Chapter 7

Introducing AJAX Controls

AJAX

- AJAX stands for ***Asynchronous Java and XML.***
- Microsoft has both a server-side Ajax framework and a client-side Ajax framework.
- The advantage of the server-side framework is that it provides existing ASP.NET developers with a painless method of doing Ajax.
- The disadvantage of the server-side framework is that it doesn't escape all the problems associated with a server-side framework. You still have to run back to the server whenever you perform any client-side action.
- To build applications using client side AJAX you must use JavaScript.
- The advantage of building applications with the client-side framework is that you can build rich and responsive web applications.

AJAX

Debugging the AJAX applications

- You can use a tool called fiddler. You can download this tool (for free) at http://www.fiddlertool.
- The other critical Ajax debugging tool is Firebug, which is a free Firefox extension.
- You can download Firebug by launching Firefox and selecting Tools, Add-ons.

ASP .Net AJAX Controls

- ScriptManager
- ScriptManagerProxy
- UpdatePanel
- Timer
- UpdateProgress

ScriptManager Control

You must use a ScriptManager control on a page to enable the following features of ASP.NET AJAX:

- *Client-script functionality of the Microsoft AJAX Library* can be accessed only if we use ScriptManager.
- ScriptManager enables us to use Partial-page rendering. *Partial-page rendering*, enables regions on the page to be independently refreshed without a postback.
- The ASP.NET AJAX UpdatePanel, UpdateProgress, and Timer controls require a ScriptManager control to support partial-page rendering else they will not work.
- It is used to access web-services through JavaScript proxy classes.
- It is used by JavaScript classes to access ASP.NET authentication and profile application services.

ScriptManagerProxy Control

- We can have *only one ScriptManager Control on a web page.*
- In cases where a ScriptManager control is already on the page but a nested or parent component needs additional features of the ScriptManager control, the component can include a ScriptManagerProxy control.

For Example,

- Consider a scenario in which we have a ScriptManager control on the Master Page. Let a web page is using this Master Page. So this web page can not have its own ScriptManager control.
- Hence in order to access a ScriptManager control that is defined in a master page from a content page, you can use the ScriptManagerProxy.

ScriptManagerProxy Control

That is in short

If a page already contains a ScriptManager control, but a nested or parent component needs additional features of the ScriptManager control, the component can include a ScriptManagerProxy control.

Using the UpdatePanel Control

- Microsoft's server-side AJAX framework consists of one main control: UpdatePanel.
- The UpdatePanel control enables you to update a portion of a page without updating the entire page.
- In other words, it enables you to perform partial-page rendering.
- You can do nesting of Update Panels to any levels.
- ***Example:***

