

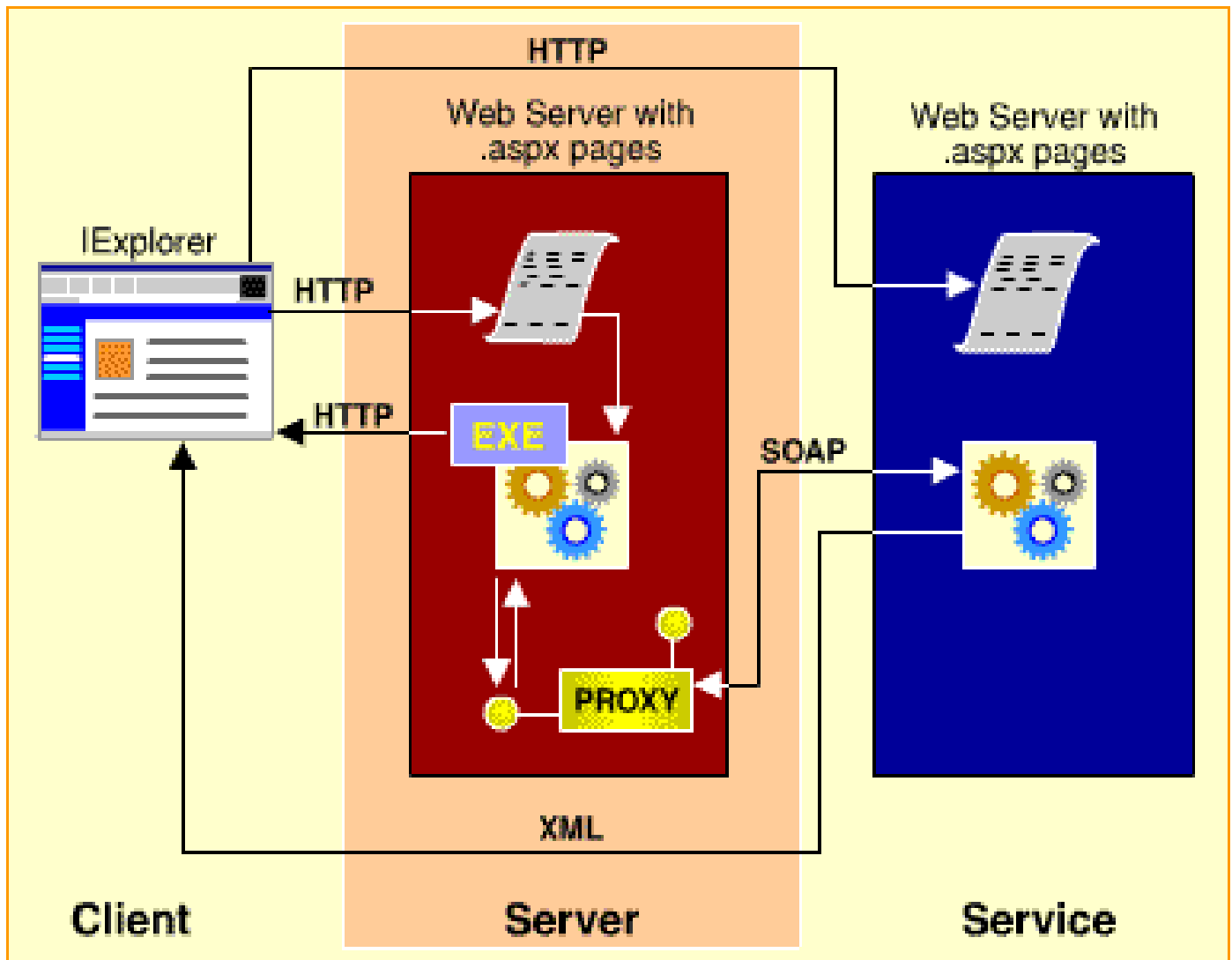
Internet Application Development
Web Services - Assignment

Dated: Thursday, 15th May 2025

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Q1) Draw web services execution model?



