

Module Five

Advanced REST



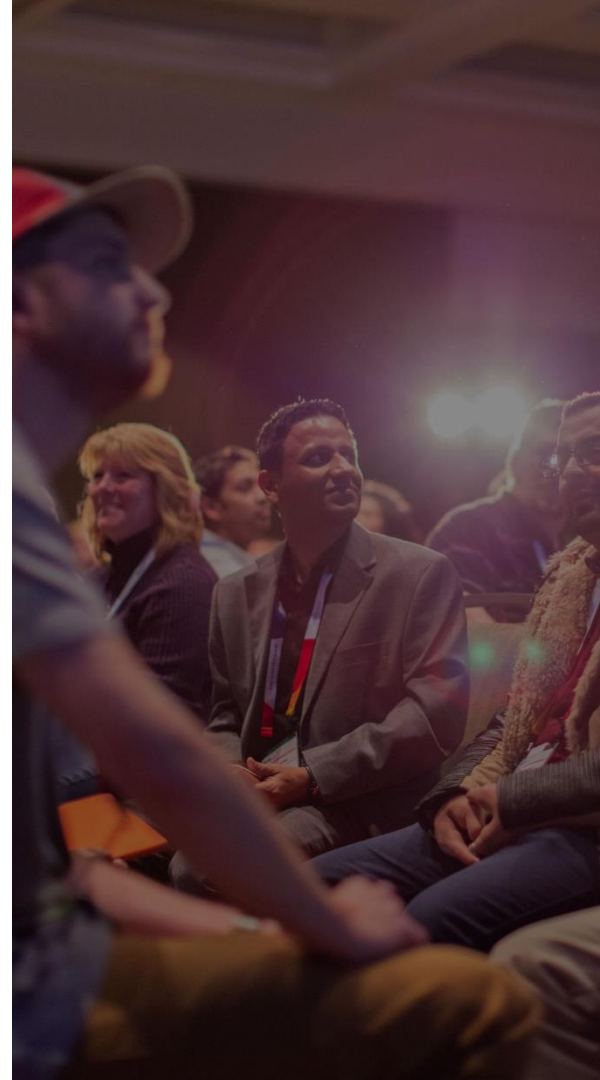
Agenda

Deeper REST

- Handling concurrency
- Dealing with authorization and authentication
- Providing versioning
- Serving large data sets
- Providing customer-friendly Software Development Kits (SDKs)

Concurrency

| concur.