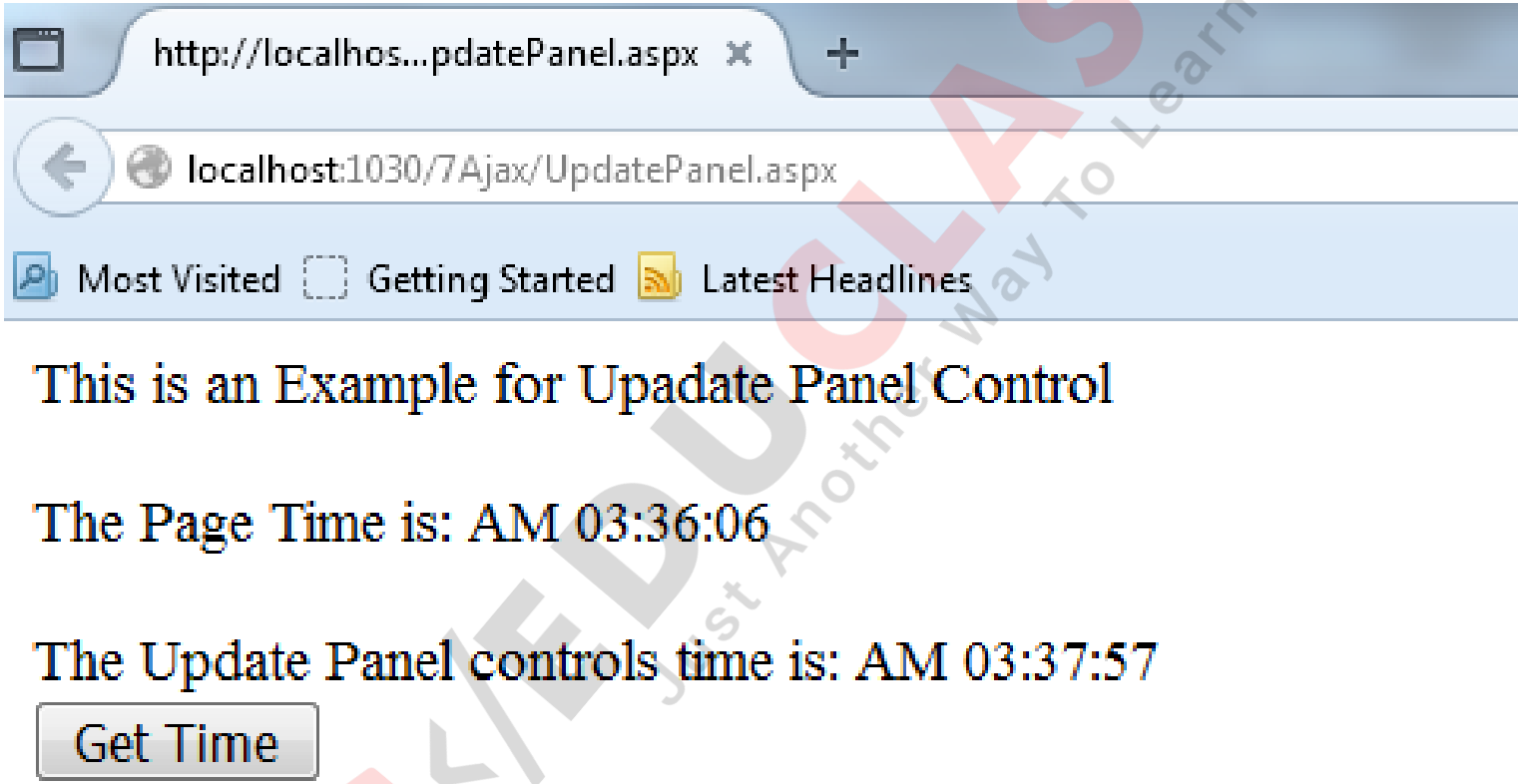
Let's start with a example of a page that uses the UpdatePanel control.

The example contains a ScriptManager control and an UpdatePanel control.

The UpdatePanel control contains a single Button control.

When you click the button, only the content contained in the UpdatePanel control is refreshed

UpdatePanel Control



UpdatePanel Control

```
<%@ Page Language="C#" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<script runat="server">

    protected void Page_Init(object sender, EventArgs e)
    {
        lblPage.Text = DateTime.Now.ToString("T");
    }

    protected void btnUpdate_Click(object sender, EventArgs e)
    {
        lblPanel.Text = DateTime.Now.ToString("T");
    }
</script>
```

UpdatePanel Control

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
   <title></title>
</head>
```

UpdatePanel Control

```
<body>
  <form id="form1" runat="server">
  <div>
    <asp:ScriptManager ID="ScriptManager1" runat="server">      </asp:ScriptManager>