Q2) Develop a web service with four web methods as follows:

(a) Add

(c) Multiply

(b) Subtract

(d) Divide

Assume all above methods need two parameters and return a single value as string value.

```
<%@ WebService Language="vb" Class="Calculator" %>
```

```
Imports System.Web.Services
```

```
<WebService(Namespace:="http://tempuri.org/MathLibService")> _
```

```
Public Class Calculator
```

```
    Inherits WebService
```

```
    <WebMethod()>
```

```
    Public Function Add(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        Return (num1 + num2).ToString()
```

```
    End Function
```

```
    <WebMethod()> _
```

```
    Public Function Subtract(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        Return (num1 - num2).ToString()
```

```
    End Function
```

```
    <WebMethod()> _
```

```
    Public Function Multiply(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        Return (num1 * num2).ToString()
```

```
    End Function
```

```
    <WebMethod()> _
```

```
    Public Function Divide(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        If num2 = 0 Then
```

```
            Return "Error: Division by zero"
```

```
        Else
```

```
            Return (num1 / num2).ToString()
```

```
        End If
```

```
    End Function
```

```
End Class
```

Q3) Test the web service using browser on local pc.

Install Internet Information Services on your laptop/pc (if not installed)

Using IIS manager create two separate applications as follows:

(a) MathLibService

- Create the .asmx File
- Save the file as Calculator.asmx in: C:\inetpub\wwwroot\MathLibService\

 Calculator.asmx - Notepad

File Edit Format View Help

```
<%@ WebService Language="vb" Class="Calculator" %>
```

```
Imports System.Web.Services
```

```
<WebService(Namespace:="http://tempuri.org/MathLibService")> _
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Public Class Calculator
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    <WebMethod()>
```

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    Public Function Add(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        Return (num1 + num2).ToString()
```

```
    End Function
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```
    <WebMethod()> _
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```
    Public Function Subtract(ByVal num1 As Double, ByVal num2 As Double) As String
```

```
        Return (num1 - num2).ToString()
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```

```
    End Function
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    <WebMethod()> _
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    Public Function Divide(ByVal num1 As Double, ByVal num2 As Double) As String
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            Return "Error: Division by zero"
```

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        Else
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            Return (num1 / num2).ToString()
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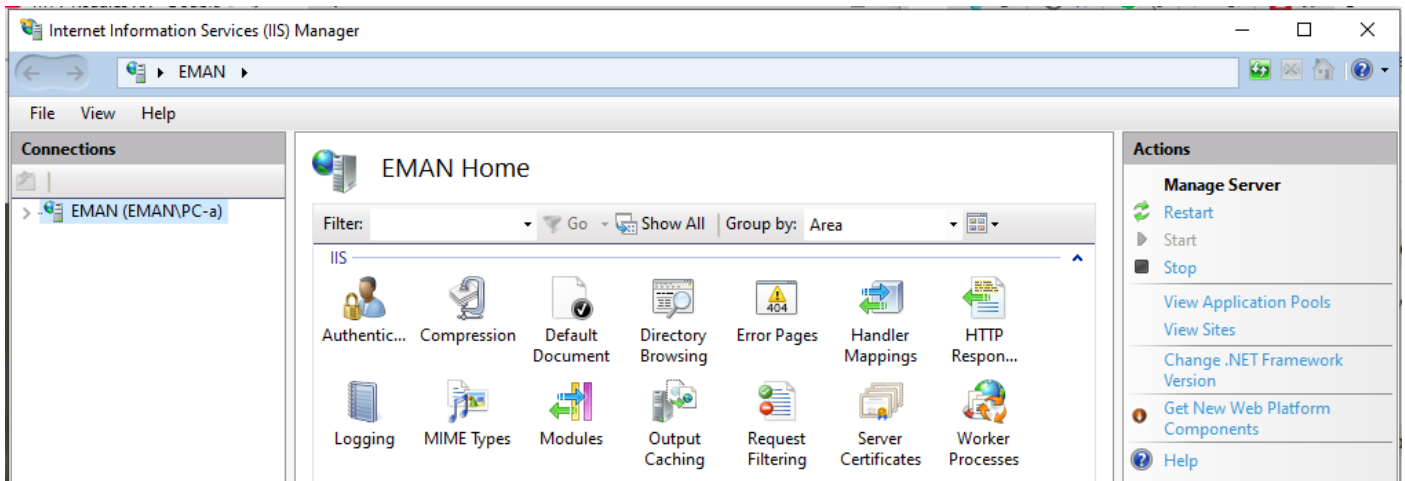
```
        End If
```

```
    End Function
```

```
End Class
```

- Configure IIS for MathLibService
- Open IIS Manager (Press Win + R, type inetmgr, and hit Enter).
- Right-click Sites → Add Website.
- Site name: MathLibService
- Physical path: C:\inetpub\wwwroot\MathLibService
- Port: 8080 (or any unused port)

- Click OK.



