How-To Create and Consume a Web Service in C# and ASP.NET

Create a new Visual Studio project

New Project			2 ×
P Recent		.NET Framework 3.5 + Sort by: Default	- 🔢 🔚 Search Installed Te 👂 -
Installed Templates Visual C#		ASP.NET Empty Web ApplicatVisual C#	Type: Visual C# An empty project for creating an application with a Web user interface
Visual C+ Windows Web Android Cloud Extensibil iOS LightSwit Office/Sh Silverlight Test WCF Workflow	ity ich iarePoint t		
Donline		Click here to go online and find templates.	
Name:	WebService		
Location:	E:\CodeSamples	\ -	Browsen
Solution name:	WebService		Create directory for solution Add to Source Control OK Cancel

Right click on the project and select Add > New Item > Web Service (ASMX)

dd New Item - WebService					? * *
 Installed 	Sort by:	Default -	II. E		Search Installed Templates (Ctrl+E)
∡ Visual C# Code	E	TypeScript JSX File	Visual C#	*	Type: Visual C#
Data General	O.	WCF Service	Visual C#		A visually designed class for creating a Web Service
✓ Web General	OF	WCF Service (Ajax-enabled)	Visual C#		
Markup MVC	P	Web Configuration File	Visual C#		
Razor Scripts	1	Web Forms Master Page	Visual C#		
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WPF Silverlight		Web Forms User Control	Visual C#	l	
SQL Server Workflow	≡⊕	Web Service (ASMX)	Visual C#		
Online	ប	Bower Configuration File	Visual C#		
		Click here to go online and fine	<u>d templates.</u>		
Name: WebServi	ce.asmx				
					Add Cancel

See that the following code gets automatically generated in WebService.asmx.cs

WebService.asmx.cs

```
1
     using System.Web.Services;
2
3
     namespace WebService
4
      {
5
         /// <summary>
         /// Summary description for WebService
6
         /// </summary>
7
         [WebService (Namespace = "<u>http://tempuri.org/</u>")]
8
         [WebServiceBinding(ConformsTo = WsiProfiles.BasicProfile1_1)]
9
         [System.ComponentModel.ToolboxItem(false)]
10
         // To allow this Web Service to be called from script, using ASP.NET AJAX, uncommo
         // [System.Web.Script.Services.ScriptService]
11
        public class WebService : System.Web.Services.WebService
12
         {
13
14
            [WebMethod]
15
            public string HelloWorld()
16
            {
               return "Hello World";
17
            }
18
         }
19
      }
20
```

On compiling and running the project you are directed to a web browser that points to your service containing the single 'HelloWorld' method:



And when you click on the 'HelloWorld' link you are directed to the page to invoke the selected operation:



Clicking Invoke then directs you to the XML file:



Add two additional services, Square and SquareRoot to WebService.asmx.cs:

WebService.asmx.cs

```
1
2
      using System;
3
      using System. Web. Services;
4
      namespace WebService
5
      {
6
         /// <summary>
7
         /// Summary description for WebService
8
         /// </summary>
         [WebService (Namespace = "http://tempuri.org/")]
9
         [WebServiceBinding(ConformsTo = WsiProfiles.BasicProfile1 1)]
10
         [System.ComponentModel.ToolboxItem(false)]
11
         // To allow this Web Service to be called from script, using ASP.NET AJAX, uncomme
12
         // [System.Web.Script.Services.ScriptService]
13
         public class WebService : System.Web.Services.WebService
         {
14
15
            [WebMethod]
16
            public string HelloWorld()
17
            {
18
               return "Hello World";
19
            }
20
            [WebMethod]
21
            public double Square (double x)
22
            {
23
               return x * x;
24
            }
25
            [WebMethod]
26
            public double SquareRoot (float x)
27
            {
28
               return Math.Sqrt(x);
29
            }
30
         }
      }
31
32
```

Rebuild and re-run your project and notice that two additional services are displayed:

$\in \rightarrow \mathbf{C}$	Collocalho	st:52298/Web	Service.asmx		\$
Apps	Imported From IE	TFS V6	TFS IDT Powers - T	ab 📋 IDT	» 🛛 📒 Other bookma
Webs	Service				
The follow	ing operations are su	pported. For a	formal definition, plea	se review the	Service Description.
	HelloWorld				
	<u>Square</u>				
	SquareRoot				
This web	service is using	http://temp	ouri.org/ as its de	fault names	pace.
Recomm public.	endation: Change	e the default	namespace befor	e the XML V	Veb service is made
Each XML services or published	Web service needs a in the Web. http://ten XML Web services sh	unique names npuri.org/ is av ould use a mor	pace in order for client vailable for XML Web s re permanent namesp	t applications t ervices that ar ace.	o distinguish it from other re under development, but
Your XML 1 company's look like U	Web service should b Internet domain nar RLs, they need not p	e identified by ne as part of th oint to actual r	a namespace that you he namespace. Althou esources on the Web.	u control. For e gh many XML (XML Web ser	example, you can use your Web service namespaces rvice namespaces are URIs.]
For XML W attribute's the XML W 'http://mie	eb services creating Namespace property eb service methods. crosoft.com/webservi	using ASP.NET . The WebServ Below is a cod ces/":	, the default namespa rice attribute is an attr e example that sets th	ce can be char ribute applied t ne namespace	nged using the WebService to the class that contains to
C#					
[WebSe: public //)	rvice(Namespace="htt class MyWebService implementation	p://microsoft. {	com/webservices/")]		
Visual Basi	ic.				
<webser End Cla</webser 	rvice(Namespace:="ht implementation ass	tp://microsoft	.com/webservices/")>	Public Class	MyWebService
C++					
[WebSe: public // };	rvice(Namespace="htt ref class MyWebServ implementation	p://microsoft. ice {	com/webservices/")]		
For more o	letails on XML names	paces, see the	W3C recommendation	n on <u>Namesp</u> a	aces in XML.

Click on one of the new examples, SquareRoot for example, and invoke this:

$\rightarrow c$	① localhost:52298/WebService.asmx?op=SquareRoot ☆	
Apps	Imported From IE 🎦 TFS V6 🗹 TFS IDT Powers - Tab 🔛 IDT 🛛 » 📃 Other bookm	irk
NebS	ervice	
lick <u>here</u>	or a complete list of operations.	
quare	Root	-
est		
To test t	e operation using the HTTP POST protocol, click the 'Invoke' button.	
Parame	er Value	
x:	64	
	Invoke	
DAP 1 1		
The follo	ving is a sample SOAP 1.1 request and response. The placeholders shown need to be replaced	
The second second		
POST /W Host: 1	bService.asmx HITP/1.1 scalhost	
Content	Type: text/xml; charset=utf-8 'Length: length	
SOAPAct	.on: "http://tempuri.org/SquareRoot"	
<7xml v	ursion="1.0" encoding="utf-8"?> ursion= wmln=:vei="http://www.w2.org/2001/XMESchematinetance" wmln=:ved="http://www.w2.org/2	
<soap< td=""><td>Body></td><td>Ĩ</td></soap<>	Body>	Ĩ
<59	areRoot xmlns="http://tempuri.org/"> c>float	
3</td <td>uareRoot> s:Body></td> <td></td>	uareRoot> s:Body>	
<td>invelope></td> <td></td>	invelope>	
HTTP/1.	200 OK	
Content	Type: text/xml; charset=utf-8 -Length: length	
alimation and	union#** At anothing#*und=#**	
<seap:e< td=""><td><pre>ivelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2</pre></td><td>¢</td></seap:e<>	<pre>ivelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2</pre>	¢
<soap <30</soap 	.Body> mareRootResponse xmlns="http://tempuri.org/">	
-/-	<pre>/quareRootResult>double </pre>	
504</td <td>):Body></td> <td></td>):Body>	
<td>invelope></td> <td></td>	invelope>	
OAP 1.2		
The felle	ving is a cample SOAR 1.2 request and response. The placeholders shown need to be replaced	
The Tono	any is a sample SUAP 1.2 request and response. The placeholders shown need to be replaced	

Giving use the answer in XML format as shown:



Consuming the web service Create a new Console Application in your solution

dd New Project						2 X
Recent		.NET Fr	emework 3.5 • Sort by: D	efault		- 🏢 🔚 Search Installed Te 🔑
✓ Installed		- °i	Windows Forms Application	Visual C#		Type: Visual C#
✓ Visual C#		ŗ	WPF Application	Visual C#		A project for creating a command-line application
Android		• ••	Console Application	Visual C≢		
Extensibility		5j	Shared Project	Visual C#		
LightSwitch Office/ShareP	oint		Class Library (Portable for iOS.	. Visual C#		
Silverlight Test		R.S.	Class Library	Visual C#		
WCF Workflow		S.	Silverlight Application	Visual C≠		
 Visual Basic Visual F# 	10	N	Silverlight Class Library	Visual C#		
Visual C++ Windows Installer	XML	Q.	WCF Service Application	Visual C≢	1	
SQL Server	-	~	C+++E (A+ (DV 4	101 C=	٣	
Online		\$	lick here to go online and find t	emplates.		
Name:	WebServiceCons	umer				
Location:	E:\CodeSamples	WebServ	ice		C	Browse
						OK Cancel

Right click your project and select Add > Service Reference...

Rename the namespace if you wish:

	- Go Discours
Operations:	• <u>Bo</u> <u>Discover</u>
	Operations:

Click on the Advanced button.

