



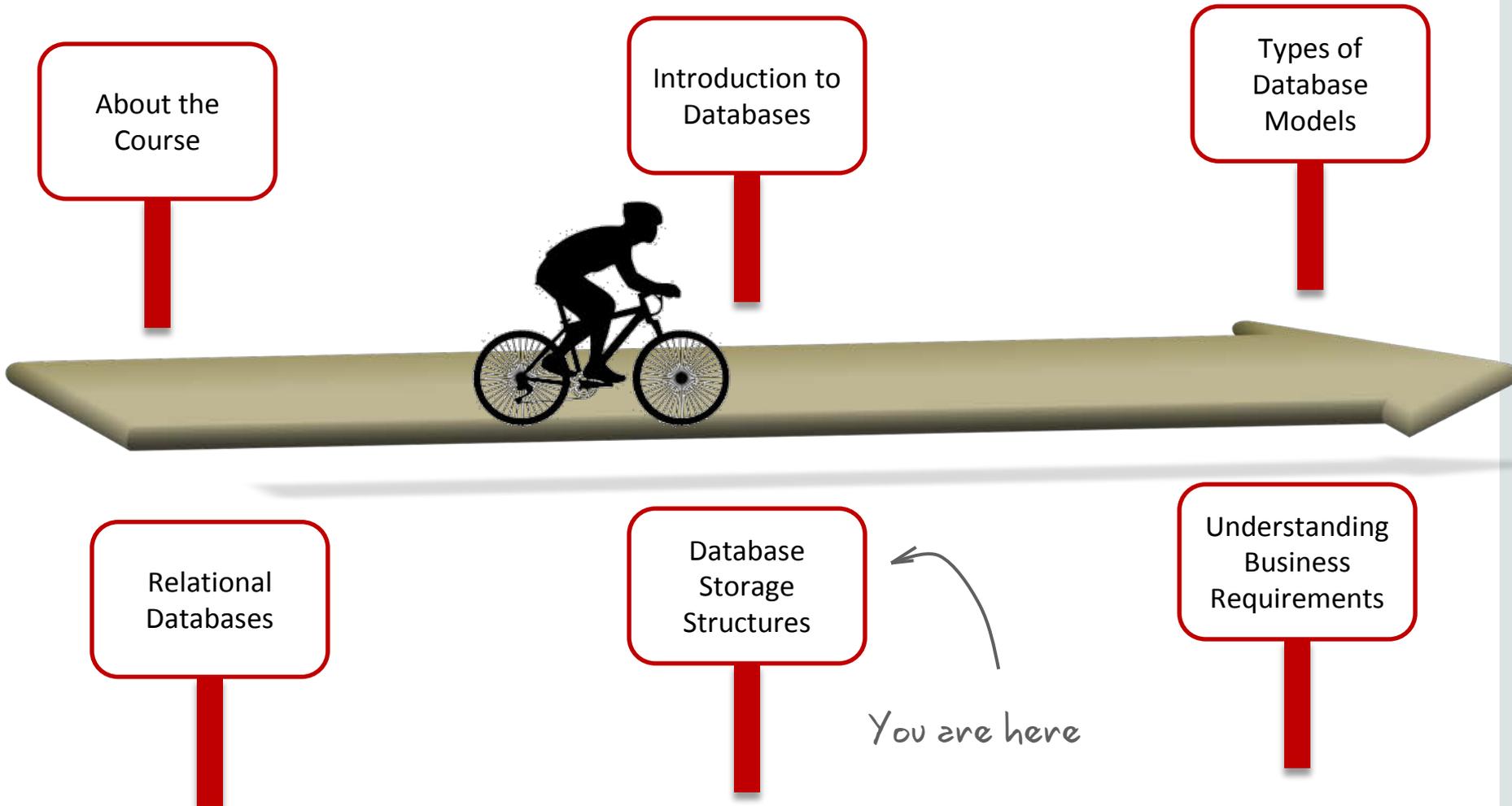
# Database Foundations

1-5

Database Storage Structures



# Roadmap



# Objectives

This lesson covers the following objectives:

