Overview of RDBMS

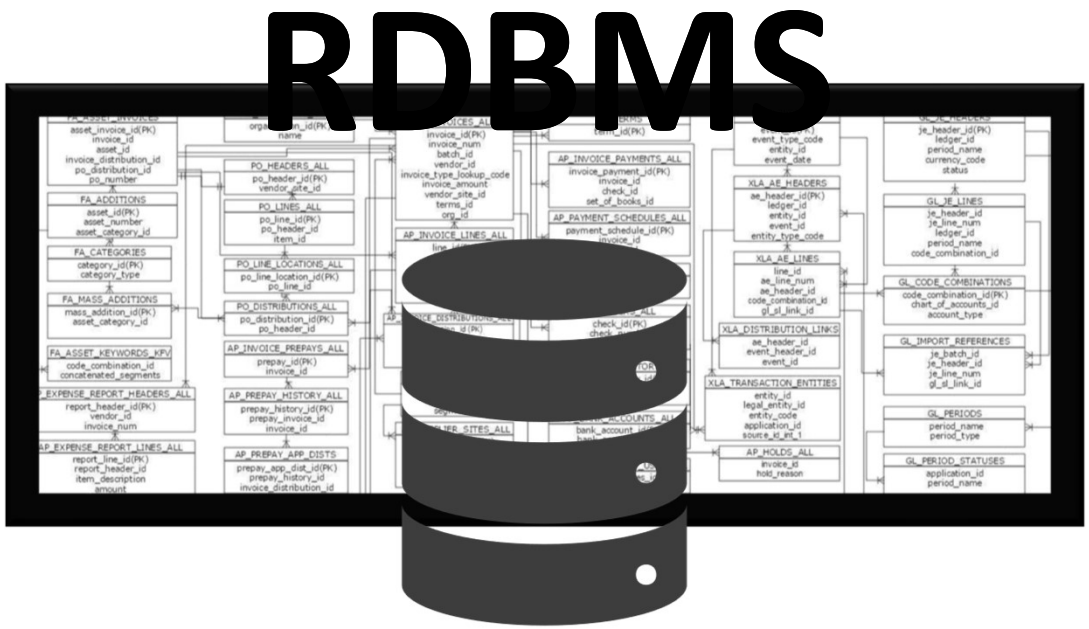
By Ahmed Baraka

Objectives

In this lecture, you will learn how to perform the following:

- Describe the Relational Database Management Systems RDBMS and their features
- Describe Structured Query Language (SQL)
- List some known RDBMS products in the market
- Understand the difference between 2-tier, 3-tier, and n-tier architectures
- Describe the application types

What is Relational Database Management System?



