Get Started with ASP.NET Web API 2 (C#)

3/15/2018 • 8 min to read • Edit Online

by Mike Wasson

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HTTP is not just for serving up web pages. HTTP is also a powerful platform for building APIs that expose services and data. HTTP is simple, flexible, and ubiquitous. Almost any platform that you can think of has an HTTP library, so HTTP services can reach a broad range of clients, including browsers, mobile devices, and traditional desktop applications.

ASP.NET Web API is a framework for building web APIs on top of the .NET Framework. In this tutorial, you will use ASP.NET Web API to create a web API that returns a list of products.

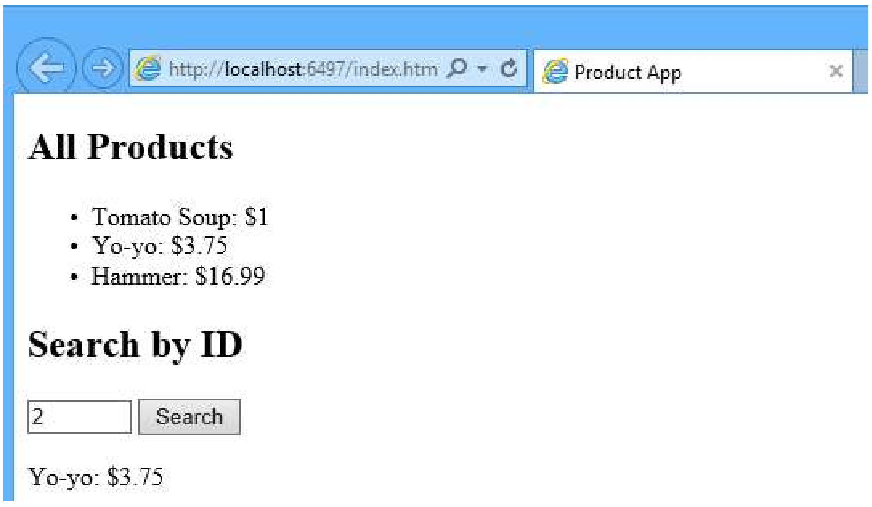
Software versions used in the tutorial

- Visual Studio 2017
- Web API 2

See Create a web API with ASP.NET Core and Visual Studio for Windows for a newer version of this tutorial.

Create a Web API Project

In this tutorial, you will use ASP.NET Web API to create a web API that returns a list of products. The front-end web page uses jQuery to display the results.



All Products

- Tomato Soup: $1
- Yo-yo: $3.75
- Hammer: $16.99

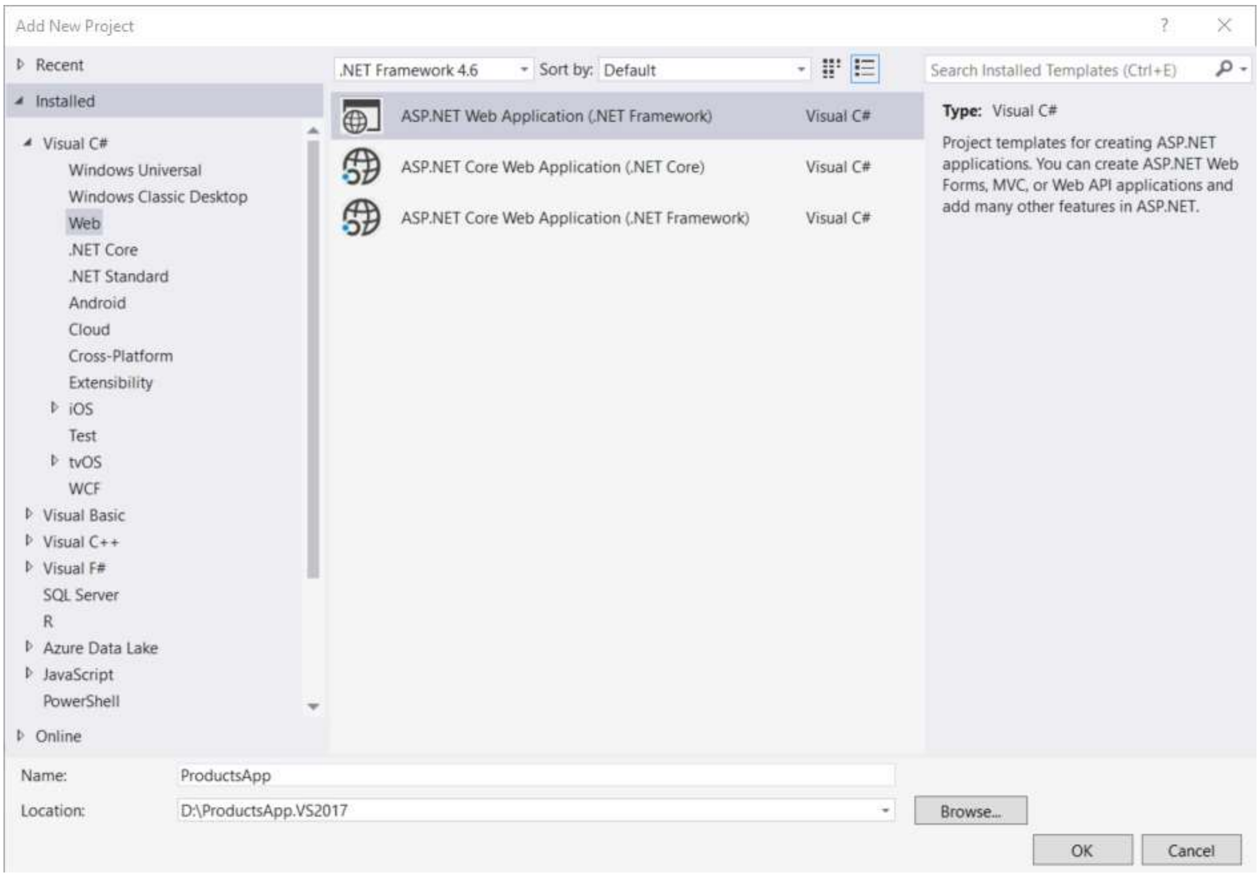
Search by ID

2

Yo-yo: $3.75

Start Visual Studio and select **New Project** from the **Start** page. Or, from the **File** menu, select **New** and then **Project**.

In the **Templates** pane, select **Installed Templates** and expand the **Visual C#** node. Under **Visual C#**, select **Web**. In the list of project templates, select **ASP.NET Web Application**. Name the project "ProductsApp" and click **OK**.


Add New Project

- Recent
- Installed
  - Visual C#
    - Windows Universal
    - Windows Classic Desktop
    - Web
    - .NET Core
    - .NET Standard
    - Android
    - Cloud
    - Cross-Platform
    - Extensibility
    - iOS
    - Test
    - tvOS
    - WCF
  - Visual Basic
  - Visual C++
  - Visual F#
  - SQL Server
  - R
  - Azure Data Lake
  - JavaScript
  - PowerShell
- Online

.NET Framework 4.6 | Sort by: Default | Search Installed Templates (Ctrl+E)

ASP.NET Web Application (.NET Framework)	Visual C#
ASP.NET Core Web Application (.NET Core)	Visual C#
ASP.NET Core Web Application (.NET Framework)	Visual C#

Type: Visual C#

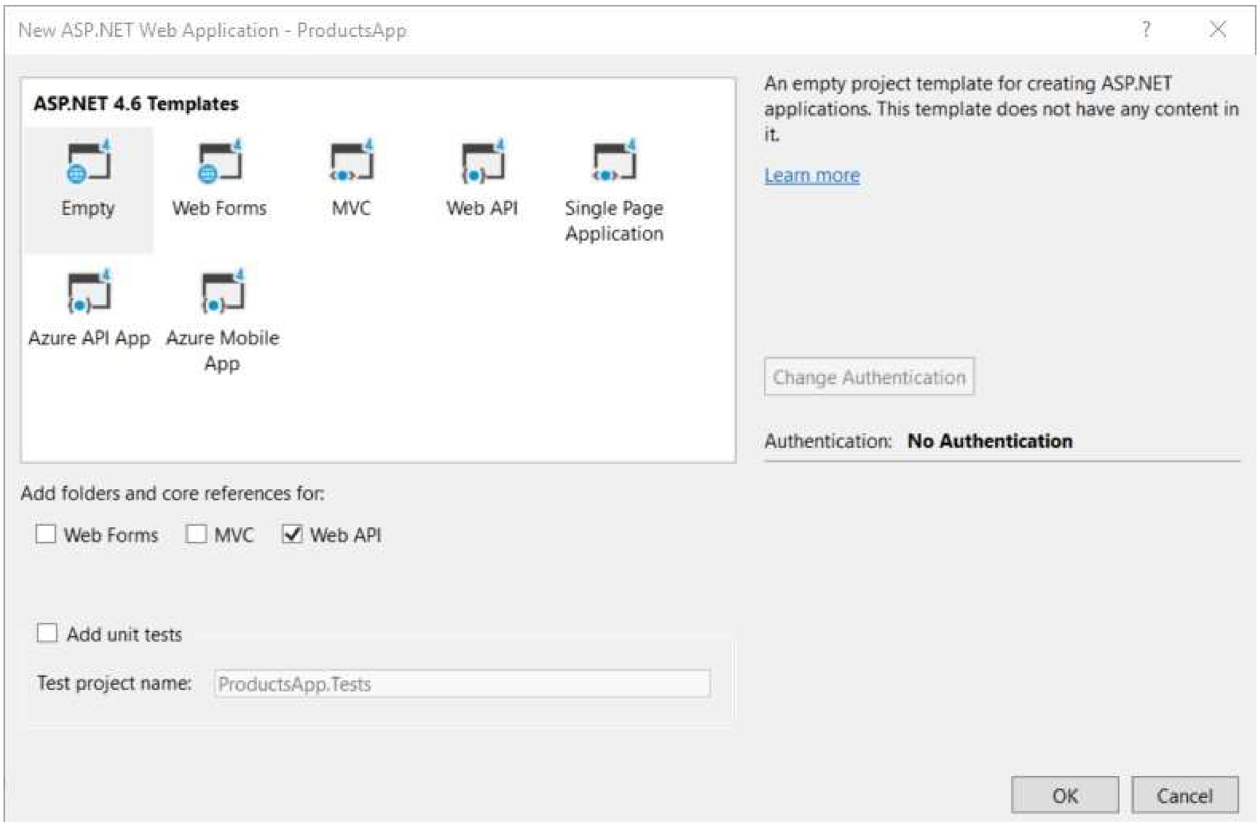
Project templates for creating ASP.NET applications. You can create ASP.NET Web Forms, MVC, or Web API applications and add many other features in ASP.NET.