- Understand database data storage
- Define logical structures
  - Data blocks
  - Extents
  - Segments
  - Tablespaces



# Objectives

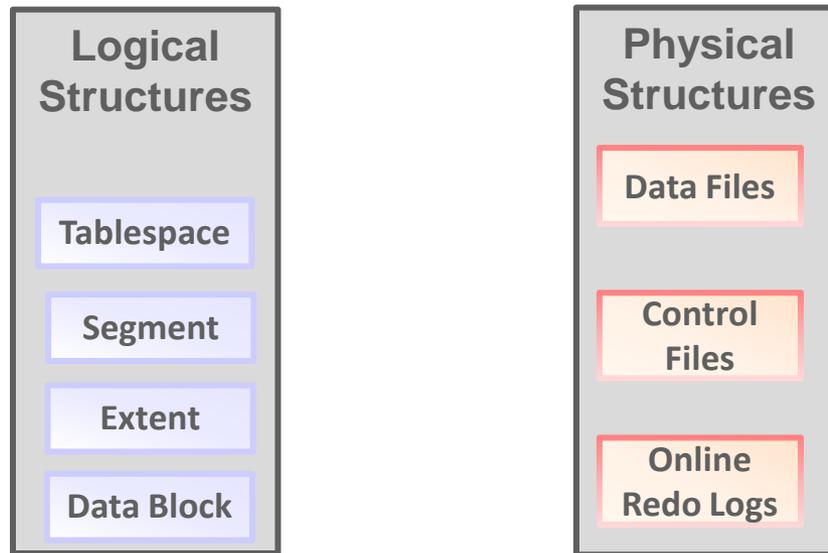
After completing this lesson, you should be able to:

- Define physical storage structures
  - Data files
  - Control files
  - Online redo log files



# Database Data Storage

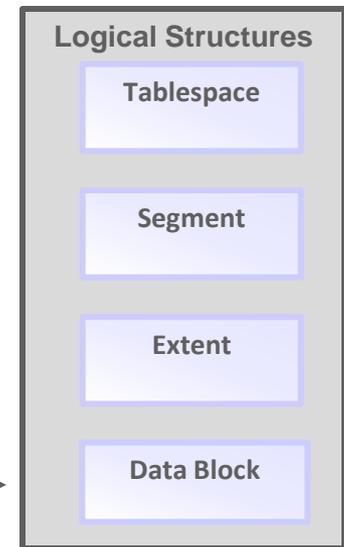
- Data storage is one of the essential tasks of the database.
- The database has physical structures and logical structures.



# Introduction to Logical Structures

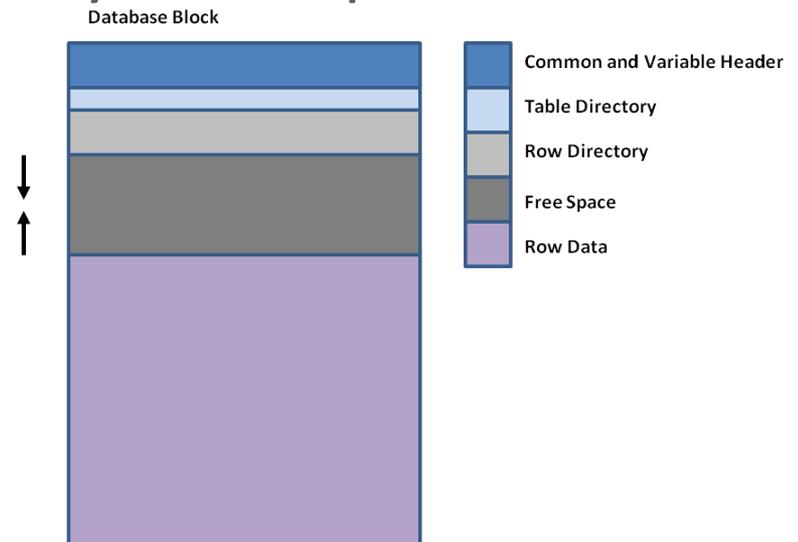
- Oracle Database allocates logical space for all data in the database.
- There are four logical units of database space allocation:
  - Data blocks
  - Extents
  - Segments
  - Tablespaces

