

# **ADO.NET**

**PRESENTED BY**

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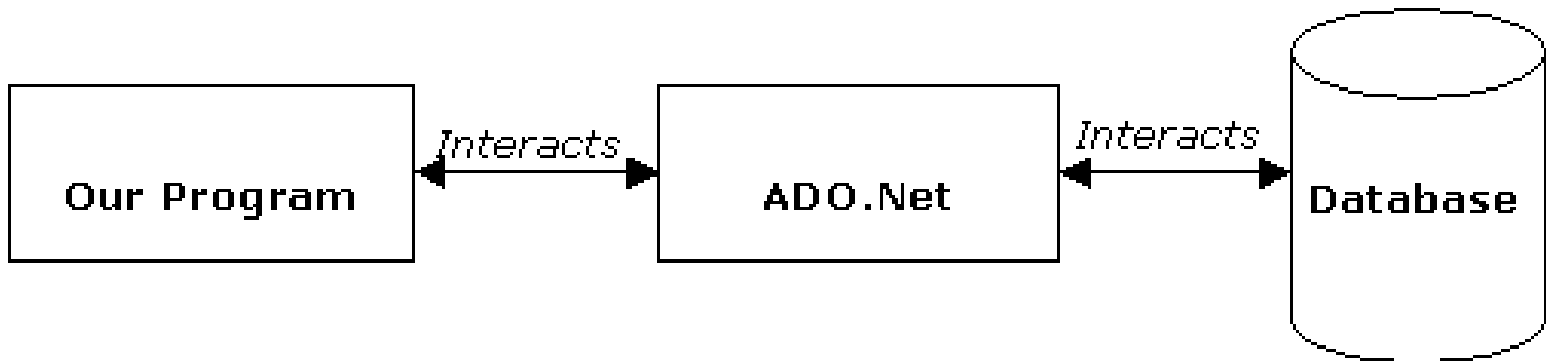
**A.P CSE DEPT.**

# ADO.NET

- A data-access technology that enables applications to connect to data stores and manipulate data contained in them in various ways
- Former version was ADO (ActiveX Data Object)