RDBMS Features

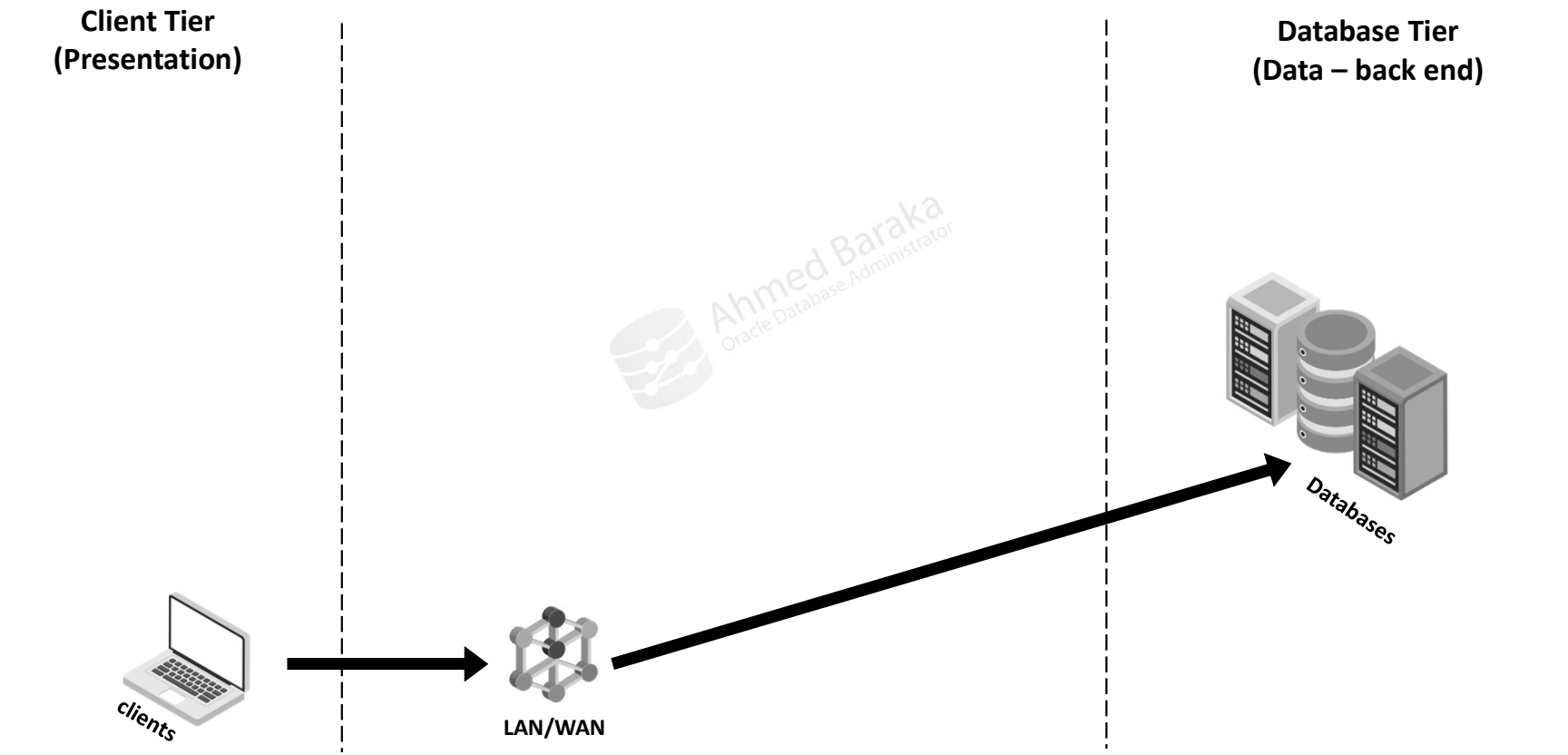
- Storing structured data
- Supports data structure and data manipulation commands (SQL)
- Table relationships
- Multiple users
- Concurrent transactions
- Data integrity
- Locking mechanisms
- Data Consistency
- Provides data security

About Structured Query Language (SQL)

