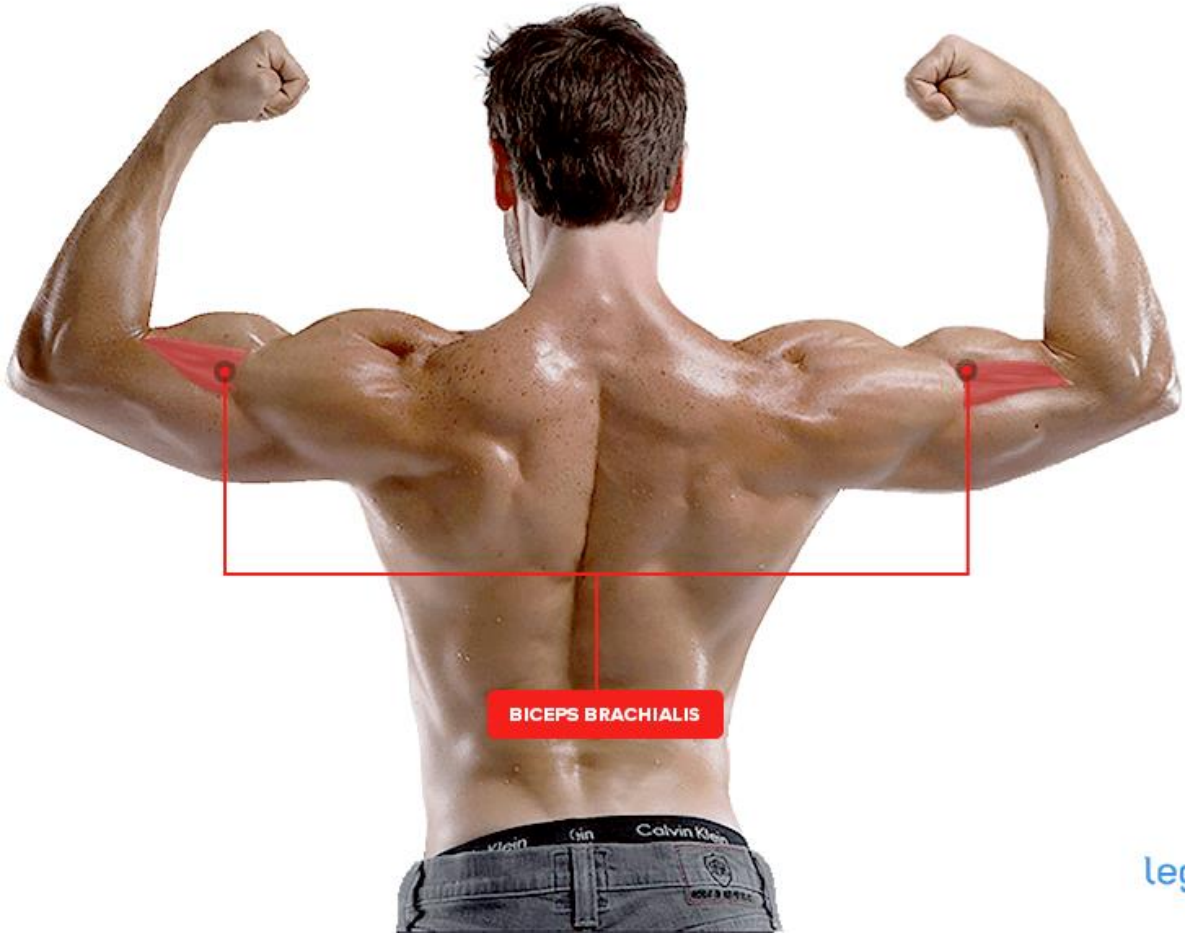
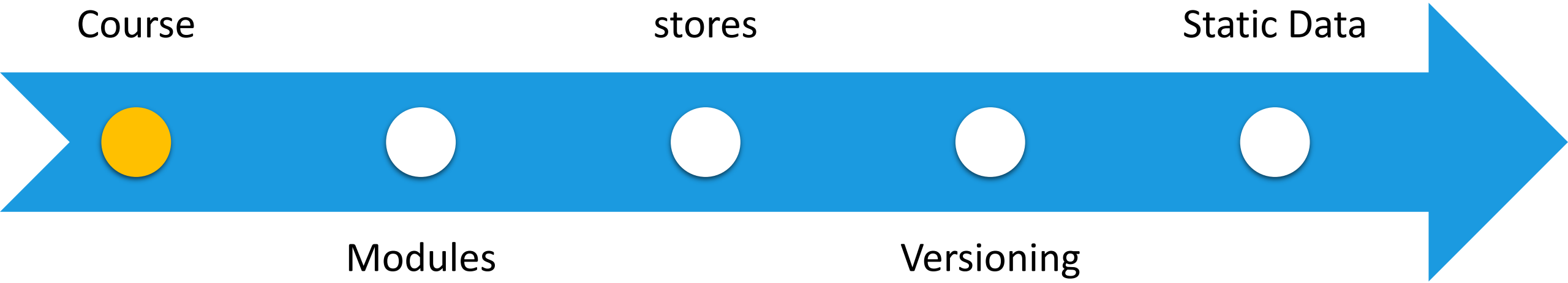
MC2MC

