

Unit-V

ADO.NET

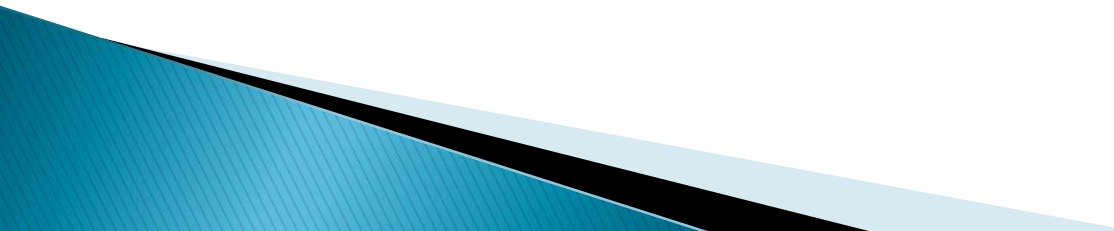
ADO.NET Architecture

- ▶ ADO.NET consist of a set of Objects that expose data access services to the .NET environment.
- ▶ ADO.NET is the evolution of ADO (Active Data Objects). It is used to interact with a database or a data source. ADO.NET contains such useful classes to work with the databases as:
 1. Connection
 2. Command
 3. DataReader
 4. DataSet
 5. DataAdapter
- ▶ It is a data access technology from Microsoft .Net Framework , which provides communication between relational and non relational systems through a common set of components .

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- System.Data namespace is the core of ADO.NET and it contains classes used by all data providers.

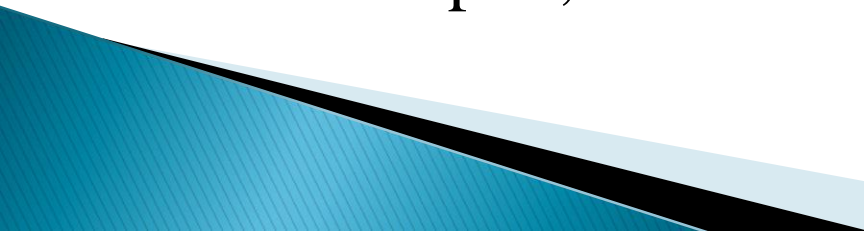
The two key components of ADO.NET are Data Providers and DataSet .

- ▶ The Data Provider classes are meant to work with different kinds of data sources.
 - ▶ They are used to perform all data-management operations on specific databases.
 - ▶ DataSet class provides mechanisms for managing data when it is disconnected from the data source.
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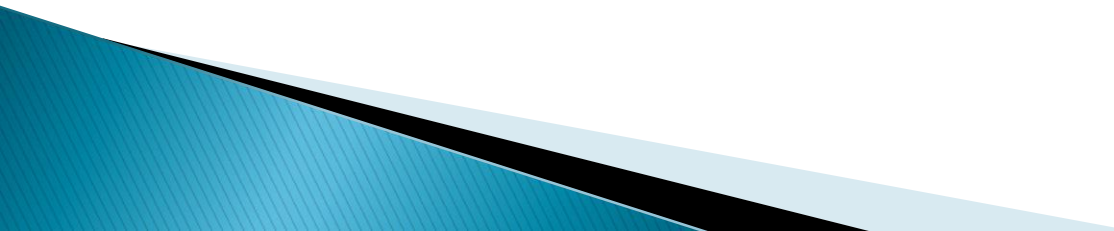
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Data Providers

The .Net Framework includes mainly three Data Providers for ADO.NET.