# What is ADO.NET?

An object oriented framework that allows you to interact with database systems



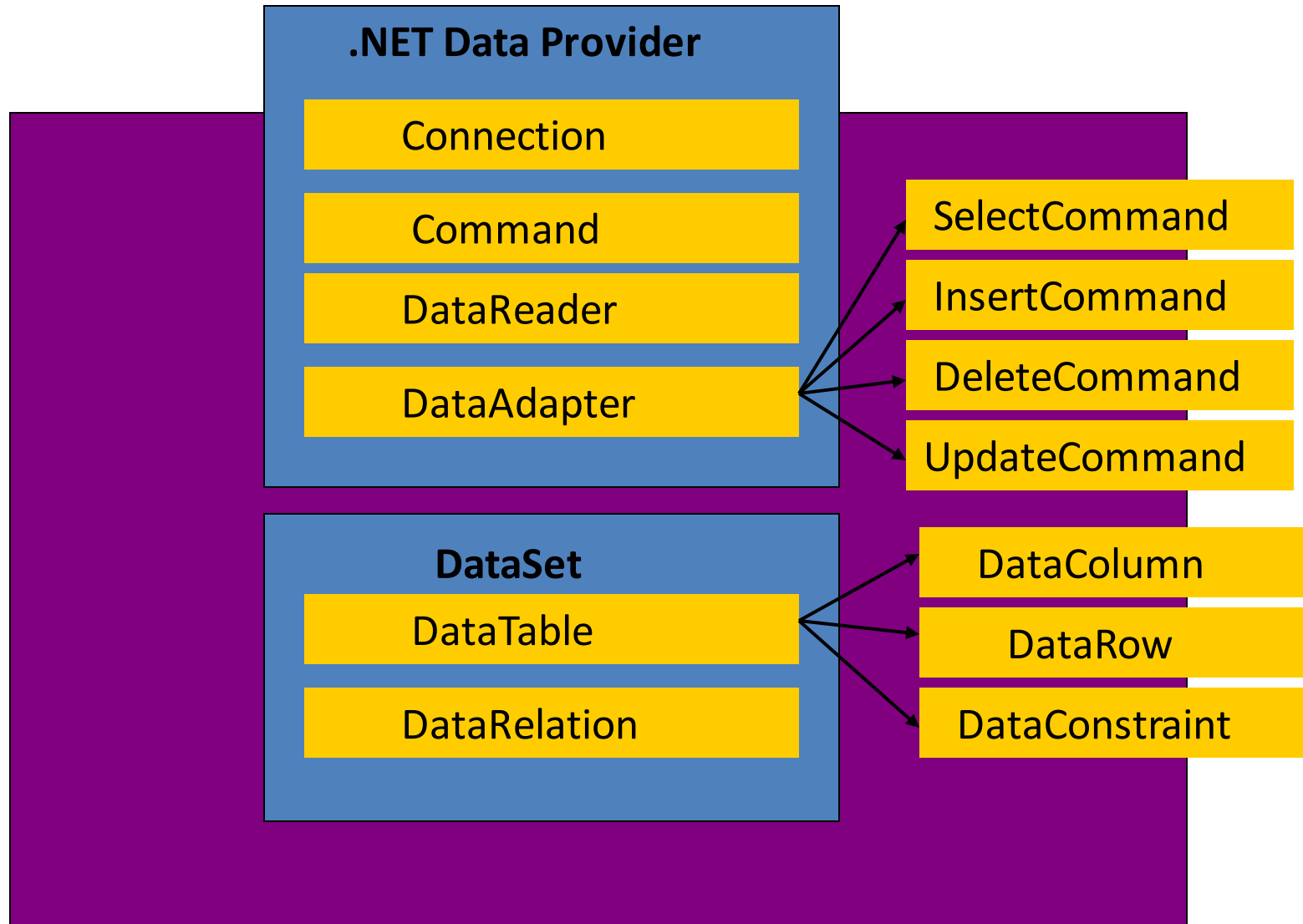
# Objective of ADO.NET

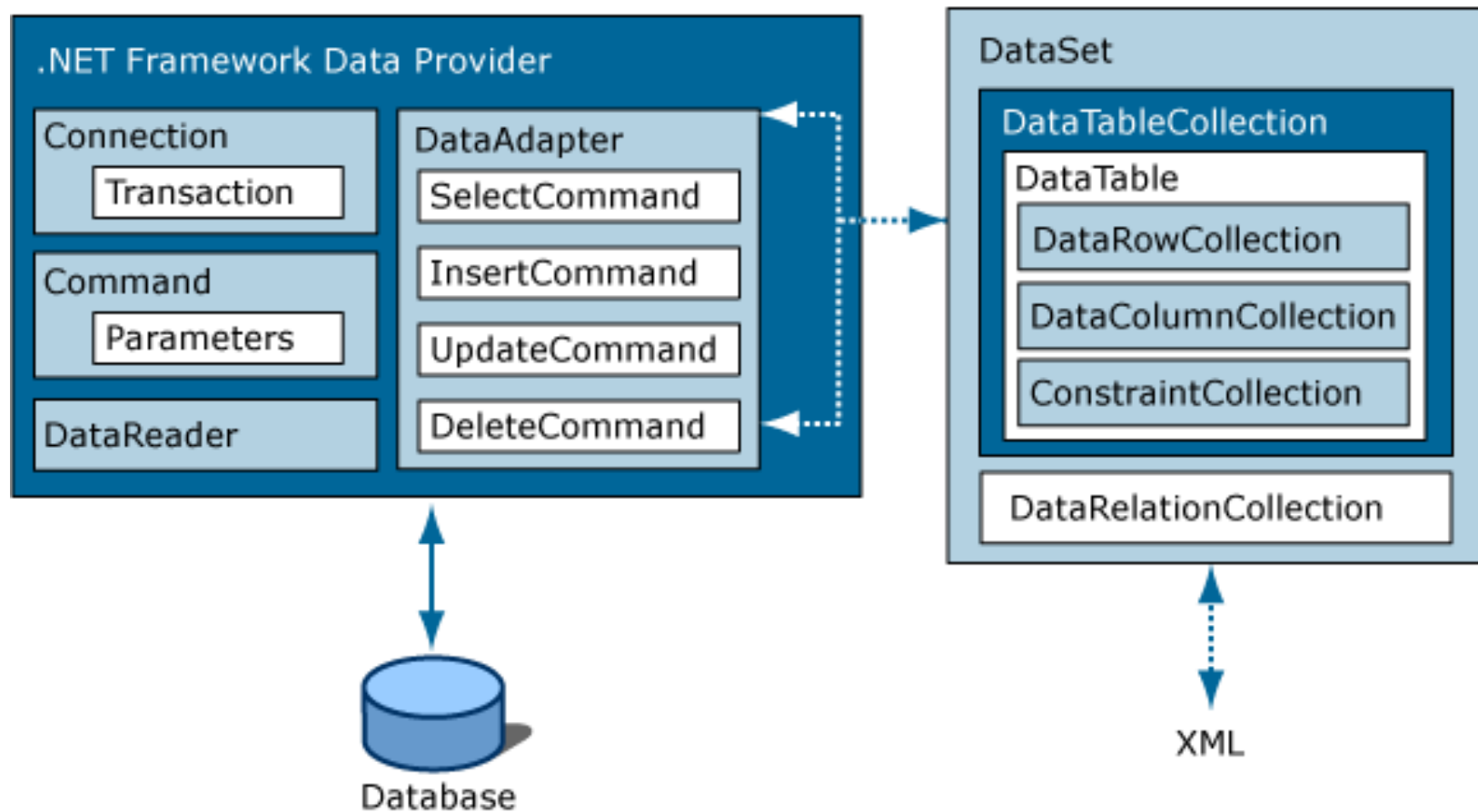
- Support disconnected data architecture,
- Tight integration with XML,
- Common data representation
- Ability to combine data from multiple and varied data sources
- Optimized facilities for interacting with a database

