load insert, all indexes are maintained and all enabled constraints are enforced.

Next

Previous

Print

Grade Now

Exhibit

Main Menu

Architecture and Administration

Minimum and Default Storage Clauses

- **Minimum** size of *INITIAL* extent is $2 * db_block_size$. **Default** size of *INITIAL* extent = 5 db blocks
- **Minimum** size of *NEXT* extent is one block. **Default** is 5 db blocks
- **Minimum** and **default** for *MINEXTENTS* = 1
- **Minimum** value of *PCTINCREASE* = 0 and the **default** is 50 (not available for RBS)
- **Minimum** value of *MAXEXTENTS*=1 and the **default** is a function of the db block size.

What will I be expected to know for each exam?

- *9i New Features for Administrators*
- *Architecture and Administration*
- **Backup and Recovery**
- *Tuning*
- *Networking*
- *SQL – PL/SQL*

Backup and Recovery

RMAN (Recovery Manager)

Definition

- Oracle 8 backup and recovery utility. Used to backup and restore database files, archive logs, and control files. Can restore a database until the point in time of failure. Can detect changes to the block level (**9i can recover to the block level**). Supports incremental backups, only changed blocks of data are backed up. Checks for and detects corrupt blocks and prevents them from being backed up or restored

Know syntax, concepts, and conditions

- Connecting to, resynch, changing and registering recovery catalog
- Backing up, restoring, and recovering databases
- Incomplete Recovery options (time, scn, cancel)
- Allocating channels
- Lists and reports
- Creating backup and recovery stored scripts and their parameters

Backup and Recovery

DBVerify Utility

Definition

- *Verifies integrity of data blocks within data files.*
- *Used to validate a database backup or data file before it's restored.*
- *Used to diagnose data corruption problems*
- *Verify online and offline data files.*
- *Verify portion of a data file.*

Location

- *External to the database, located in the @?/bin directory*

Syntax

- *dbv file = <filename> blocksize =<number> specify if blocksize isn't 2kb*
Start=<number> beginning block address end=<number> ending block
address
Logfile=output
dbv file=d:\backup\indx01.dbf blocksize = 4096 start=1 end = 500

Backup and Recovery

DBMS_REPAIR Package

Definition

- *Enables you to detect and report corrupt blocks in tables and indexes*

Know the procedures and how they're implemented

- *Fix_corrupt_blocks* – identifies and marks blocks that are found to be SW corrupt. Info's retained in the repair_table.
- *Skip_corrupt_blocks* – Enables the server to read non-corrupt blocks. Implication: Rows marked corrupt are in accessible to the user.
- *Rebuild_freelists* – If head of free list is corrupt
- *Dump_orphan_keys*
- *Segment_Fix_status* (9i feature), manual fix corrupted state of a bitmap entry. Used when you modify pct_free for a tablespace in 9i using "Automatic Segment Free Space Management" (9i feature). Alternative to using free lists and pct_free. Bitmap describes status of each block in the segment. Only works at tablespace level with locally managed tablespaces.

Restrictions

- *Tables with out-of-line columns are not analyzed*
- *LOBs, VARRAYs, and Nested tables are not supported*
- *Can't analyze Index Organized Tables or LOB indexes*

Backup and Recovery

Standby Database

Definition

- *Physical copy of the primary database. Used for disaster recovery and fail over.*

Know the syntax, concepts, order, and guidelines

- *Syntax to convert standby to primary*
- *Steps for creating a standby database*
- *Steps for Synchronizing*
- *Oracle 7.3 or later*
- *Same ID string*
- *Same db version, OS, and patches*
- *Separate machines*
- *Same names for data files, redolog, and control files*

Restrictions

- *Can't perform DML or create temp file entries when standby database is in read-only mode*
- *Renaming data files on primary are not propagated to standby*
- *Adding and dropping log groups are not propagated to standby*
- *Can't switch primary back to standby. Must recreate standby database*

Examine this command:

```
rman> recover managed standby database timeout 60;
```

What is true about this command?

- A. The standby database is set for managed recovery after 60 minutes.
- B. An error will result if the standby database is not recovered in 60 minutes.
- C. The standby database will shut down if it has not received an archive file for the last 60 minutes.
- D. The standby database will be activated as the new primary database if the primary database does not respond within 60 seconds.

Reference

Question:
Examine this command:

```
rman> recover managed standby database timeout 60;
```

What is true about this command?

Answer:
[C] The standby database will shut down if it has not received an archive file for the last 60 minutes.