Name: ProductsApp

Location: D:\ProductsApp.VS2017

Browse... OK Cancel

In the **New ASP.NET Project** dialog, select the **Empty** template. Under "Add folders and core references for", check **Web API**. Click **OK**.


New ASP.NET Web Application - ProductsApp

ASP.NET 4.6 Templates

Empty, Web Forms, MVC, Web API, Single Page Application, Azure API App, Azure Mobile App

An empty project template for creating ASP.NET applications. This template does not have any content in it.

Learn more

Change Authentication

Authentication: **No Authentication**

Add folders and core references for:

☐ Web Forms ☐ MVC ☑ Web API

☐ Add unit tests

Test project name: ProductsApp.Tests

OK Cancel

NOTE

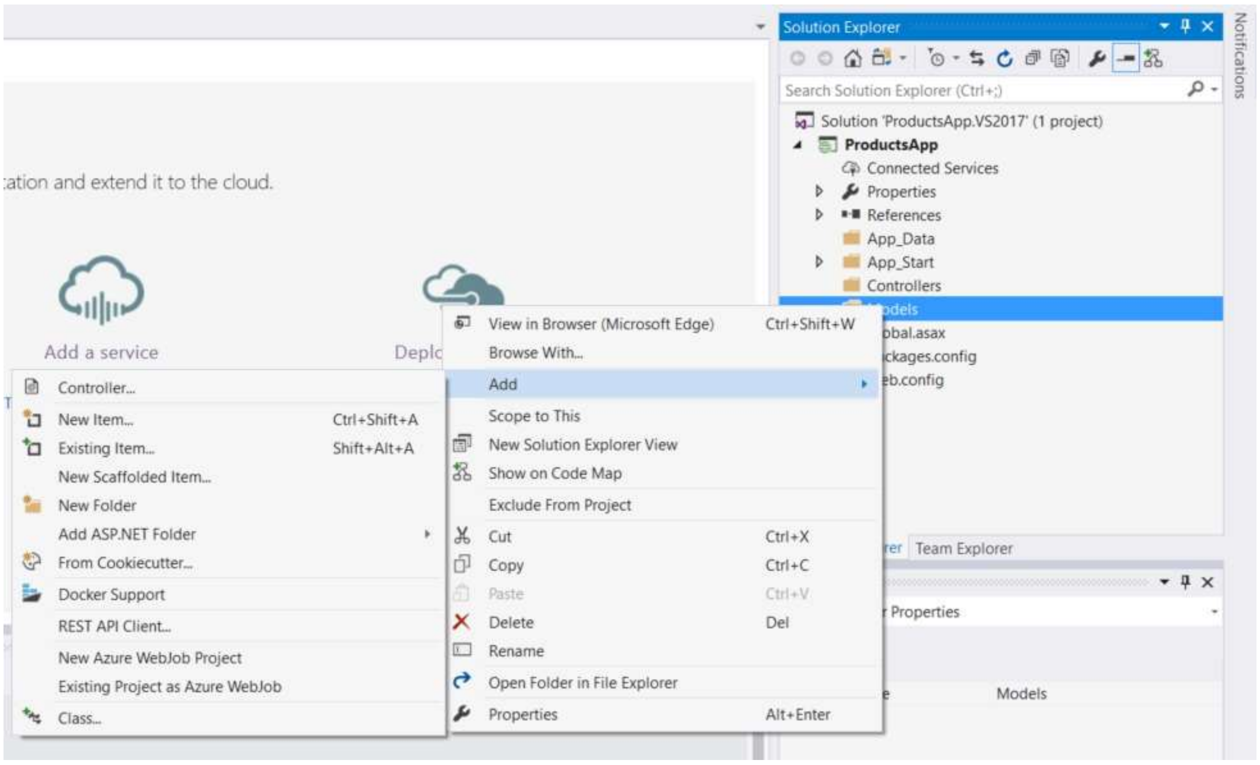
You can also create a Web API project using the "Web API" template. The Web API template uses ASP.NET MVC to provide API help pages. I'm using the Empty template for this tutorial because I want to show Web API without MVC. In general, you don't need to know ASP.NET MVC to use Web API.

Adding a Model

A *model* is an object that represents the data in your application. ASP.NET Web API can automatically serialize your model to JSON, XML, or some other format, and then write the serialized data into the body of the HTTP response message. As long as a client can read the serialization format, it can deserialize the object. Most clients can parse either XML or JSON. Moreover, the client can indicate which format it wants by setting the Accept header in the HTTP request message.

Let's start by creating a simple model that represents a product.

If Solution Explorer is not already visible, click the **View** menu and select **Solution Explorer**. In Solution Explorer, right-click the Models folder. From the context menu, select **Add** then select **Class**.



Name the class "Product". Add the following properties to the `Product` class.

```
namespace ProductsApp.Models
{
    public class Product
    {
        public int Id { get; set; }
        public string Name { get; set; }
        public string Category { get; set; }
        public decimal Price { get; set; }
    }
}
```

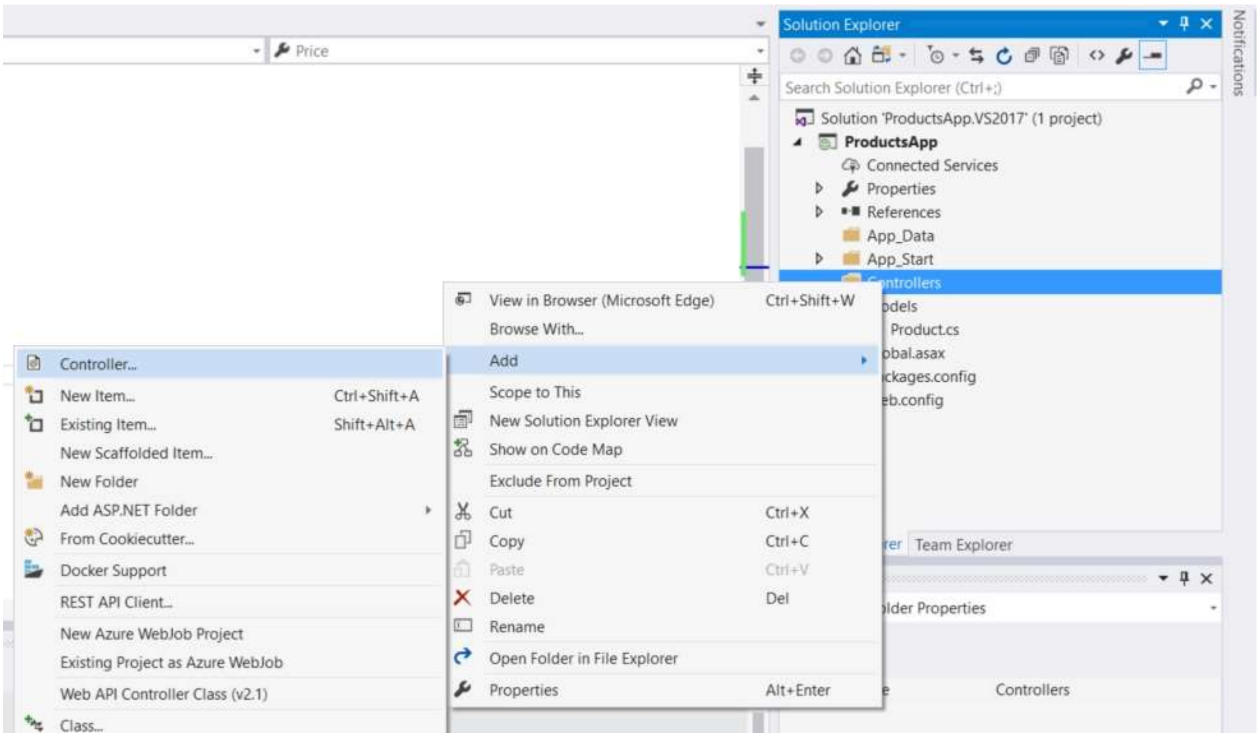
Adding a Controller

In Web API, a *controller* is an object that handles HTTP requests. We'll add a controller that can return either a list of products or a single product specified by ID.

