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EXPERT SOLUTIONS FOR ENTERPRISE DEVELOPERS

Building Secure and Scalable APIs in .NET 6

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Owner
Champion DS

Level: Intermediate / Advanced

#VSLIVE

NO CODE LIMITS

Making sure only the right people are invited

SECURING ACCESS TO APIS

When should we secure APIs?

Always

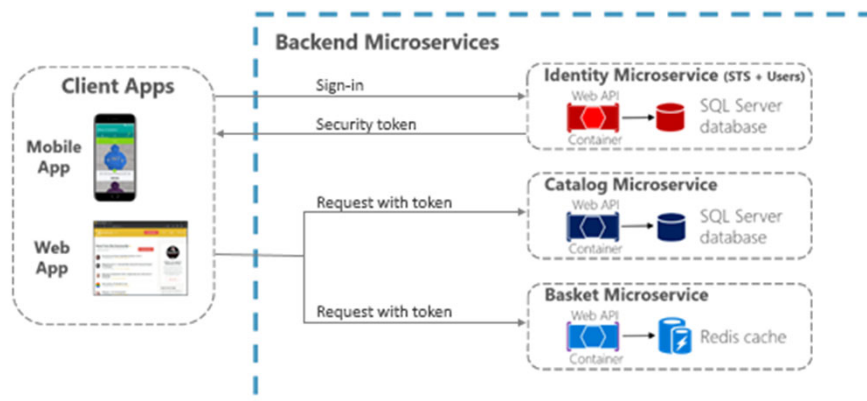
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Oauth 2.0

- Can create your own authentication scheme
 - Integrate into other 3rd party or internal processes
 - Custom authentication solutions

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Authentication



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Custom Authentication

- Can create your own authentication scheme
 - Integrate into other 3rd party or internal processes
 - Custom authentication solutions

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Authorize

- Once a user or consumer has been authenticated, .NET has built in Authorization mechanism

[Authorize]

[Authorize(Users="")]

[Authorize(Roles="")]

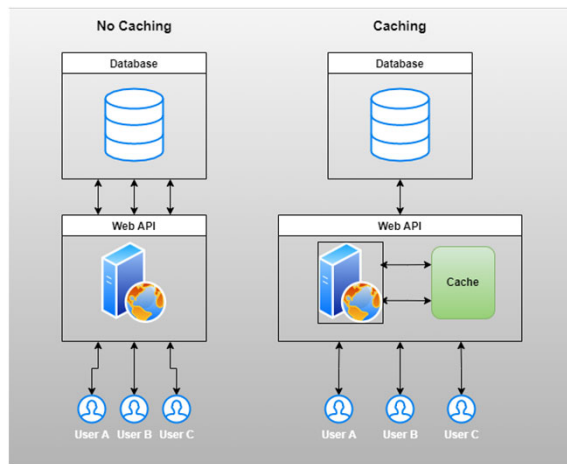


Sometimes the same question needs the same answer

PERFORMANCE VIA CACHING



Caching APIs



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Response Caching

- Caches calls using cached-control headers
- Pros
 - Easy to implement
 - Can be configured at API, controller, or method level
- Cons
 - Cannot invalidate cache

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In-Memory Caching

- Caching responses using server memory
- Pros
 - Easy to customize what is being cached and its duration
 - Caching can be shared between methods
- Cons
 - Memory footprint must be maintained
 - Does not scale out to multiple instances



Distributed Cache

- Enterprise level caching using separate server
- Pros
 - Highly performant
 - Scales across multiple API instances
 - Same benefits as In-Memory
- Cons
 - Requires additional server / service
 - Additional costs for operation
 - Can be more difficult to troubleshoot



Making the right decisions to support your consumers

TUNING YOUR APIS



Paging and Searching

- Pros
 - Limits the amount of data being handled and returned
 - More performant and better experience for consumer
- Cons
 - Is a more complex approach to data APIs
 - Typically requires extra queries for counts



Paging and Searching

- When to use
 - Any large data sets
 - Data sets that have an unknown growth
 - When data access is costly



Know your Resources

- The API server is typically the fastest component in your stack
- Make sure additional resources are scaled and located appropriately
- Use your resources to their strengths



Cosmos and Elastic



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APIs don't get all of the fun...

