Database Foundations

1-5
Database Storage Structures
Roadmap

About the Course

Introduction to Databases

Types of Database Models

Relational Databases

Database Storage Structures

Understanding Business Requirements

You are here
Objectives

This lesson covers the following objectives:

• Understand database data storage

• Define logical structures
  – Data blocks
  – Extents
  – Segments
  – Tablespaces
Objectives

After completing this lesson, you should be able to:

• Define physical storage structures
  – Data files
  – Control files
  – Online redo log files
Database Data Storage

- Data storage is one of the essential tasks of the database.
- The database has physical structures and logical structures.
Introduction to Logical Structures

- Oracle Database allocates logical space for all data in the database.
- There are four logical units of database space allocation:
  - Data blocks
  - Extents
  - Segments
  - Tablespaces
Data Blocks

- A data block is the smallest logical storage unit of a database.
- A single data block represents a specific number of bytes on the physical hard disk.
- The size of a data block is generally a multiple of the operating system block size.
Extents

An extent is a logical unit of database storage space allocation made up of contiguous data blocks.
Segments
Tablespaces

Oracle Database stores data logically in tablespaces and physically in data files associated with the corresponding tablespace.
Introduction to Physical Storage Structures

• An Oracle database is a set of files that store Oracle data in persistent disk storage.

• The following database files are generated:
  – Data files and temp files
  – Control files
  – Online redo log files
Data Files
Control Files

• The database control file is a small binary file associated with only one database.

• A control file contains the following type of information:
  – Database name and database unique identifier (DBID)
  – Time stamp of database creation
  – Information about data files and online redo log files
  – Tablespace information
  – Current log sequence number
  – Metadata that must be accessible when the database is not open
Online Redo Log Files

• Every instance of an Oracle database has an associated redo log to protect the database in case of an instance failure.

• The redo log for each database instance is also referred to as a redo thread.
Summary

In this lesson, you should have learned how to:

• Describe database data storage

• Define logical structures
  – Data blocks
  – Extents
  – Segments
  – Tablespaces
Summary

In this lesson, you should have learned how to:

• Define physical storage structures:
  – Data files
  – Control files
  – Online redo log files