*Finest level of granularity*



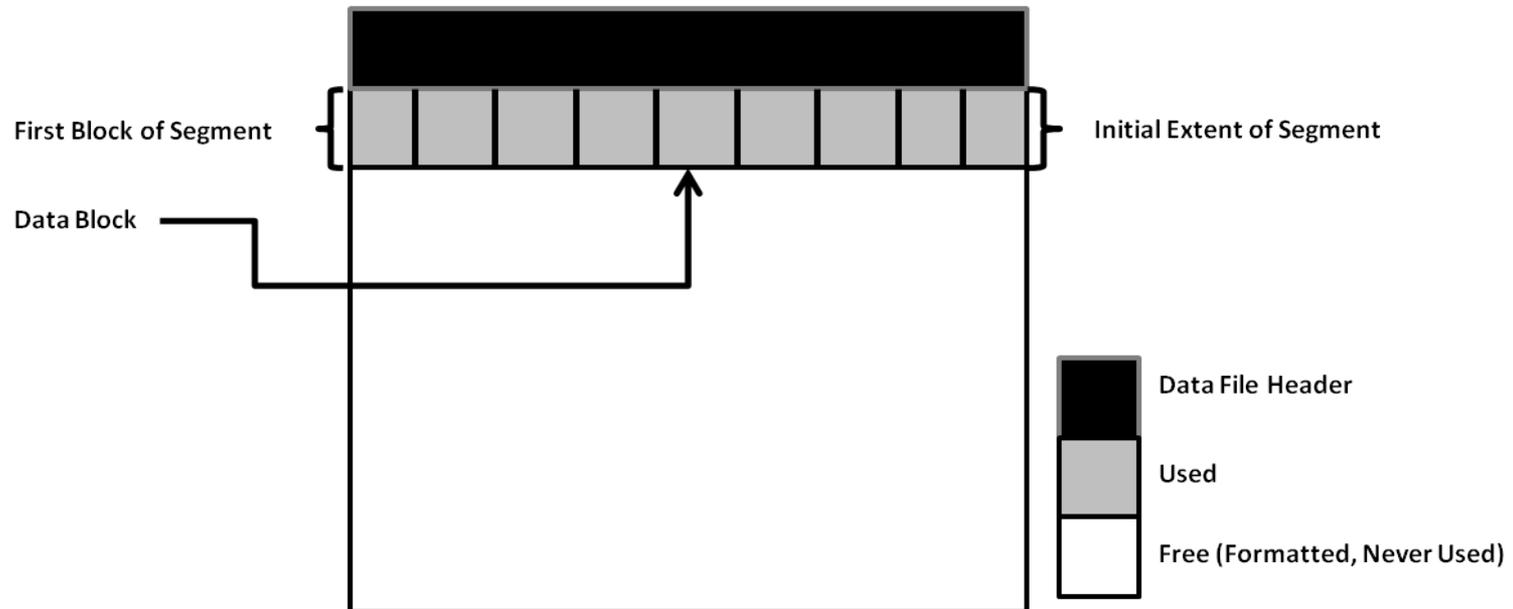
# Data Blocks

- 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.