Designing and managing Bicep templates at scale and automatically



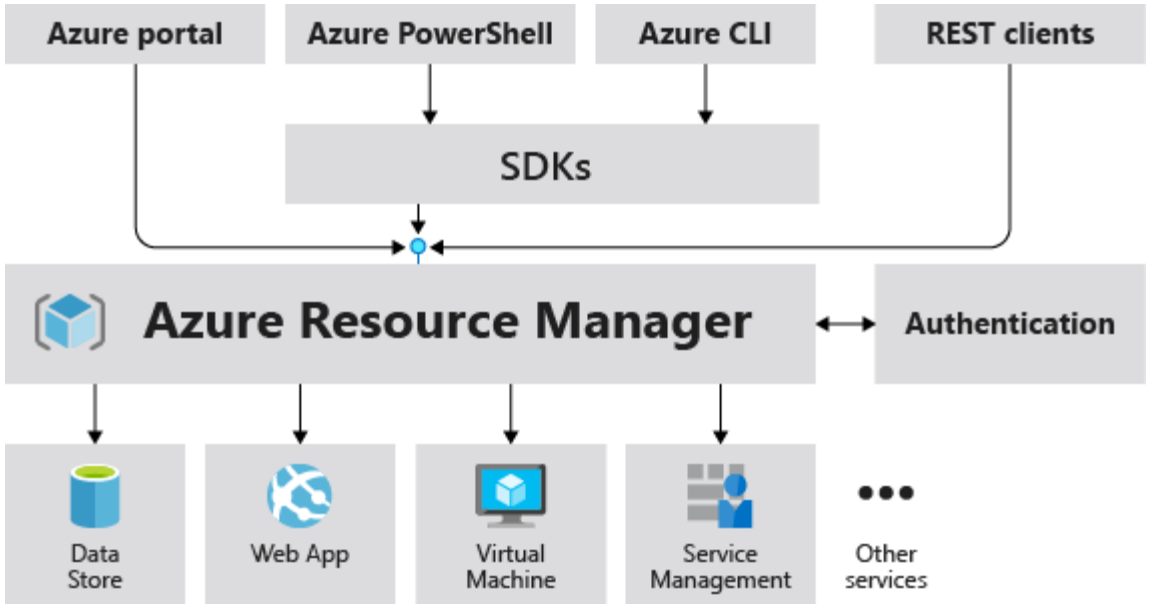
Cédric Braekevelt

- Azure & DevOps Engineer @ Lebon.It
- Blog @ Hybridbrothers
- Focus on
  - Entra ID
  - Azure Governance / LZ
  - IaC
  - Scripting
  - Hybrid


Bicep Crash Course
Modules & Customer Repository
Module stores
Versioning & Deployment
Static Data