# Architecture of ADO.NET

- Data providers
- What does it look like?
- Connection to the source
- Command creation
- Cursors
- Data storage in memory
- DataAdapter – automatic data upload
- XML Integration

# Architecture of ADO.NET





# ADO.NET Core Objects

- Core namespace: System.Data
- .NET Framework data providers:

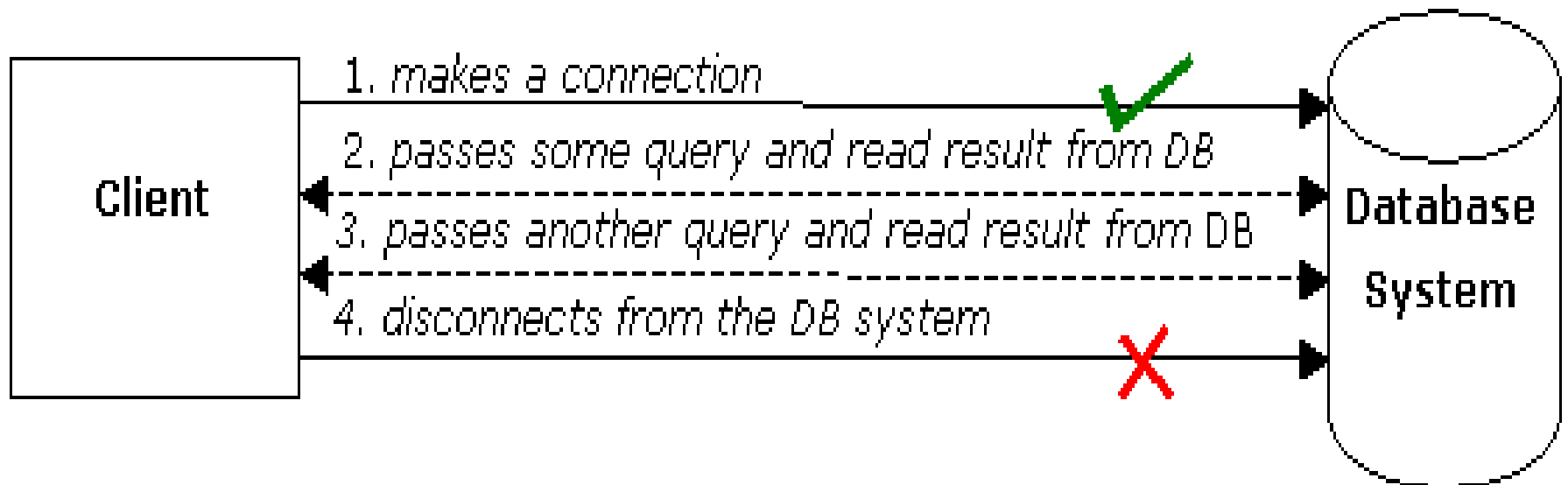
<b>Data Provider</b>	<b>Namespace</b>
SQL Server	<code>System.Data.SqlClient</code>
OLE DB	<code>System.Data.OleDb</code>
ODBC	<code>System.Data.Odbc</code>
Oracle	<code>System.Data.OracleClient</code>



