UNIT 2 ASP.NET& WEB CONTROLS

ASP.NET

- It is a web framework designed and developed by Microsoft.
- It is used to develop websites, web applications and web services.
- It provides fantastic integration of HTML, CSS and JavaScript.
- It was first released in January 2002.
- It is built on the Common Language Runtime (CLR) and allows programmers to write code using any supported .NET language.
- ASP.NET is a part of Microsoft .NET Framework.

The following image shows the component stack.

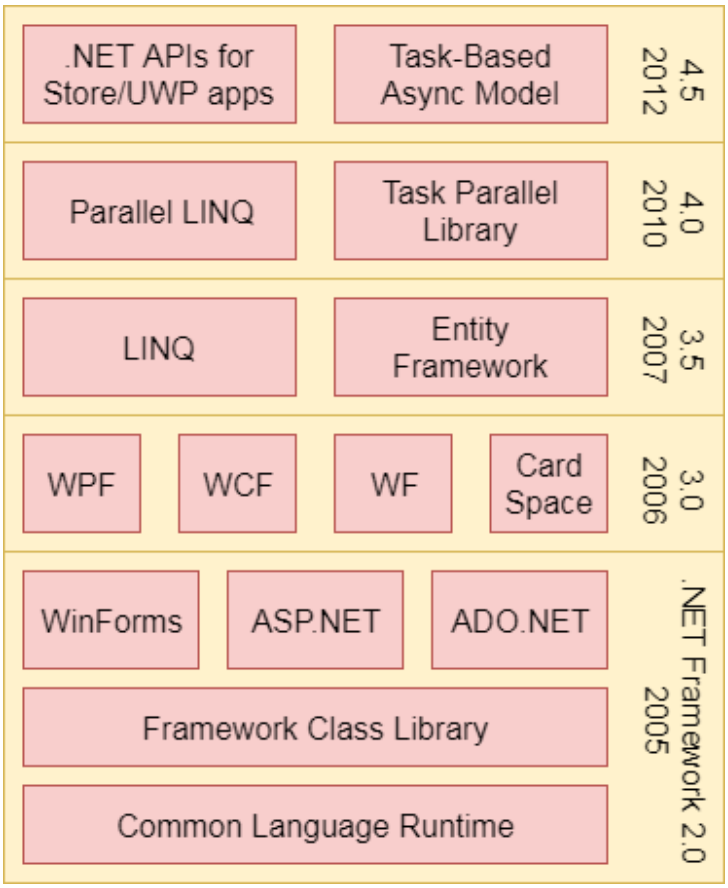

Fig: .NET framework components

ASP.NET provides three development styles for creating web applications:

1. Web Forms
2. ASP.NET MVC
3. ASP.NET Web Pages

Web Forms

- It is an event driven development framework.
- It is used to develop application with powerful data access.
- It provides server side controls and events to create web application.
- It is part of the ASP.NET framework.

ASP.NET MVC

- It gives us a MVC (Model View Controller), patterns-based way to build dynamic websites.

- It enables a clean separation of concerns and that gives you full control over markup for enjoyable, agile development.
- It also provides many features that enable fast development for creating outstanding applications.

ASP.NET Web Pages

- It is used to create dynamic web pages. It provides fast and lightweight way to combine server code with HTML.
- It helps to add video, link to the social sites.
- It also provides other features like you can create beautiful sites that conform to the latest web standards.
- All these are stable and well equipped frameworks. We can create web applications with any of them.
- These are also based on the .NET Framework and share core functionalities of .NET and ASP.NET.
- We can use any development style to create application.
- The selection of style is depends on the skills and experience of the programmer.
- Although each framework is independent to other, we can combine and use any of that at any level of our application. For example, to develop client interaction module, we can use MVC and for data control, we can use Web Forms.

The following table illustrates each development model.

Model	Skills	Development style	Experience
Web Forms	Win Forms, WPF, .NET	Rapid development using a rich library of controls that encapsulate HTML markup	Mid-Level, Advanced RAD
MVC	Ruby on Rails, .NET	Full control over HTML markup, code and markup separated, and easy to write tests. The best choice for mobile and single-page applications (SPA).	Mid-Level, Advanced
Web Pages	Classic ASP, PHP	HTML markup and your code together in the same file	New, Mid-Level

ASP.NET Page Lifecycle

In ASP.NET, a web page has execution lifecycle that includes various phases. These phases include initialization, instantiation, restoring and maintaining state etc. it is required to understand the page lifecycle so that we can put custom code at any stage to perform our business logic.

Page Lifecycle stages

The following table contains the lifecycle stages of ASP.NET web page.