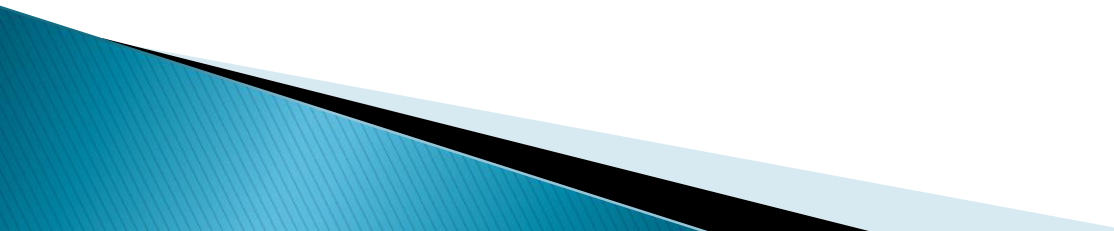
- ▶ They are
 - ▶ the Microsoft SQL Server Data Provider , OLEDB Data Provider and ODBC Data Provider.
 - ▶ SQL Server uses the SqlConnection object , OLEDB uses the OleDbConnection Object and ODBC uses OdbcConnection Object respectively.
 - ▶ A data provider contains Connection, Command, DataAdapter, and DataReader objects.
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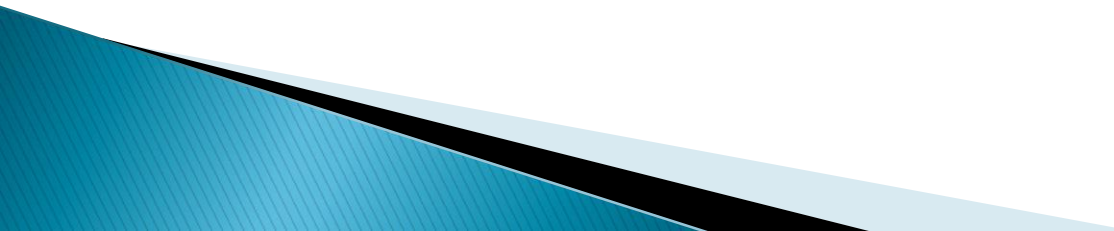
- ▶ **Connection**
 - ▶ The Connection Object provides physical connection to the Data Source.
 - ▶ Connection object needs the necessary information to recognize the data source and to log on to it properly, this information is provided through a connection string.
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Command

