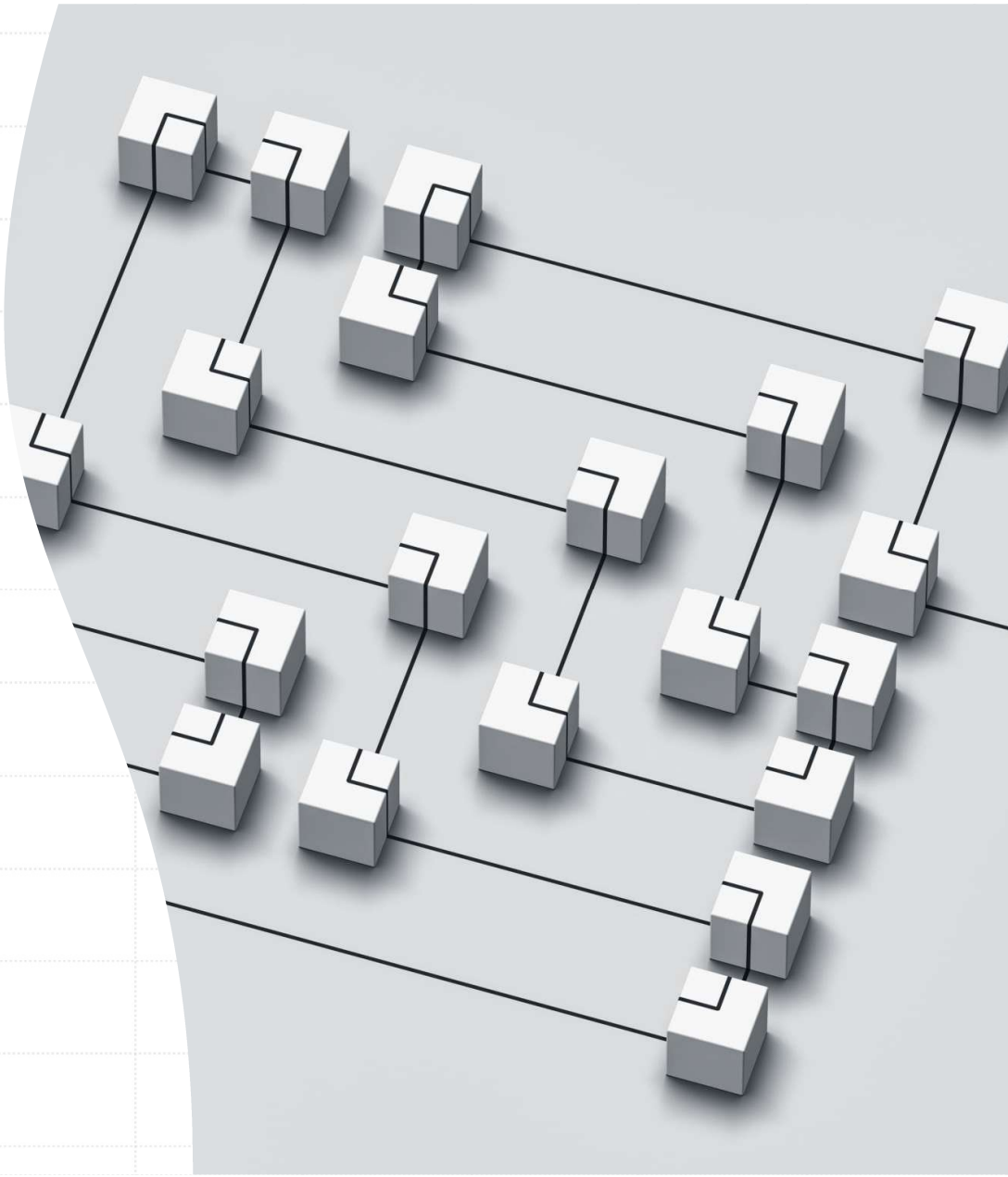
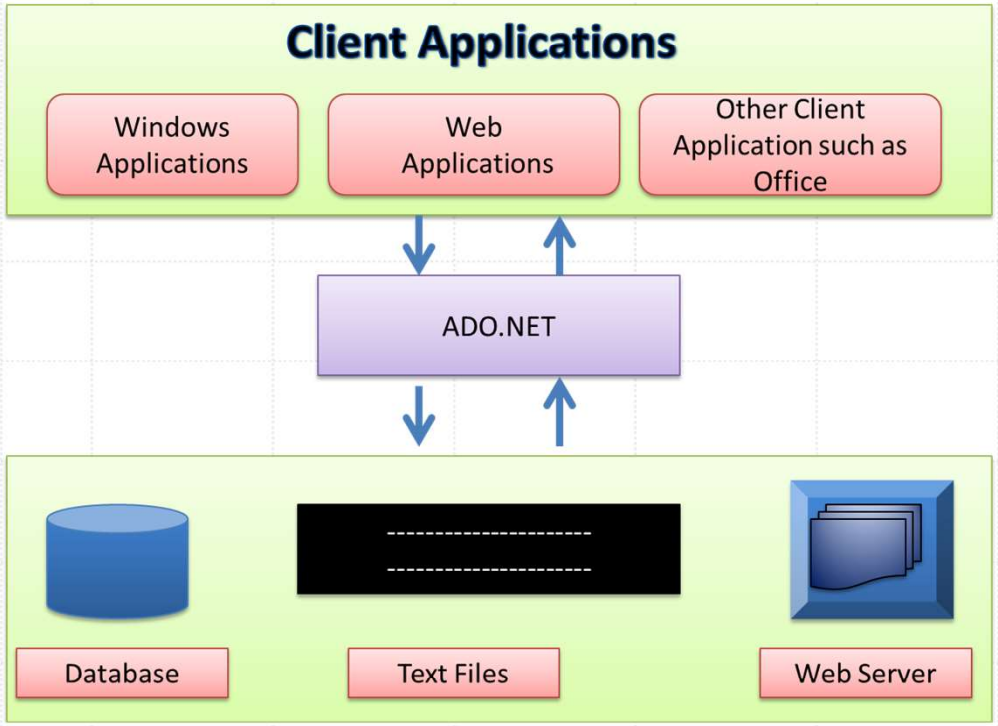
ADO.NET

