ADO.NET

What is ADO.NET?

ADO.NET is not a different technology. In simple terms, we can think of ADO.NET, **as a set of classes (Framework), that can be used to interact with data sources like Databases and XML files**. This data can, then be consumed in any.NET application. **ADO stands for Microsoft ActiveX Data Objects**.

The following are, a few of the different types of.NET applications that use ADO.NET to connect to a database, execute commands, and retrieve data.

- ASP.NET Web Applications
- Windows Applications
- Console Applications

Dot Net Data Providers:

- Data Provider for SQL Server-System.Data.SqlClient
- Data Provider for Oracle - System.Data.OracleClient
- Data Provider for OLEDB-System.Data.OleDb
- Data Provider for ODBC-System.Data.Odbc

All the required classes are residing inside the Namespaces.

Steps

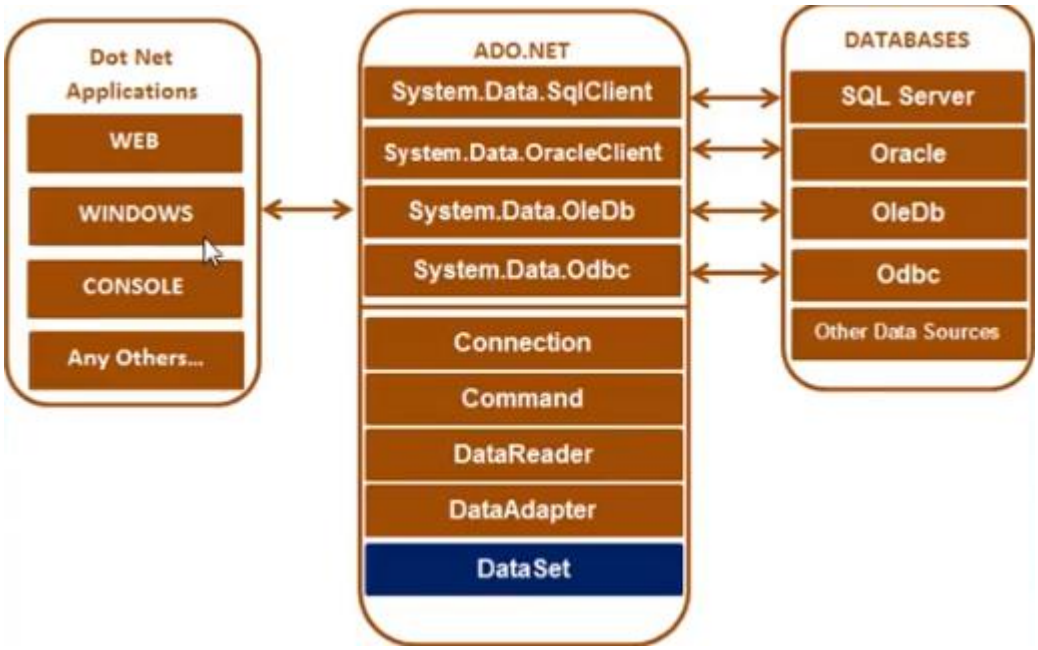
1. Need to established an **`SQLConnection con`**.
2. Need an **`SQLCommand cmd`**, with the connection object **`con`**.
3. Need to open the connection
4. Need **`ExecuteReader`** that will execute the **`SQLCommand`** and retrieve the data. This will return the data as a SQL data format. So, we may need an **`SQLDataReader`** object get the data in the for of datatable.
5. Do the work/ create Dataset/ etc.
6. Close Connection
7. Dispose the connection

```
using System.Data.SqlClient;


            SqlConnection con = new SqlConnection("data source=.;
database=MySQLDB; integrated security=SSPI");
            SqlCommand cmd = new SqlCommand("Select * from tmp_costing_data",
con);
            con.Open();
            SqlDataReader rdr=cmd.ExecuteReader();
            GridView1.DataSource = rdr;
            GridView1.DataBind();
            con.Close();
             con.Dispose();
```

```
using System.Data.OracleClient;

            OracleConnection con = new OracleConnection("Data
Source=TMCTEST;User ID=tmclive;pwd=tmclive;integrated security = no");
            OracleCommand cmd = new OracleCommand("Select * from
tmp_costing_data", con);
            con.Open();
           OracleDataReader rdr = cmd.ExecuteReader();
            GridView1.DataSource = rdr;
            GridView1.DataBind();
            con.Close();
            con.Dispose();
```



SQLConnection/OracleConnection objects

`SqlConnection()` or `OracleConnection()` have two constructors. The first one is ParameterLess and the second one is with one parameter with connection string. So, either of this can be used as the following way :

```
            string connectionString = "Data Source=TMCTEST;User
ID=tmclive;pwd=tmclive;integrated security = no";
            OracleConnection conOr = new OracleConnection();
            conOr.ConnectionString = connectionString;
```

or

```
SqlConnection con = new SqlConnection("data source=.;database=MySQLDB;integrated
security=SSPI");
```

Once a is `SqlConnection` opened, it should be closed, as soon as the data get fetched. If there is an exception while fetching data from

```
OracleDataReader rdr = cmd.ExecuteReader();
```

then it will be opened. The good practice is to open the `SqlConnection` as late as possible and close as soon as possible. If did not closed, then the scalability of the program will be badly affected.