    This is an Example for Upadate Panel Control <br /> <br />
    The Page Time is:
    <asp:Label ID="lblPage" runat="server" Text=""></asp:Label>
    <br /> <br />
    <asp:UpdatePanel ID="UpdatePanel1" runat="server">
      <ContentTemplate>
        The Update Panel controls time is:
        <asp:Label ID="lblPanel" runat="server" Text=""></asp:Label> <br />
        <asp:Button ID="btnUpdate" runat="server" Text="Get Time" OnClick="btnUpdate_Click" />
      </ContentTemplate>
    </asp:UpdatePanel>
  </div>
  </form>
</body>
</html>
```

UpdatePanel Control

- The above example displays the current time both inside and outside the UpdatePanel control.
- When you click the button, only the time within the UpdatePanel control is refreshed.
- The UpdatePanel hijacks the normal postback and performs a "partial" postback to grab the new content in the background.
- The ***ScriptManager*** control in above example adds the necessary JavaScript scripts to enable Ajax.
- Anytime you create a page that uses Ajax, regardless of whether you are doing server-side or client-side Ajax, you'll add a ScriptManager control to the page.

UpdatePanel Control

Major properties of UpdatePanel Control

- **ChildrenAsTriggers—**Gets or sets a Boolean value that indicates whether child controls should trigger an asynchronous postback automatically.
- **ContentTemplateContainer—**Gets the container for the UpdatePanel control's ContentTemplate. You can add controls to the ContentTemplate programmatically using this property.
- **IsInPartialRendering—**Gets a Boolean value indicating whether the UpdatePanel is rendered in response to an asynchronous postback.
- **Triggers—**Gets a list of controls that trigger the UpdatePanel to perform either an asynchronous or synchronous postback.

Specifying UpdatePanel Triggers

- By default, an UpdatePanel hijacks any postbacks that any of its child controls performs.
- For example, if a Button control is contained in an UpdatePanel, the UpdatePanel hijacks the button Click event and performs an Ajax call instead of the normal postback.
- You can cause an UpdatePanel to refresh its contents from a control located outside of the UpdatePanel by specifying a trigger.
- For example, the below example contains a Button control outside of an UpdatePanel that causes the UpdatePanel to refresh its content.

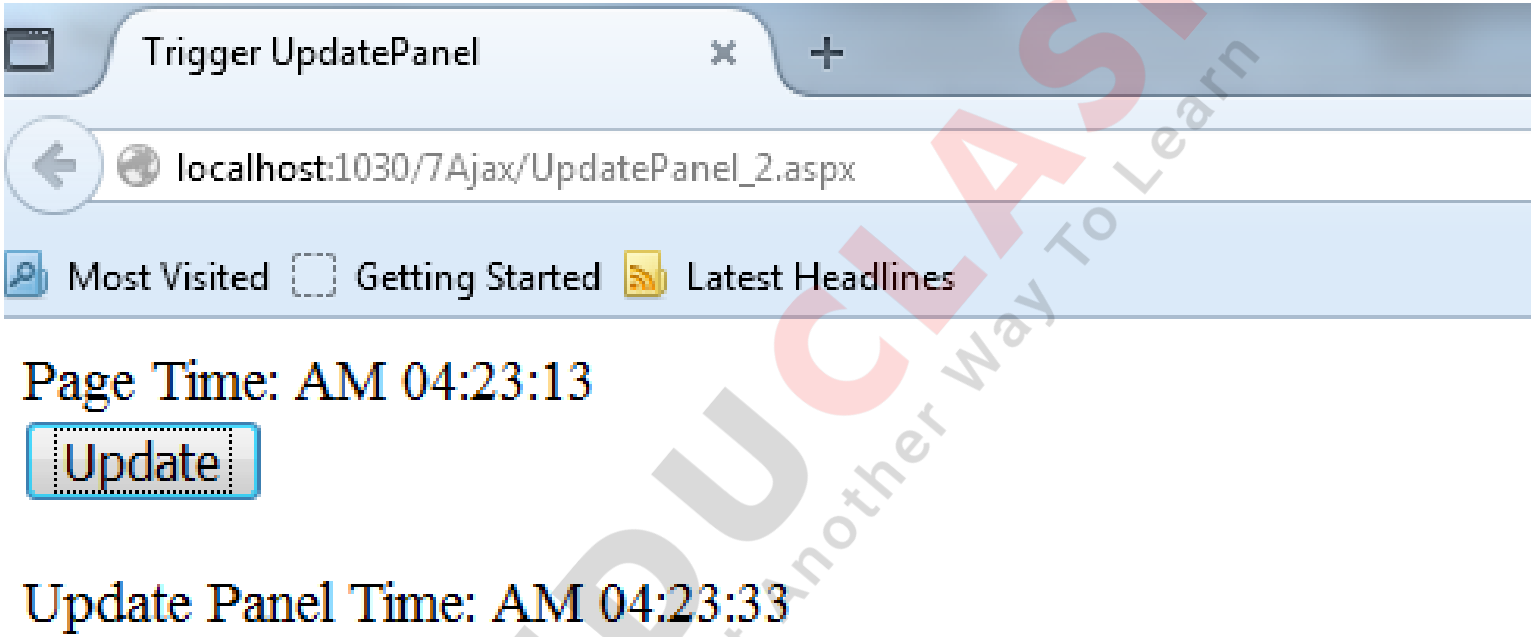
UpdatePanel Trigger