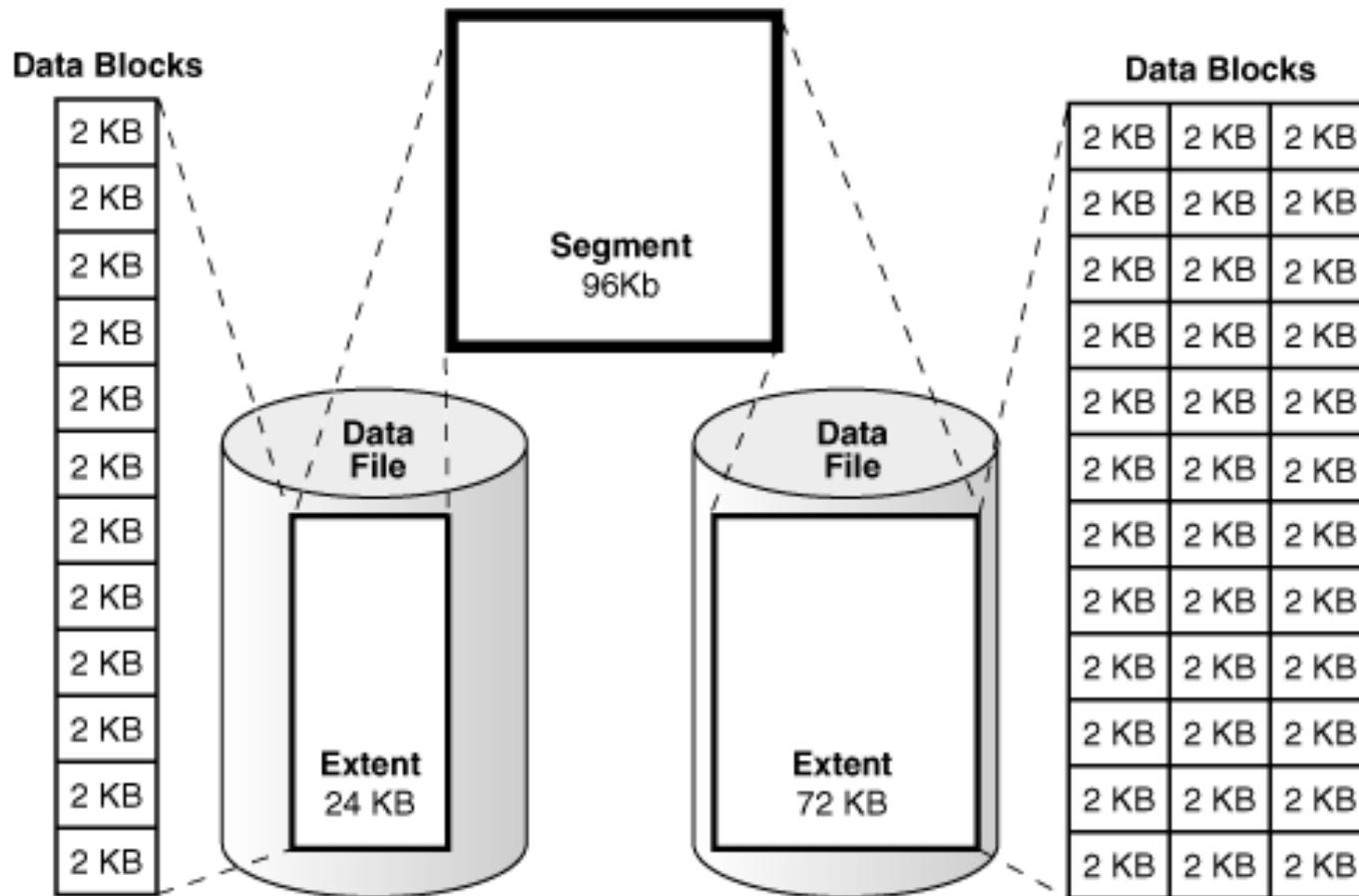


# Extents

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

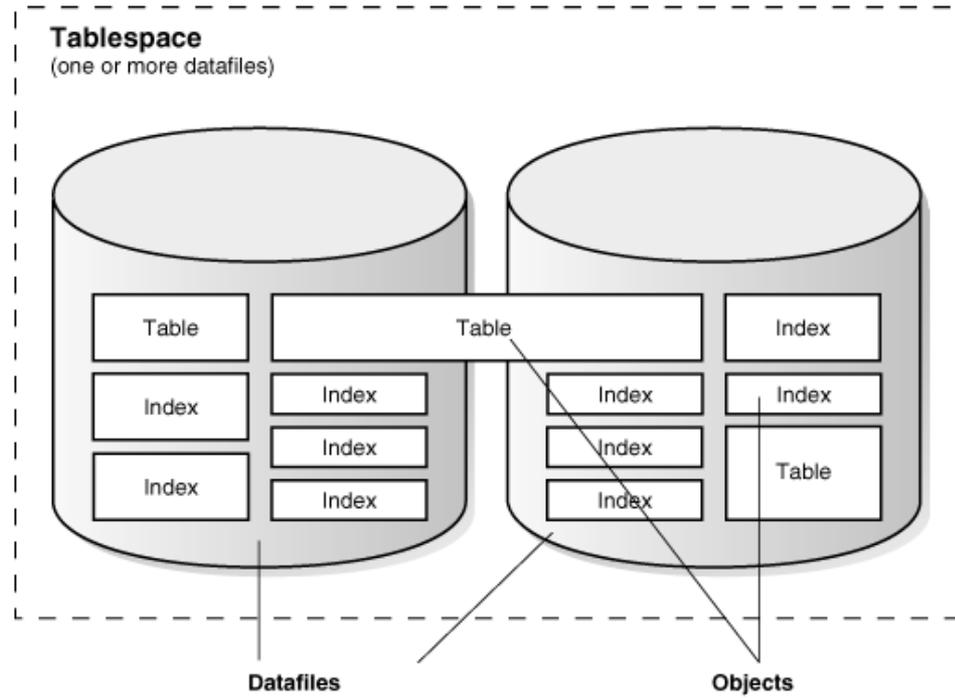