Arctech Info Private Limited

What is ADO.NET

- ADO.NET stands for ActiveX Data Objects which is Microsoft technology.
- The main job that handles ADO.NET is data management.
- It is widely used for accessing, selecting, saving, deleting or managing data with the database.
- Ado.net is a data bridge between your apps and databases that carry data between them.
- Ado.net has a rich set of classes, methods, and interfaces that allow you to handles data in the database more efficiently.
- ADO.NET is a set of classes that allows you to connect and work with data sources like databases, excel file, access file, xml file, mysql, sql or notepad.




Client Applications
Windows Applications
Web Applications
Other Client Application such as Office
ADO.NET
Database
Text Files
Web Server

.NET DATA PROVIDERS

- To connect your application with different sources of database you need to know the right Data Provider.
- There are several Data Providers in ADO.NET that connects with different types of sources.

Data Provider	Description
SQL Server	System.Data.SqlClient – This Data Provider is used to connect with SQL Server Databases.
OLEDB	System.Data.OleDb – This Data Provider is used to connect with SQL Server, Oracle and Microsoft Jet
ODBC	System.Data.Odbc. It is used to connect with SQL Server, Oracle and Microsoft Databases(.mdb).
Data Provider for Oracle	System.Data.OracleClient
EntityClient Provider	Provides data access for Entity Data Model (EDM) applications. Uses the System.Data.EntityClient namespace.
SQL Server Compact 4.0	Provides data access for Microsoft SQL Server Compact 4.0. Uses the System.Data.SqlServerCe namespace.

CORE COMPONENTS OF .NET DATA PROVIDERS

There are 4 Core Components of .Net Data Providers that is used to connect, access and retrieve data from the database.

1. **Connection** – This component is used for connecting to the database. The base class is DbConnection.
2. **Command** – This component executes SQL query against the data source. The base class is DbCommand.
3. **DataReader** – It reads data from data source. It accesses data read-only and forward-only. The base class is DbDataReader.
4. **DataAdapter** – It invokes dataset and resolves updates with the data source. The base class is DbDataAdapter.

Connection Class

- ADO.NET connection is an object that provides database connectivity and the entry point to a database.
- When the connection of an object is instantiated, the constructor takes a connection string that contains the information about the database server, server type, database name, connection type, and database user credentials.
- Once the connection string is passed and the connection object is created, you can establish a connection with the database.
- A connection string is usually stored in the web.config file or app.config file of an application.

Command Class

- The Command class provides methods for storing and executing SQL statements and Stored Procedures. The following are the various commands that are executed by the Command Class.
- **ExecuteReader:** Returns data to the client as rows. This would typically be an SQL select statement or a Stored Procedure that contains one or more select statements. This method returns a DataReader object that can be used to fill a DataTable object or used directly for printing reports and so forth.
- **ExecuteNonQuery:** Executes a command that changes the data in the database, such as an update, delete, or insert statement, or a Stored Procedure that contains one or more of these statements. This method returns an integer that is the number of rows affected by the query.
- **ExecuteScalar:** This method only returns a single value. This kind of query returns a count of rows or a calculated value.
- **ExecuteXMLReader:** (SqlClient classes only) Obtains data from an SQL Server 2000 database using an XML stream. Returns an XML Reader object.

DataReader Class

- The DataReader is used to retrieve data. It is used in conjunction with the Command class to execute an SQL Select statement and then access the returned rows.
- You can use the ADO.NET DataReader to retrieve a read-only, forward-only stream of data from a database
- You use the Read method of the DataReader object to obtain a row from the results of the query
- Each column of the returned row can be acessed by passing the name or ordinal reference of the column to the DataReader.

DataReader Class

- The DataReader is a good choice when retrieving large amounts of data because the data is not cached in memory. You should always call the Close method when you have finished using the DataReader object
- Note that while a DataReader is open, the Connection is in use exclusively by that DataReader. You will not be able to execute any commands for the Connection, including creating another DataReader, until the original DataReader is closed.