```
<%@ Page Language="C#" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<script runat="server">

</script>

<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
   <title>Trigger UpdatePanel</title>
</head>
<body>
   <form id="form1" runat="server">
   <div>
```

UpdatePanel Trigger

```
<asp:ScriptManager id="sm1" Runat="server" />
    Page Time: <%= DateTime.Now.ToString("T") %>
    <br />
    <asp:Button id="btnUpdate" Text="Update" Runat="server" />
        <br />
    <asp:UpdatePanel id="up1" Runat="server">
      <Triggers>
        <asp:AsyncPostBackTrigger ControlID="btnUpdate"
      EventName="Click" />
      </Triggers>
      <ContentTemplate>
        Update Panel Time: <%= DateTime.Now.ToString("T") %>
      </ContentTemplate>
    </asp:UpdatePanel>
</div>     </form>     </body>  </html>
```

UpdatePanel Trigger



UpdatePanel Triggers

- If you want, you can prevent the UpdatePanel from refreshing its contents unless you have explicitly created a trigger.
- If you set the UpdatePanel control's ChildrenAsTriggers property to the value false, you must explicitly create a trigger to update the contents of the UpdatePanel.
- The UpdatePanel supports two types of triggers:
  AsyncPostBackTrigger and PostBackTrigger.
  - The AsyncPostBackTrigger causes an asynchronous (Ajax) postback.
  - The PostBackTrigger causes a normal entire-page postback.

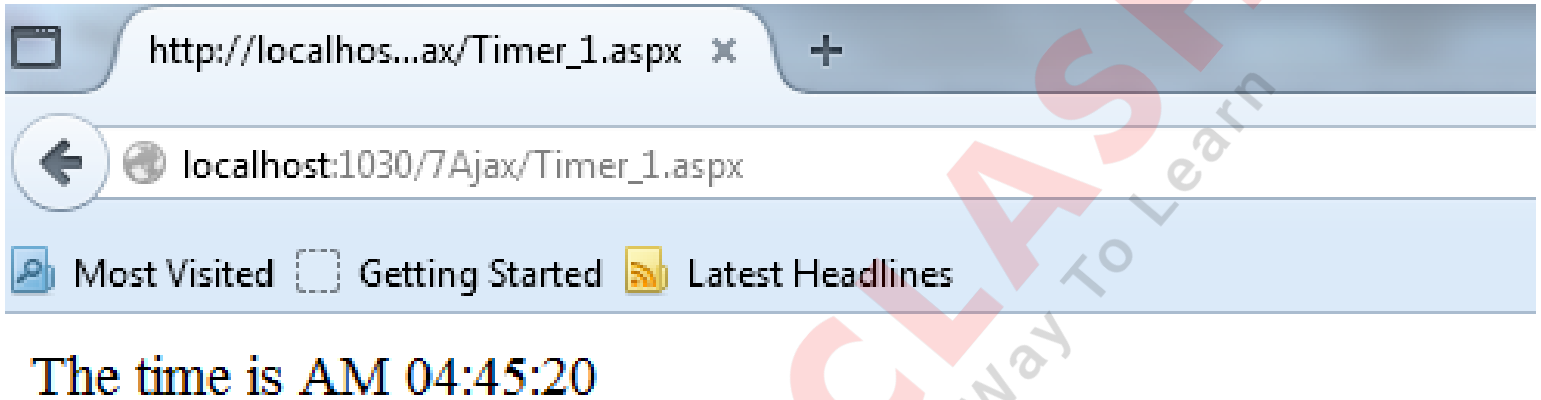
Timer Control

- *The ASP.NET AJAX Timer control enables you to refresh an UpdatePanel (or the entire page) on a timed basis.*
- The Timer control has one important property:

***Interval*—The amount of time, in milliseconds, between Tick events.** The default value is 60,000 (1 minute).

- The Timer control raises a ***Tick event*** , depending on the value of its Interval property.
- If you don't associate the Timer control with an UpdatePanel, the Timer posts the entire page back to the server performing a normal postback.
- ***For example, in the below example***, the page posts the entire page back to the server every 2 seconds.

Timer Control