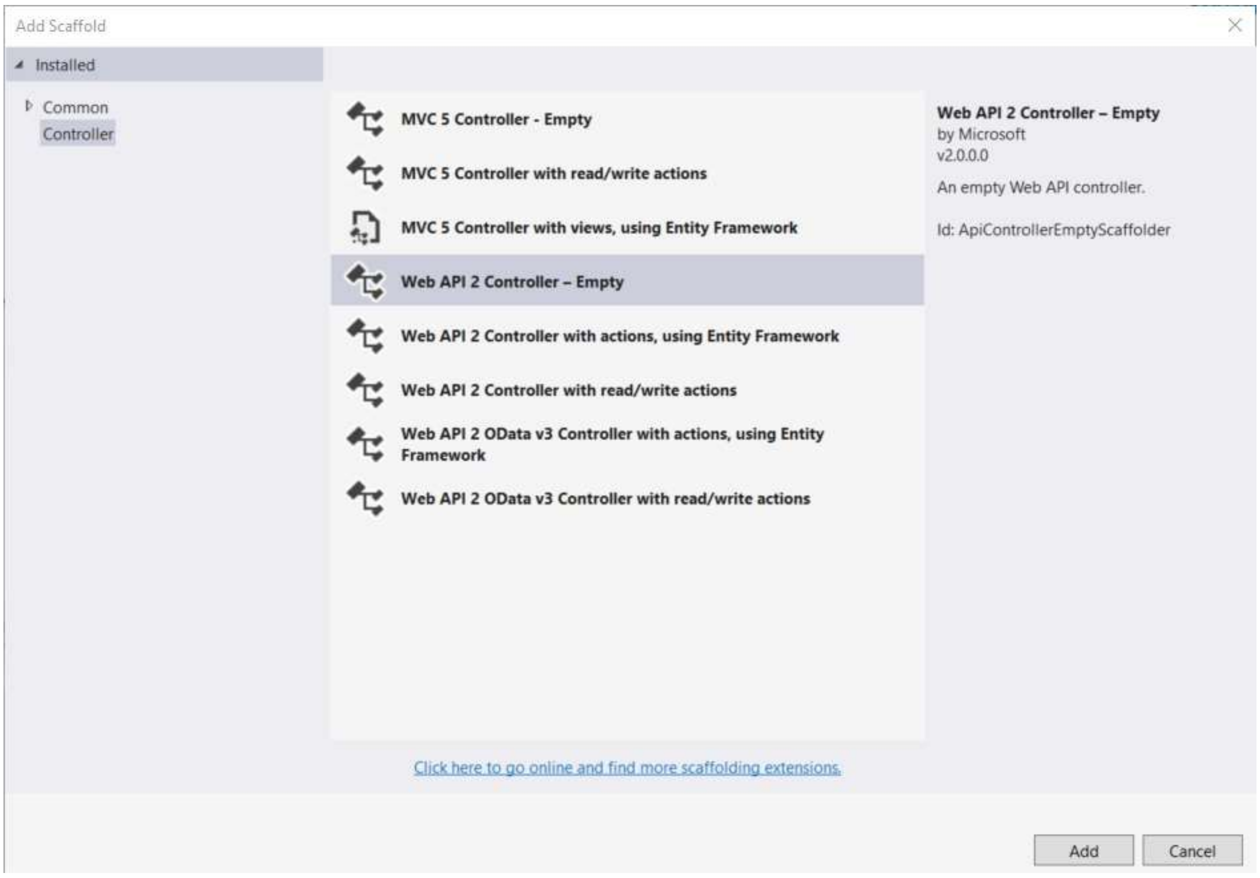
NOTE

If you have used ASP.NET MVC, you are already familiar with controllers. Web API controllers are similar to MVC controllers, but inherit the **ApiController** class instead of the **Controller** class.

In **Solution Explorer**, right-click the Controllers folder. Select **Add** and then select **Controller**.

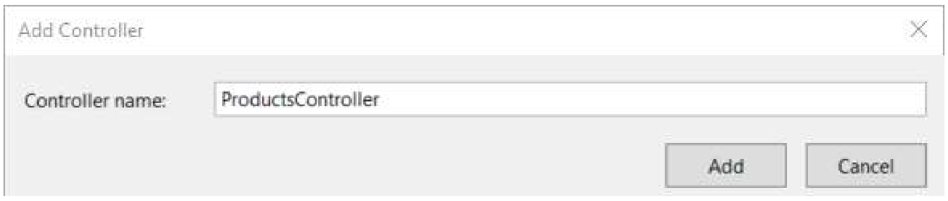


In the **Add Scaffold** dialog, select **Web API Controller - Empty**. Click **Add**.


Add Scaffold
Installed
Common
Controller
MVC 5 Controller - Empty
MVC 5 Controller with read/write actions
MVC 5 Controller with views, using Entity Framework
Web API 2 Controller – Empty
Web API 2 Controller with actions, using Entity Framework
Web API 2 Controller with read/write actions
Web API 2 OData v3 Controller with actions, using Entity Framework
Web API 2 OData v3 Controller with read/write actions
Click here to go online and find more scaffolding extensions.
Add
Cancel

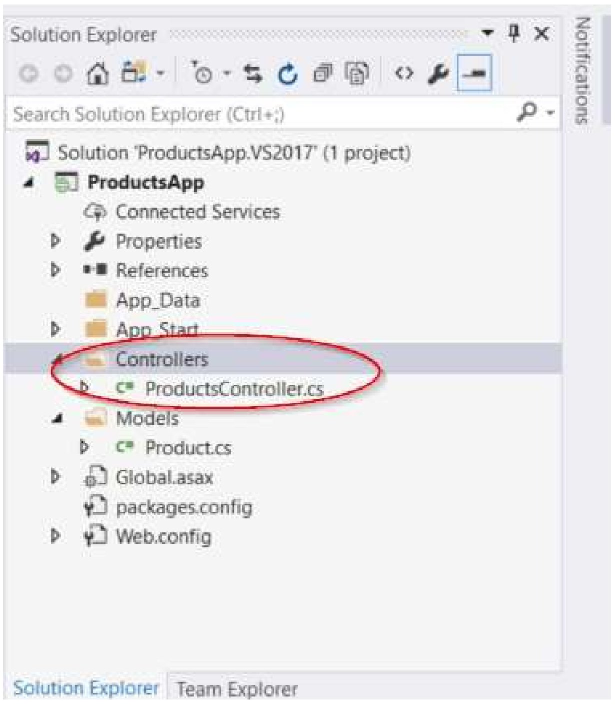
Web API 2 Controller – Empty
by Microsoft
v2.0.0.0
An empty Web API controller.
Id: ApiControllerEmptyScaffolder

In the **Add Controller** dialog, name the controller "ProductsController". Click **Add**.



Controller name: ProductsController

The scaffolding creates a file named ProductsController.cs in the Controllers folder.



NOTE

You don't need to put your controllers into a folder named Controllers. The folder name is just a convenient way to organize your source files.

If this file is not open already, double-click the file to open it. Replace the code in this file with the following:

```
using ProductsApp.Models;
using System;
using System.Collections.Generic;
using System.Linq;
using System.Net;
using System.Web.Http;

namespace ProductsApp.Controllers
{
    public class ProductsController : ApiController
    {
        Product[] products = new Product[]
        {
            new Product { Id = 1, Name = "Tomato Soup", Category = "Groceries", Price = 1 },
            new Product { Id = 2, Name = "Yo-yo", Category = "Toys", Price = 3.75M },
            new Product { Id = 3, Name = "Hammer", Category = "Hardware", Price = 16.99M }
        };

        public IEnumerable<Product> GetAllProducts()
        {
            return products;
        }

        public IHttpActionResult GetProduct(int id)
        {
            var product = products.FirstOrDefault((p) => p.Id == id);
            if (product == null)
            {
                return NotFound();
            }
            return Ok(product);
        }
    }
}
```

To keep the example simple, products are stored in a fixed array inside the controller class. Of course, in a real application, you would query a database or use some other external data source.

The controller defines two methods that return products:

- The `GetAllProducts` method returns the entire list of products as an **IEnumerable<Product>** type.
- The `GetProduct` method looks up a single product by its ID.