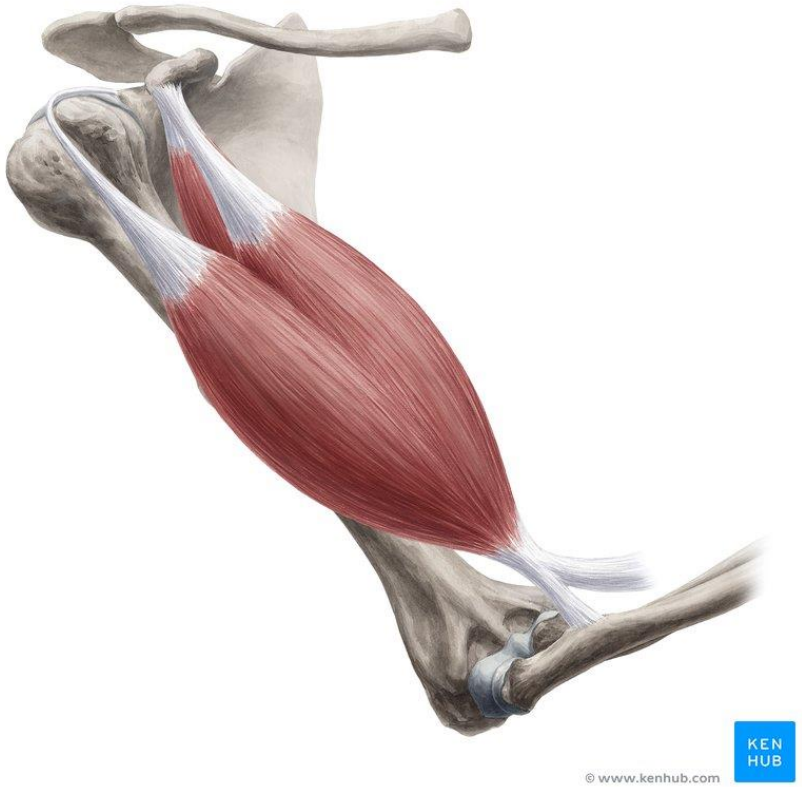
Azure Resource Manager

- JSON based
- ASM ➔ ARM
- ARM templates
- Hard to write!
  - Copy index
- Error prone



Properties

- Infrastructure as Code
- 2020 @ Micro$oft
- Declarative
- Descriptive
- Idempotent
- Compiles into ARM templates



Resources

- Resource providers
- Resource type
- API Version
- Child resources
- Extension resources

```
resource resourceItem 'Microsoft.Network/networkWatchers@2023-05-01' = {
  name: resourceName
  location: resourceObject.general.location
  tags: resourceObject.general.?tags
}
```

```
resource resourceItem 'Microsoft.Compute/virtualMachines/extensions@2023-09-01' = {
  name: resourceObject.?name ?? resourceObject.type
  parent: virtualMachineItem
  location: location
  properties: properties
}
```

```
resource resourceList 'Microsoft.Authorization/locks@2020-05-01' = {
  name: resourceObject.?name ?? resourceObject.level
  scope: subscription()
  properties: {
    level: resourceObject.level
    notes: resourceObject.?notes!
    owners: resourceObject.?owners!
  }
}
```

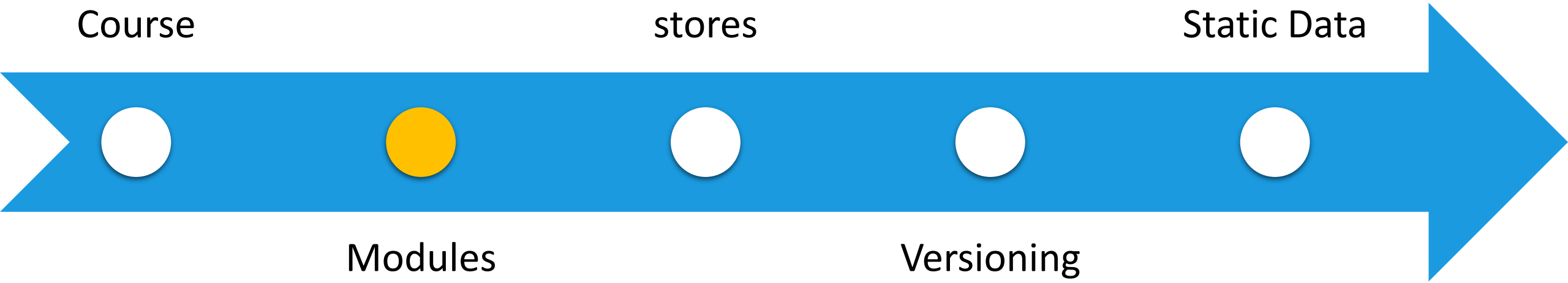
Targetscope & Modules

- Scope where file will be deployed
- 4 levels
- Module <> Scope

```bicep
module resourceItem 'network-watcher.bicep' = {
  name: 'network-watcher'
  scope: resourceGroup('rg-network-dev-westeurope')
  params: {
    resourceName: resourceName
    resourceObject: resourceObject
  }
}
```