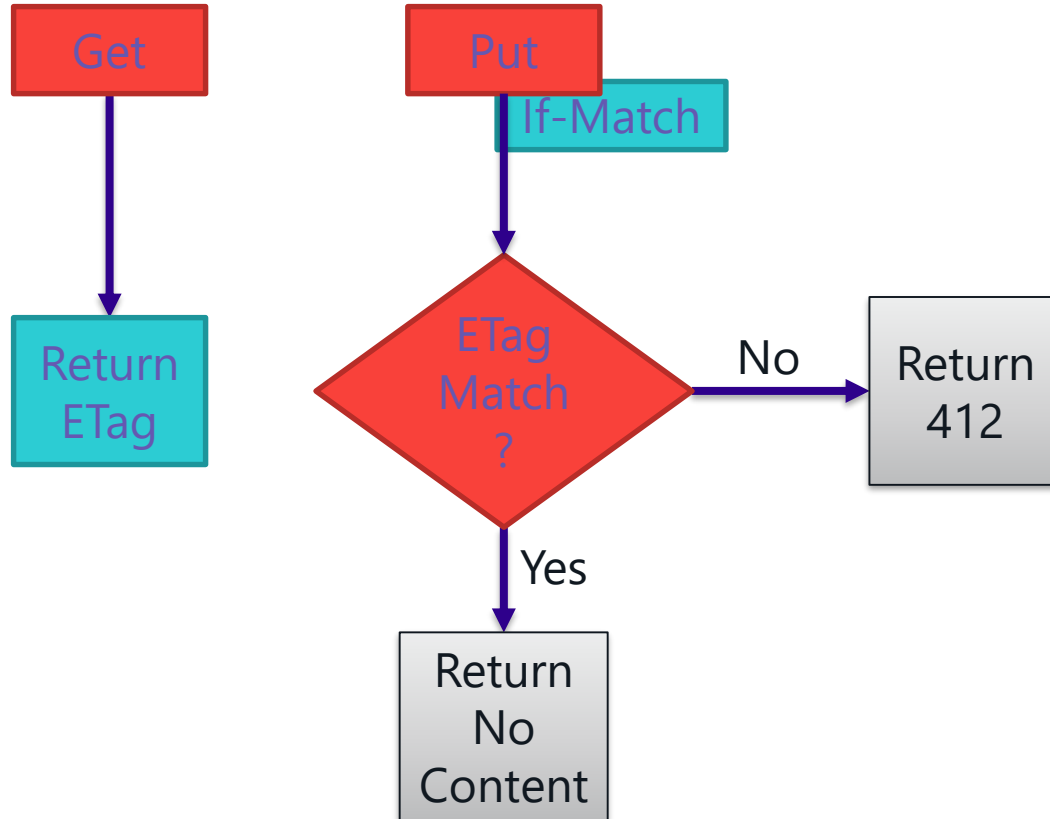


Concurrency

Wait, you mean there's more than one user?!

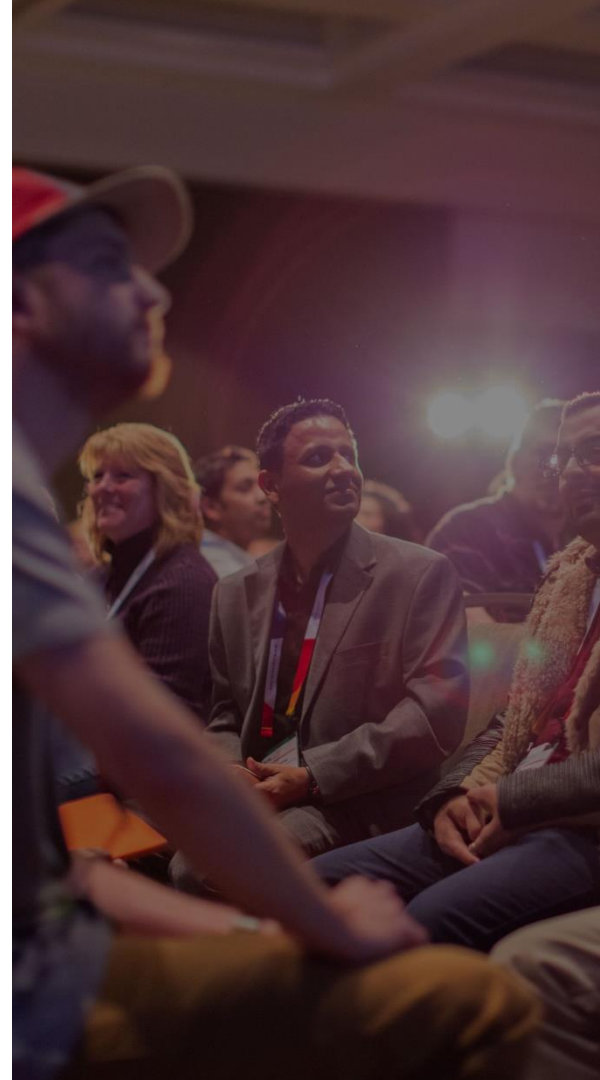
- Two flavors:
 - *Pessimistic* – lock the resource so only one change is possible
 - *Optimistic* – allow the change, if the underlying resources is unchanged
- Most implementations are optimistic
- Leverage “ETag” (Entity Tag) and “If-Match”

Concurrency



Demo

Implementing an ETag



Security

More than just a token look.



Security

“You are not authorized to authenticate.”

- Authentication: establish identity
- Authorization: grant permission
- REST has several options. Most common:
 - Custom token
 - JWT (JSON Web Token)
 - OAuth

Demo

Custom Token



JavaScript Web Token (JWT)

“The secrets are in the secret.”