OFF LOADING YOUR WORKLOAD

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When to Offload Workload

- A call is process or time extensive
- Resources have limited bandwidth
- API calls need to be fast and disconnected from business logic



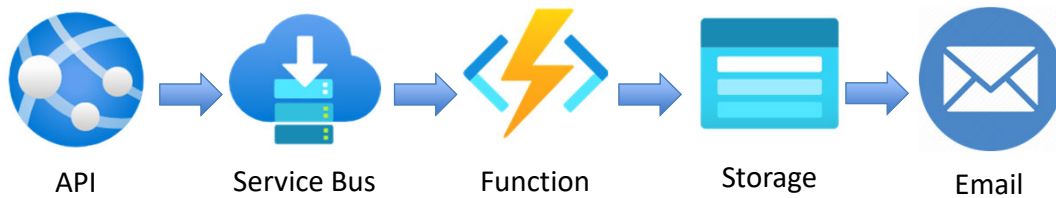
Azure Functions

- Serverless compute resource
- Multiple trigger points
 - Http, Timer, CosmosDb, Service Bus, etc
- Create solution for micro or disconnected services



Process Heavy Execution

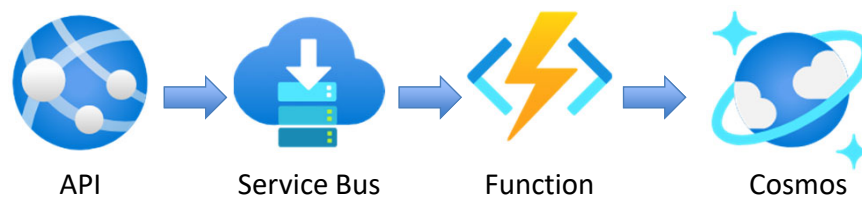
Report Generation



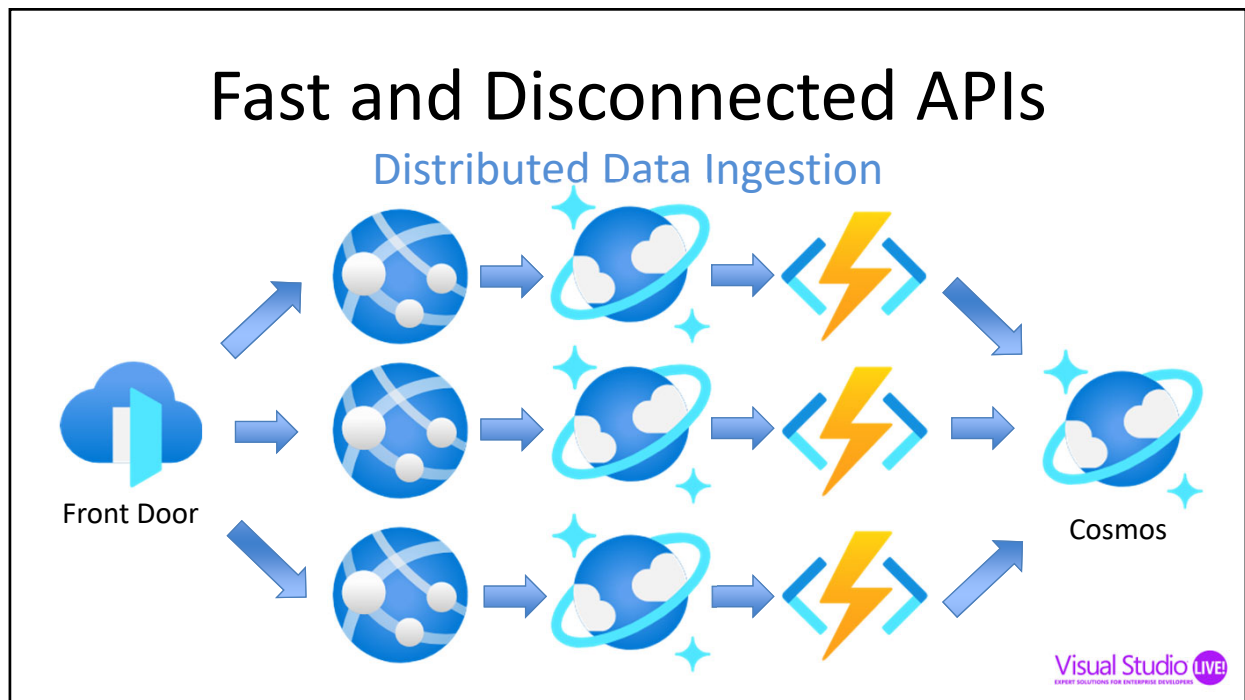
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Limited Bandwidth Sources

Data Ingestion



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Supporting growth over the long run

VERSIONING

Reasons for Versioning

- Allows APIs to grow while supporting older consumers
- Supports changes to DTOs
- Supports changes to workflows and features