Add Website

Site name: **Application pool:**

Content Directory

Physical path:

Pass-through authentication

Binding

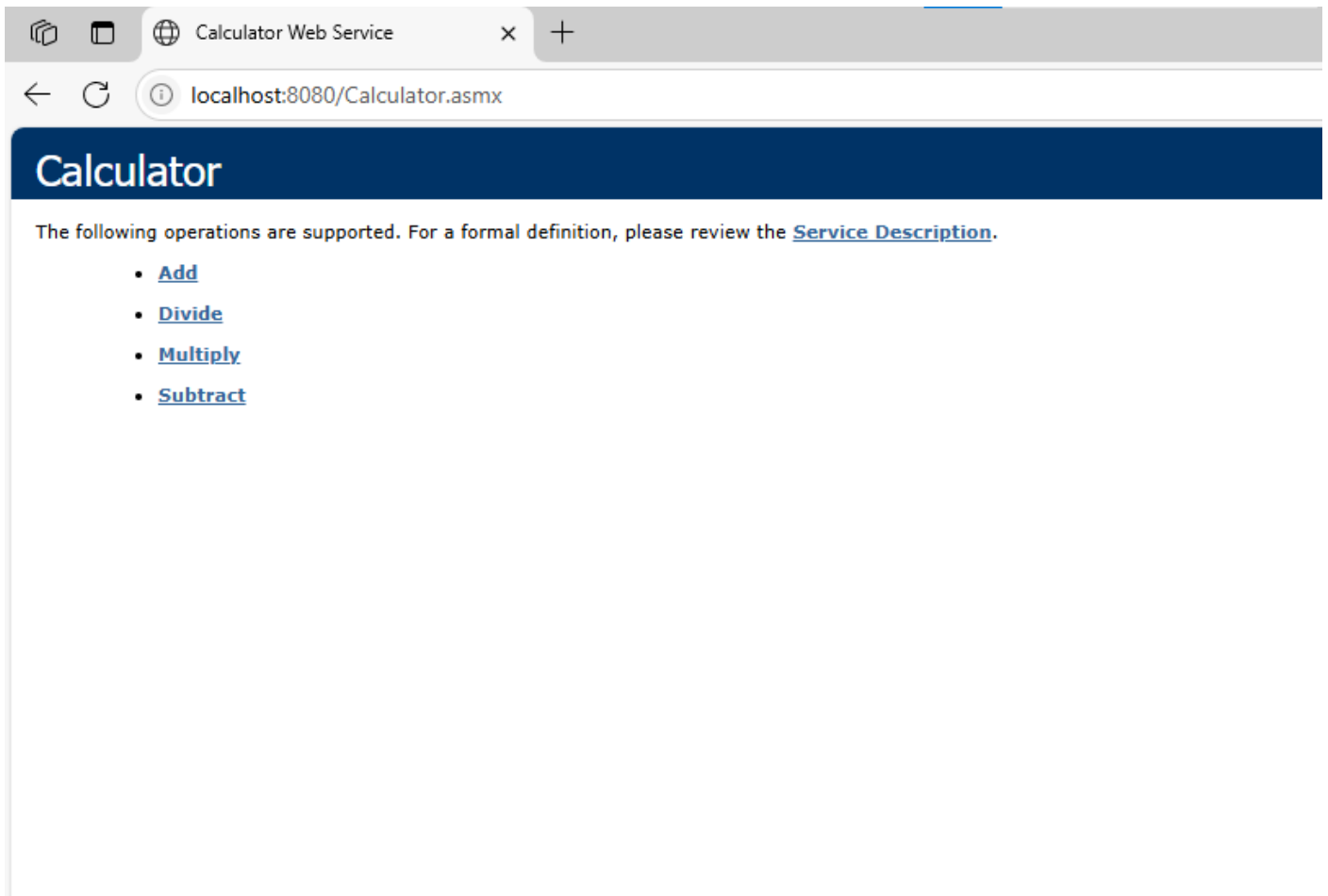
Type: **IP address:** **Port:**

Host name:

Example: www.contoso.com or marketing.contoso.com

☒ Start Website immediately

- Test the Web Service in Browser
- Open a browser and navigate to: <http://localhost:8080/Calculator.aspx>



