Controller

.NET

***Controllers** are responsible for responding to requests made against an ASP.NET website. Each browser request is mapped to a particular **controller**.*

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/aspnet-mvc-controllers-overview-cs#understanding-controllers

ASP.NET URL Routing

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/asp-net-mvc-routing-overview-cs

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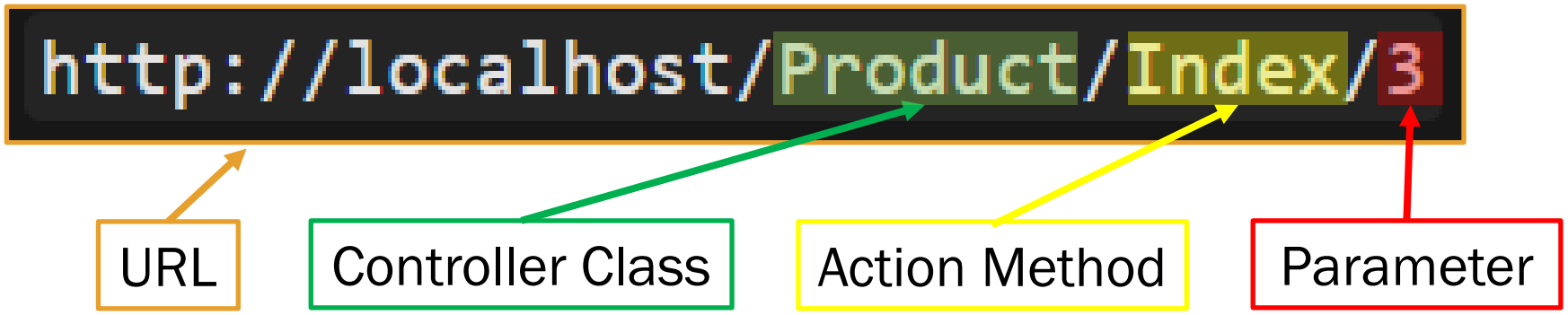
The default route in an ASP.NET Core application maps the first addition of a URL to a controller name, the second addition to the controller action, and the third addition to a named parameter. The below URL equates to calling ***Product.Index(3).***



The routing configuration includes defaults for all three parameters. If a ***controller*** is not supplied, the route defaults 'Home'. If an ***action*** is not supplied, the action defaults to 'Index'. If there's no id, the id parameter defaults to an empty string.

Controllers

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/aspnet-mvc-controllers-overview-cs

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If the URL, ***http://localhost/Product/Index/3***, is entered into the browser, a ***controller*** named 'ProductController' is invoked. ProductController is responsible for generating the response to the browser request. Convention (and default) is to route Urls to a named ***controller***.

A ***controller*** is a regular C# class that derives from either the base ***System.Web.Mvc.Controller*** class for MVC apps or the ***Microsoft.AspNetCore.Mvc.ControllerBase*** class for APIs. These base classes provide the controller with valuable functionality.

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
using System.Web.Mvc;
using System.Web.Mvc.Ajax;

namespace MvcApplication1.Controllers
{
    public class ProductController : Controller
    {
        //
        // GET: /Products/

        public ActionResult Index()
        {
            // Add action logic here
            return View();
        }
    }
}
```

Controller Actions

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/aspnet-mvc-controllers-overview-cs#understanding-controller-actions

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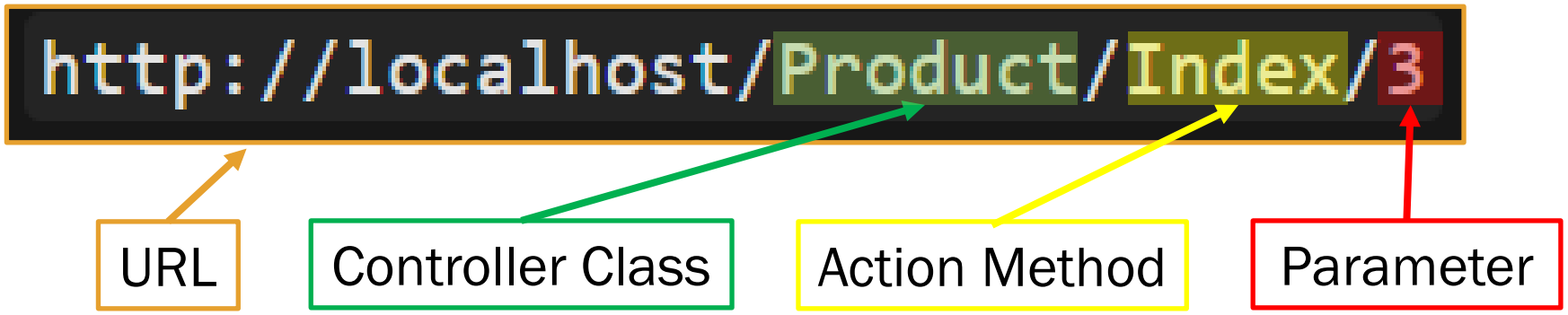
An ***action*** method is a method in a ***controller*** class that gets called when you enter a URL with the ***action*** specified. A request is made URL ***http://localhost/Product/Index/3***, will be routed to the Product ***controller*** and the Index ***action*** with the parameter 3.



A ***controller action*** must be a ***public method*** of a ***controller*** class. Any ***public method*** in a ***controller*** class is exposed as a ***controller action.*** A ***method*** used as a ***controller action*** cannot be overloaded.

ActionResult<>

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/aspnet-mvc-controllers-overview-cs#understanding-action-results

```
[HandleError]
public class HomeController : Controller
{
    public ActionResult Index(string id)
    {
        return View();
    }
}
```

When a browser makes a request, a ***controller action*** returns a response in the form of an ***ActionResult***.

