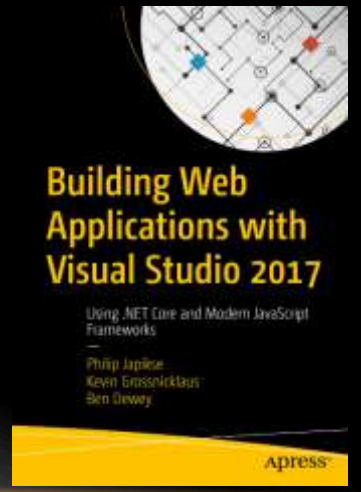
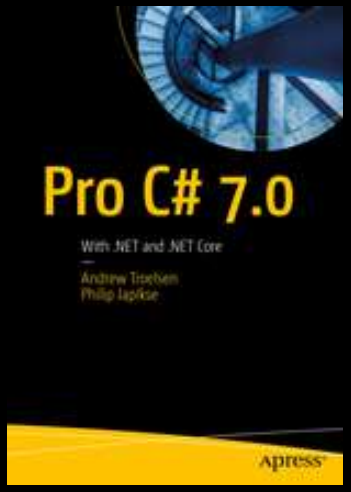
VERSION ASP.NET CORE APIS

Philip Japikse (@skimedic)
skimedic@outlook.com
www.skimedic.com/blog
Microsoft MVP, ASPInsider, MCSD, MCDBA, CSM, PSM II, PSD
Consultant, Teacher, Writer

Phil.About()

- Director of Consulting/Chief Architect
- Author: Apress.com (http://bit.ly/apressbooks)
- Speaker: http://www.skimedic.com/blog/page/Abstracts.aspx
- Microsoft MVP, ASPInsider, MCSD, MCDBA, CSM, PSM II, PSD
- Founder, Agile Conferences, Inc.
  - http://www.cincydeliver.org
- President, Cincinnati .NET User's Group





DEFINING THE PROBLEM

DO YOU NEED TO VERSION?

- Your API is Public
- Your API needs updating
- Your API has more than one client OR you plan on adding more
- You want to plan for the future (but not gold plate)

- Clients need to count on services being stable over time
- Business needs to add new features and make changes

MICROSOFT REST API GUIDELINES ON VERSIONING

VERSION FORMATS

- Services are versioned using the Major.Minor versioning scheme
  - 1.0, 2.0
- Services can opt for only the Major version - the ".0" is implied
  - V1 => v1.0
- Status (RC, Alpha, Beta, etc.) can be specified after the Minor version
  - 1.0-Alpha
- Grouping using YYYY-MM-DD
  - 2018-06-12.1.0-RC

https://github.com/Microsoft/api-guidelines/blob/vNext/Guidelines.md

VERSIONING OPTIONS

- Embed the version after the service root
  - https://www.skimedic.com/api/v1.0/classes
- Use a query string parameter
  - https://www.skimedic.com/api/classes?api-version=1.0
- HTTP Headers (Not compliant with MS REST Guidelines)
  - api-version:2.0
- Use Media Type (Not compliant, but generally accepted)
  - Content-Type: application/json;v=2.0 (or Accept)

https://github.com/Microsoft/api-guidelines/blob/vNext/Guidelines.md

API GUIDANCE

- Present a consistent user experience
- Guarantee stability of the REST APIs
- Not change names or structures over time

https://github.com/Microsoft/api-guidelines/blob/vNext/Guidelines.md

VERSIONING GUIDANCE

- Be consistent with versioning mechanism (URL v. Query String)
- Indicate deprecated version(s)
- Update versions with breaking changes

- https://github.com/Microsoft/api-guidelines/blob/master/Guidelines.md#12-versioning

ALL REQUIRED UPDATED VERSIONING

- Breaking Changes –
  - Removal or renaming APIs or API parameters
  - Changes in the behavior of an existing API
  - Changes in Error Codes and Fault Contracts
- New Features
- Anything that violates the Principle of Least Astonishment

PRINCIPLE OF LEAST ASTONISHMENT

- If a necessary feature has a high astonishment factor, it may be necessary to redesign the feature - 1984
  - A component of a system should behave in a way that users expect

- For an API, function or method names intuitively match their behavior

https://en.wikipedia.org/wiki/Principle_of_least_astonishment

GROUP VERSIONING

- Group Versioning is an optional feature
  - Defined using the YYYY-MM-DD format
  - Does not replace the Major.Minor version format

- Allows for logical grouping of API
  - Developers can lookup a single version and use it across related end points

- Can cause confusion due to reusing versions

VERSIONING ASP.NET CORE WEB SERVICES

THE BARE MINIMUM

- Add Package Microsoft.AspNetCore.Mvc.Versioning
- Add call to services.AddApiVersioning in ConfigureServices (Startup.cs)
  - Set option to report API versions
- Use ApiVersion Attributes on Controllers
  - ApiVersion, MapToApiVersion, ApiVersionNeutral, ~~AdvertiseApiVersions~~
- [optional] Add route for URL version scheme