Default.aspx

```
<%@ Page Language="VB" AutoEventWireup="false" CodeFile="Default.aspx.vb" Inherits="_Default"
%>

<!DOCTYPE html>
<html>
<head>
    <title>Simple Calculator</title>
    <style>
body {
font-family: Arial;
width: 180px;
margin: 20px
auto;
    padding: 10px;
}
    .input-field {
        margin-bottom: 10px;
        width: 100%;
    }
    input {
width:
100%;
padding:
8px;
        box-sizing: border-box;
    }
    .buttons {
display: flex;
        flex-direction: column;
        gap:
5px;
margin: 10px
0;
    }
        button {
            padding: 10px;
            background:
#4CAF50;
            color: white;
            border: none;
            width: 100%;
        }
        .result {
margin-top: 10px;
```

```

padding: 8px;
background: #f0f0f0;
    text-align: center;
}
</style>
</head>
<body>
    <form id="form1" runat="server">
        <h3 style="text-align: center;">Calculator</h3>

        <div class="input-field">
            <asp:TextBox ID="txtNum1" runat="server" placeholder="First number">
</asp:TextBox>
        </div>
        <div class="input-field">
            <asp:TextBox ID="txtNum2" runat="server" placeholder="Second number">
</asp:TextBox>
        </div>

        <div class="buttons">
            <asp:Button ID="btnAdd" runat="server" Text="Add (+)"
OnClick="OperationButton_Click" CommandArgument="Add" />
            <asp:Button ID="btnSubtract" runat="server" Text="Subtract (-)"
OnClick="OperationButton_Click" CommandArgument="Subtract" />
            <asp:Button ID="btnMultiply" runat="server" Text="Multiply (×)"
OnClick="OperationButton_Click" CommandArgument="Multiply" />
            <asp:Button ID="btnDivide" runat="server" Text="Divide (÷)"
OnClick="OperationButton_Click" CommandArgument="Divide" />
        </div>

        <div class="result">
            <asp:Literal ID="lblResult" runat="server" Text="0"></asp:Literal>
        </div>
    </form>
</body>
</html>

```

Default.aspx.vb

```

Imports System
Imports System.Web.Services
Imports System.Web.UI
Imports System.Web.UI.WebControls

```

```

Partial Class _Default
    Inherits System.Web.UI.Page

```

```

Protected Sub OperationButton_Click(sender As Object, e As EventArgs)
    Dim operationButton As Button = CType(sender, Button)
    Dim operation As String = operationButton.CommandArgument

```

```

Dim num1 As Double =
Double.Parse(txtNum1.Text)    Dim num2 As
Double = Double.Parse(txtNum2.Text)
Dim service As New localhost.WebService()
' Create proxy for the web service

```

```

Dim result As String = ""

```

```

Select Case
operation      Case
"Add"
    result = service.Add(num1,
num2)          Case "Subtract"
    result = service.Subtract(num1,
num2)          Case "Multiply"
    result = service.Multiply(num1,
num2)          Case "Divide"
    result = service.Divide(num1,
num2)          End Select

```

```

lblResult.Text = "Result: " & result
End Sub
End Class

```

Web.config:

```

<?xml version="1.0"?>
<configuration>
  <!--
    For a description of web.config changes see http://go.microsoft.com/fwlink/?LinkId=235367.
  -->

```

The following attributes can be set on the <httpRuntime> tag.

```

  <system.Web>
    <httpRuntime targetFramework="4.8.1" />
  </system.Web>
-->
<system.web>
  <compilation debug="true" targetFramework="4.8.1"/>
  <pages controlRenderingCompatibilityVersion="4.0"/>
</system.web>

<system.serviceModel>
  <bindings>
    <basicHttpBinding>
      <binding name="MathLibServiceSoap" />
    </basicHttpBinding>
  </bindings>
  <client>
    <endpoint address="http://localhost:8080/WebService.asmx"
      binding="basicHttpBinding" bindingConfiguration="MathLibServiceSoap"
contract="localhost.MathLibServiceSoap" name="MathLibServiceSoap" /> </client>

```

</system.serviceModel>

</configuration>

Deploy ServiceClient to IIS

- Right-click the ServiceClient project → Publish.
- Choose IIS, FTP, etc. → Click Publish.