Reference:
Enterprise DBA Part I B: Backup and Recovery Workshop - Oracle Standby Database

The **TIMEOUT** option of the **RECOVER MANAGED STANDBY DATABASE** command specifies the number of minutes the standby database will wait for the Oracle server to write the requested archived log file to the standby control file's directory.

Backup and Recovery

Log Miner Utility

Definition

- *Used to determine when a logical corruption to the database began (time or SCN). Provides you with the ability to view online or archived redo logs. Undo specific changes made by one or more transactions*

Know syntax, concepts, and conditions

- *Understand v\$logmnr_contents view*
- *V\$logmnr_contents columns: sql_redo=new value, sql_undo=old value*
- *Know the process for implementing log miner (required steps)*

Restrictions

- *Can't view DDL statements (capable in 9i)*

Note

- *Log Miner questions are asked in DBA, Tuning, Backup and Recovery, and 9i Upgrade exams (includes log miner viewer and skip_corruption, corrupt blocks are flagged and log miner proceeds).*

What will I be expected to know for each exam?

- *9i New Features for Administrators*
- *Architecture and Administration*
- *Backup and Recovery*
- **Tuning**
- *Networking*
- *SQL – PL/SQL*

Tuning

V\$SYSSTAT

Definition

- General statistics for an instance

Know how it's used

- DB buffer cache hit ratio –
`SELECT 1-(physical_reads/(db_block_gets + consistent_gets))*100 FROM v$sysstat`
- Redo buffer allocation retries (number of times user waits for space in log buffer).
- 'redo log space requests' - active log is full
- **Name like work area executions** in 9i. (single-pass, multi-pass, optimal values)
- Number of disk sorts occurring on disk or in memory. Select name, value from v\$sysstat where name = 'sorts(rows)';
- Number of full table scans
- System performance stats since instance started
- Make sure you know the other stats tables: v\$system_event, v\$session_event, v\$session_wait, v\$sqlarea, v\$session, v\$wait_stat...etc;

Tuning Oracle Expert

Definition

Performs automated performance tuning. Automates process for collecting and analyzing data using database tuning rules. Included in Oracle Tuning Pack.

Understand each step in Oracle Expert Tuning Methodology

- Specify tuning scope*
- Collect data*
- View and edit collected data and rules*
- Analyze data and generate recommendations*
- Review tuning recommendations*
- Generate parameter files and scripts to implement recommendations*

Tuning

Row Chaining / Migration

Definition

- *Row chaining occurs with large rows, like a LOB. The row is split into two blocks (inserts/updates). Migration occurs with updates. Row may no longer fit in the data block. Pointer is set to point to a new row.*

Detecting chained rows

- *Analyze table emp compute statistics*
- *Select numrows, chain_cnt from dba_tables*

OR

- *@?\vdbms\admin\utlchain.sql*
- *Analyze table scott.emp list chained rows;*
- *Select owner_name, table_name, head_rowid from chained_rows*

Head_rowid's last character is different because the row is stored in different blocks.

Resolving Migration and Chained Rows

- *Row migration can be avoided by recreating tables that have a high deletion rate.*
- *Increase PCT_FREE to reduce chained rows*

Removing Chaining and migration from a table (4 step process)

- *Analyze table*
- *Copy non-chained rows to new table*
- *Delete chained rows*
- *Insert data from new table back into original table*

Tuning

Steps to properly tune the database

MAKE SURE YOU KNOW THE ORDER OF EVENTS

- *Tune architecture and design of the data model*
- *Tune database applications. Tune SQL statements, efficient sql takes less time to process*
- *Tune memory structures (SGA and user process memory)*
- *Tune I/O – distribution of data files and monitor data files and memory during reads and writes (Use OFA and Raid 0+1)*
- *Reduce contention (blocks, deadlocks, shared pool, latches)*
- *Tune the OS to handle demands of OS server*

Tuning

Managed Mixed Workload

Definition

- **Database resource manager allocates a minimum amount of resources to users or groups of users. CPU times allocated to different users. Limit number of parallel query(PQ) to users. Can be used for daytime and evening setup without restarting the instance. Modified in 9i to include add'l plan directives: active session pool (active sessions per group), automatic consumer group switching, max estimated execution time, queuing_p1 (how long sessions on queue before aborting), maximum undo size, undo_pool, and OEM GUI support. Used with Quiesce database (another 9i feature). "Quiesce Database" put's a database in a partially available state. Resource Manager handles active and inactive session pools, setting them to zero. Quiesce database will not work without Resource Manager.**

Understand database resource manager order of events

- **Create a resource plan**
- **Create Resource Consumer group**
- **Create resource plan directives**
- **Validate Pending Area before submitting**
- **Assign users and roles to consumer groups**
- **Set plan to be used by instance**

Understand database resource manager order of events

- **Db_a_rsrc_plans**
- **Db_a_rsrc_plan_directives**
- **Db_a_rsrc_consumer_groups**
- **Db_a_rsrc_consumer_group_privs**
- **V\$rsrc_plan and v\$rsrc_consumer_group**

Which two can be accomplished when using Oracle Resource Manager? (Choose two.)