ADDING VERSIONING TO CONTROLLERS

- Use the ApiVersion attribute to add versioning

```
//Query String and Media Type
[ApiVersion( "2.0" )]
[Route( "api/helloworld" )]
public class HelloWorld2Controller : Controller
{
    …
}
//URL Versioning
[ApiVersion( "1.0" )]
[Route( "api/v{version:apiVersion}/[controller]" )]
public class HelloWorldController : Controller
{
    …
}
```

VERSION INTERLEAVING

- Use the ApiVersion/MapToApiVersion attributes to add versioning

```
[ApiVersion( "2.0" )]
[ApiVersion( "3.0" )]
[Route( "api/v{version:apiVersion}/helloworld" )]
public class HelloWorld2Controller : Controller
{
    [HttpGet]
    public string Get() => "Hello world v2!";

    [HttpGet, MapToApiVersion( "3.0" )]
    public string GetV3() => "Hello world v3!";
}
```

DEPRECATING VERSIONS

- Add Deprecated to the ApiVersion attribute

```
[ApiVersion( "2.0" )]
[ApiVersion( "1.0", Deprecated = true )]
[Route( "api/[controller]" )]
public class HelloWorldController : Controller
{
   //omitted
}
```

VERSION NEUTRALITY

- Use the ApiVersionNeutral attribute to expose an endpoint to all versions

```
[ApiVersionNeutral]
[Route("api/v{version:apiVersion}/[controller]/[action]")]
public class HealthController : Controller
{
    [HttpGet]
    public string Ping() => "Ok";
}
```

REQUESTS AND VERSION INFORMATION

- Request Formats (querystring, header, URL):
  - QueryString (?api-version=1.0)
  - URL (api/v1.0/[Controller])
  - Media Type (Content-Type: application/json;v=2.0) || Accept
  - Header – must configure manually with ApiVersionReader
  - Note: All are customizable

- Getting Version requested:
  - HttpContext.GetRequestedApiVersion
  - Model Binding supported in 3.0+

GETTING THE REQUESTED VERSION INFORMATION

- Use the GetRequestedApiVersion or ModelBinding to return the requested version information

```
[ApiVersion("1.0")]
[ApiVersion("2.0")]
[Route("api/v{version:apiVersion}/[controller]/[action]")]
public class DifferentVersionsController : Controller
{
   [HttpGet]
   public string RequestedApiVersion() =>
      JsonConvert.SerializeObject(HttpContext.GetRequestedApiVersion());

   [HttpGet] //3.0+
   public string Get(ApiVersion apiVersion)
      => $"Controller = {GetType().Name}\nVersion = {apiVersion}";
}
```

API VERSIONING OPTIONS

CONVENTIONS

- Allow for versioning without using attributes
  - Version specification at the Controller and/or Action level
  - Version By Namespace
  - Custom conventions

SETTING DEFAULT VERSION FOR REQUESTS

- AssumeDefaultVersionWhenUnspecified
  - Used when adding versioning to an existing API
  - Returned version is configured with ApiVersionSelector

- ApiVersionSelector defines the behavior for unspecified requests.
  - Default – the configured default
  - Constant – always selects the specified version
  - Current/Lowest Implementation – greatest/lowest version number

DEFAULT VERSIONS FOR APICONTROLLERS

- DefaultApiVersion – Versions Controllers w/o ApiVersion attribute
  - Configured default value is 1.0
  - Can be set to another value

- Also used with AssumeDefaultVersionWhenUnspecified when Default is the ApiVersionSelector

APIVERSIONREADER

- The **IApiVersionReader** interface defines the behavior of how an API version is read in its raw, unparsed form from the current HTTP request.
- Can update defaults for:
  - QueryStringApiVersionReader
  - HeaderApiVersionReader
  - MediaTypeApiVersionReader

VERSION DOCUMENTATION

API DOCUMENTATION

- The ASP.NET/ASP.NET Core API Versioning project provides Swagger and Swashbuckle support.
- Add SwaggerGen to Configure Services (Startup.cs)
- Add Swagger and SwaggerUI to Configure (Startup.cs)
- To add Swashbuckle, must leverage Swashbuckle Extensibility model
  - Implement an IOperationFilter and add to Swagger

CONFLICTING ACTIONS RESOLVER

- c.ResolveConflictingActions(apiDescriptions => apiDescriptions.First());

ASP.NET CORE 3 SUPPORT

- ATM, need Preview 8 (Daily Builds) and Versioning 4 Preview 8

Contact Me

skimedic@outlook.com
www.skimedic.com/blog
www.twitter.com/skimedic

http://bit.ly/skimediclyndacourses
http://bit.ly/apressbooks

www.hallwayconversations.com

Questions?

Thank You!

Find the code at: https://github.com/skimedic/presentations