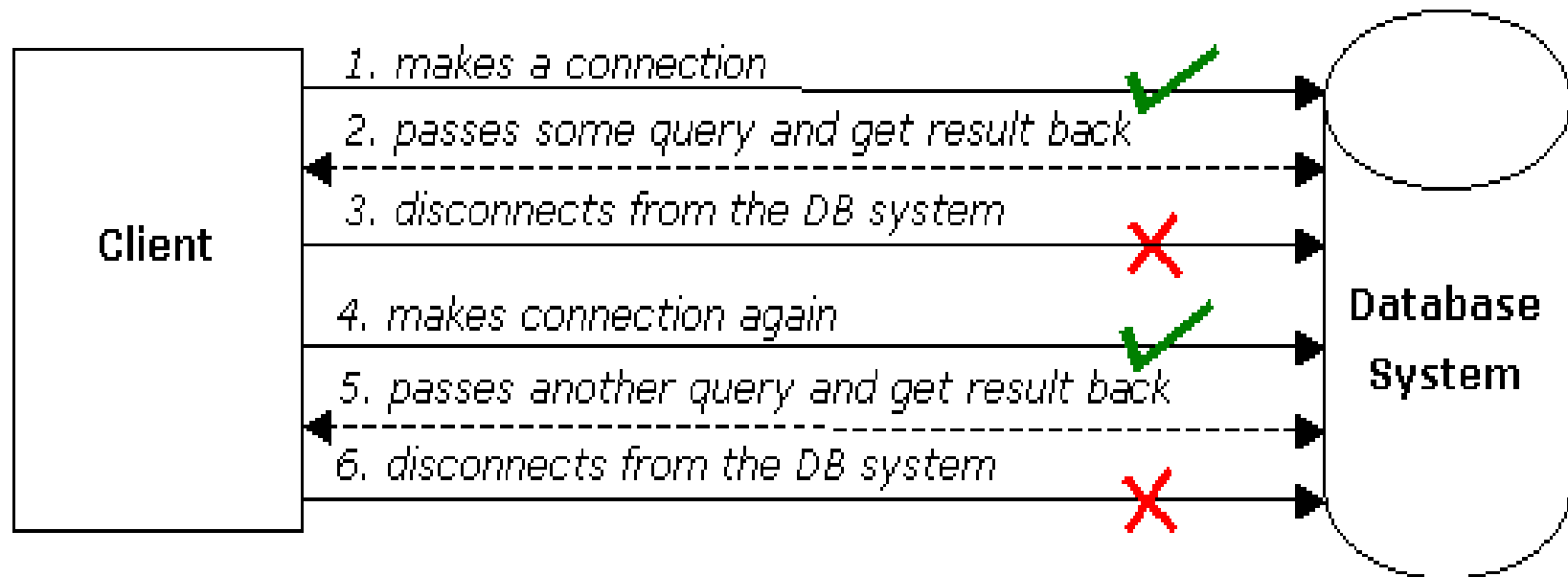
# ADO.NET Core Objects

Object	Description
<b>Connection</b>	Establishes a connection to a specific data source. (Base class: <b>DbConnection</b> )
<b>Command</b>	Executes a command against a data source. Exposes <b>Parameters</b> and can execute within the scope of a <b>Transaction</b> from a <b>Connection</b> . (The base class: <b>DbCommand</b> )
<b>DataReader</b>	Reads a forward-only, read-only stream of data from a data source. (Base class: <b>DbDataReader</b> )
<b>DataAdapter</b>	Populates a <b>DataSet</b> and resolves updates with the data source. (Base class: <b>DbDataAdapter</b> )
<b>DataTable</b>	Has a collection of <b>DataRow</b> s and <b>DataColumn</b> s representing table data, used in disconnected model
<b>DataSet</b>	Represents a cache of data. Consists of a set of <b>DataTables</b> and relations among them