- A. sort operations tuning
- B. lock activity monitoring
- C. resource processing distribution
- D. system wide statistics collection
- E. resource allocation method configuration

Reference

Question:
Which two can be accomplished when using Oracle Resource Manager? (Choose two.)

Answer:
[C] resource processing distribution
[E] resource allocation method configuration

Reference:
Enterprise DBA Part2: Performance and Tuning - Managing a Mixed Workload
Oracle8i Performance Tuning: Strategies and Techniques - TBT - Unit 5, Lesson 1, Topic 2:
Database Resource Manager: Features

Oracle Resource Manager can be used to distribute available processing resources through the allocation of CPU time percentages to different users. It can also be used to configure different methods of resource allocation depending on the operational need, such as OLTP during the day and DSS in the evening.

What will I be expected to know for each exam?

- *9i New Features for Administrators*
- *Architecture and Administration*
- *Backup and Recovery*
- *Tuning*
- **Networking**
- *SQL – PL/SQL*

Networking

Oracle Advanced Security

Definition

- *Network security is an optional product for Net8. Enables Net8 to use data-stream encryption and checksum operations.*
- *Prevents data from being read during transmission.*
- *Supports 3rd party security servers such as Kerberos (user authentication) services that support single sign-on.*
- *Supports token authentication via DCE and biometric authentication.*
- *Advanced security must be installed on client and server.*

Understand Data Encryption and Cryptographic Check Summing

- *(data integrity) client and server and it's corresponding sqlnet.ora parameters.*
- *Know the Network authentication process, types and corresponding sqlnet.ora and init.ora parameters.*

Differences

- *Data integrity(disrupted data), Privacy(stolen data) and Authorization.*

Which security risk are you guarding against in your system by ensuring that data is not altered or disrupted during transfer?

- A. data privacy
- B. authorization
- C. authentication
- D. data integrity

Reference

Question:
Which security risk are you guarding against in your system by ensuring that data is not altered or disrupted during transfer?

Answer:
(D) data integrity

Reference:
Enterprise DBA Part 3: Network Administration - Security in the Network Environment
Oracle8i Network Administration: Net8 Architecture and Basic Configuration - TBT - Unit 3, Lesson 1, Topic 2: Network Security Risks

There are four elements that must be secured in a networked environment: data privacy, data integrity, authentication, and authorization. Data integrity ensures that data is not modified or disrupted during transmission.

Networking

Net 8 Architecture Layers

MAKE SURE YOU KNOW THE ORDER OF EVENTS

- *Application - forms, sqlplus, GUI*
- *OCI - code to initiate a sql dialog (parse, execute, fetch, cursors)*
- *TTC – two task common layer performs data-type and character conversion*
- *TNS – Transport network substitute layer provides common interface to industry standard protocols and handles interrupts. Supports encryption and enforces security.*
- *OPA – Oracle Protocol Adapter responsible for mapping protocols.*
- *Protocols – Responsible for transmitting data from client to server.*

Networking

Connection Manager (CMAN)

Definition

- *Allows large number of users to access a single server process. Only available for TCP/IP. Normally installed on middle-tier. Add'l clients connecting through Connection Manager use the same connection as initial one. Passes info from clients and servers on different protocols. Provides filtering / firewall capabilities via Network Access Control.*

Understand components and options

- *Understand CMAN utility options and settings.*
- *Distinguish between Connection Concentration, Multiple Protocol Support, and Network Access. Specified in definition.*

Restrictions

- *Can't use Connection Concentration with Connection Pooling*
Set in MTS_DISPATCHERS parameter of init.ora - (mul=on) or (pool=on)

Networking

Diagnose Log and Trace files

Know steps used to analyze a log file

- Review most recent TNS error. Last entry in the log file*
- Locate first non-zero error code in the report (bottom of file identifies actual cause of network error).*
- Continue up the errors until you find the correct error*
- If cause isn't clear, turn on tracing.*

Know how to analyze a trace file using the trace assistant utility.