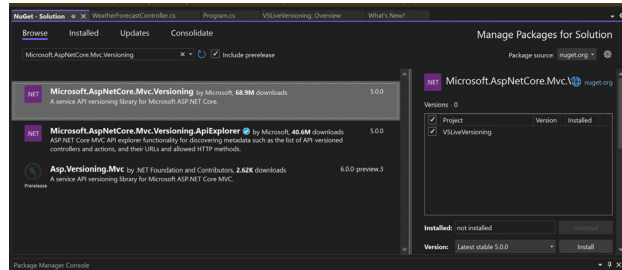


Adding Versioning to API



Adding Versioning to API

- Add Microsoft.AspNetCore.Mvc.Versioning package to project



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Adding Versioning to API

- Add Microsoft.AspNetCore.Mvc.Versioning package to project
- Add ApiVersioning to services

```
services.AddApiVersioning(options =>
{
    // ReportApiVersions will return the "api-supported-versions" and "api-deprecated-versions" headers.
    options.ReportApiVersions = true;
    options.AssumeDefaultVersionWhenUnspecified = true;
    options.DefaultApiVersion = new ApiVersion(1, 0);

    options.ApiVersionReader = ApiVersionReader.Combine(
        // The Default versioning mechanism which reads the API version from the "api-version" Query String parameter.
        new QueryStringApiVersionReader("api-version"),
        // Use the following, if you would like to specify the version as a custom HTTP Header.
        new HeaderApiVersionReader("Accept-Version"),
        // Use the following, if you would like to specify the version as a Media Type Header.
        new MediaTypeApiVersionReader("api-version")
    );
});
```

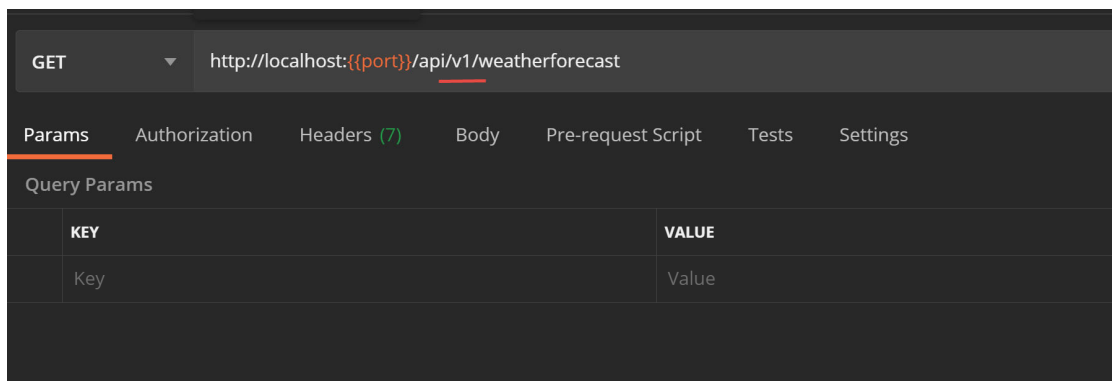
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Adding Versioning to API

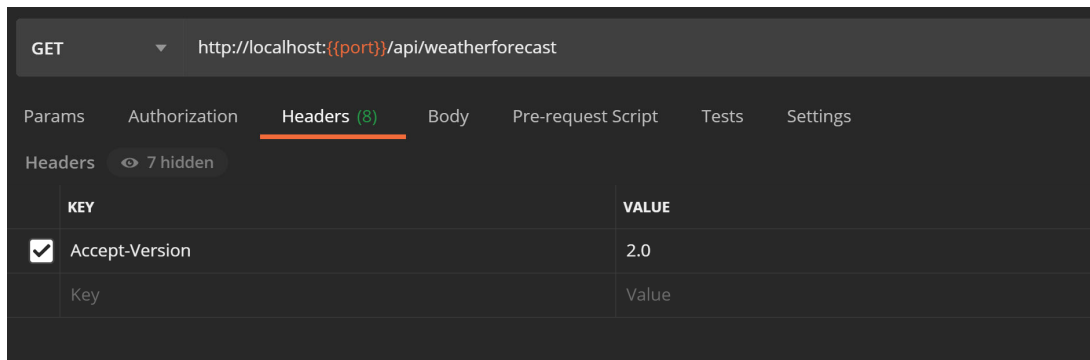
- Add Microsoft.AspNetCore.Mvc.Versioning package to project
- Add ApiVersioning to services
- Add versioning to controllers

```
[ApiController]
[ApiVersion("1.0")]
[Route("api/[controller]")]
[Route("api/v{version:apiVersion}/{controller}")]
```

