

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A. (5 th Semester)

Proposed Syllabus

Paper : 503 : Distributed Databases

Effective From June 2011

- 1. Distributed Database Concepts**
 - 1.1 Introduction & Recent Trends in Distributed Databases
 - 1.2 Distributed Database Architecture
 - 1.3 Database Links
 - 1.4 Distributed Database Administration
 - 1.5 Transaction Processing in a Distributed System
 - 1.6 Distributed Database Application Development
 - 1.7 Character Set Support for Distributed Environments
- 2 Managing a Distributed Database**
 - 2.1 Managing Global Names in a Distributed System
 - 2.2 Creating Database Links
 - 2.3 Using Shared Database Links
 - 2.4 Managing Database Links
 - 2.5 Viewing Information About Database Links
 - 2.6 Creating Location Transparency
 - 2.7 Managing Statement Transparency
 - 2.8 Managing a Distributed Database: Examples
- 3 Developing Applications for a Distributed Database**
 - 3.1 Managing the Distribution of Application Data
 - 3.2 Controlling Connections Established by Database Links
 - 3.3 Maintaining Referential Integrity in a Distributed System
 - 3.4 Tuning Distributed Queries
 - 3.5 Characterization of Query Processors
 - 3.6 Layers of Query Processing
 - 3.7 Handling Errors in Remote Procedures
- 4 Replication**
 - 4.1 Synchronous Replication
 - 4.2 Asynchronous Replication
 - 4.3 Peer-to-Peer Replication
 - 4.4 Primary Site Replication
 - 4.5 Implementing the Capture & Apply steps
- 5 Distributed Transaction Concepts**
 - 5.1 What Are Distributed Transactions?
 - 5.2 Transaction Properties
 - 5.3 Session Trees for Distributed Transactions
 - 5.4 Two-Phase Commit Mechanism
 - 5.5 In-Doubt Transactions
 - 5.6 Distributed Transaction Processing: Case Study
- 6 Managing Distributed Transactions**
 - 6.1 Specifying the Commit Point Strength of a Node
 - 6.2 Naming Transactions
 - 6.3 Types of Transactions - Flat, Nested & Workflows
 - 6.4 Viewing Information About Distributed Transactions

- 6.5 Deciding How to Handle In-Doubt Transactions
- 6.6 Manually Overriding In-Doubt Transactions
- 6.7 Purging Pending Rows from the Data Dictionary
- 6.8 Manually Committing an In-Doubt Transaction: Example
- 6.9 Data Access Failures Due to Locks
- 6.10 Simulating Distributed Transaction Failure
- 6.11 Managing Read Consistency
- 7 Database Security**
 - 7.1 Site Autonomy
 - 7.2 Distributed Database Security
 - 7.2.1 Authentication through database links
 - 7.2.2 Authentication without passwords
 - 7.2.3 Supporting user accounts and roles
 - 7.2.4 Centralized user and privilege management
 - 7.2.5 Data encryption
 - 7.3 Auditing Database Links
 - 7.4 Administration Tools

References :

- 1 Oracle Database Administration Guide 10G Version 1
- 2 Principles of Distributed Database Systems : M. Tamer Ozsu, Patrick Valduriez, Pearson Education
- 3 Database Management Systems - 2nd Edition : Raghu Ramakrishnan, Johannes Gehrke, MGH
- 4 Managing Distributed Databases - Building Bridges between Database Islands: Donald K Burlison

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Proposed Syllabus

Paper : 504 : Advanced Database Administration

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1. Oracle10g Instance creation and management

- 1.1 Oracle Instance
- 1.2 Installing Oracle
- 1.3 Oracle Optimal Flexible Architecture (OFA)
- 1.4 Locating initialization, listener.ora & sqlnet.ora files
- 1.5 Finding the alert log
- 1.6 Common environment variables
- 1.7 Structures in an Oracle Instance
- 1.8 Oracle Memory Structures, SGA and PGA
- 1.9 Oracle Processes and their purposes
- 1.10 Startup nomount, mount and open database commands

2. Oracle10g Database Architecture

- 2.1 Oracle10g management framework
- 2.1 Using the Database Creation Assistant (DBA)
- 2.3 Creating and dropping a database
- 2.4 Tablespaces
- 2.5 Tables and Indexes
- 2.6 Clusters
- 2.7 Partitioning of Tables and Indexes
- 2.8 Gathering and applying patches

3. Concurrency Management

- 3.1 Transactions, serialization, locks and latches
- 3.2 Lock modes
- 3.3 Detecting and resolving lock conflicts
- 3.4 Managing deadlocks

4. Interfacing with Oracle

- 4.1 Oracle transaction management
- 4.2 Using SQL*Plus and iSQL*Plus
- 4.3 Using embedded Oracle with Pro*C & Java
- 4.4 PL/SQL & Triggers
- 4.5 Pining PL/SQL packages & compiling PL/SQL
- 4.6 System-level triggers – startup trigger, logon trigger, PL/SQL error trigger

5. Oracle*Net

- 5.1 Basic Network structure
- 5.2 Oracle*Net Files
- 5.3 Multi-threaded server
- 5.4 Create additional listeners
- 5.5 Create Oracle Net service aliases

- 5.6 Configure connect time failover
- 5.7 Oracle*Net names resolution

6. Tablespace Management Overview

- 6.1 Dictionary Managed Tablespaces
- 6.2 Locally Managed Tablespaces
- 6.3 Automatic Segment Space Management
- 6.4 Moving tablespaces online and offline