- Used for analyzing trace files in a readable format where `trace_levels=support`*
- Analyzes events that occur at the OCI and TTC layers*
- Understand syntax: `trcasst -odt -e -s trace 1`*
- Understand trcasst options*

Networking Sessions

Bequeath Session

- *Listener spawns a dedicated server process and passes or bequeaths the connection request to the server process. Less resources used.*

Redirect Session

- *Listener redirects the connection request to a pre-spawned dedicated server process. “prespawn_max” parameter in listener.ora file. Redirect reduces connection time but uses more resources*

Redirect session to dispatcher (MTS)

- *Listener redirects the connection request to a dispatcher server process. Dispatcher allocates/deallocates shared server processes to clients. Shared Server (new name) was modified in Oracle 9i (listener passes the client connection socket to the dispatcher as opposed to creating a new connection from the client. Minimizes number of network messages).*

What will I be expected to know for each exam?

- *9i New Features for Administrators*
- *Architecture and Administration*
- *Backup and Recovery*
- *Tuning*
- *Networking*
- **SQL – PL/SQL**

SQL – PL/SQL

Sub - Query

Definition

- *A select statement that is embedded in a clause of another SQL statement. Used in Where, Having, and From clause.*

3 types of sub-queries

- *Single-row sub-query – returns one value from the specified table. Error occurs if no rows are returned or more than one row's returned*
- *Multiple-row sub-query – returns values from one or more rows in the specified table.*
- *Multiple-column sub-query – returns more than one column from the inner select statement*

Guidelines

- *Use parenthesis*
- *Place subquery on right side of comparison operator*
- *Can't have an order by clause in a sub - query (TBT – Oracle SQL Data Retrieval: Unit: 3, Lesson: 1, Topic: 2, Page 18).*
- *Use single row operators with single row sub-queries: <, >, =, <=, =>, < >*
- *Account for possibility of null values in inner query (Use NVL function with zero value to avoid errors).*
- *All sub - queries raise an error if no values are returned*

Click the EXHIBIT button and examine the INVENTORY table.

Evaluate this SQL statement:

```
SELECT sales_rep
FROM manufacturer
WHERE manufacturer_id =
  (SELECT manufacturer_id
   FROM inventory
   WHERE description = 'Plaster'
   OR description = 'Cotton');
```

This statement fails when executed. Which change will correct the problem?

- A. Remove the subquery WHERE clause.
- B. Change the outer query WHERE clause to "WHERE manufacturer_id IN".
- C. Change the outer query WHERE clause to "WHERE manufacturer_id LIKE".
- D. Change the subquery WHERE clause to "WHERE description IN('Plaster', 'Cotton')".
- E. Change the subquery WHERE clause to "WHERE description LIKE 'Plaster' OR description LIKE 'Cotton'".

ID_NUMBER	DESCRIPTION	MANUFACTURER_ID	QUANTITY	PRICE	ORDER_DATE
25025	Ribbon	sundel0525	255	2.03	10-JUN-1997
25027	Chain	goodis0626	633	0.25	11-OCT-1996
25023	Cable	belsot0426	845	8.01	19-APR-1997
25028	Felt	packex0122	987	1.21	30-OCT-1996
32081	Vinyl Sheets	tranly0804	587	27.21	31-JAN-1997
32096	Cotton	packex0122	695	8.43	25-JUL-1997
25026	Plaster	wallpp0925	246	10.21	11-SEP-1997
45025	Copper Wire	ejmadb0225	8510	8.25	15-SEP-1997

Reference

This statement fails when executed. Which change will correct the problem?

Answer:
(B) Change the outer query WHERE clause to "WHERE manufacturer_id IN".

Reference:
Introduction to Oracle: SQL and PL/SQL - Subqueries
Oracle SQL: Data Retrieval - TBT - Unit 3, Lesson 3, Topic 1: Multiple-Row Subqueries: Guidelines

This statement fails because the subquery returns multiple rows which cannot be compared to a single value with the equality operator (=) in the outer query. The outer query WHERE clause must be changed to "WHERE manufacturer_id IN".

SQL – PL/SQL

Create Table As Select (CTAS)

Definition

- Copies the structure of one table to another table or to copy the structure and values from one table to a new table.