# Segments



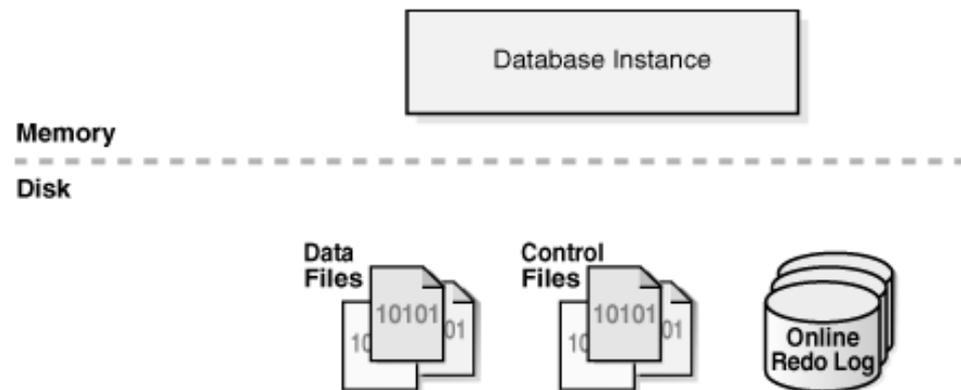
# Tablespaces

Oracle Database stores data logically in tablespaces and physically in data files associated with the corresponding tablespace.