7. UNDO Tablespace Management

- 7.1 Use of undo segments
- 7.2 Creating an undo tablespace
- 7.3 User managed undo tablespaces
- 7.4 Automatic undo management
- 7.5 Monitor & Configure undo retention
- 7.6 Use the Undo Advisor
- 7.7 Size the undo tablespace

8. Oracle Utilities

- 8.1 Datapump - Import/export
- 8.2 SQL*Loader
- 8.3 Oracle Streams
- 8.4 Automatic Database Diagnostic Monitor
- 8.5 Automatic Tuning Optimizer
- 8.6 Automatic Shared Memory Tuning

9. Oracle Performance Tuning

- 9.1 Locate invalid and unusable objects
- 9.2 Gather SQL optimizer statistics with dbms_stats
- 9.3 Basic Oracle performance metrics
- 9.4 Use OEM and dbms_alert to set warning and critical alert thresholds
- 9.5 The SQL Tuning Advisor
- 9.6 The SQL Access Advisor
- 9.6 Interpreting server generated alerts
- 9.7 Oracle advisory utilities v\$db_cache_advice, v\$shared_pool_advice
v\$pga_aggregate_target_advice
- 9.8 Using OEM performance screens
- 9.9 Fixing performance issues

10. User Management

- 10.1 Creating Users
- 10.2 Altering users
- 10.3 User Profiles
- 10.4 User resource groups
- 10.5 Granting privileges & roles
- 10.6 Auditing user activity with dbms_audit

11. Oracle Security

- 11.1 Password use in Oracle
Password encryption and password aging
External authentication
Using Single sign-on (SSO)

- 11.2 Object security
- 11.3 Virtual Private Databases (VPD) in Oracle
- 11.4 Oracle “grant execute” security
- 11.5 Use of Roles in Oracle
- 11.6 Register for security updates

12. Backup & Recovery

- 12.1 Oracle backup & recovery planning
- 12.2 Parallel instance recovery
- 12.3 Basics of checkpoints, redo log files, and archived log files
- 12.4 Using ARCHIVELOG mode
- 12.5 Creating consistent Oracle backups
- 12.6 Online hot backups
- 12.7 Incremental Oracle backups
- 12.8 Automating database backups with dbms_scheduler
- 12.9 Monitor the flash recovery area
- 12.10 Recovering from loss of a Control file
- 12.11 Recovering from loss of a Redo log file
- 12.12 Recovering from loss of a system-critical data file
- 12.13 Recovering from loss of a non system-critical data file

REFERENCES

1. Rick Greenwald, Robert Stackowiak, Jonathan Stern : Oracle Essentials : Oracle Database 10g – O’Reilly
2. Gavin Powell : Oracle High Performance Tuning for 9i and 10g – Digital Press
3. Loney, Kevin, Bryla, Bob : Oracle Database 10g, DBA Handbook – Oracle Press
4. Loney, Kevin : Oracle Database 10g The Complete Reference – Oracle Press
5. Micheal Abbey, Ian Abramson Oracle Database 10g: A Beginner’s Guide – Osborne Oracle Press Series

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Proposed Syllabus

Paper : 505 : Data ware Housing and Data mining

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- 1. Introduction**
 - 1.1 Data Warehouse characteristics
 - 1.2 Data Marts

- 2. Online Analytical Processing**
 - 2.1 OLTP and OLAP systems
 - 2.2 Star schema for multidimensional view
 - 2.3 Multifact star schema or snow flake schema
 - 1.4 OLAP Tools

- 3. Developing A Data Warehouse**
 - 3.1 Building a Data Warehouse
 - 3.2 Architectural strategies & Design issues
 - 3.3 Data Content
 - 3.4 Metadata
 - 3.5 Distribution of data
 - 3.6 Tools for Data Warehousing
 - 3.7 Performance considerations

- 4. Data Mining**
 - 4.1 Introduction
 - 4.2 Data Description
 - 4.2.1 Clustering
 - 4.2.2 Link Analysis
 - 4.3 Predictive Data Mining
 - 4.3.1 Classification
 - 4.3.2 Regression
 - 4.3.3 Time Series
 - 4.4 Models & Patterns
 - 4.4.1 Decision Trees
 - 4.4.2 Multivariate adaptive regression splines
 - 4.4.3 Rule Induction
 - 4.4.4 K-nearest neighbour and memory based reasoning
 - 4.4.5 Logistic regression
 - 4.4.6 Discriminant Analysis
 - 4.4.7 Generalized Adaptive models
 - 4.4.8 Genetic algorithms
 - 4.4.9 Pattern Structures
 - 4.4.9.1 Patterns in Data Matrices
 - 4.4.9.2 Patterns for Strings

- 5 Applications of Data Warehousing and Data Mining**
- 6. At least two case studies of Data Mining**

REFERENCES

1. R. Kinball: Data Warehouse Toolkit – John Wiley & Sons
2. Efram G. Mallach : Decision Support and Data Warehouse Systems – TMH
3. Paulraj Pulliah : Data Warehousing Fundamentals – Wiley
4. S. Anahory & D. Murray: Data Warehousing in the real world – Addison Wesley
5. R. Kinball, L.Reeves : The Data Warehouse Lifecycle Toolkit – John Wiley & Sons
6. David Hand, Heikki Mannila,Padhraic Smyth : Principles of Data Mining-PHI
7. C.S.R.Prabhu : Data Warehousing – PHI
8. Hillol Kargupta, Anupam Joshi, Yelena Yesha, Krishnamoorthy Sivakumar : Data Mining Next Generation Challenges & Future Directions – PHI
9. Jiawei Han, Micheline Kamber : Data Mining Concepts & Techniques
10. Dunham : Data Mining Introductory and Advanced Topics - Pearson