Syntax

```
CREATE TABLE emp  
AS  
SELECT * FROM dept  
WHERE 1=2;
```

```
CREATE TABLE emp  
(empno NUMBER(4),  
empname VARCHAR2(13))  
AS  
SELECT empno, empname  
FROM dept;
```

Restrictions / Rules

- New table only inherits not null constraints
- Always name the same attribute consistently in different tables
- Name must NOT contain schema name

SQL – PL/SQL

Simple / Complex Views

Definition

- Gives users info without directly accessing the base tables where the data is stored.
- Simple View – derive data from only ONE table and cannot contain group functions. Allows for DML activity.
- Complex View – derive data from multiple tables and can contain functions. Limited DML

Understand syntax and options

- (force|noforce), with check option constraint emp_pk, with read only....etc;

Familiarize yourself with user_views

- (select view_name, text from user_views)

Know restrictions

- For DML operations in complex views

SQL – PL/SQL

Index Rules and Recommendations

Definition

- *Two types of indexes: Unique and Non-Unique*
- *Unique – Server automatically creates a unique index when you create a primary key or unique key constraint. The index adopts the same name as the constraint.*
- *Non-Unique requires manual creation*
- *Know different indexes: B-Tree, Bitmap, Reverse-Key, Bitmap-Join (9i feature), Partitioned, Clustered, Hash, Snow Flake, Star, IOT,...etc;*

Rules/Recommendations

- *Can contain up to 32 columns in a composite index*
- *Create an index that is frequent in where clause / join condition*
- *Create a concatenated index when two or more columns are used together*
- *Create indexes on large tables where most queries retrieve less than 5% of rows. Oracle rule - you don't have to agree with. However, might be tested on it. Exam claims that you can't convert a dictionary managed tablespace to a LMT. Use the `DBMS_SPACE_ADMIN.TABLESPACE_MIGRATE_TO/FROM_LOCAL` procedure. Available in Oracle 8.1.6*
- *Can't modify an index but you can remove it.*
- *No `pct_used` in an index, only `pct_free`*
- *Don't create indexes on small tables, frequently updated tables, or rarely used columns.*

SQL – PL/SQL

Exceptions

Definition

- Named internally or by user. Terminates a block or traps and handles an exception.

Three types of exceptions

- **Predefined** - zero-divide, `storage_error`, about 20, not declared by user. Raised (implicitly) by oracle server. `No_Data-Found`, `Too_Many_Rows`, `Invalid_Cursor`, `Login_Denied...etc`;
- **Non-Predefined** – Handled by server(implicit). Named by developer. Declared by users in pl/sql block. Name the error before you trap and handle it.
 - 1. Declare exception – `exception_name exception`.
 - 2. Associate declared exception with error # - `pragma exception_init (e_emp_dupl, -2239)`
- **User defined exceptions** –
 - 1. Declare name of exception – `e_emp exception`,
 - 2. Raise exception – `If sql%notfound RAISE e_emp end if;` 3. Exception when `e_emp` then

Know guidelines for each exception type and additional components

- `Raise_Application_Error = -20,000,-20,999`

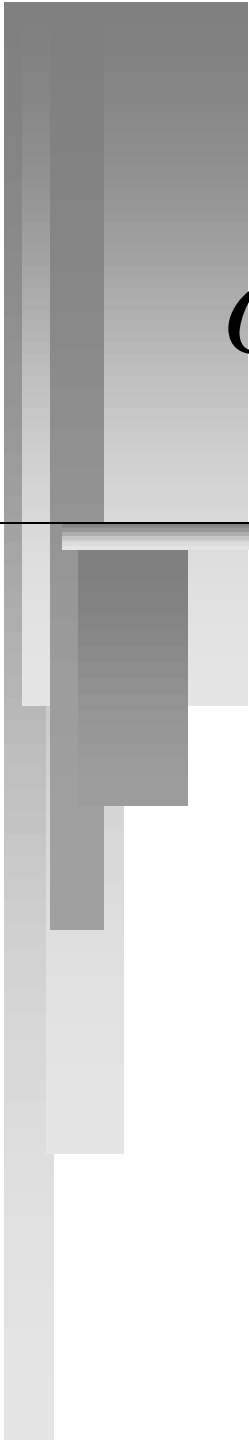
References

Books and Software:

- *Oracle Technical Based Training (TBT) OCP Bundle*
- *Oracle Professional Jan 2002- Pinnacle*
- *Self-Test Software*

Web Sites:

- <http://www.dbdomain.com>
- <http://metalink.oracle.com>
- <http://www.elementkjournals.com>
- <http://searchdatabase.techtarget.com/>
- <http://www.oracle.com/education/certification>
- <http://www.examnotes.com>
- <http://www.oracle.com/oraclemagazine>
- <http://www.lazydba.com>



Oracle Certification Preparation (OCP) / Hidden Treasures

ANY QUESTIONS ?

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