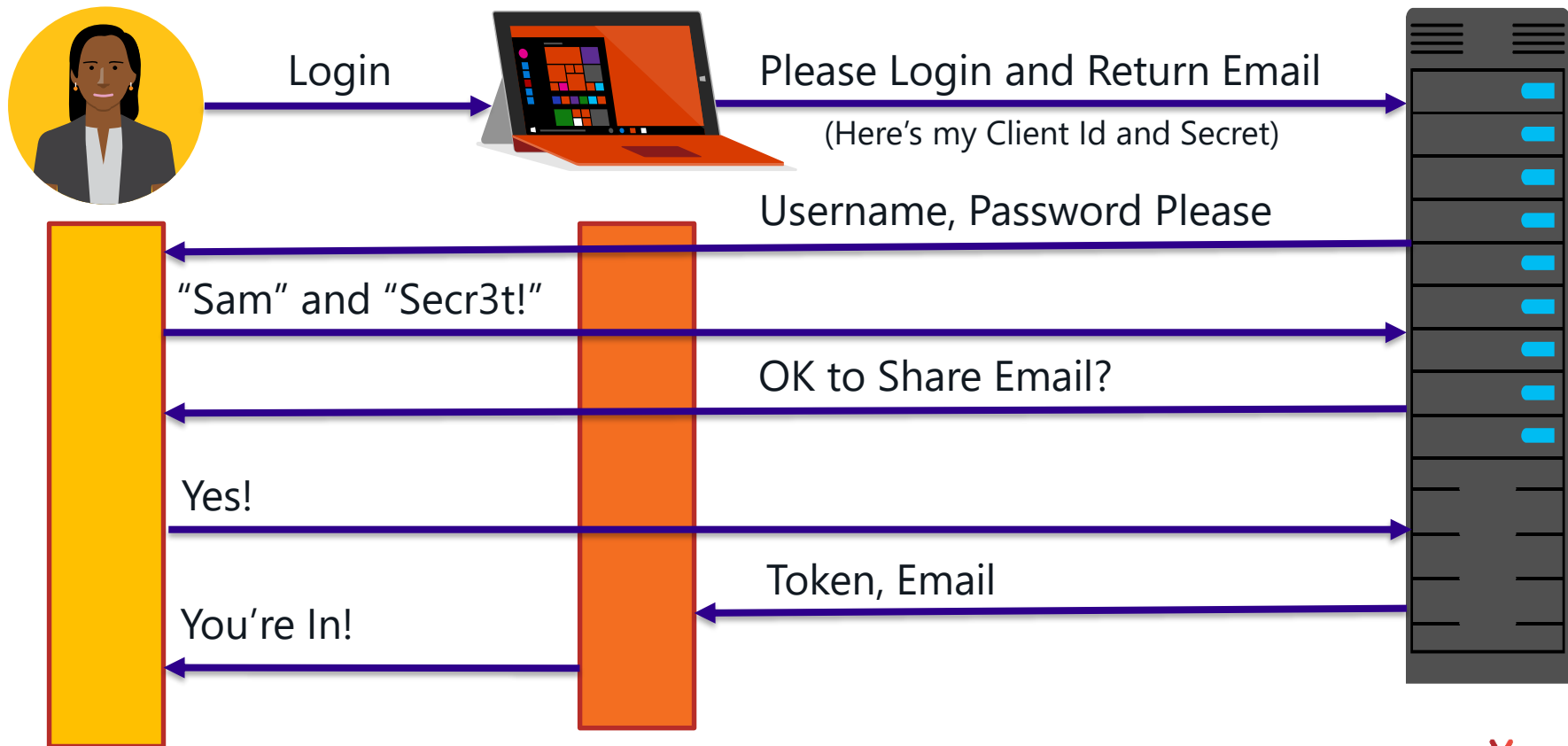
- Secret key
- Signed so no tampering
- Base64 encoded
- Standard parts:
 - *sub* – subject (i.e. target)
 - *iss* – issuer of token
 - *iat* – when token was issued
- Test it all: <http://jwt.io>

Demo

JWT Authentication



OAuth (2.0)