```
<%@ Page Language="C#" %>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<script runat="server">
</script>

<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
   <title></title>
</head>
```

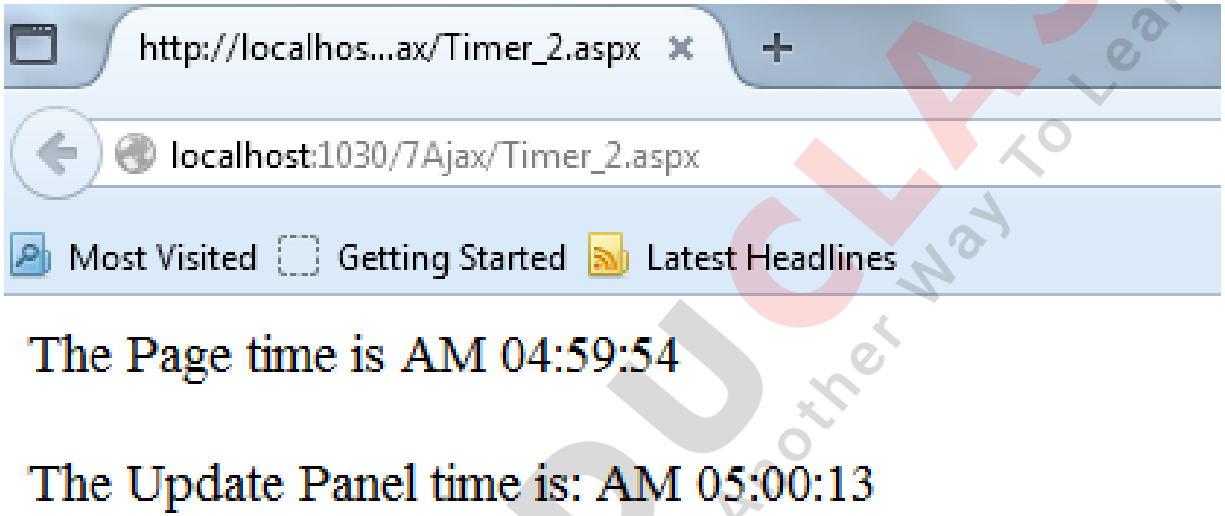
Timer Control

```
<body>
  <form id="form1" runat="server">
  <div>
    <asp:ScriptManager ID="ScriptManager1" runat="server" />
    <asp:Timer ID="Timer1" Interval="2000" runat="server" />
    The time is <%= DateTime.Now.ToString("T") %>
  </div>
  </form>
</body>
</html>
```

Timer Control

Another Example:

Refresh an UpdatePanel control's content on a timed basis.




```
<%@ Page Language="C#" %>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<script runat="server">
</script>
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
   <title></title>
</head>
```

Timer Control

```
<body>
  <form id="form1" runat="server">
  <div>
    <asp:ScriptManager ID="ScriptManager1" runat="server" />
    <asp:Timer ID="Timer1" Interval="2000" runat="server" />
    The Page time is <%= DateTime.Now.ToString("T") %> <br /> <br />
    <asp:UpdatePanel ID="UpdatePanel1" runat="server">
      <ContentTemplate>
        The Update Panel time is: <%= DateTime.Now.ToString("T") %>
      </ContentTemplate>
      <Triggers>
        <asp:AsyncPostBackTrigger ControlID="Timer1" EventName="tick" />
      </Triggers>
    </asp:UpdatePanel>
  </div>
  </form>
</body>
</html>
```

UpdateProgress Control

- This control enables you to display a progress indicator while an UpdatePanel is updating its content.
- During a normal postback, the browser displays its progress in downloading new content by spinning an icon or displaying a progress bar.
- During an asynchronous postback, on the other hand, there is no visual indication of progress.
- You can use the UpdateProgress control to give the users some sense that something is happening during an asynchronous postback.

UpdateProgress Control

- The following example illustrates how to use the UpdateProgress control.
- If you click the button, an animation spins while the asynchronous postback is performed