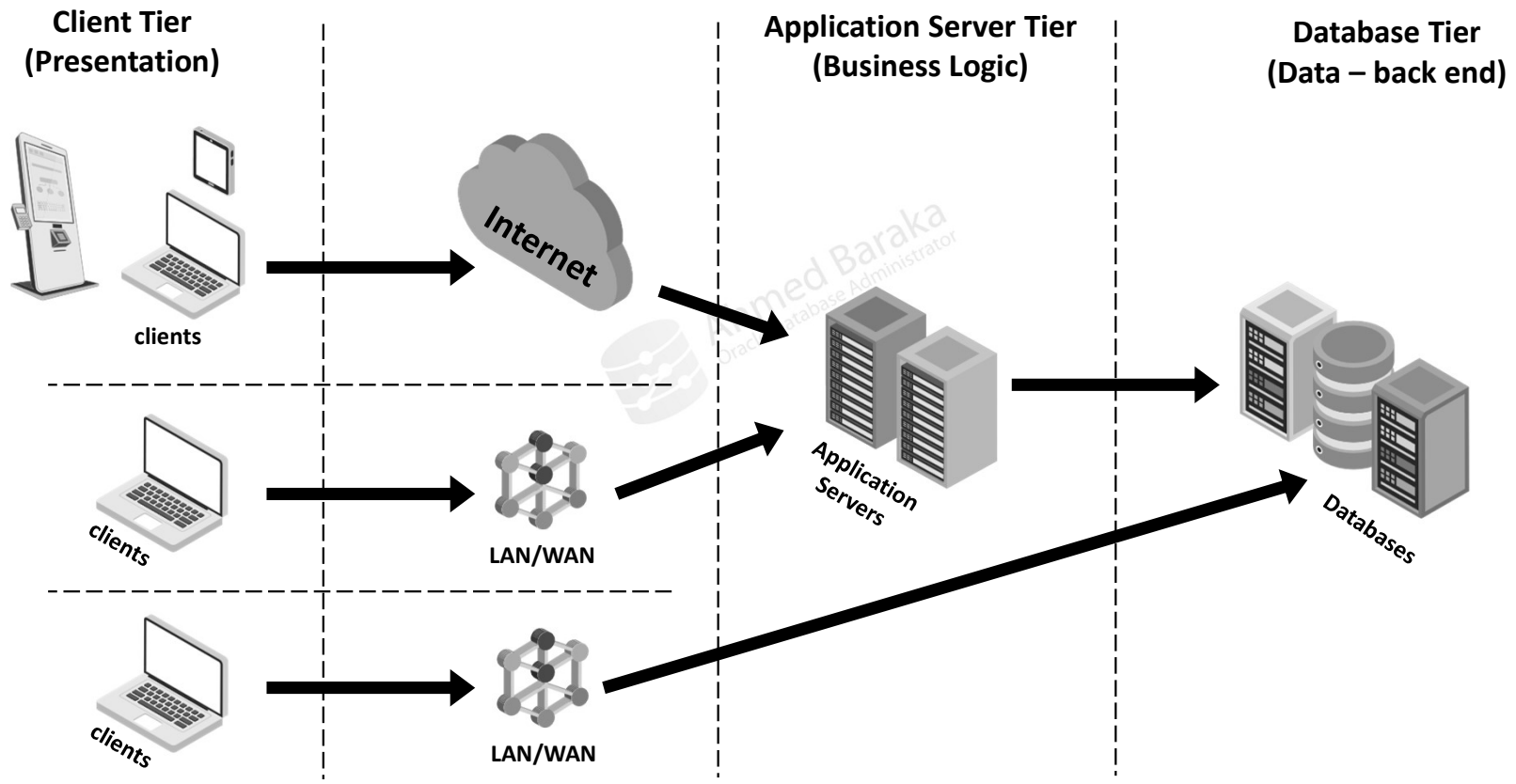
- Structured Query Language (SQL)
  - Query command **`SELECT`**
  - Data Manipulation Language DML: **`INSERT`**, **`UPDATE`**, **`DELET`**, **`MERGE`**
  - Data Definition Language DDL: **`CREATE`**, **`ALTER`**, **`DROP`**
- Interfaces for Oracle databases:
  - SQL*Plus
  - SQL Developer
  - ODBC
  - JDBC
  - Programming Language APIs

Known RDBMS Products

Client Server Architecture (2-tier)



Client Server Architecture (2-tier, 3-tier, n-tier)



Application Types

- **Online Transaction Processing (OLTP)**
  - Retrieve few rows for update or insert few rows
  - Examples: order entry, ATM, online banking, sales entry point, ticketing…etc
- **Decision Support Systems (DSS)**
  - Equivalent to Online Analytical Processing OLAP
  - Retrieve high number of rows for read/mostly operations or load bulk of rows
  - Examples: Business Intelligence (BI) and Reporting tools
- **General purposes / Hybrid**

Comparison between Application Types

	Warehouse	OLTP
Workload Characteristics	Ad hoc queries	Predefined operations
Data modifications	Mostly by ETL	Routine DML statements
Schema design	Denormalized	Normalized
Data retrieval size	Thousands or millions of rows	A dozens of rows
Historical data retention period	Many years	A few weeks or months
Concurrency	Low	High

Oracle Database and NoSQL Databases

- **Oracle database** is not a No-SQL Database
- **Oracle NoSQL Database** is available

Summary

In this lecture, you should have learnt how to perform the following:

- Describe the Relational Database Management Systems RDBMS and their features
- Describe Structured Query Language (SQL)
- List some known RDBMS products in the market
- Understand the difference between 2-tier, 3-tier, and n-tier architectures
- Describe the application types