That's it! You have a working web API. Each method on the controller corresponds to one or more URIs:

CONTROLLER METHOD	URI
GetAllProducts	/api/products
GetProduct	/api/products/*id*

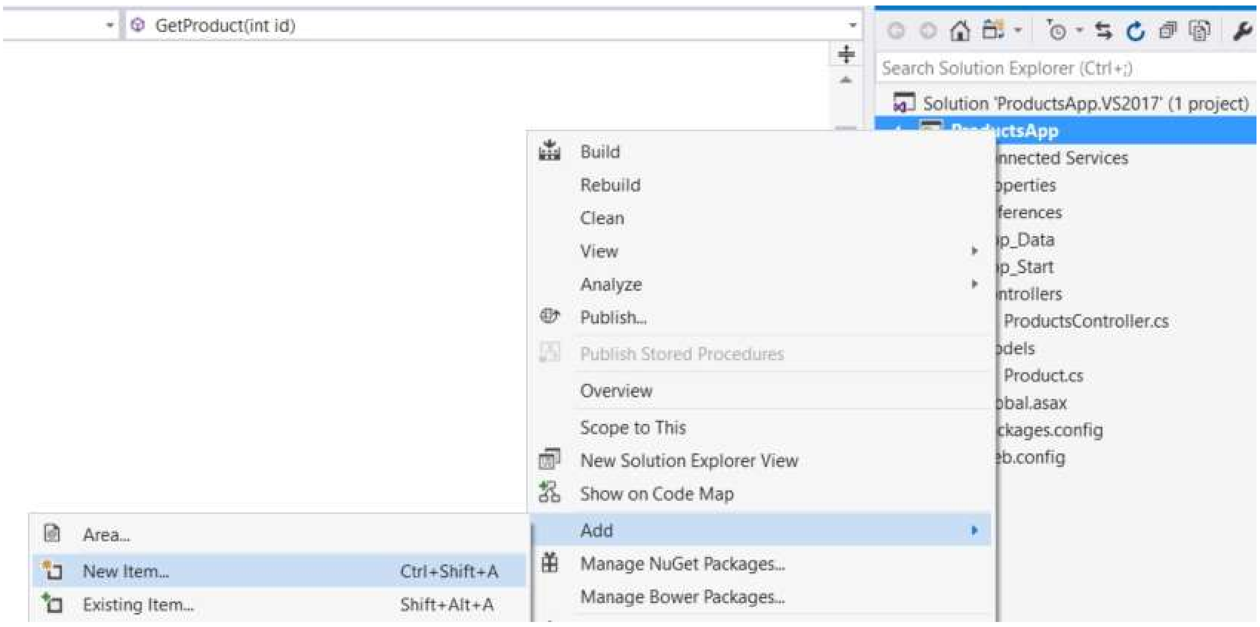
For the `GetProduct` method, the *id* in the URI is a placeholder. For example, to get the product with ID of 5, the URI is `api/products/5`.

For more information about how Web API routes HTTP requests to controller methods, see Routing in ASP.NET Web API.

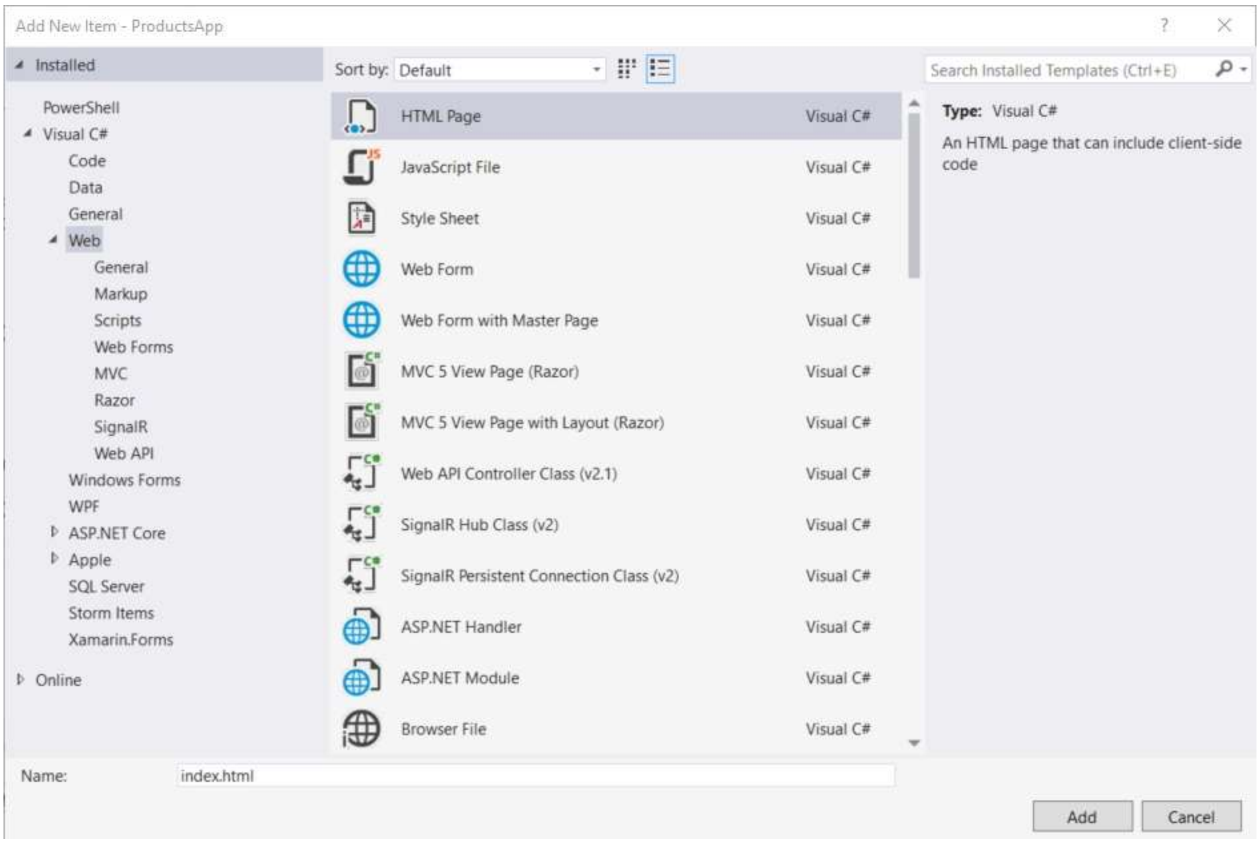
Calling the Web API with Javascript and jQuery

In this section, we'll add an HTML page that uses AJAX to call the web API. We'll use jQuery to make the AJAX calls and also to update the page with the results.

In Solution Explorer, right-click the project and select **Add**, then select **New Item**.



In the **Add New Item** dialog, select the **Web** node under **Visual C#**, and then select the **HTML Page** item. Name the page "index.html".



Sort by: Default

HTML Page	Visual C#
JavaScript File	Visual C#
Style Sheet	Visual C#
Web Form	Visual C#
Web Form with Master Page	Visual C#
MVC 5 View Page (Razor)	Visual C#
MVC 5 View Page with Layout (Razor)	Visual C#
Web API Controller Class (v2.1)	Visual C#
SignalR Hub Class (v2)	Visual C#
SignalR Persistent Connection Class (v2)	Visual C#
ASP.NET Handler	Visual C#
ASP.NET Module	Visual C#
Browser File	Visual C#

Type: Visual C#

An HTML page that can include client-side code

Name: index.html

Replace everything in this file with the following:

```
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
  <title>Product App</title>
</head>
<body>

  <div>
    <h2>All Products</h2>
    <ul id="products" />
  </div>
  <div>
    <h2>Search by ID</h2>
    <input type="text" id="prodId" size="5" />
    <input type="button" value="Search" onclick="find();" />
    <p id="product" />
  </div>

  <script src="http://ajax.aspnetcdn.com/ajax/jQuery/jquery-2.0.3.min.js"></script>
  <script>
    var uri = 'api/products';

    $(document).ready(function () {
      // Send an AJAX request
      $.getJSON(uri)
          .done(function (data) {
            // On success, 'data' contains a list of products.
            $.each(data, function (key, item) {
              // Add a list item for the product.
              $('<li>', { text: formatItem(item) }).appendTo($('#products'));
            });
          });
    });

    function formatItem(item) {
      return item.Name + ': $' + item.Price;
    }

    function find() {
      var id = $('#prodId').val();
      $.getJSON(uri + '/' + id)
          .done(function (data) {
            $('#product').text(formatItem(data));
          })
          .fail(function (jqXHR, textStatus, err) {
            $('#product').text('Error: ' + err);
          });
    }
  </script>
</body>
</html>
```

There are several ways to get jQuery. In this example, I used the Microsoft Ajax CDN. You can also download it from http://jquery.com/, and the ASP.NET "Web API" project template includes jQuery as well.

Getting a List of Products

To get a list of products, send an HTTP GET request to "/api/products".