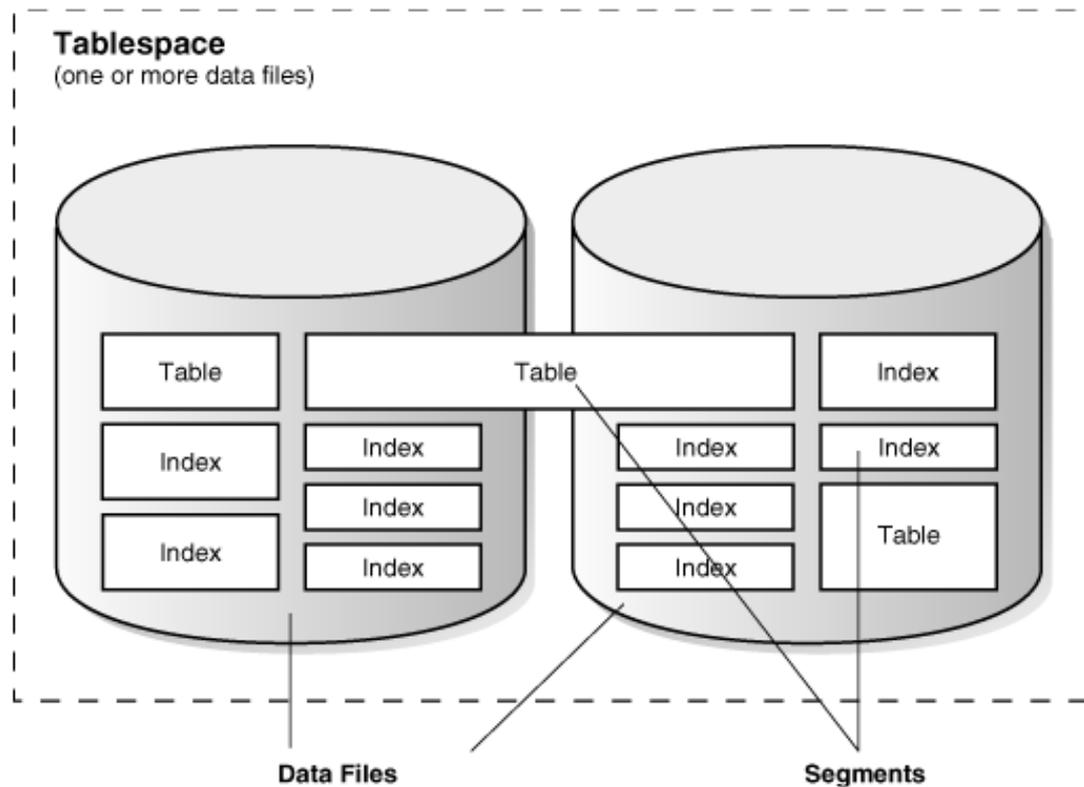


# Introduction to Physical Storage Structures

- 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

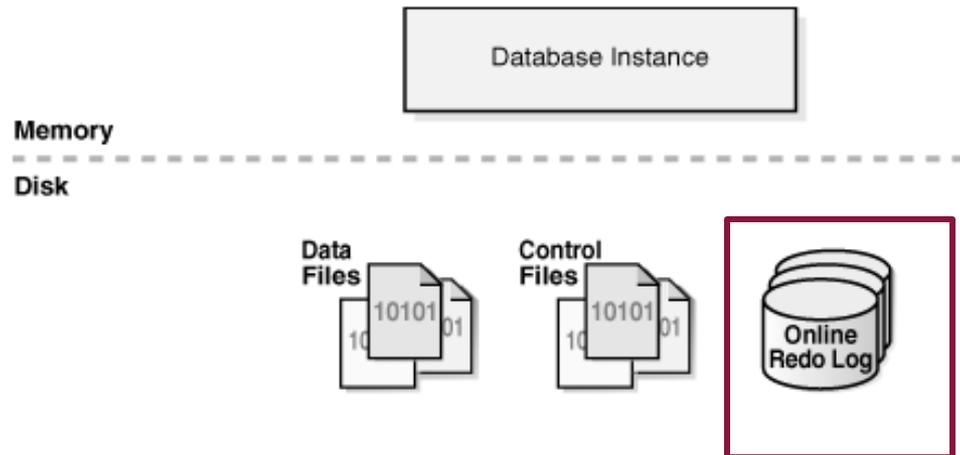


# Control Files

- 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