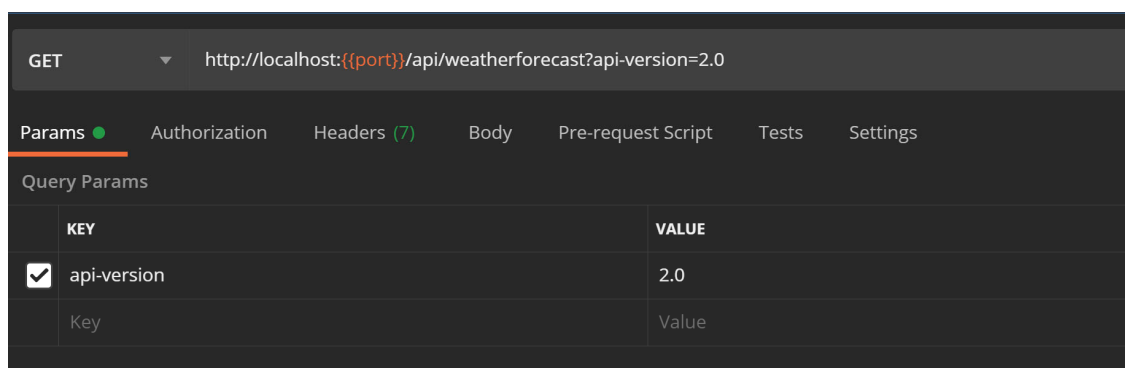
URI Versioning



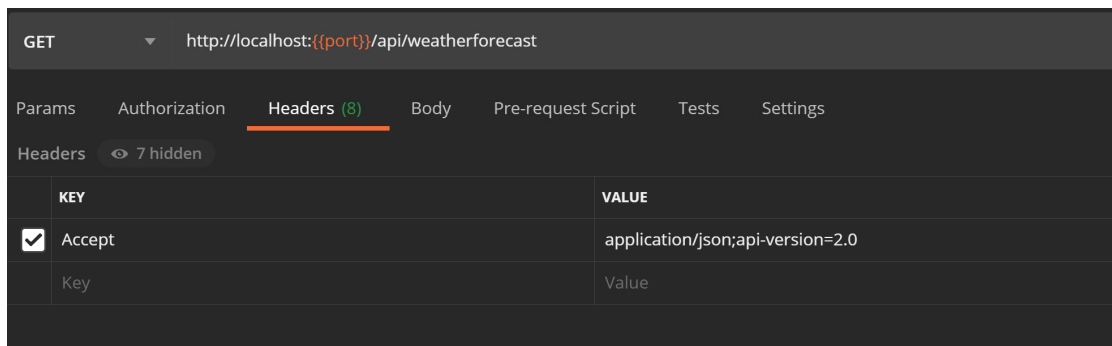
Header Versioning



Querystring Versioning

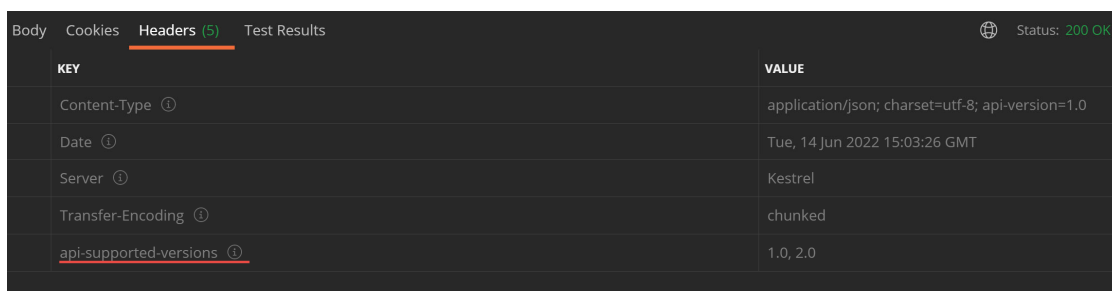


Media Versioning



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Supported Versions



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Deprecated Versions

Body	Cookies	Headers (6)	Test Results	Status: 200 OK
KEY	VALUE			
Content-Type ⓘ	application/json; charset=utf-8; api-version=1.0			
Date ⓘ	Tue, 14 Jun 2022 15:00:18 GMT			
Server ⓘ	Kestrel			
Transfer-Encoding ⓘ	chunked			
api-supported-versions ⓘ	2.0			
api-deprecated-versions ⓘ	1.0			

Session Survey

- Your feedback is very important to us
- Please take a moment to complete the session survey found in the mobile app
- Use the QR code or search for “Converge360 Events” in your app store
- Find this session on the Agenda tab
- Click “Session Evaluation”
- Thank you!



Thank you for spending your time with me this afternoon

QUESTIONS