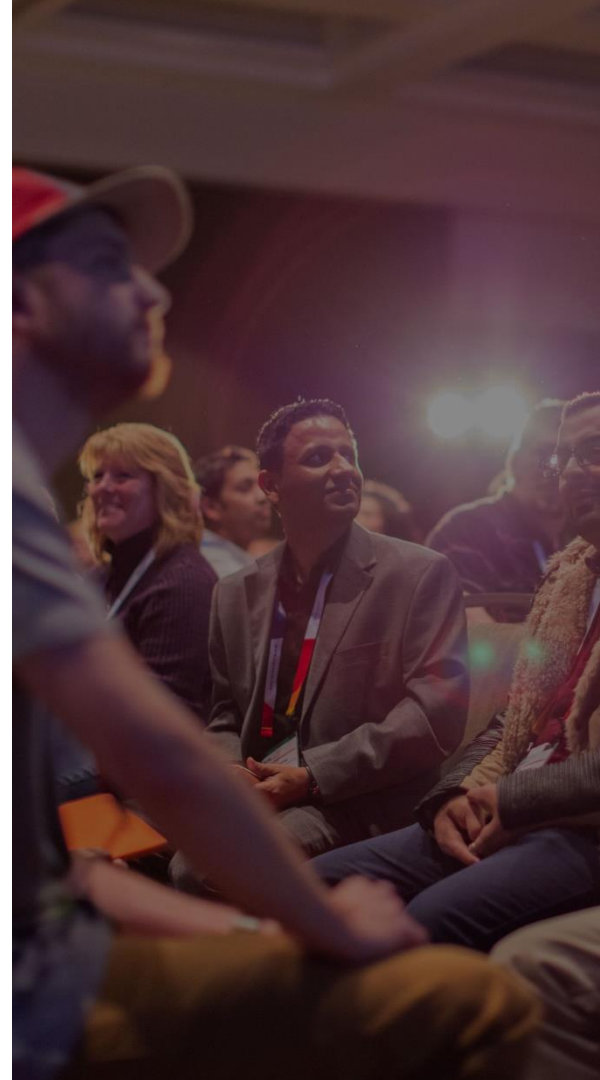
Oauth 2.0 in .NET Core

```
services.AddAuthentication().AddGoogle(googleOptions =>
{
    googleOptions.ClientId = Configuration["Authentication:Google:ClientId"];
    googleOptions.ClientSecret =
Configuration["Authentication:Google:ClientSecret"];
});
```

```
services.AddAuthentication().AddTwitter(twitterOptions =>
{
    twitterOptions.ConsumerKey =
Configuration["Authentication:Twitter:ConsumerKey"];
    twitterOptions.ConsumerSecret =
Configuration["Authentication:Twitter:ConsumerSecret"];
});
```

Versioning

What's what.