So, the good practice is, `try- catch- finally`

```
            SqlConnection con = new SqlConnection("data
source=.;database=MySQLDB;integrated security=SSPI");
            SqlCommand cmd = new SqlCommand("Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateSQL from tmp_costing_data
order by tmp_mr_num asc", con);
            try
            {
                con.Open();
                SqlDataReader rdr = cmd.ExecuteReader();
                GridView1.DataSource = rdr;
                GridView1.DataBind();
            }
            catch
            {

            }
            finally
            {
                con.Close();

            }
```

Or

```
            string connectionString = "Data Source=TMCTEST;User
ID=tmclive;pwd=tmclive;integrated security = no";

            using (OracleConnection conOr = new
OracleConnection(connectionString))
            {
                OracleCommand cmdOr = new OracleCommand("Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateOracle from
tmp_costing_data  order by tmp_mr_num desc", conOr);

                conOr.Open();
                OracleDataReader rdrOr = cmdOr.ExecuteReader();
                GridView2.DataSource = rdrOr;
                GridView2.DataBind();
            }
```

1. Connections should be opened as late as possible, and should be closed as early as possible.

2. Connections should be closed in the finally block, or using, the `using` statement. No need to explicitly mention

```
con.Close();
```

Connection Strings and Web.config

In Web.config inside `configuration` define `connectionStrings` and then give a name, the connection string and the provider name

```
<configuration>
  <connectionStrings>
```

```
    <add name="DBCSSql" connectionString="data
source=.;database=MySQLDB;integrated security=SSPI"
providerName="System.Data.SqlClient" />

    <add name="DBCSOracle" connectionString="Data Source=TMCTEST;User
ID=tmclive;pwd=tmclive;integrated security = no"
providerName="System.Data.OracleClient" />
  </connectionStrings>
```

Then in aspx.cs

```
        protected void Page_Load(object sender, EventArgs e)
        {
           string ConnSQL=
ConfigurationManager.ConnectionStrings["DBCSSql"].ConnectionString;
            SqlConnection con = new SqlConnection(ConnSQL);

            SqlCommand cmd = new SqlCommand("Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateSQL from tmp_costing_data
order by tmp_mr_num asc", con);
            try
            {
                con.Open();
                SqlDataReader rdr = cmd.ExecuteReader();
                GridView1.DataSource = rdr;
                GridView1.DataBind();
            }
            catch
            {

            }
            finally
            {
                con.Close();

            }


            using (OracleConnection conOr = new
OracleConnection(ConfigurationManager.ConnectionStrings["DBCSOracle"].ConnectionS
tring))
            {
                OracleCommand cmdOr = new OracleCommand("Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateOracle from
tmp_costing_data  order by tmp_mr_num desc", conOr);

                conOr.Open();
                OracleDataReader rdrOr = cmdOr.ExecuteReader();
                GridView2.DataSource = rdrOr;
                GridView2.DataBind();
            }

        }
```

For windows application, instead web,config, we may define in app.config.

SQLCommand/OracleCommand

SqlCommand class is used to prepare an SQL statement or Stored Procedure that we want to execute on a SQL Server database.

The most commonly used methods of the SqlCommand class

1. **ExecuteReader** - Use when the T-SQL statement returns more than a single value. For example, if the query returns rows of data.

```
          string connectionString=
ConfigurationManager.ConnectionStrings["DBCSOracle"].ConnectionString;
            using (OracleConnection con = new OracleConnection(connectionString))
            {
                OracleCommand command = new OracleCommand("Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateOracle from
tmp_costing_data order by tmp_mr_num asc", con);
                con.Open();
                OracleDataReader rdr = command.ExecuteReader();
                GridView1.DataSource = rdr;
                GridView1.DataBind();
            }


            //or


            string connectionStringSql =
ConfigurationManager.ConnectionStrings["DBCSSql"].ConnectionString;
            using (SqlConnection conSql = new SqlConnection(connectionStringSql))
            {
                SqlCommand commandSql = new SqlCommand();
                commandSql.CommandText = "Select TMP_MR_NUM
Patient_Number,TMP_PAT_NUM MR_NUMBER,TMP_EFF_DATE DateSQL from tmp_costing_data
order by tmp_mr_num desc";
                commandSql.Connection = conSql;
                conSql.Open();
                GridView2.DataSource = commandSql.ExecuteReader();
                GridView2.DataBind();
            }
```

2. **ExecuteNonQuery** - Use when you want to perform an Insert, Update or Delete operation.

3. **ExecuteScalar** - Use when the query returns a single(scalar) value. For example, queries that return the total number of rows in a table. In case of dataset, it will return only the first column of the first row. Else will be ignored.

```
            string connectionString =
ConfigurationManager.ConnectionStrings["DBCSOracle"].ConnectionString;
            using (OracleConnection con = new OracleConnection(connectionString))
            {
                OracleCommand command = new OracleCommand("Select count(1) from
tmp_costing_data t order by tmp_mr_num asc", con);
                con.Open();
                lblOracle.Text  ="Oracle Count:" +
command.ExecuteScalar().ToString();

            }
```

```
            //or


            string connectionStringSql =
ConfigurationManager.ConnectionStrings["DBCSSql"].ConnectionString;
            using (SqlConnection conSql = new SqlConnection(connectionStringSql))
            {
                SqlCommand commandSql = new SqlCommand();
                commandSql.CommandText = "Select count(tmp_pat_num) from
tmp_costing_data t ";
                commandSql.Connection = conSql;
                conSql.Open();
                int rowCount = (int)commandSql.ExecuteScalar();
                lblSql.Text = "Sql Count:" + rowCount;

            }
```