UDF & U

- User Define
- Used Define

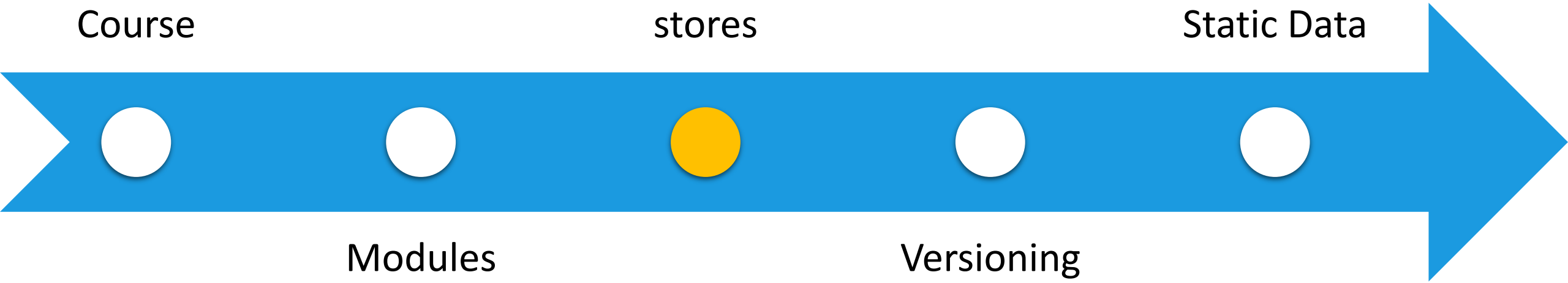

Bicep Crash Course
Modules & Customer Repository
Module stores
Versioning & Deployment
Static Data

Module Library

- Mono repo
- Folder per Module
- Let’s take a look!

Customer repository

- Platform
- Solutions


Bicep Crash Course
Modules & Customer Repository
Module stores
Versioning & Deployment
Static Data

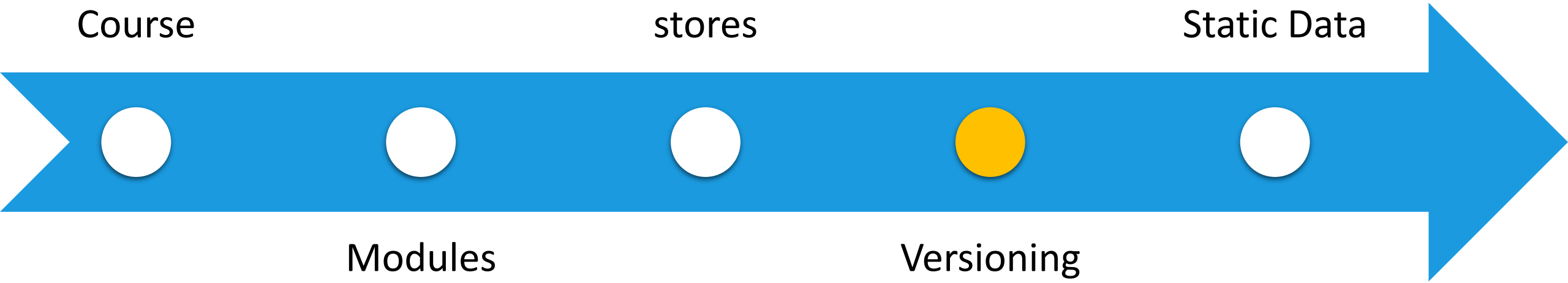
Module Stores

Container Registry

- Multi-tenant
- Resource for all modules
  - RBAC for all modules
- Embeds module content
  - (too) Big ARM templates

Template Spec

- Single-tenant
- Resource per module
  - RBAC per module
- References module content
  - Small ARM templates


Bicep Crash Course
Modules & Customer Repository
Module stores
Versioning & Deployment
Static Data