The jQuery getJSON function sends an AJAX request. For response contains array of JSON objects. The `done` function specifies a callback that is called if the request succeeds. In the callback, we update the DOM with the product information.

```
$(document).ready(function () {
    // Send an AJAX request
    $.getJSON(apiUrl)
        .done(function (data) {
            // On success, 'data' contains a list of products.
            $.each(data, function (key, item) {
                // Add a list item for the product.
                $('<li>', { text: formatItem(item) }).appendTo($('#products'));
            });
        });
});
```

Getting a Product By ID

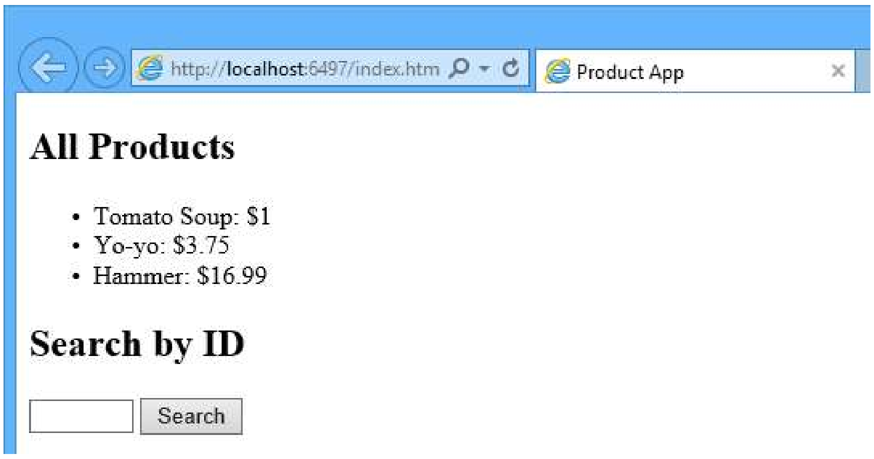
To get a product by ID, send an HTTP GET request to "/api/products/*id*", where *id* is the product ID.

```
function find() {
    var id = $('#prodId').val();
    $.getJSON(apiUrl + '/' + id)
        .done(function (data) {
            $('#product').text(formatItem(data));
        })
        .fail(function (jqXHR, textStatus, err) {
            $('#product').text('Error: ' + err);
        });
}
```

We still call `getJSON` to send the AJAX request, but this time we put the ID in the request URI. The response from this request is a JSON representation of a single product.

Running the Application

Press F5 to start debugging the application. The web page should look like the following:

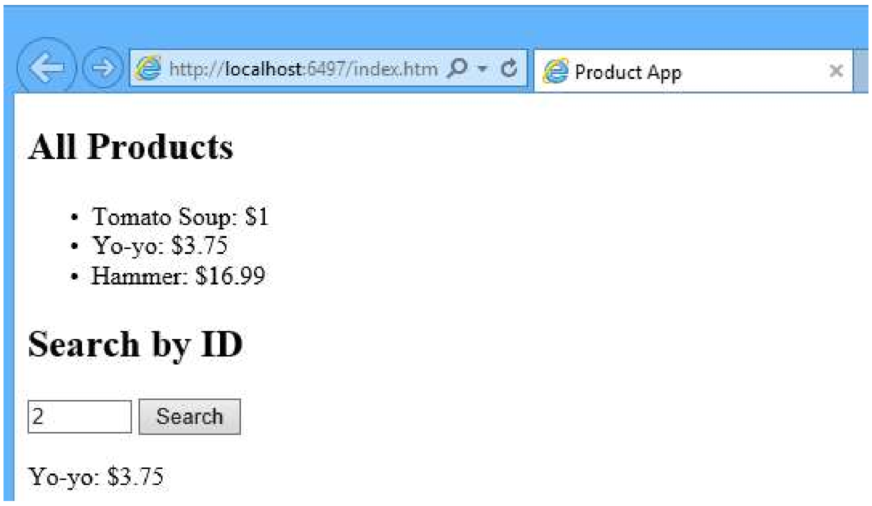


All Products

- Tomato Soup: $1
- Yo-yo: $3.75
- Hammer: $16.99

Search by ID

To get a product by ID, enter the ID and click Search:


http://localhost:6497/index.htm

Product App

All Products

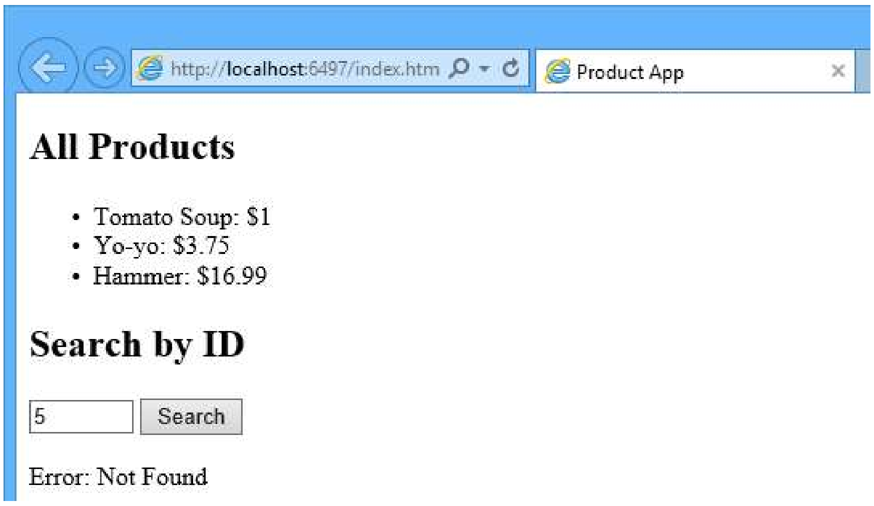
- Tomato Soup: $1
- Yo-yo: $3.75
- Hammer: $16.99

Search by ID

2 Search

Yo-yo: $3.75

If you enter an invalid ID, the server returns an HTTP error:


http://localhost:6497/index.htm

Product App

All Products

- Tomato Soup: $1
- Yo-yo: $3.75
- Hammer: $16.99

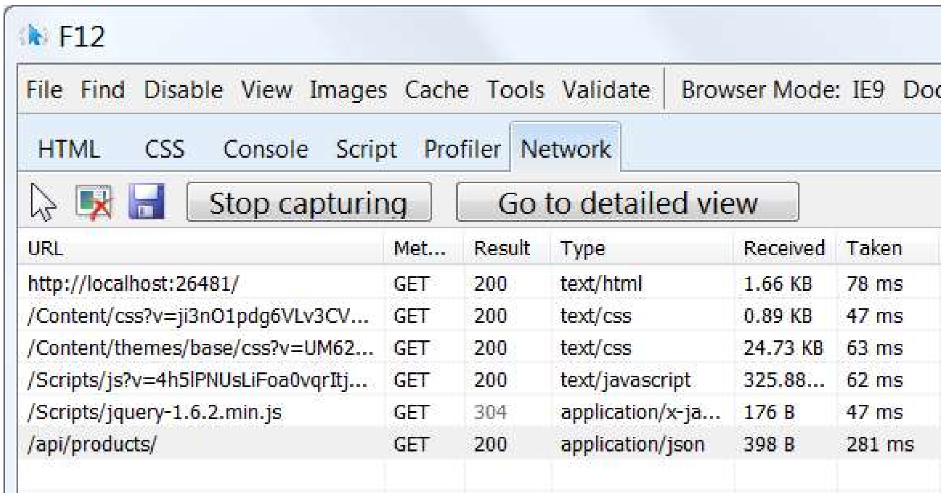
Search by ID

5 Search

Error: Not Found

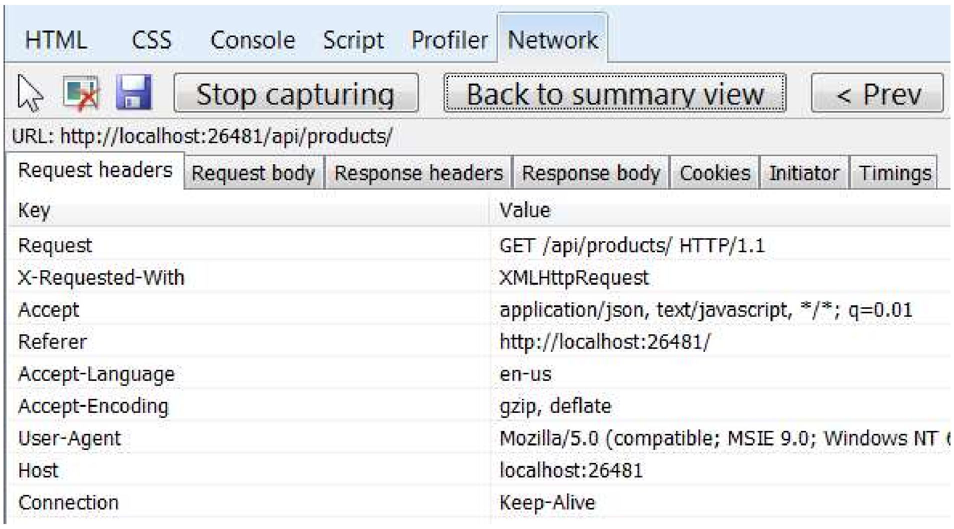
Using F12 to View the HTTP Request and Response

When you are working with an HTTP service, it can be very useful to see the HTTP request and request messages. You can do this by using the F12 developer tools in Internet Explorer 9. From Internet Explorer 9, press **F12** to open the tools. Click the **Network** tab and press **Start Capturing**. Now go back to the web page and press **F5** to reload the web page. Internet Explorer will capture the HTTP traffic between the browser and the web server. The summary view shows all the network traffic for a page:


F12
File Find Disable View Images Cache Tools Validate Browser Mode: IE9 Doc
HTML CSS Console Script Profiler Network
Stop capturing
Go to detailed view

URL	Met...	Result	Type	Received	Taken
http://localhost:26481/	GET	200	text/html	1.66 KB	78 ms
/Content/css?v=ji3nO1pdg6VLv3CV...	GET	200	text/css	0.89 KB	47 ms
/Content/themes/base/css?v=UM62...	GET	200	text/css	24.73 KB	63 ms
/Scripts/js?v=4h5lPNUsLiFoa0vqrItj...	GET	200	text/javascript	325.88...	62 ms
/Scripts/jquery-1.6.2.min.js	GET	304	application/x-ja...	176 B	47 ms
/api/products/	GET	200	application/json	398 B	281 ms

Locate the entry for the relative URI "api/products/". Select this entry and click **Go to detailed view**. In the detail view, there are tabs to view the request and response headers and bodies. For example, if you click the **Request headers** tab, you can see that the client requested "application/json" in the Accept header.



