Introduction to SQLServer
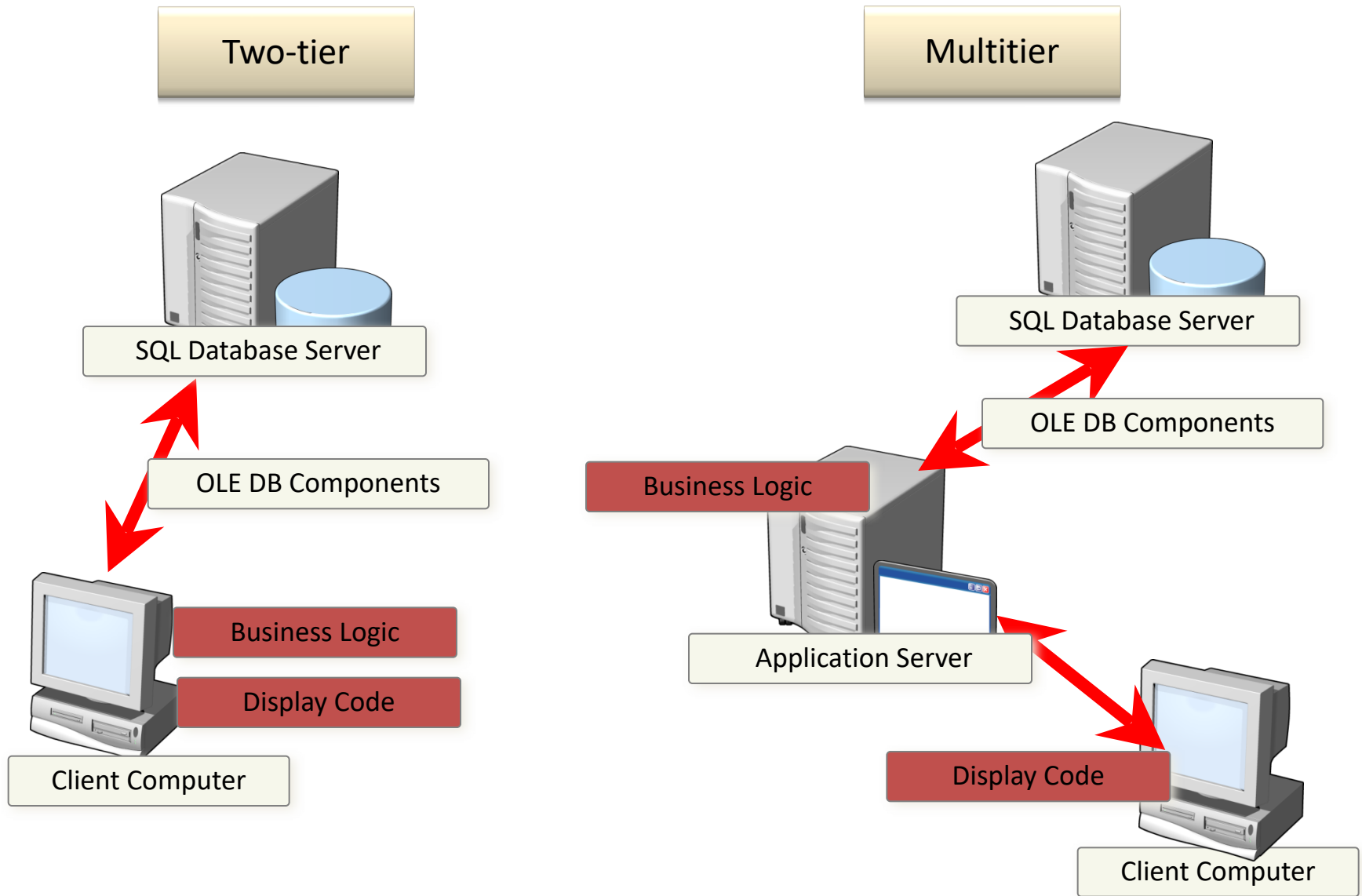
Agenda

- Overview of SQL Server

- Overview of SQL Server Databases

- Overview and Syntax Elements of T-SQL

- Using T-SQL Querying Tools

Overview of SQL Server

- Overview of Client/Server Architecture

- SQL Server Components

- SQL Server Management Tools

- SQL Server Database Engine Components

Overview of Client/Server Architecture

Two-tier

Multitier

SQL Database Server

OLE DB Components

Business Logic

Display Code

Client Computer

SQL Database Server

OLE DB Components

Business Logic

Application Server

Display Code

Client Computer

SQL Server Components

Server Components	Description
SQL Server Database Engine	Core service for storing and processing data
Analysis Services	Tools for creating and managing analytical processing
Reporting Services	Components for creating and deploying reports
Integration Services	Tools for moving, copying, and transforming data