```
public class StatusController : Controller
{
    public ActionResult Index()
    {
        return Content("Hello World!");
    }
}
```

ActionResult	Controller Base Class Method	Purpose
ViewResult	Return View();	Returns a HTML ***View*** to the browser
EmptyResult	Return new EmptyResult()	Returns empty (void)
RedirectResult	Return RedirectToAction(Index);	Calls another ***Action*** Method.
ContentResult	Content("Hello World!");	Returns text to the browser

```
public class HomeController : Controller
    {
        // GET: for main view
        public EmptyResult EmptyData()
        {
        return new EmptyResult();
        }

    }
```

Filter Attributes

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/understanding-action-filters-cs#the-different-types-of-filters
https://docs.microsoft.com/en-us/aspnet/web-api/overview/security/authentication-filters#setting-an-authentication-filter

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The ASP.NET framework supports four different types of filters. Here they are listed in order of execution.

- Authorization filters – Implements the IAuthorizationFilter attribute. Always executes first.
- Action filters – Implements the IActionFilter attribute.
- Result filters – Implements the IResultFilter attribute.
- Exception filters – Implements the IExceptionFilter attribute. Always executes last. Can be used for logging.

To implement any filter, create a class that inherits the base ***Filter*** class and implements one or more of the ***IAuthorizationFilter***, ***IActionFilter***, ***IResultFilter***, or ***IExceptionFilter*** interfaces.

```
[Authorize] // Require authenticated requests.
public class HomeController : ApiController
{
    public IHttpActionResult Get() { . . . }

    [IdentityBasicAuthentication] // Enable Basic authentication for this action.
    public IHttpActionResult Post() { . . . }
}
```

Action Filters

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/understanding-action-filters-cs

An ***action filter*** is an ***attribute*** that you can apply to a ***controller action*** or an entire ***controller***. It modifies the way in which the ***action*** is executed. The ASP.NET framework includes several ***action filters:***

- OutputCache – caches the output of a controller action for a specified amount of time.
- HandleError – handles errors raised when a controller action executes.
- Authorize – enables you to restrict access to a user or role.
- You can also create custom filters.

You can apply more than one action filter at a time.

```
using System;
using System.Web.Mvc;

namespace MvcApplication1.Controllers
{
    public class DataController : Controller
    {
        [OutputCache(Duration=10)]
        public string Index()
        {
            return DateTime.Now.ToString("T");
        }
    }
}
```

This ***OutputCache*** filter causes the returned value to be cached for 10 seconds. If you repeatedly invoke the Index() ***action*** by hitting the Refresh button, you will see the same time for 10 seconds.

Request Parameters

https://docs.microsoft.com/en-us/aspnet/mvc/overview/older-versions-1/controllers-and-routing/creating-a-route-constraint-cs

The last part of a Url is the query parameter. This value is passed in the ***Action*** Method where it can be acted upon.

To prevent an invalid value from being passed to the ***Action*** Method, you can

- define constraints when defining routes.
- check the value of the parameter and RedirectToAction() to handle the input correctly.

```
using System.Web.Mvc;

namespace MvcApplication1.Controllers
{
    public class CustomerController : Controller
    {
        public ActionResult Details(int? id)
        {
            if (!id.HasValue)
                return RedirectToAction("Index");

            return View();
        }

        public ActionResult Index()
        {
            return View();
        }

    }
}
```

HTTP Verbs in ASP.NET

https://docs.microsoft.com/en-us/aspnet/web-api/overview/web-api-routing-and-actions/routing-in-aspnet-web-api

Instead of using the naming convention for ***HTTP verbs***, you can explicitly specify the ***HTTP verb*** for an ***action*** by decorating the ***action*** method with one of the following ***attributes***:

[HttpGet]	[HttpPut]
[HttpDelete]	[HttpOptions]
[HttpPatch]	[HttpPost]
[HttpHead]	

Use ***attributes*** to specify the allowed ***HTTP verbs***. You can override the ***action*** name given in the URL by using the ***[ActionName] attribute***.
api/products/thumbnail/id maps to both of the below ***Action*** Methods.

```
public class ProductsController : ApiController
{
    [HttpGet]
    [ActionName("Thumbnail")]
    public HttpResponseMessage GetThumbnailImage(int id);

    [HttpPost]
    [ActionName("Thumbnail")]
    public void AddThumbnailImage(int id);
}
```

ASP.NET Core MVC Tutorial

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