URL: http://localhost:26481/api/products/

Key	Value
Request	GET /api/products/ HTTP/1.1
X-Requested-With	XMLHttpRequest
Accept	application/json, text/javascript, */*; q=0.01
Referer	http://localhost:26481/
Accept-Language	en-us
Accept-Encoding	gzip, deflate
User-Agent	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT
Host	localhost:26481
Connection	Keep-Alive

If you click the Response body tab, you can see how the product list was serialized to JSON. Other browsers have similar functionality. Another useful tool is Fiddler, a web debugging proxy. You can use Fiddler to view your HTTP traffic, and also to compose HTTP requests, which gives you full control over the HTTP headers in the request.

See this App Running on Azure

Would you like to see the finished site running as a live web app? You can deploy a complete version of the app to your Azure account by simply clicking the following button.

Deploy to Azure

You need an Azure account to deploy this solution to Azure. If you do not already have an account, you have the following options:

- Open an Azure account for free - You get credits you can use to try out paid Azure services, and even after they're used up you can keep the account and use free Azure services.
- Activate MSDN subscriber benefits - Your MSDN subscription gives you credits every month that you can use for paid Azure services.

Next Steps

- For a more complete example of an HTTP service that supports POST, PUT, and DELETE actions and writes to a database, see Using Web API 2 with Entity Framework 6.
- For more about creating fluid and responsive web applications on top of an HTTP service, see ASP.NET Single Page Application.
- For information about how to deploy a Visual Studio web project to Azure App Service, see Create an ASP.NET web app in Azure App Service.

Action Results in Web API 2

1/24/2018 • 3 min to read • Edit Online

by Mike Wasson

This topic describes how ASP.NET Web API converts the return value from a controller action into an HTTP response message.

A Web API controller action can return any of the following:

1. void
2. **HttpResponseMessage**
3. **IHttpActionResult**
4. Some other type

Depending on which of these is returned, Web API uses a different mechanism to create the HTTP response.

RETURN TYPE	HOW WEB API CREATES THE RESPONSE
void	Return empty 204 (No Content)
HttpResponseMessage	Convert directly to an HTTP response message.
IHttpActionResult	Call **ExecuteAsync** to create an **HttpResponseMessage**, then convert to an HTTP response message.
Other type	Write the serialized return value into the response body; return 200 (OK).

The rest of this topic describes each option in more detail.

void

If the return type is `void`, Web API simply returns an empty HTTP response with status code 204 (No Content).

Example controller:

```
public class ValuesController : ApiController
{
    public void Post()
    {
    }
}
```

HTTP response:

```
HTTP/1.1 204 No Content
Server: Microsoft-IIS/8.0
Date: Mon, 27 Jan 2014 02:13:26 GMT
```

HttpResponseMessage

If the action returns an HttpResponseMessage, Web API converts the return value directly into an HTTP response message, using the properties of the **HttpResponseMessage** object to populate the response.

This option gives you a lot of control over the response message. For example, the following controller action sets the Cache-Control header.

```
public class ValuesController : ApiController
{
    public HttpResponseMessage Get()
    {
        HttpResponseMessage response = Request.CreateResponse(HttpStatusCode.OK, "value");
        response.Content = new StringContent("hello", Encoding.Unicode);
        response.Headers.CacheControl = new CacheControlHeaderValue()
        {
            MaxAge = TimeSpan.FromMinutes(20)
        };
        return response;
    }
}
```

Response:

```
HTTP/1.1 200 OK
Cache-Control: max-age=1200
Content-Length: 10
Content-Type: text/plain; charset=utf-16
Server: Microsoft-IIS/8.0
Date: Mon, 27 Jan 2014 08:53:35 GMT

hello
```

If you pass a domain model to the **CreateResponse** method, Web API uses a media formatter to write the serialized model into the response body.

```
public HttpResponseMessage Get()
{
    // Get a list of products from a database.
    IEnumerable<Product> products = GetProductsFromDB();

    // Write the list to the response body.
    HttpResponseMessage response = Request.CreateResponse(HttpStatusCode.OK, products);
    return response;
}
```

Web API uses the Accept header in the request to choose the formatter. For more information, see Content Negotiation.

IHttpActionResult

The **IHttpActionResult** interface was introduced in Web API 2. Essentially, it defines an **HttpResponseMessage** factory. Here are some advantages of using the **IHttpActionResult** interface:

- Simplifies unit testing your controllers.
- Moves common logic for creating HTTP responses into separate classes.
- Makes the intent of the controller action clearer, by hiding the low-level details of constructing the response.

IHttpActionResult contains a single method, **ExecuteAsync**, which asynchronously creates an **HttpResponseMessage** instance.

```
public interface IHttpActionResult
{
    Task<HttpResponseMessage> ExecuteAsync(CancellationToken cancellationToken);
}
```

If a controller action returns an **IHttpActionResult**, Web API calls the **ExecuteAsync** method to create an **HttpResponseMessage**. Then it converts the **HttpResponseMessage** into an HTTP response message.

Here is a simple implementaton of **IHttpActionResult** that creates a plain text response:

```
public class TextResult : IHttpActionResult
{
    string _value;
    HttpRequestMessage _request;

    public TextResult(string value, HttpRequestMessage request)
    {
        _value = value;
        _request = request;
    }
    public Task<HttpResponseMessage> ExecuteAsync(CancellationToken cancellationToken)
    {
        var response = new HttpResponseMessage()
        {
            Content = new StringContent(_value),
            RequestMessage = _request
        };
        return Task.FromResult(response);
    }
}
```

Example controller action:

```
public class ValuesController : ApiController
{
    public IHttpActionResult Get()
    {
        return new TextResult("hello", Request);
    }
}
```

Response:

```
HTTP/1.1 200 OK
Content-Length: 5
Content-Type: text/plain; charset=utf-8
Server: Microsoft-IIS/8.0
Date: Mon, 27 Jan 2014 08:53:35 GMT

hello
```

More often, you will use the **IHttpActionResult** implementations defined in the **System.Web.Http.Results** namespace. The **ApiController** class defines helper methods that return these built-in action results.

In the following example, if the request does not match an existing product ID, the controller calls ApiController.NotFound to create a 404 (Not Found) response. Otherwise, the controller calls ApiController.OK, which creates a 200 (OK) response that contains the product.

```
public IHttpActionResult Get (int id)
{
    Product product = _repository.Get (id);
    if (product == null)
    {
        return NotFound(); // Returns a NotFoundResult
    }
    return Ok(product);  // Returns an OkNegotiatedContentResult
}
```

Other Return Types

For all other return types, Web API uses a media formatter to serialize the return value. Web API writes the serialized value into the response body. The response status code is 200 (OK).

```
public class ProductsController : ApiController
{
    public IEnumerable<Product> Get()
    {
        return GetAllProductsFromDB();
    }
}
```

A disadvantage of this approach is that you cannot directly return an error code, such as 404. However, you can throw an **HttpResponseException** for error codes. For more information, see Exception Handling in ASP.NET Web API.

Web API uses the Accept header in the request to choose the formatter. For more information, see Content Negotiation.

Example request

```
GET http://localhost/api/products HTTP/1.1
User-Agent: Fiddler
Host: localhost:24127
Accept: application/json
```

Example response:

```
HTTP/1.1 200 OK
Content-Type: application/json; charset=utf-8
Server: Microsoft-IIS/8.0
Date: Mon, 27 Jan 2014 08:53:35 GMT
Content-Length: 56

[{"Id":1,"Name":"Yo-yo","Category":"Toys","Price":6.95}]
```

Using Web API with ASP.NET Web Forms

11/30/2017 • 3 min to read • Edit Online

by Mike Wasson

Although ASP.NET Web API is packaged with ASP.NET MVC, it is easy to add Web API to a traditional ASP.NET Web Forms application. This tutorial walks you through the steps.

