

Action Results in Web API 2

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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:

C#

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

HTTP response:

console

 Copy

```
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.

C#

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```
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:

console

 Copy

```
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.

C#

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```
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.

C#

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```
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 implementation of **IHttpActionResult** that creates a plain text response:

C#

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```
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:

C#

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

Response:

console

 Copy

```
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.

C#

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```
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).

C#	 Copy
<pre>public class ProductsController : ApiController { public IEnumerable<Product> Get() { return GetAllProductsFromDB(); } }</pre>	


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

console	 Copy
<pre>GET http://localhost/api/products HTTP/1.1 User-Agent: Fiddler Host: localhost:24127 Accept: application/json</pre>	

Example response:

console	 Copy
<pre>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}]</pre>	

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