# Connected Data Access Model



# Disconnected Data Access Model



# Pros and Cons

	<b>Connected</b>	<b>Disconnected</b>
Database Resources	-	+
Network Traffic	-	+
Memory Usage	+	-
Data Access	-	+

# Connection

- What is Connection?
- Define Connection
  - `SqlConnection conn=new SqlConnection();`
  - `Conn.ConnectionString="User ID=sa;password=;`  
`Data Source=MyServer;Initial Catalog=Northwind;"`
- ConnectionString Parameters
  - Provider
  - Data Source
  - Initial Catalog
  - Integrated Security
  - UserID/Password

# Connection (Error and Pooling)

- `System.Data.SqlClient.SqlException`
- Errors collection
- `SqlError`
  - Class
  - `LineNumber`
  - `Message`
  - `Number`
- Pooling and `Dispose` method

# Command Object

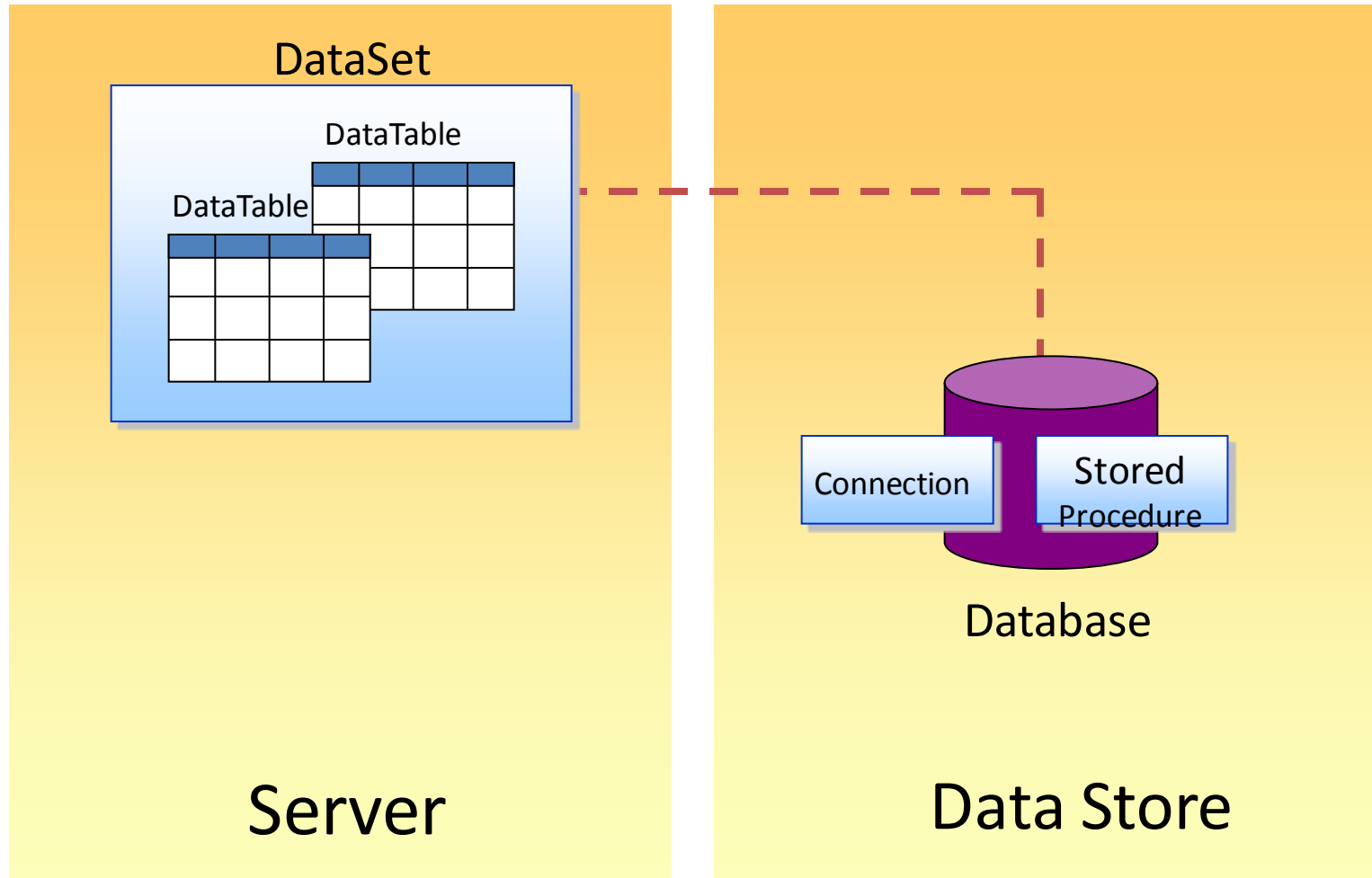
- A command object is a reference to a SQL statement or stored procedure
- Properties
  - Connection
  - CommandType
  - CommandText
  - Parameters
- Methods
  - ExecuteNonQuery
  - ExecuteReader
  - ExecuteScalar