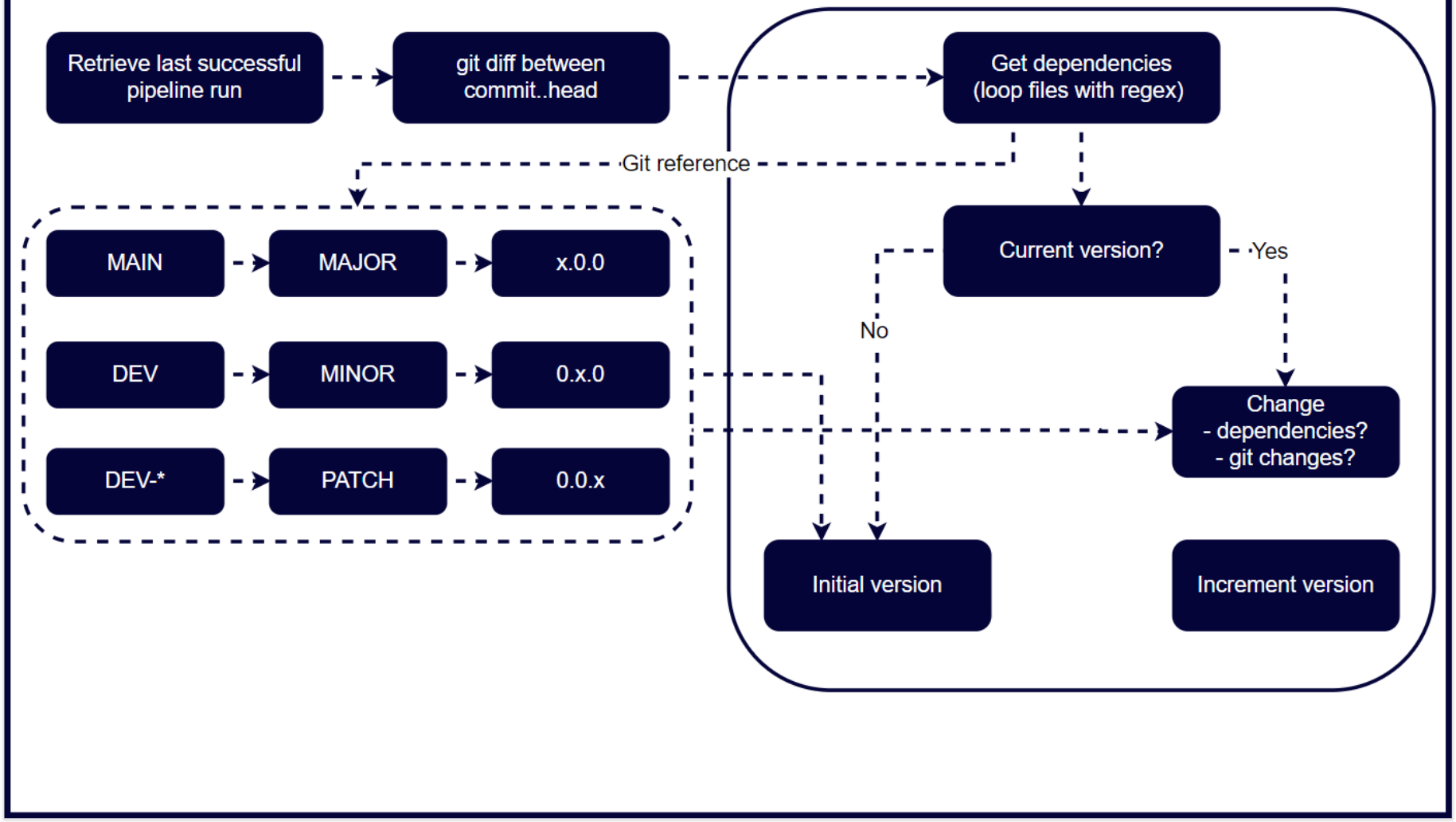
Objective

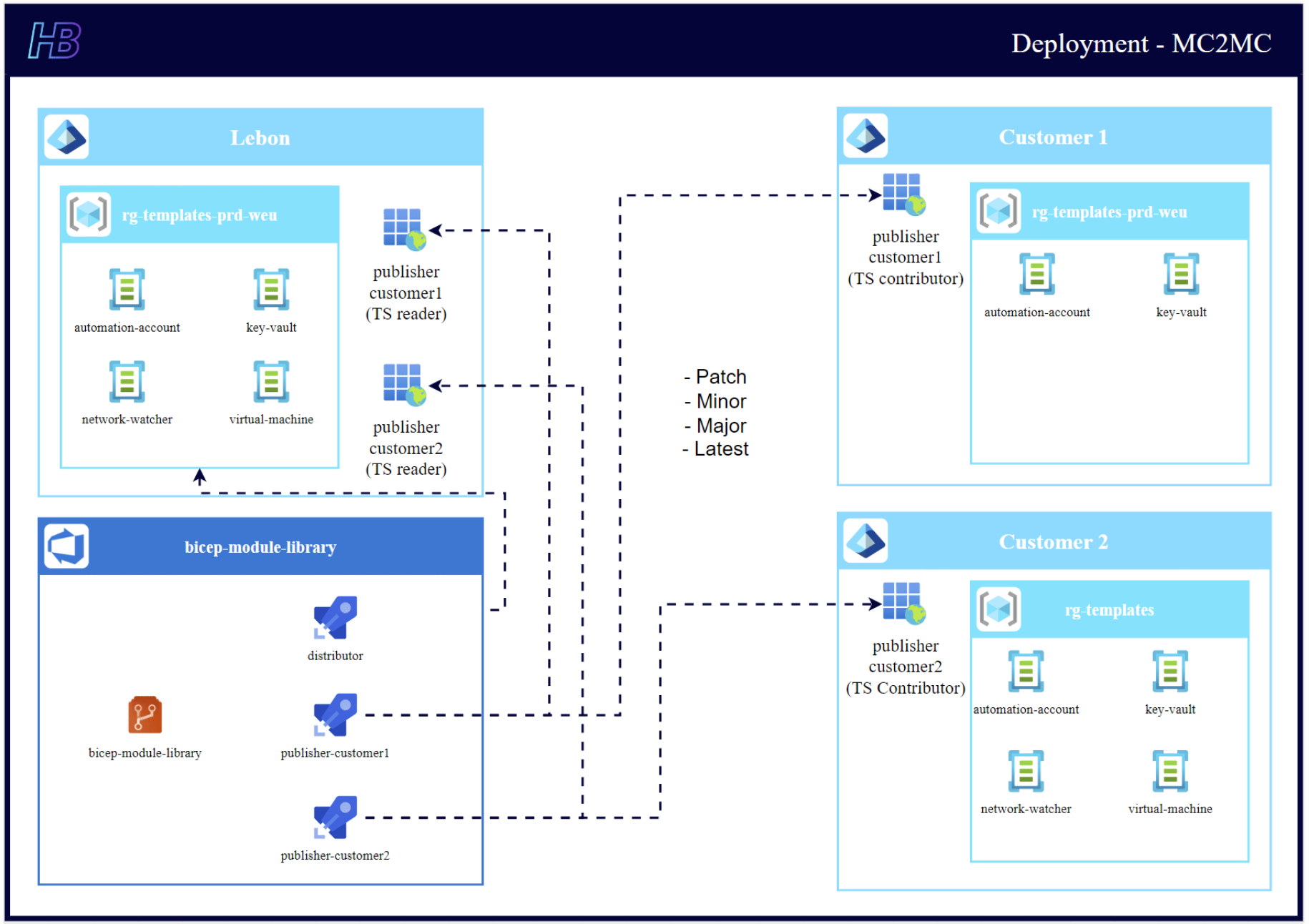
1. Version modules automatically
2. Manage dependencies
3. Deploy module automatically
4. Pipeline should be able to handle failures

Manage dependencies

- Upload in the correct order taking care of dependency errors
- Update parent modules when child updates