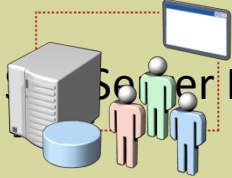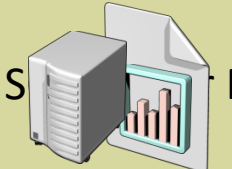The Database Engine also features these components:

- Full-Text Search
- Replication
- Service Broker
- Notification Services

SQL Server Management Tools

Management tools	Description
SQL Server Management Studio	An environment to access, configure, manage, and administer SQL components
SQL Server Configuration Manager	An interface to provide management for SQL services, protocols, and client aliases
SQL Server Profiler	A GUI tool to profile and trace the Database Engine and Analysis Services
Database Engine Tuning Advisor	An application to create an optimal sets of indexes, indexed views, and partitions
Business Intelligence Development Studio	An IDE for creating Analysis Services, Reporting Services, and Integration Services solutions

SQL Server Database Engine Components

Components	Description
• Protocols	Ways to implement the external interface to the SQL Server
• Relational Engine	Interface into the storage engine, composed of services to interact with the underlying database storage components and features
• Storage Engine	Core of SQL Server, a highly scalable and available service for data storage, processing, and security
• SQLOS	Operating system with a powerful API, which brings together all system components, enabling innovation of SQL Server's scalability and performance, providing manageability and supportability features

SQL Server Database Objects

Objects	Notes
Tables	Contain all the data in SQL Server databases
Views	Act like a virtual table or a stored query
Indexes	Enable fast retrieval, built from one or more columns in table or view
Triggers	Execute a batch of SQL code when an insert, update or delete command is executed against a specific table
Procedures	Accept parameters, contain statements, and return values.
Constraints	Prevent inconsistent data from being placed in a column
Rules	Specify acceptable values that can be inserted in column

Overview of Data Types

Each column, variable, expression, parameter has a data type

A data type specifies the type of data the object can hold: integers, characters, monetary data, date and time, binary

Data types are organized into the following categories:

- Exact numerics
- Approximate numerics
- Date and time
- Character strings

- Unicode character strings
- Binary strings
- Other data types

A History and Definition of ANSI SQL and T-SQL

- Developed in the early 1970s

- ANSI-SQL defined by the American National Standards Institute

- Microsoft implementation is T-SQL, or Transact SQL

- Other implementations include PL/SQL and SQL Procedural Language.

Categories of SQL Statements

- ## DML – Data Manipulation Language

INSERT Table1 VALUES (1, 'Row #1')

- DCL – Data Control Language

GRANT CONNECT TO guest;

GRANT CONTROL SERVER TO user_name;

- DDL – Data Definition Language
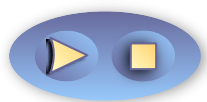
CREATE USER user_name

- TCL - Transactional Control Language

COMMIT TRANSACTION Inner2;

- DQL - SQL Select Statements

SELECT ProductID, Name, ListPrice
FROM Production.Product

Tools for Querying SQL Server Databases

Tool	Description
• SQL Server Management Studio	• Used for interactive creation of T-SQL scripts • To access, configure, manage, and create many other SQL Server Objects
• Microsoft Office Excel	• A spreadsheet used by financial and business professional to retrieve data
• SQLCMD	• A command used by administrators for command line and batch files processing `SQLCMD –S server\instance –i C:\script`
• PowerShell	• An environment used by administrators for command line and batch processing

An Introduction to SQL Server Management Studio

- Support for writing and editing queries or scripts

- Integrated source control for solution and script projects

- Supports most administrative tasks for SQL Server

- An integrated Web browser for quick browsing