# DataReader Object

- What is query?
- Forward-only cursor
- Read method
  - Read next record
  - Return true if record is exist
- IsDBNull
- Close method
- NextResult – for multiply select statements

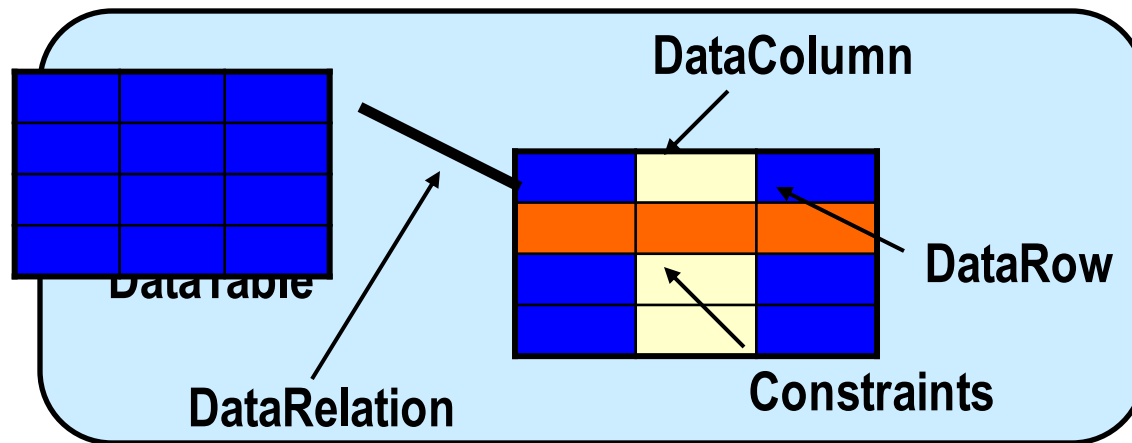


# What Are DataSets and DataTables



# The DataSet Object Model

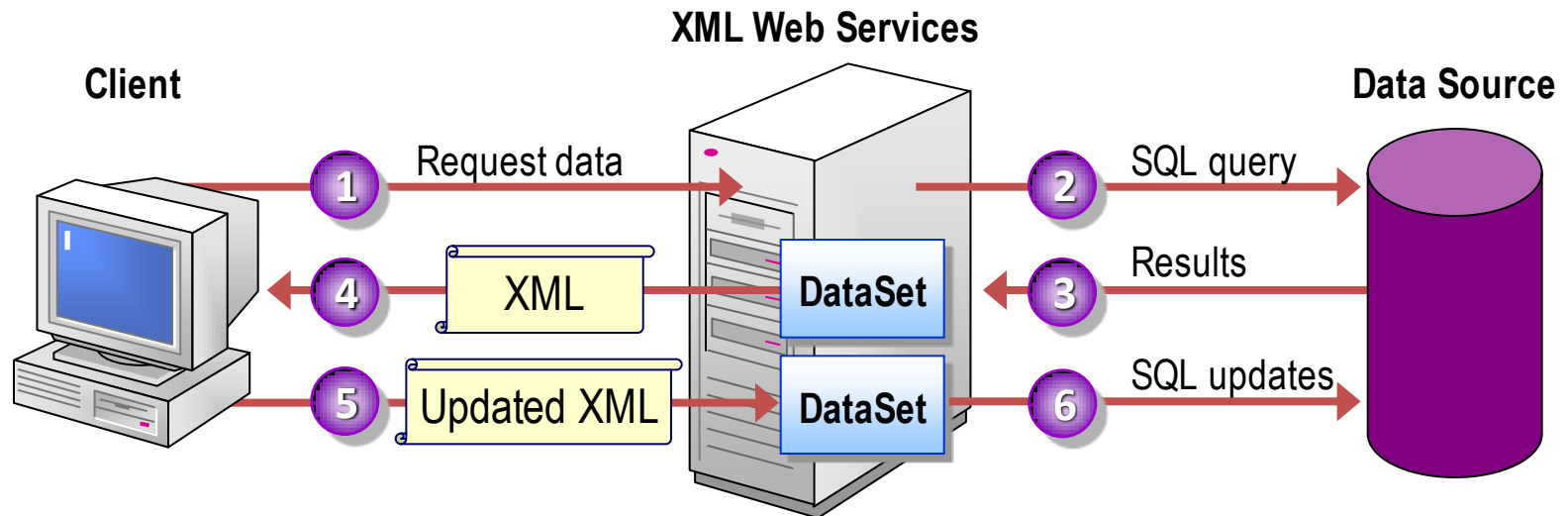
- Common collections
  - Tables (collection of DataTable objects)
  - Relations (collection of DataRelation objects)
- Data binding to Web and Windows controls supported
- Schema can be defined programmatically or using XSD



Demo

# XML Support

- ADO.NET is tightly integrated with XML
- Using XML in a disconnected application