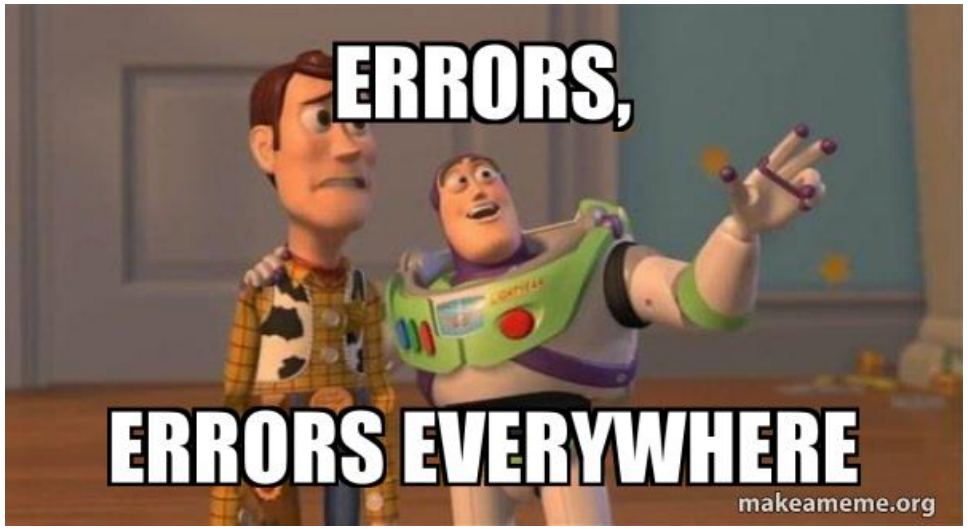
Versioning - MC2MC

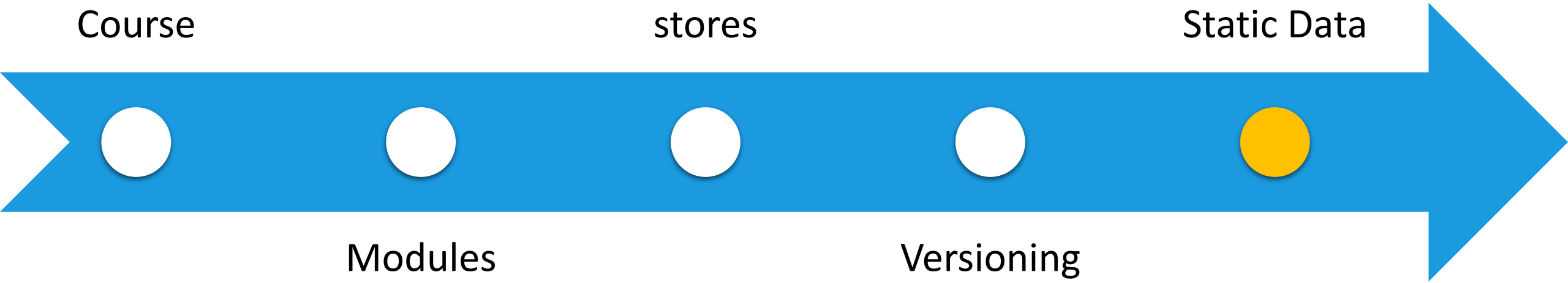



Deployment - MC2MC
Lebon
rg-templates-prd-weu
automation-account
key-vault
network-watcher
virtual-machine
publisher customer1 (TS reader)
publisher customer2 (TS reader)
bicep-module-library
distributor
bicep-module-library
publisher-customer1
publisher-customer2
- Patch
- Minor
- Major
- Latest
Customer 1
publisher customer1 (TS contributor)
rg-templates-prd-weu
automation-account
key-vault
Customer 2
publisher customer2 (TS Contributor)
rg-templates
automation-account
key-vault
network-watcher
virtual-machine

Pipeline failures

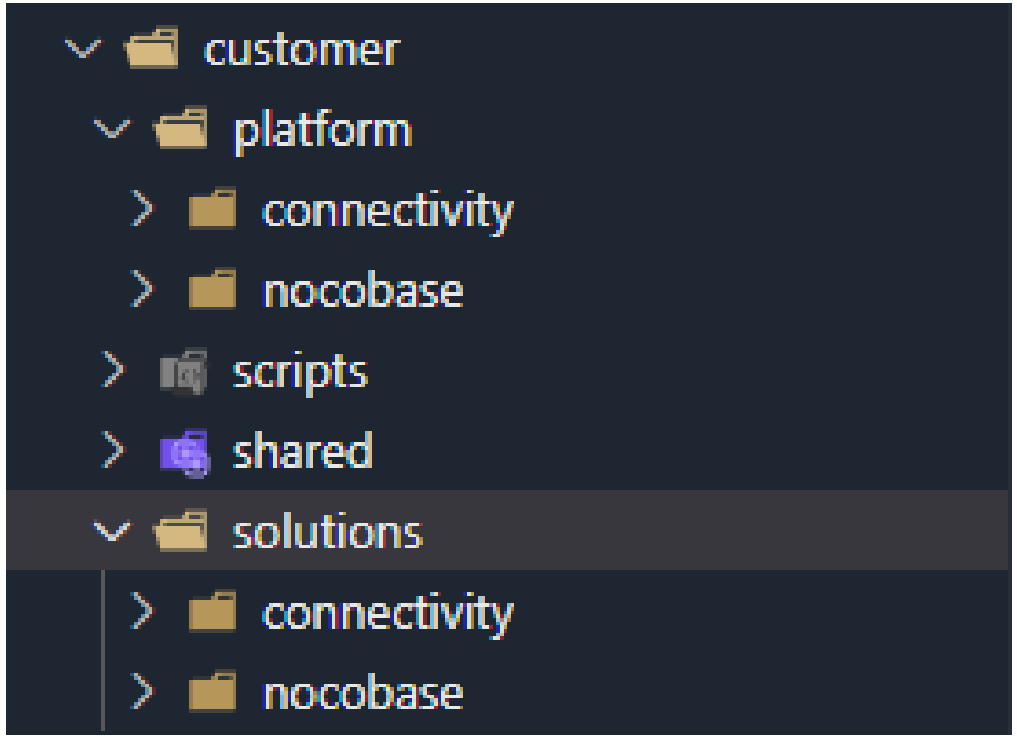
- Check last succeeded pipeline run
  - git diff --name-only $commitId^..HEAD^
- Check if a Bicep Build was a success:
  - $output = bicep build ("{moduleName}/main.bicep") --stdout 2>&1