Stage	Description
Page request	This stage occurs before the lifecycle begins. When a page is requested by the user, ASP.NET parses and compiles that page.
Start	In this stage, page properties such as Request and response are set. It also determines the Request type.
Initialization	In this stage, each control's UniqueID property is set. Master page is applied to the page.
Load	During this phase, if page request is postback, control properties are loaded with information.
Postback event handling	In this stage, event handler is called if page request is postback. After that, the Validate method of all validator controls is called.
Rendering	Before rendering, view state is saved for the page and all controls. During the rendering stage, the page calls the Render method for each control, providing a text writer that writes its output to the OutputStream object of the page's Response property.

Unload	At this stage the requested page has been fully rendered and is ready to terminate.at this stage all properties are unloaded and cleanup is performed.

A requested page first loaded into the server memory after that processes and sent to the bowser. At last it is unloaded from the server memory. ASP.NET provides methods and events at each stage of the page lifecycle that we can use in our application. In the following table, we are tabled events.

ASP.NET Life Cycle Events

Page Event	Typical Use
PreInit	This event is raised after the start stage is complete and before the initialization stage.
Init	This event occurs after all controls have been initialized. We can use this event to read or initialize control properties.
InitComplete	This event occurs at the end of the page's initialization stage. We can use this event to make changes to view state that we want to make sure are persisted after the next postback.
PreLoad	This event is occurs before the post back data is loaded in the controls.
Load	This event is raised for the page first time and then recursively for all child controls.
Control events	This event is used to handle specific control events such as Button control' Click event.
LoadComplete	This event occurs at the end of the event-handling stage. We can use this event for tasks that require all other controls on the page be loaded.
PreRender	This event occurs after the page object has created all controls that are required in order to render the page.
PreRenderComplete	This event occurs after each data bound control whose DataSourceID property is set calls its DataBind method.
SaveStateComplete	It is raised after view state and control state have been saved for the page and for all controls.
Render	This is not an event; instead, at this stage of processing, the Page object calls this method on each control.
Unload	This event raised for each control and then for the page.

ASP.NET Web Forms

Web Forms are web pages built on the ASP.NET Technology. It executes on the server and generates output to the browser. It is compatible to any browser to any language supported by .NET common language runtime. It is flexible and allows us to create and add custom controls.

We can use Visual Studio to create ASP.NET Web Forms. It is an IDE (Integrated Development Environment) that allows us to drag and drop server controls to the web forms. It also allows us to set properties, events and methods for the controls. To write business logic, we can choose any .NET language like: Visual Basic or Visual C#.

Web Forms are made up of two components: the visual portion (the ASPX file), and the code behind the form, which resides in a separate class file.

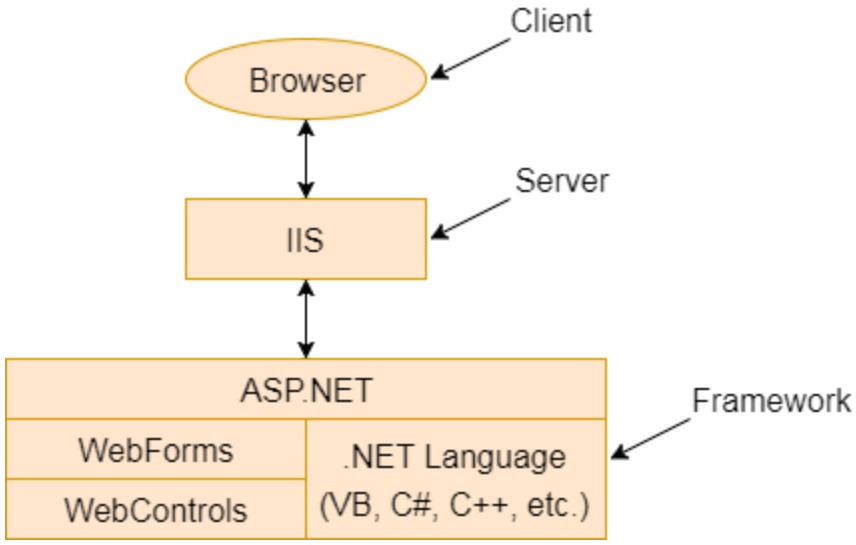

Fig: This diagram shows the components of the ASP.NET

The main purpose of Web Forms is to overcome the limitations of ASP and separate view from the application logic.

ASP.NET provides various controls like: server controls and HTML controls for the Web Forms. We have tables all these controls below.

Server Controls

The following table contains the server-side controls for the Web Forms.