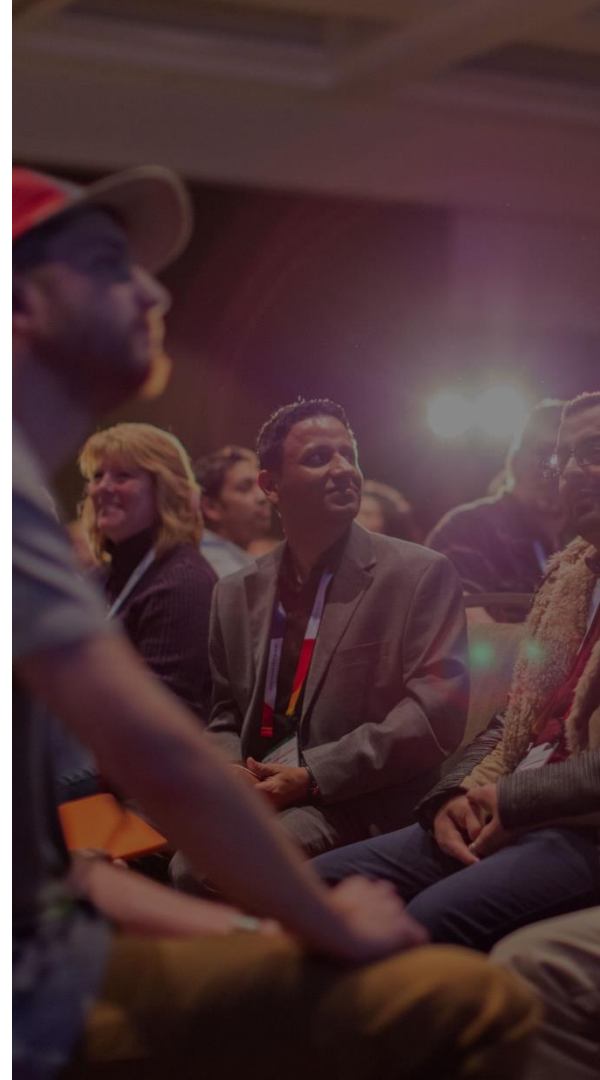
Versioning Guidance

Don't break me. Don't break me. Don't break me.

- Used to be options for: header, path, and querystring
- Header is no longer in fashion
- Major.Minor
 - Increment minor when there is a breaking change (i.e. all prior clients may not work)
 - Increment major when change implies prior support will be deprecated
- Examples:
 - <https://my.api.com/v1.0/widgets>
 - https://my.api.com/widgets?api_version=1.0
- Group version: collection of endpoints, date-based: YYYY-MM-DD

Demo

To Do: Update Version



Large Data

"Big. Big data. Lots of it."



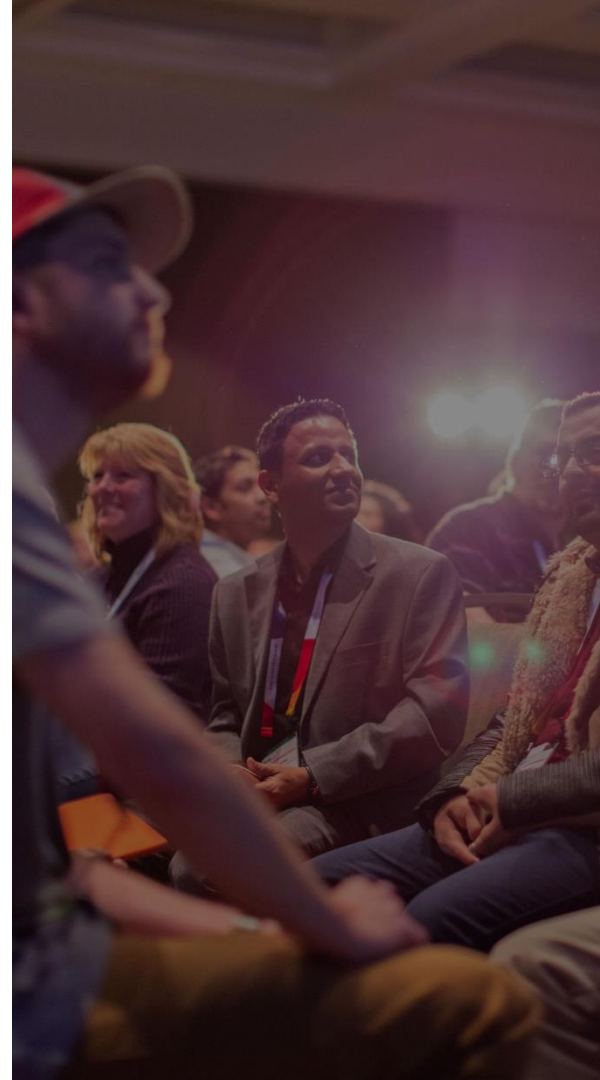
Big Data

Turning a new page in your API.

- Large data sets? Page it.
- Minimum: URI for the next page.
- Optimal:
 - Set page size (pre-determined range)
 - Choose page (return total pages, next page URI, previous page URI)
 - Skip and take
- OData is a great example for this

SDK

The “Easy Button” for
Consumption



Make Life Easy

SDKs ensure rapid development and consumption.

- Easy interface to security
- Configuration end points, test mode
- Plug and play example
- Tools like Swagger make this easier (next module)

Demo

SDK for Todo



Advanced API Design

Quick Recap

- Optimistic concurrency with ETags
- Security with JWT and OAuth tokens
- Explicit versioning
- Paging strategy
- SDKs



Thank You

Learn more from Jeremy Likness



@JeremyLikness



Jeremy.Likness@microsoft.com