Bicep Crash Course
Modules & Customer Repository
Module stores
Versioning & Deployment
Static Data

Challenges

- How do we couple these?
  - ~~Export resource ids~~
  - ~~All resources in one file~~
  - ~~Define as existing~~



Requirements

- Solution that indexes resources
- Entra & Azure
- Fast!
- Easy to maintain
- Expandable

Solution

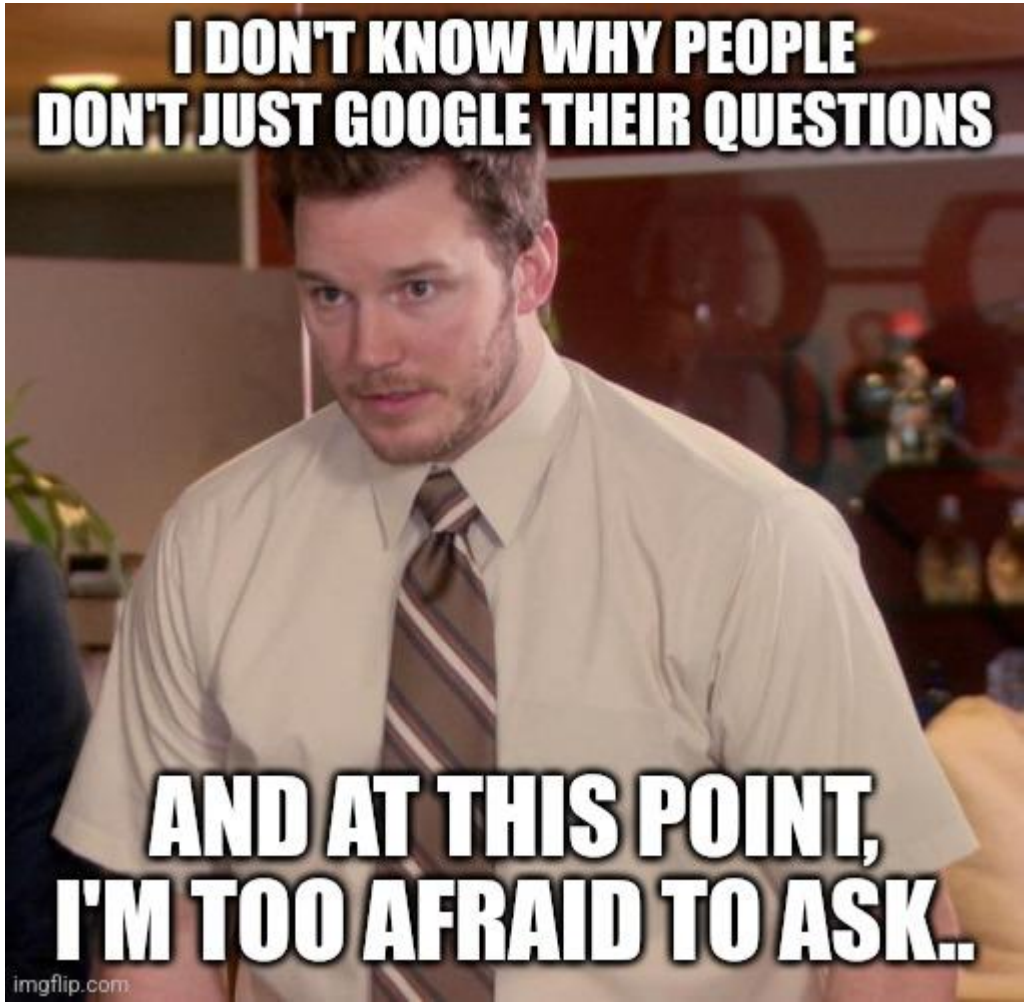
- A Powershell script
- Consumes access token and indexes resources
- Save all data to a JSON file
- Load JSON file in Bicep
- Azure Function

Thanks!

savaco

MC²

Questions?


I DON'T KNOW WHY PEOPLE
DON'T JUST GOOGLE THEIR QUESTIONS
AND AT THIS POINT,
I'M TOO AFRAID TO ASK..
imgflip.com