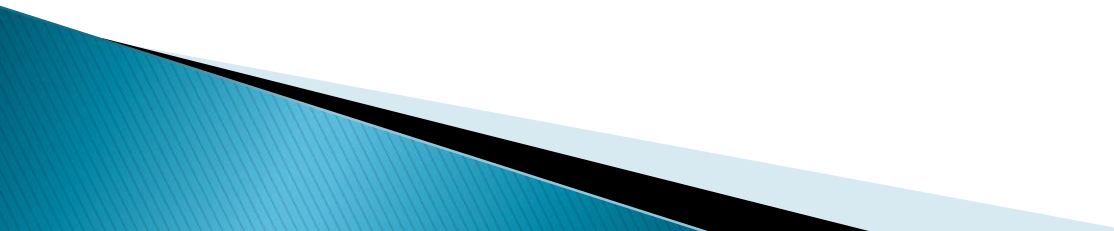
- ▶ The Command Object uses to perform SQL statement or stored procedure to be executed at the Data Source.
 - ▶ The command object provides a number of Execute methods that can be used to perform the SQL queries in a variety of fashions.
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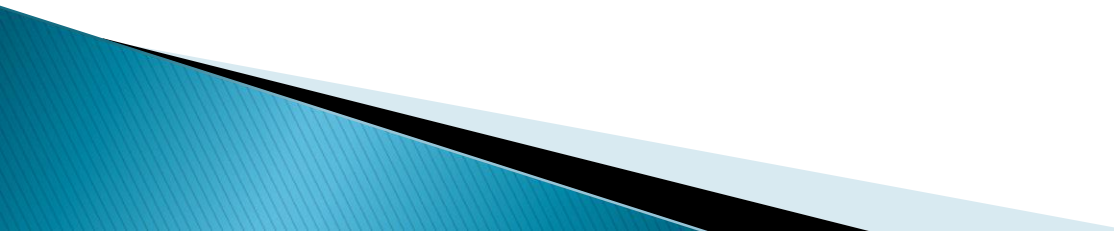
- ▶ **DataReader**
 - ▶ The DataReader Object is a stream-based , forward-only, read-only retrieval of query results from the Data Source, which do not update the data.
 - ▶ DataReader requires a live connection with the database and provides a very intelligent way of consuming all or part of the result set.
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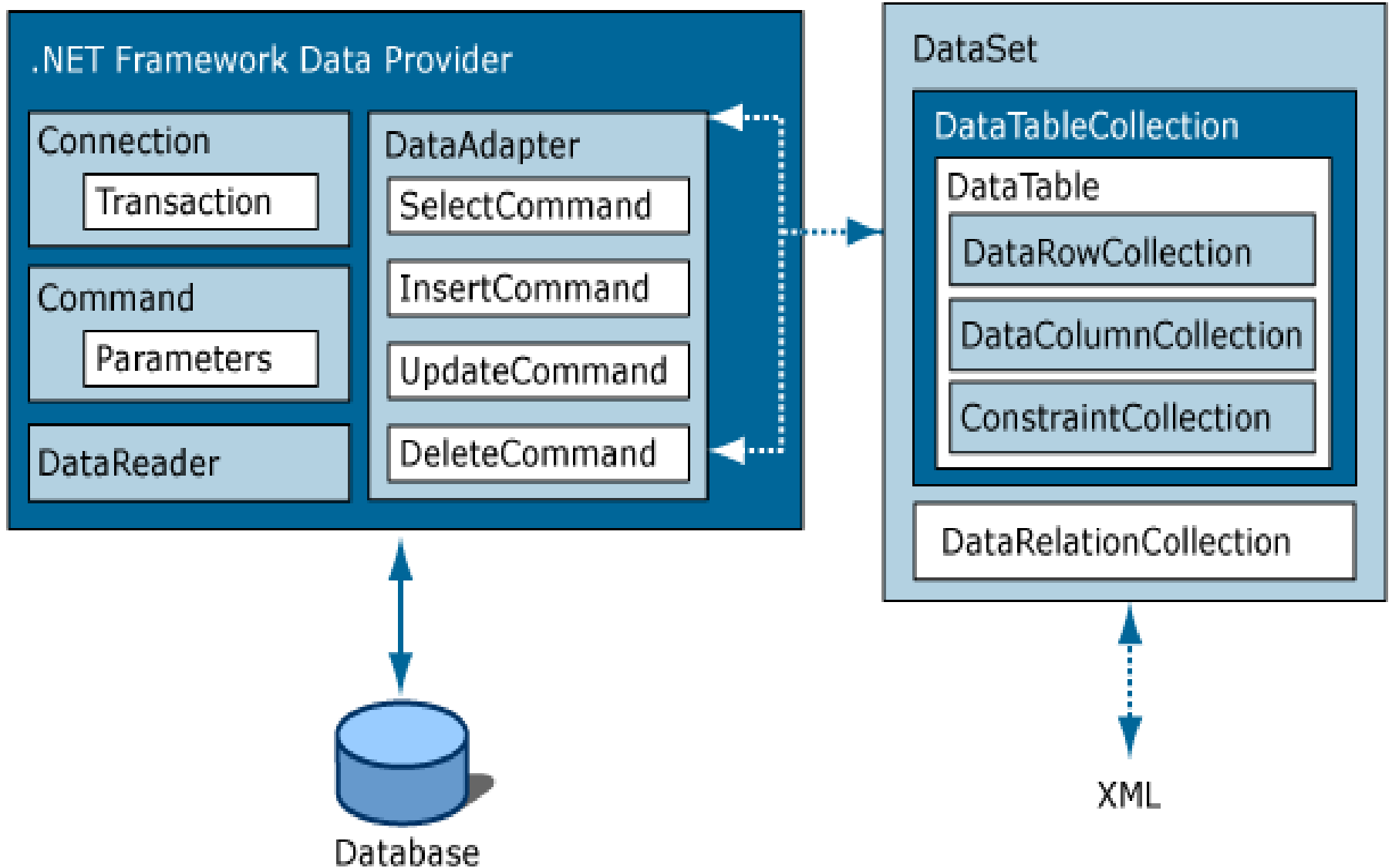
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DataAdapter