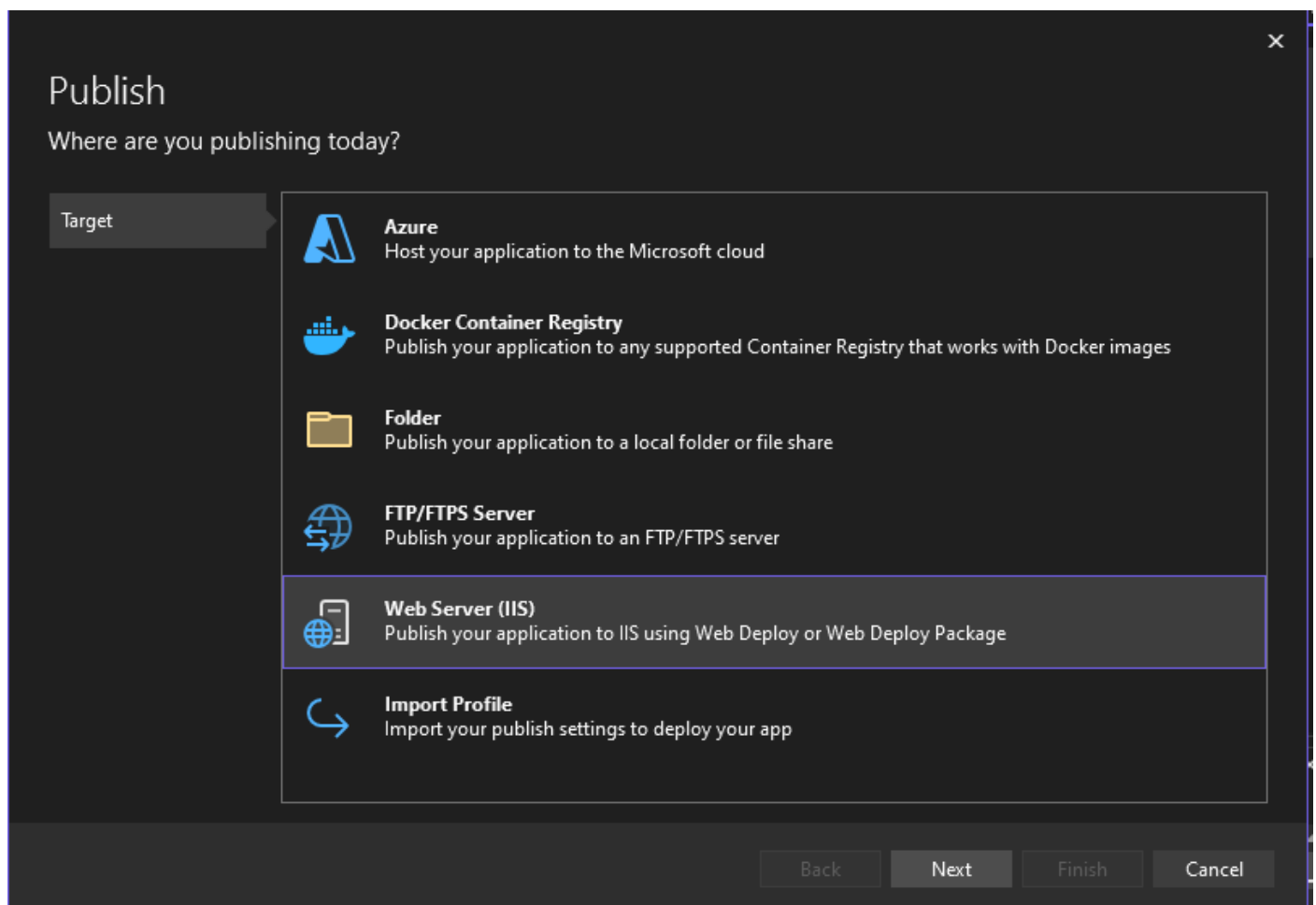
Set:

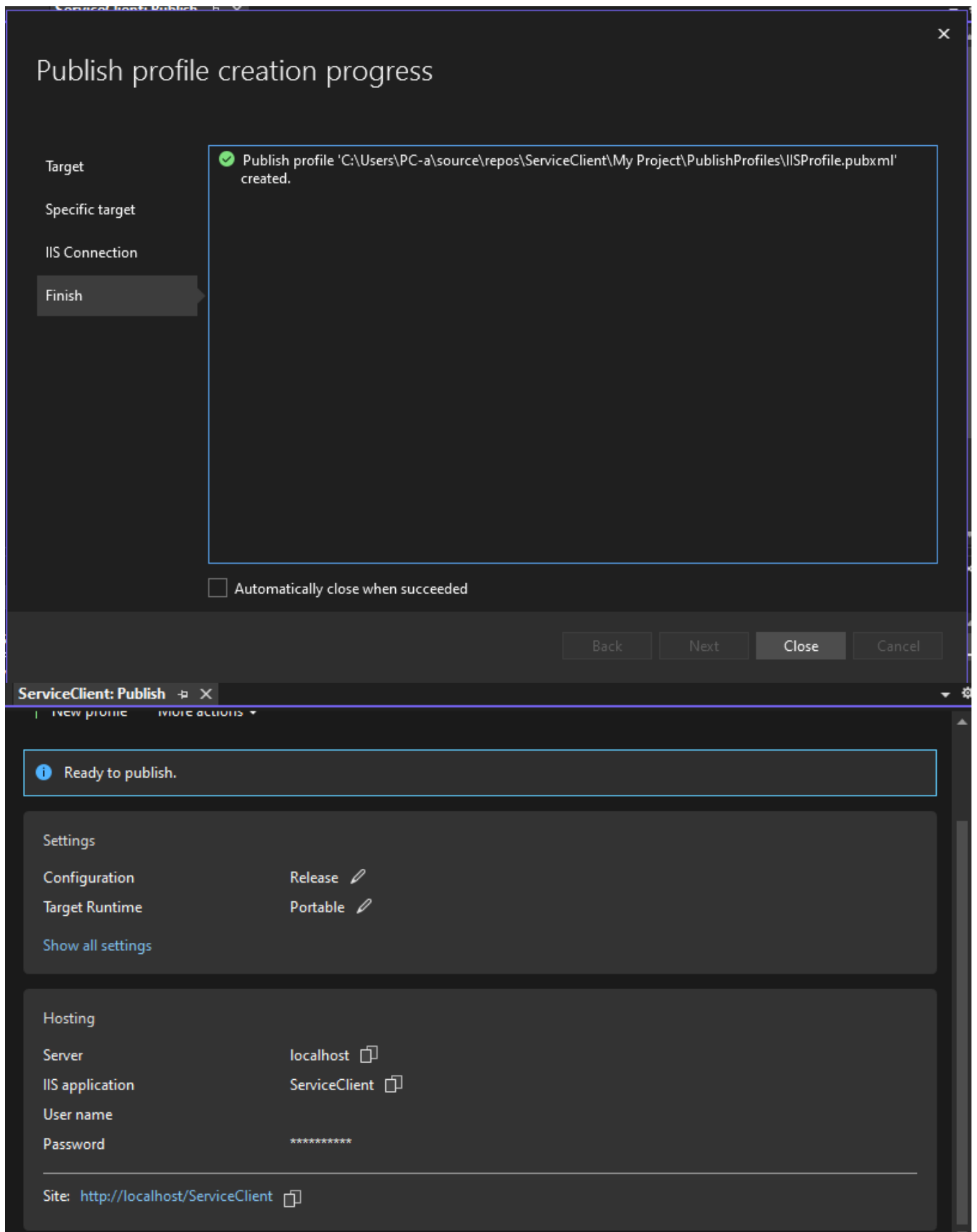
Server: localhost

Site name: ServiceClient

Destination URL: http://localhost/ServiceClient

Click Publish.





Configure IIS for ServiceClient

In IIS Manager, right-click Sites → Add Website:

Site name: ServiceClient

Physical path: C:\inetpub\wwwroot\ServiceClient

Port: 81 (to avoid conflict with MathLibService on port 80)

Click OK.

The screenshot shows the 'Add Website' dialog box in IIS Manager. The dialog has a title bar with a question mark and a close button. It contains the following fields and controls:

- Site name:** A text box containing 'ServiceClient'.
- Application pool:** A dropdown menu showing 'ServiceClient' and a 'Select...' button.
- Content Directory:** A section containing:
 - Physical path:** A text box containing 'C:\inetpub\wwwroot\ServiceClient' and a browse button ('...').
 - Pass-through authentication:** A section with two buttons: 'Connect as...' and 'Test Settings...'.
- Binding:** A section containing:
 - Type:** A dropdown menu showing 'http'.
 - IP address:** A dropdown menu showing 'All Unassigned'.
 - Port:** A text box containing '8081'.
 - Host name:** An empty text box.
 - Example:** The text 'Example: www.contoso.com or marketing.contoso.com'.
- Start Website immediately:** A checked checkbox.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Calculator

First number

Second number

Add (+)

Subtract (-)

Multiply (×)

Divide (÷)

0

Calculator

4

10

Add (+)

Subtract (-)

Multiply (×)

Divide (÷)

Result: 40

Calculator

2

8

Add (+)

Subtract (-)

Multiply (×)

Divide (÷)

Result: -6

Calculator

45

67

Add (+)

Subtract (-)

Multiply (×)

Divide (÷)

Result: 112