Control Name	Applicable Events	Description
Label	None	It is used to display text on the HTML page.
TextBox	TextChanged	It is used to create a text input in the form.
Button	Click, Command	It is used to create a button.
LinkButton	Click, Command	It is used to create a button that looks similar to the hyperlink.
ImageButton	Click	It is used to create an imagesButton. Here, an image works as a Button.
Hyperlink	None	It is used to create a hyperlink control that responds to a click event.
DropDownList	SelectedIndexChanged	It is used to create a dropdown list control.
ListBox	SelectedIndexCnhaged	It is used to create a ListBox control like the HTML control.
DataGrid	CancelCommand, EditCommand, DeleteCommand, ItemCommand,	It used to create a frid that is used to show data. We can also perform paging, sorting,

	SelectedIndexChanged, PageIndexChanged, SortCommand, UpdateCommand, ItemCreated, ItemDataBound	and formatting very easily with this control.
DataList	CancelCommand, EditCommand, DeleteCommand, ItemCommand, SelectedIndexChanged, UpdateCommand, ItemCreated, ItemDataBound	It is used to create datalist that is non-tabular and used to show data.
Repeater	ItemCommand, ItemCreated, ItemDataBound	It allows us to create a non-tabular type of format for data. You can bind the data to template items, which are like bits of HTML put together in a specific repeating format.
CheckBox	CheckChanged	It is used to create checkbox.
CheckBoxList	SelectedIndexChanged	It is used to create a group of check boxes that all work together.
RadioButton	CheckChanged	It is used to create radio button.
RadioButtonList	SelectedIndexChanged	It is used to create a group of radio button controls that all work together.
Image	None	It is used to show image within the page.
Panel	None	It is used to create a panel that works as a container.
PlaceHolder	None	It is used to set placeholder for the control.
Calendar	SelectionChanged, VisibleMonthChanged, DayRender	It is used to create a calendar. We can set the default date, move forward and backward etc.
AdRotator	AdCreated	It allows us to specify a list of ads to display. Each time the user re-displays the page.
Table	None	It is used to create table.
XML	None	It is used to display XML documents within the HTML.
Literal	None	It is like a label in that it displays a literal, but allows us to create new literals at runtime and place them into this control.

HTML Controls

These controls render by the browser. We can also make HTML controls as server control. we will discuss about this in further our tutorial.

Controls Name	Description
Button	It is used to create HTML button.
Reset Button	Resets all other HTML form elements on a form to a default value
Submit Button	Automatically POSTs the form data to the specified page listed in the Action attribute in the FORM tag
Text Field	Gives the user an input area on an HTML form
Text Area	Used for multi-line input on an HTML form
File Field	Places a text field and a Browse button on a form and allows the user to select a file name from their local machine when the Browse button is clicked
Password Field	An input area on an HTML form, although any characters typed into this field are displayed as asterisks
CheckBox	Gives the user a check box that they can select or clear
Radio Button	Used two or more to a form, and allows the user to choose one of the controls
Table	Allows you to present information in a tabular format
Image	Displays an image on an HTML form
ListBox	Displays a list of items to the user. You can set the size from two or more to specify how many items you wish show. If there are more items than will fit within this limit, a scroll bar is automatically added to this control.
Dropdown	Displays a list of items to the user, but only one item at a time will appear. The user can click a down arrow from the side of this control and a list of items will be displayed.
Horizontal Rule	Displays a horizontal line across the HTML page

ASP.NET Web Forms Server Controls

ASP.NET provides web forms controls that are used to create HTML components. These controls are categories as server and client based. The following table contains the server controls for the web forms.

Control Name	Applicable Events	Description
Label	None	It is used to display text on the HTML page.
TextBox	TextChanged	It is used to create a text input in the form.
Button	Click, Command	It is used to create a button.
LinkButton	Click, Command	It is used to create a button that looks similar to the hyperlink.
ImageButton	Click	It is used to create an imagesButton. Here, an image works as a Button.

Hyperlink	None	It is used to create a hyperlink control that responds to a click event.
DropDownList	SelectedIndexChanged	It is used to create a dropdown list control.
ListBox	SelectedIndexCnhaged	It is used to create a ListBox control like the HTML control.
DataGrid	CancelCommand, EditCommand, DeleteCommand, ItemCommand, SelectedIndexChanged, PageIndexChanged, SortCommand, UpdateCommand, ItemCreated, ItemDataBound	It used to create a frid that is used to show data. We can also perform paging, sorting, and formatting very easily with this control.
DataList	CancelCommand, EditCommand, DeleteCommand, ItemCommand, SelectedIndexChanged, UpdateCommand, ItemCreated, ItemDataBound	It is used to create datalist that is non-tabular and used to show data.
CheckBox	CheckChanged	It is used to create checkbox.
CheckBoxList	SelectedIndexChanged	It is used to create a group of check boxes that all work together.
RadioButton	CheckChanged	It is used to create radio button.
RadioButtonList	SelectedIndexChanged	It is used to create a group of radio button controls that all work together.
Image	None	It is used to show image within the page.
Panel	None	It is used to create a panel that works as a container.
PlaceHolder	None	It is used to set placeholder for the control.
Calendar	SelectionChanged, VisibleMonthChanged, DayRender	It is used to create a calendar. We can set the default date, move forward and backward etc.
AdRotator	AdCreated	It allows us to specify a list of ads to display. Each time the user re-displays the page.
Table	None	It is used to create table.
XML	None	It is used to display XML documents within the HTML.
Literal	None	It is like a label in that it displays a literal, but allows us to create new literals at runtime and place them into this control.