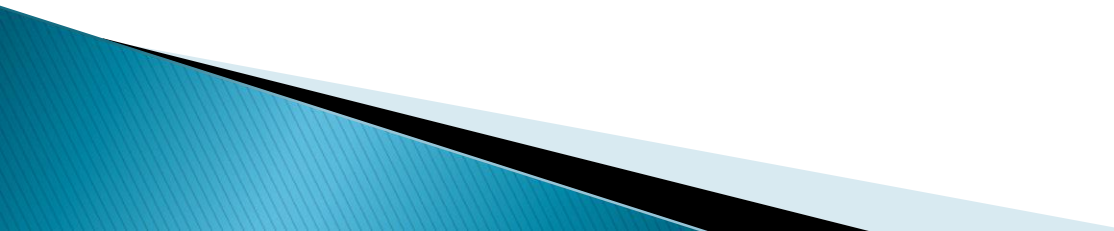
- ▶ DataAdapter Object populate a Dataset Object with results from a Data Source .
 - ▶ It is a special class whose purpose is to bridge the gap between the disconnected Dataset objects and the physical data source.
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- ▶ **DataSet**
 - ▶ DataSet provides a disconnected representation of result sets from the Data Source, and it is completely independent from the Data Source.
 - ▶ DataSet provides much greater flexibility when dealing with related Result Sets.
 - ▶ The DataAdapter Object provides a bridge between the DataSet and the Data Source.
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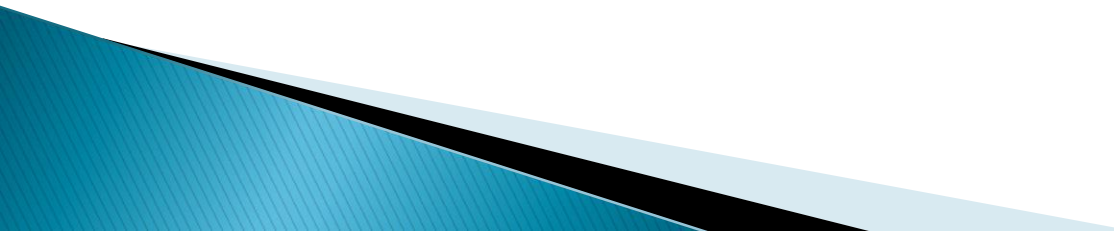
Advantages of ADO.Net

- ▶ ADO stands for ActiveX Data Objects and it relies on COM whereas ADO.NET relies on managed providers defined by the .NET Common Language Runtime.
 - ▶ ADO.NET can have separate Objects that represent connections to different data sources.
 - ▶ In ADO.NET you can create multiple data provider namespaces to connect specifically with a particular data source, making access faster and more efficient
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Difference between Data Reader, Dataset and DataAdapter

S.No	DataReader	DataSet / DataAdapter
1	Database Connecting Mode: Connected mode	Database Connecting Mode: Disconnected mode
2	Data Navigation: Unidirectional i.e., Forward Only	Data Navigation: Bidirectional i.e., data can navigate back and forth
3	Read / Write: Only Read operation can be carried out.	Read / Write: Both Read and Write operations are possible
4	Data Handling: Handles Database table	Data Handling: Handles text file, XML file and Database table
5	Storage Capacity : No storage	Storage Capacity : Temporary Storage Capacity i.e., in-memory cache of data
6	Accessibility : Can access one table at a time	Accessibility : Can access multiple table at a time
7	Speed: Much faster than DataSet	Speed: Less faster than data reader

GridView Control

- ▶ The DataGridView control can display rows of data from a data source.
 - ▶ When you specify a data source for the DataGridView, by default it will construct columns for you automatically.
 - ▶ This will be created based on the data types in the data source.
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Example:–

- ▶ Imports System.Data.OleDb
- ▶ Public Class Form1
- ▶ Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
- ▶ Dim connectionString As String =
"Provider=Microsoft.Jet.OLEDB.4.0;Data Source="Your .mdb path";"
- ▶ Dim sql As String = "SELECT * FROM Authors"
- ▶ Dim connection As New OleDbConnection(connectionString)
- ▶ Dim dataadapter As New OleDbDataAdapter(sql, connection)
- ▶ Dim ds As New DataSet()
- ▶ connection.Open()
- ▶ dataadapter.Fill(ds, "Authors_table")
- ▶ connection.Close()
- ▶ DataGridView1.DataSource = ds
- ▶ DataGridView1.DataMember = "Authors_table"
- ▶ End Sub
- ▶ End Class