ADO.NET

Created by Parita Patel

UNIT -4

- Applications:
  - Purely Client Server Architecture of .NET technology using ADO.NET that retrieving data from database as data manipulation by SQL database technology. With the help of data mining technique create charts and reports.
- ADO.NET Architecture
- 3 Tire Architecture
- ADO.NET Components – Dataset & Dataprovider (Connection, Reader, Adaptor, Command)
- Data Manipulation – Insert , Update, Delete, Select
- Datagridview and other data components
- Reports and Charts

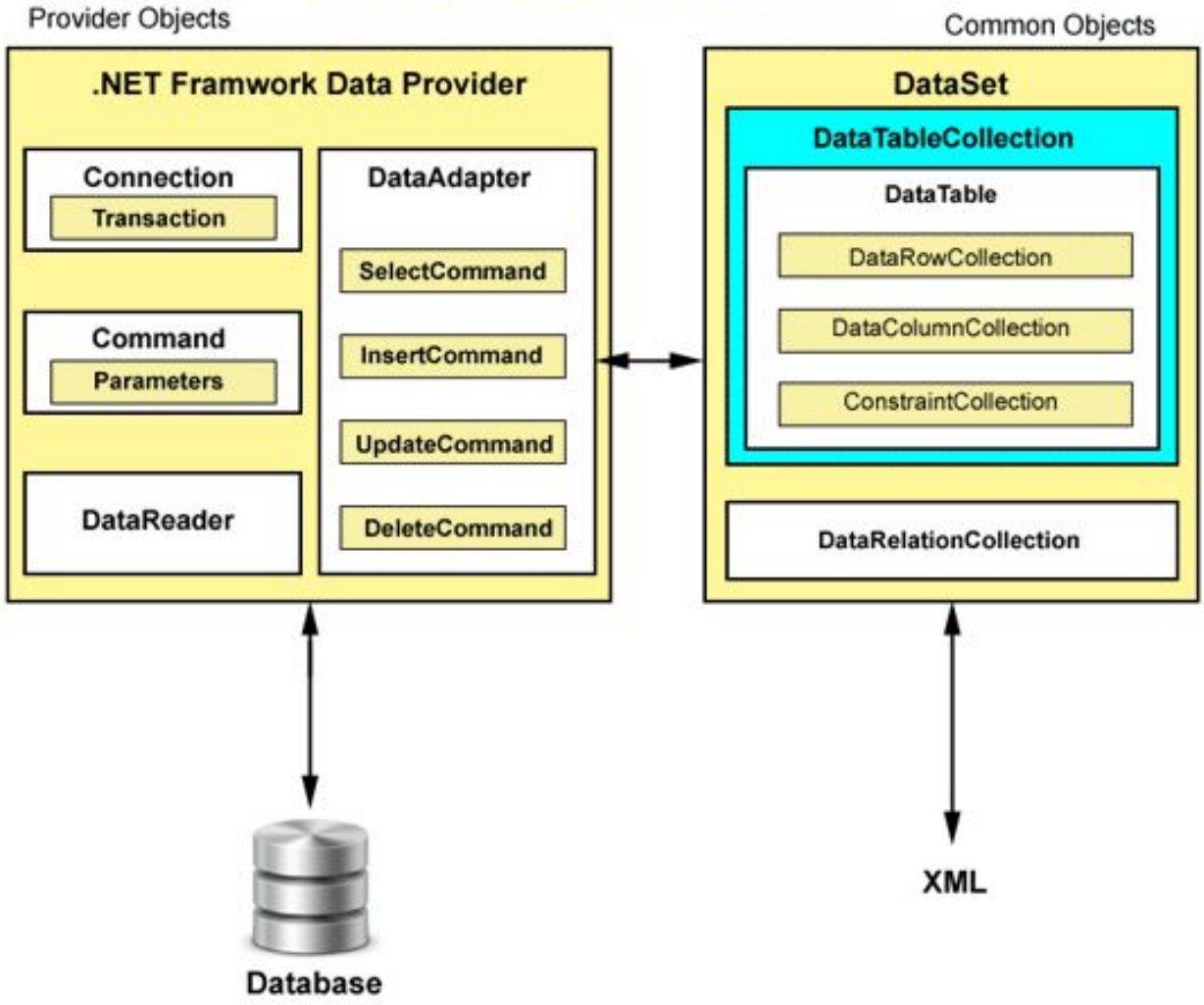
ADO.net Architecture

- ADO.NET is a part of the Microsoft .Net Framework.
- ADO stands for ActiveX Data Objects
- ADO.net is a set of classes provide in the visual Basic and It is used to access data.
- The ADO.NET is based entirely on XML
- ADO.Net has the ability to separate data access mechanisms, data manipulation mechanisms and data connectivity mechanisms.
- ADO.Net is a set of classes that allow application to read and write information in databases

Features of ADO.NET

- **Disconnected architecture**-ADO.NET uses the disconnected data architecture application connect to the database only while retrieving and updating data. After data is retrieved, the connection with the database is closed. When the database needs to be updated, the connection
- **Data cached in dataset:** a dataset is the most common method of accessing data because it implement a disconnected architecture. A dataset is cached set of database records, you can work with the records stored in a dataset as you work with real data. The only difference is that the dataset is independent of the data source, and you remain disconnected from the data source.
- **Data transfer in XML format** - XML is an industry standard and the most widely used method of sharing data among applications over the Internet. ADO .NET data is cached and transferred in XML format. All components and applications can share this data and you can transfer data via different protocols such as HTTP.
- **Interaction with the database done through data commands:** All operations on the database are performed by means of data commands. A data command can be an SQL statement or a stored procedure. You can retrieve, insert, delete or modify data from a database by executing data commands.

ADO.NET Architecture



Data Provider

- A data provider is used for connecting to a database, executing commands and retrieving data, storing it in a dataset, reading the retrieved data and updating the database.
- The data provider in ADO.Net consists of the

NO	Object	Description
1	**Connection**	This component is used to set up a connection with a data source.
2	**Command**	A command is a SQL statement or a stored procedure used to retrieve, insert, delete or modify data in a data source.
3	**DataReader**	Data reader is used to retrieve data from a data source in a read-only and forward-only mode.
4	**DataAdapter**	This is integral to the working of ADO.Net since data is transferred to and from a database through a data adapter. It retrieves data from a database into a dataset and

Types of data providers of ADO.Net

- ADO.NET providers are responsible for transferring data between a database and a Visual Basic.NET application.
  - **SQL Server Provider**- provides access to Microsoft SQL Server.
  - **OLE DB Provider** - provides access to data sources exposed by using OLE DB.
  - **ODBC Provider** - provides access to data sources exposed by ODBC.
  - **Oracle Provider**- provides access to Oracle data source.

DataSet

- **DataSet** is an in-memory representation of data.
- It is a disconnected, cached set of records that are retrieved from a database.
- Retrieved data is stored in a dataset
- When a connection is established with the database, the data adapter creates a dataset and stores data in it.
- The dataset works as a virtual database containing tables, rows, and columns.