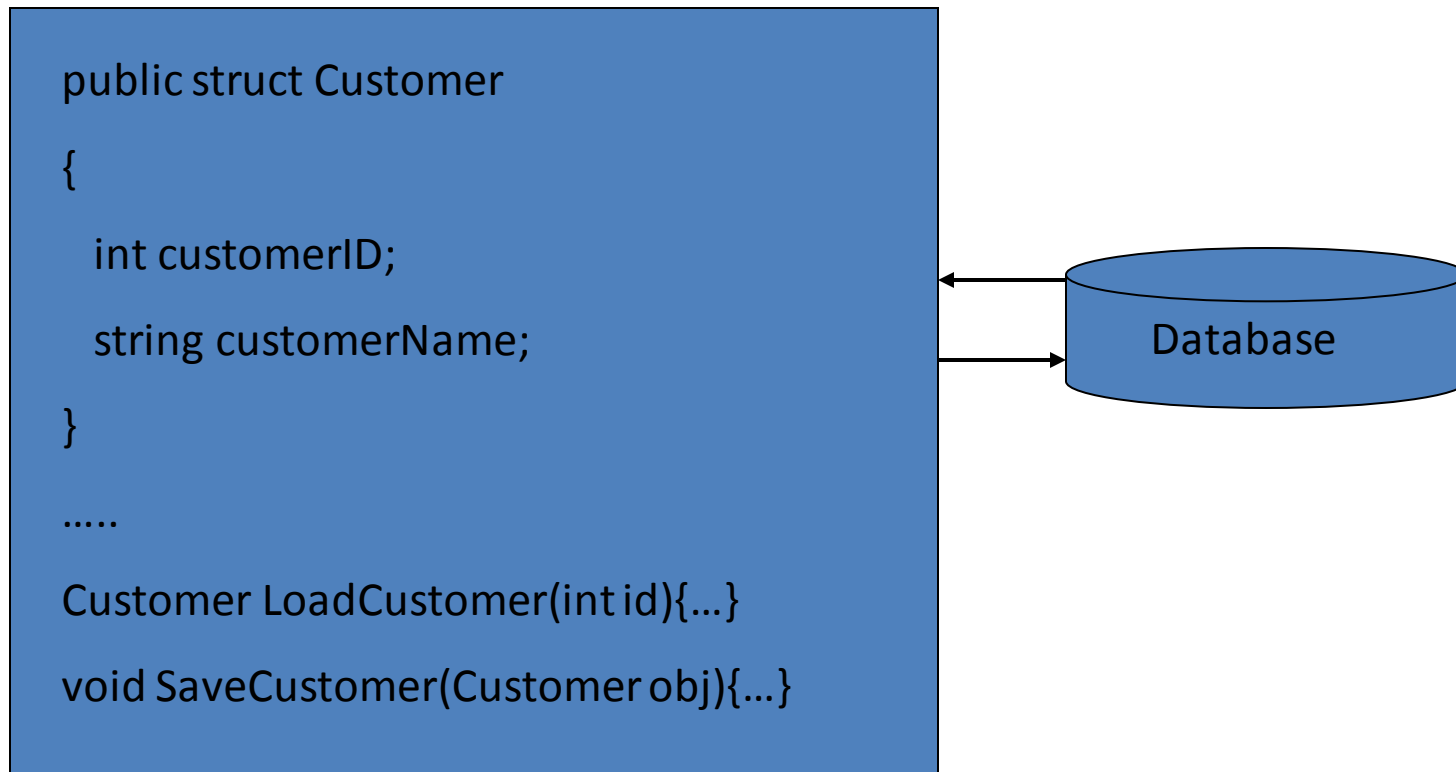


# Object Spaces

- Introduction to problem
- What is Object Spaces?
- What do we need?
- How can we resolve the problem

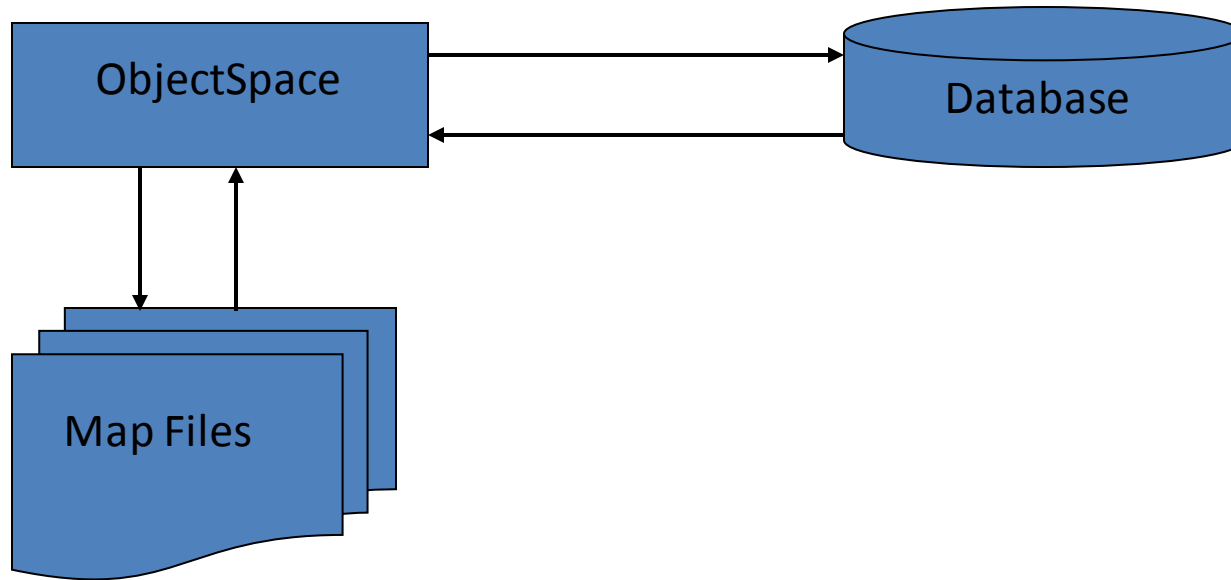
# Introduction to Problem

- There's something apparently missing
- Current situation



# What is Object Spaces?

- Relation between object and database
- Way to avoid long-drawn coding



# What do we need?

- Single table to single Object
- Object hierarchy to many tables
- Object hierarchy to single table
- Single Object to multiple tables
- Inheritance
  - All types in single table
  - Table for base type and related table per derived type