Overview

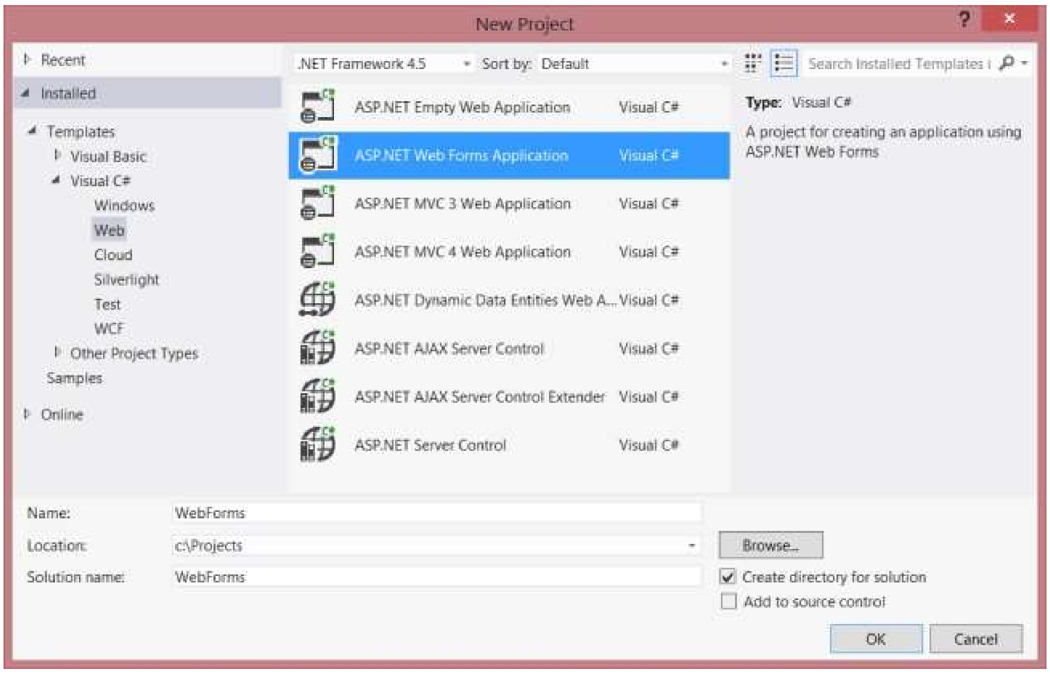
To use Web API in a Web Forms application, there are two main steps:

- Add a Web API controller that derives from the **ApiController** class.
- Add a route table to the **Application_Start** method.

Create a Web Forms Project

Start Visual Studio and select **New Project** from the **Start** page. Or, from the **File** menu, select **New** and then **Project**.

In the **Templates** pane, select **Installed Templates** and expand the **Visual C#** node. Under **Visual C#**, select **Web**. In the list of project templates, select **ASP.NET Web Forms Application**. Enter a name for the project and click **OK**.


New Project
Recent
Installed
Templates
Visual Basic
Visual C#
Windows
Web
Cloud
Silverlight
Test
WCF
Other Project Types
Samples
Online
.NET Framework 4.5
Sort by: Default
Search Installed Templates
ASP.NET Empty Web Application Visual C#
ASP.NET Web Forms Application Visual C#
ASP.NET MVC 3 Web Application Visual C#
ASP.NET MVC 4 Web Application Visual C#
ASP.NET Dynamic Data Entities Web A... Visual C#
ASP.NET AJAX Server Control Visual C#
ASP.NET AJAX Server Control Extender Visual C#
ASP.NET Server Control Visual C#
Browse...
OK
Cancel

Type: Visual C#

A project for creating an application using ASP.NET Web Forms

Name: WebForms

Location: c:\Projects

Solution name: WebForms

☑ Create directory for solution

☐ Add to source control

Create the Model and Controller

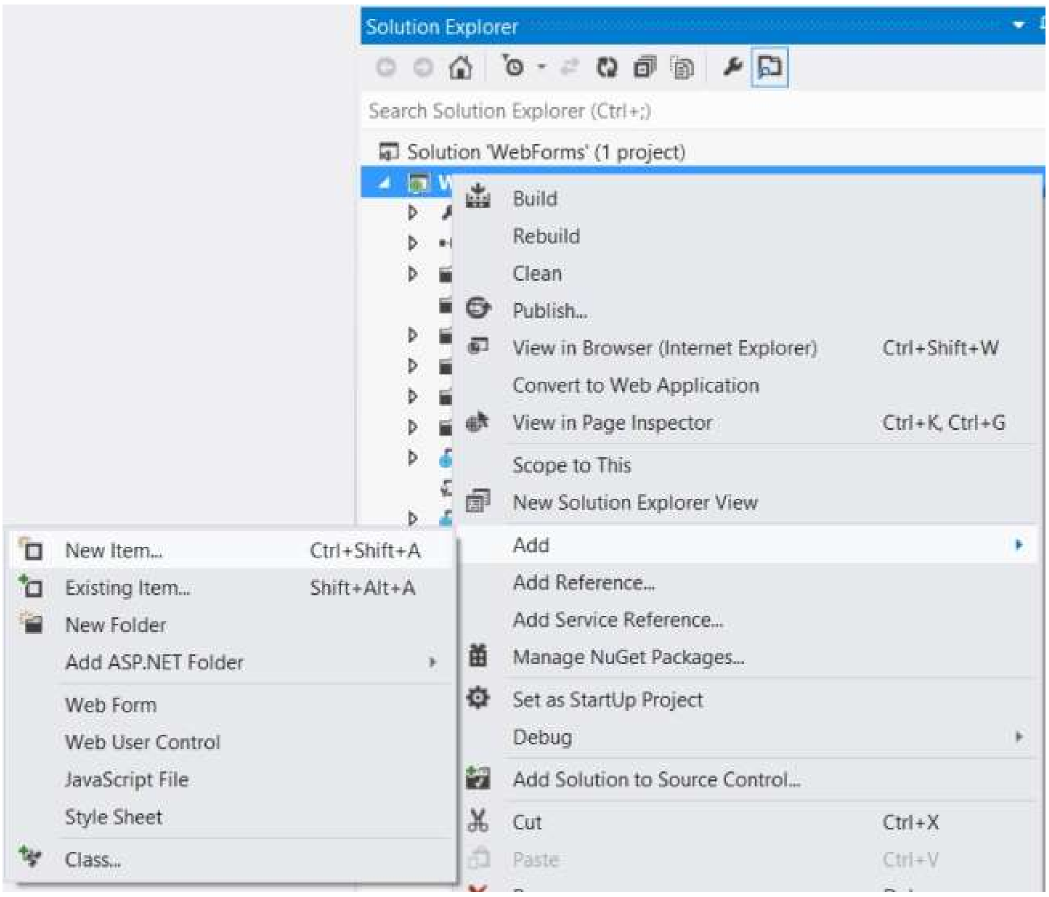
This tutorial uses the same model and controller classes as the Getting Started tutorial.

First, add a model class. In **Solution Explorer**, right-click the project and select **Add Class**. Name the class Product, and add the following implementation:

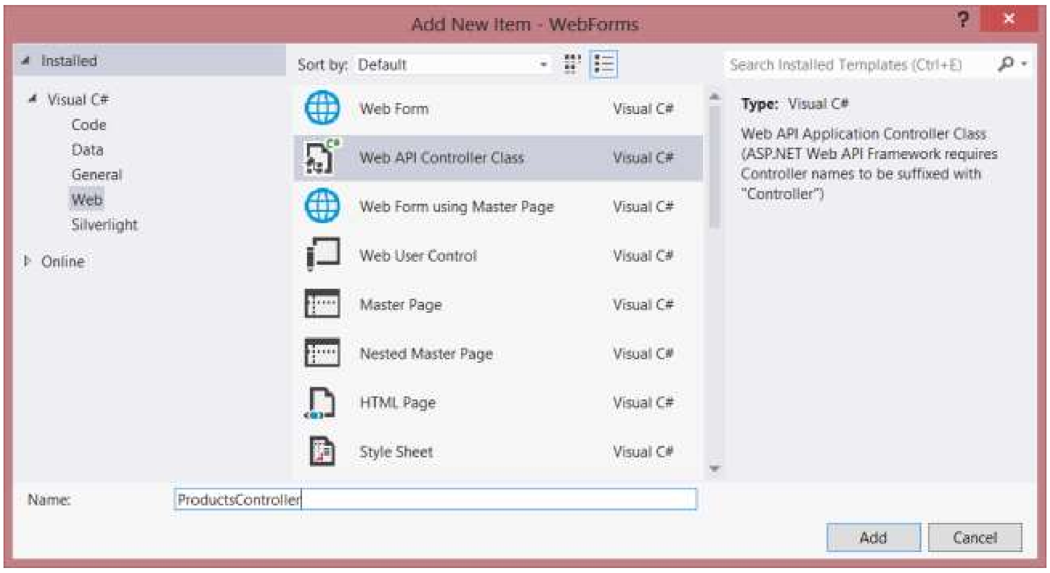
```
public class Product
{
    public int Id { get; set; }
    public string Name { get; set; }
    public decimal Price { get; set; }
    public string Category { get; set; }
}
```

Next, add a Web API controller to the project., A *controller* is the object that handles HTTP requests for Web API.

In **Solution Explorer**, right-click the project. Select **Add New Item**.



Under **Installed Templates**, expand **Visual C#** and select **Web**. Then, from the list of templates, select **Web API Controller Class**. Name the controller "ProductsController" and click **Add**.