```
<%@ Page Language="C#" %>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<script runat="server">
   protected void btnGetTime_Click(object sender, EventArgs e)
   {
      System.Threading.Thread.Sleep(5000);
   }
</script>
```

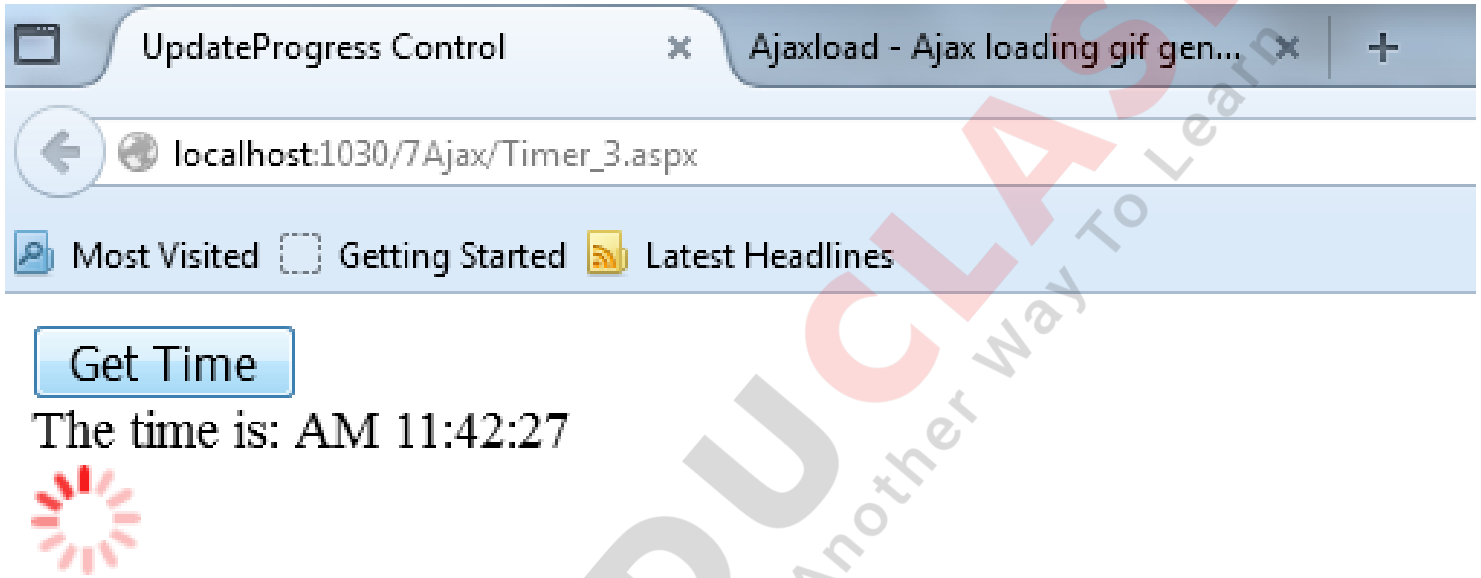
UpdateProgress Control

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
   <title></title>
</head>
<body>
   <form id="form1" runat="server">
   <div>
      <asp:ScriptManager ID="ScriptManager1"  runat="server"
></asp:ScriptManager>
```

UpdateProgress Control

```
<asp:UpdatePanel ID="UpdatePanel1" runat="server">
        <ContentTemplate>
           <asp:Button ID="btnGetTime" runat="server" Text="Get Time"
                    OnClick="btnGetTime_Click" /> <br />
           The time is:
           <%= DateTime.Now.ToString("T") %>
        </ContentTemplate>
     </asp:UpdatePanel>

<asp:UpdateProgress ID="UpdateProgress1" runat="server"
AssociatedUpdatePanelID="UpdatePanel1" >
        <ProgressTemplate>
           <asp:Image ID="Loader" ImageUrl="~/Images/ajax-
          loader.gif" runat="server" />
        </ProgressTemplate>
</asp:UpdateProgress>
   </div>    </form> </body> </html>
```

UpdateProgress Control



Several websites enable you to generate fancy animator progress indicator icons. One of such website is:

http://www.ajaxload.info

Thanks !!!