Access level for generated classes:	Public		
Allow generation of asynchronou	s operations		
Contract	ns		
Generate spin-thiopour operation	tions		
 Qenerate asynchronous opera 	lions		
Data Type			
Always generate message contraction			
Collection type:	System.Array		
Dictionary collection type:	System.Collections.Generic.Dictionary		
Reuse types in referenced assemb	lies		
Reuse types in all referenced a	assemblies		
Reuse types in specified refere	enced assemblies:		
Reuse types in specified refere	nced assemblies:		
Reuse types in specified refere D mscorlib D System D System			
 Reuse types in specified refere 			
 Reuse types in specified refere 	Extensions		
Reuse types in specified refere	Extensions		
Reuse types in specified refere	Extensions		
 Reuse types in specified refere 	Extensions Extensions rvice Reference. This will generate code based on .NET Framework 2.0		

Click Add Web Reference

Navigate to a web service URL and click Add Reference to add all the available s	services.	
Start Browsing for Web Services	Web services found at this URL:	
Use this page as a starting point to find Web services. You can click the links below, a known URL into the address bar. Browse to: • Web services in this solution • Web services on the local machine • Browse UDDI Servers on the local network Query your local network for UDDI servers.	, or type a Web reference game:	
	Add <u>B</u> eference	d

Click the link that says to browse to services in this solution... Observe that it discovers the web service we earlier created for this solution:

■ = = C (RL:	۵		• ==		
Web Services	in this Solution	COLUMN STATE	*	Web services found a	t this URL:
The Web services ava vervice.	allable in this solution are lis	ted below. Click the service link to	browse that		
Services	Project	URL			
NebService	WebService	WebService.asmx			
				Web reference name:	
					Add <u>R</u> eference
			-		Cancel

Click on this service and see that the range of service methods is displayed:

vigate to a web service URL and click Add Reference to add all the available services.			
L: http://localhost:52298/WebService.asmx			
WebService	î	Web gervices found at this URL: 1 Service Found:	
The following operations are supported. For a formal definition, please review the <u>Service Description</u> . • <u>HelloWorld</u>	E	- WebService	
<u>Square</u> <u>SquareRoot</u>			
		Web reference name:	
This web service is using http://tempuri.org/ as its default namespace. Recommendation: Change the default namespace before the XML		localhost Add <u>R</u> eference	e
Web service is made public. Each XML Web service needs a unique namespace in order for client applications to distinguish it from other services on the Web. http://tempuri.org. is available for XML Web services that are under development, but published XML Web services should use a more permanent namespace.	'		
Your XML Web service should be identified by a namespace that you control. Fo example, you can use your company's Internet domain name as part of the namespace. Although many XML Web captice namespaces look like UPLs, they	-	Can	el

Rename the Web reference name to your preference:

Id Web Reference		2 ×
avigate to a web service URL and click Add Reference to add all the available services. ● ● ※ C ☆		
RL: http://localhost:52298/WebService.asmx •		
Web Constant	1	Web services found at this URL:
WebService		1 Service Found:
The following operations are supported. For a formal definition, please review the Service Description.	-	- WebService
HelloWorld		
• Square		
SquareRoot		
		Web reference name:
This web service is using http://tempuri.org/ as its default namespace.		WebServices Add Reference
Recommendation: Change the default namespace before the XML Web service is made public.		
Each XML Web service needs a unique namespace in order for client applications to distinguish it from other services on the Web. http://tempuri.org is available for XML Web services that are under development, but published XML Web services should use a more permanent namespace.	/	
Your XML Web service should be identified by a namespace that you control. Fo example, you can use your company's Internet domain name as part of the many XML Web service namespaces box like UPLs, they	-	Cancel

Click Add Reference.

Observe the Web References folder containing WebServices is created as shown:



Set the console application as your startup project:

Solution Explorer		
0 0 d 0 - 5 C 7 0 /		
Search Solution Explorer (Ctrl+;)		
 Solution 'WebService' (2 projects) WebService 		
▶	Build Rebuild Clean View Analyze Publish Publish as Azure WebJob Scope to This	•
Ĕ	New Solution Explorer View Build Dependencies Add Manage NuGet Packages	•
\$	Set as StartUp Project Debug	•

Update Program.cs in your console application to consume the referenced web service.

In this example to find and display the square root of 64:

Program.cs

```
using System;
1
     using WebServiceConsumer.WebServices;
2
3
     namespace WebServiceConsumer
4
      {
5
         internal static class Program
6
         {
            private static void Main (string[] args)
7
            {
8
               var service = new WebService();
9
10
               Console.Write("Square root of 64 = {0}", service.SquareRoot(64));
11
            }
12
         }
```

13 }

Giving the following console output when run:



Courtesy: https://www.technical-recipes.com/2017/creating-and-consuming-a-web-service-in-c-net/

Modified: 2021.10.14.7.00.AM Dököll Solutions, Inc.