Add New Item - WebForms
Installed
Visual C#
Code
Data
General
Web
Silverlight
Online
Sort by: Default
Search Installed Templates (Ctrl+E)
Web Form Visual C#
Web API Controller Class Visual C#
Web Form using Master Page Visual C#
Web User Control Visual C#
Master Page Visual C#
Nested Master Page Visual C#
HTML Page Visual C#
Style Sheet Visual C#
Type: Visual C#
Web API Application Controller Class (ASP.NET Web API Framework requires Controller names to be suffixed with "Controller")
Name: ProductsController
Add
Cancel

The **Add New Item** wizard will create a file named ProductsController.cs. Delete the methods that the wizard included and add the following methods:

```
namespace WebForms
{
    using System;
    using System.Collections.Generic;
    using System.Linq;
    using System.Net;
    using System.Net.Http;
    using System.Web.Http;

    public class ProductsController : ApiController
    {

        Product[] products = new Product[]
        {
            new Product { Id = 1, Name = "Tomato Soup", Category = "Groceries", Price = 1 },
            new Product { Id = 2, Name = "Yo-yo", Category = "Toys", Price = 3.75M },
            new Product { Id = 3, Name = "Hammer", Category = "Hardware", Price = 16.99M }
        };

        public IEnumerable<Product> GetAllProducts()
        {
            return products;
        }

        public Product GetProductById(int id)
        {
            var product = products.FirstOrDefault((p) => p.Id == id);
            if (product == null)
            {
                throw new HttpResponseException(HttpStatusCode.NotFound);
            }
            return product;
        }

        public IEnumerable<Product> GetProductsByCategory(string category)
        {
            return products.Where(
                (p) => string.Equals(p.Category, category,
                    StringComparison.OrdinalIgnoreCase));
        }
    }
}
```

For more information about the code in this controller, see the Getting Started tutorial.

Add Routing Information

Next, we'll add a URI route so that URIs of the form "/api/products/" are routed to the controller.

In **Solution Explorer**, double-click Global.asax to open the code-behind file Global.asax.cs. Add the following **using** statement.

```
using System.Web.Http;
```

Then add the following code to the **Application_Start** method:

```
RouteTable.Routes.MapHttpRoute(
    name: "DefaultApi",
    routeTemplate: "api/{controller}/{id}",
    defaults: new { id = System.Web.Http.RouteParameter.Optional }
);
```

For more information about routing tables, see Routing in ASP.NET Web API.

Add Client-Side AJAX

That's all you need to create a web API that clients can access. Now let's add an HTML page that uses jQuery to call the API.

Make sure your master page (for example, *Site.Master*) includes a `ContentPlaceHolder` with `ID="HeadContent"`:

```
<asp:ContentPlaceHolder runat="server" ID="HeadContent"></asp:ContentPlaceHolder>
```

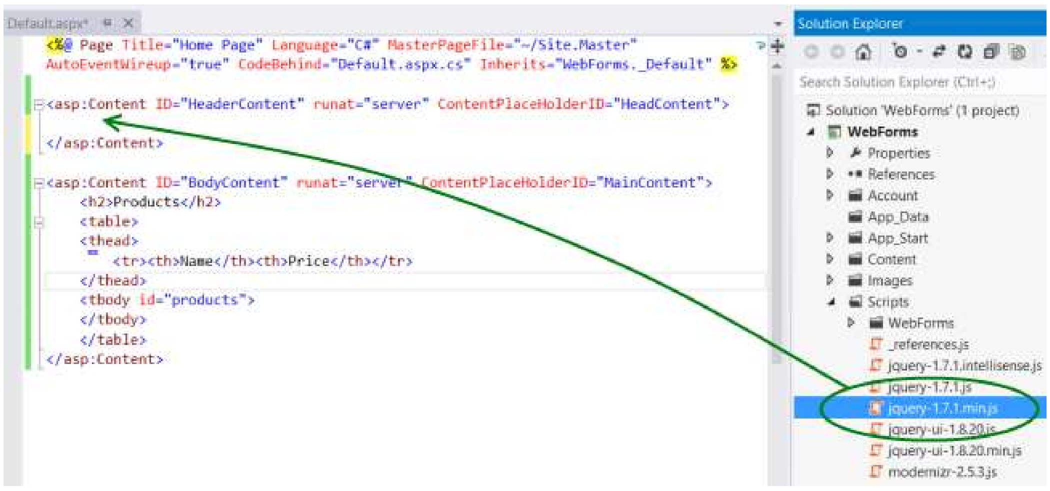
Open the file Default.aspx. Replace the boilerplate text that is in the main content section, as shown:

```
<%@ Page Title="Home Page" Language="C#" MasterPageFile="~/Site.Master"
    AutoEventWireup="true" CodeBehind="Default.aspx.cs" Inherits="WebForms._Default" %>

<asp:Content ID="HeaderContent" runat="server" ContentPlaceHolderID="HeadContent">
</asp:Content>

<asp:Content ID="BodyContent" runat="server" ContentPlaceHolderID="MainContent">
    <h2>Products</h2>
    <table>
    <thead>
        <tr><th>Name</th><th>Price</th></tr>
    </thead>
    <tbody id="products">
    </tbody>
    </table>
</asp:Content>
```

Next, add a reference to the jQuery source file in the `HeaderContent` section:

```
<asp:Content ID="HeaderContent" runat="server" ContentPlaceHolderID="HeadContent">
    <script src="Scripts/jquery-1.10.2.min.js" type="text/javascript"></script>
</asp:Content>
```

Note: You can easily add the script reference by dragging and dropping the file from **Solution Explorer** into the code editor window.



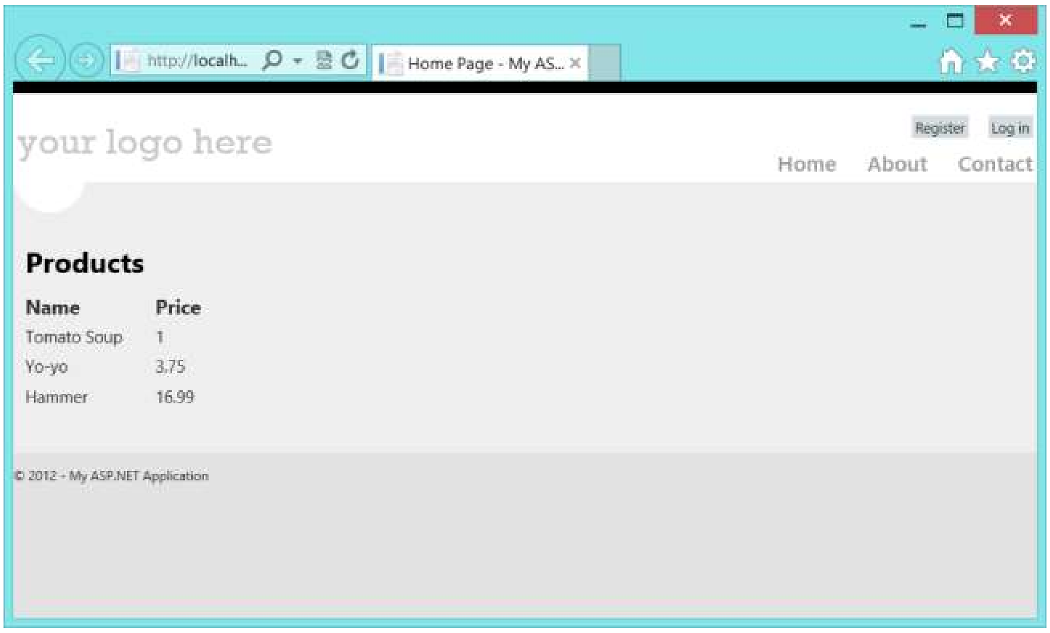
```
<%@ Page Title="Home Page" Language="C#" MasterPageFile="~/Site.Master"
AutoEventWireup="true" CodeBehind="Default.aspx.cs" Inherits="WebForms._Default" %>

<asp:Content ID="HeaderContent" runat="server" ContentPlaceHolderID="HeadContent">

</asp:Content>

<asp:Content ID="BodyContent" runat="server" ContentPlaceHolderID="MainContent">
    <h2>Products</h2>
    <table>
    <thead>
        <tr><th>Name</th><th>Price</th></tr>
    </thead>
    <tbody id="products">
    </tbody>
    </table>
</asp:Content>
```

Below the jQuery script tag, add the following script block:

```
<script type="text/javascript">
    function getProducts() {
        $.getJSON("api/products",
            function (data) {
                $('#products').empty(); // Clear the table body.

                // Loop through the list of products.
                $.each(data, function (key, val) {
                    // Add a table row for the product.
                    var row = '<td>' + val.Name + '</td><td>' + val.Price + '</td>';
                    $('<tr/>', { html: row })  // Append the name.
                        .appendTo($('#products'));
                });
            });
        }

        $(document).ready(getProducts);
</script>
```

When the document loads, this script makes an AJAX request to "api/products". The request returns a list of products in JSON format. The script adds the product information to the HTML table.

When you run the application, it should look like this:



Products

Name	Price
Tomato Soup	1
Yo-yo	3.75
Hammer	16.99

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