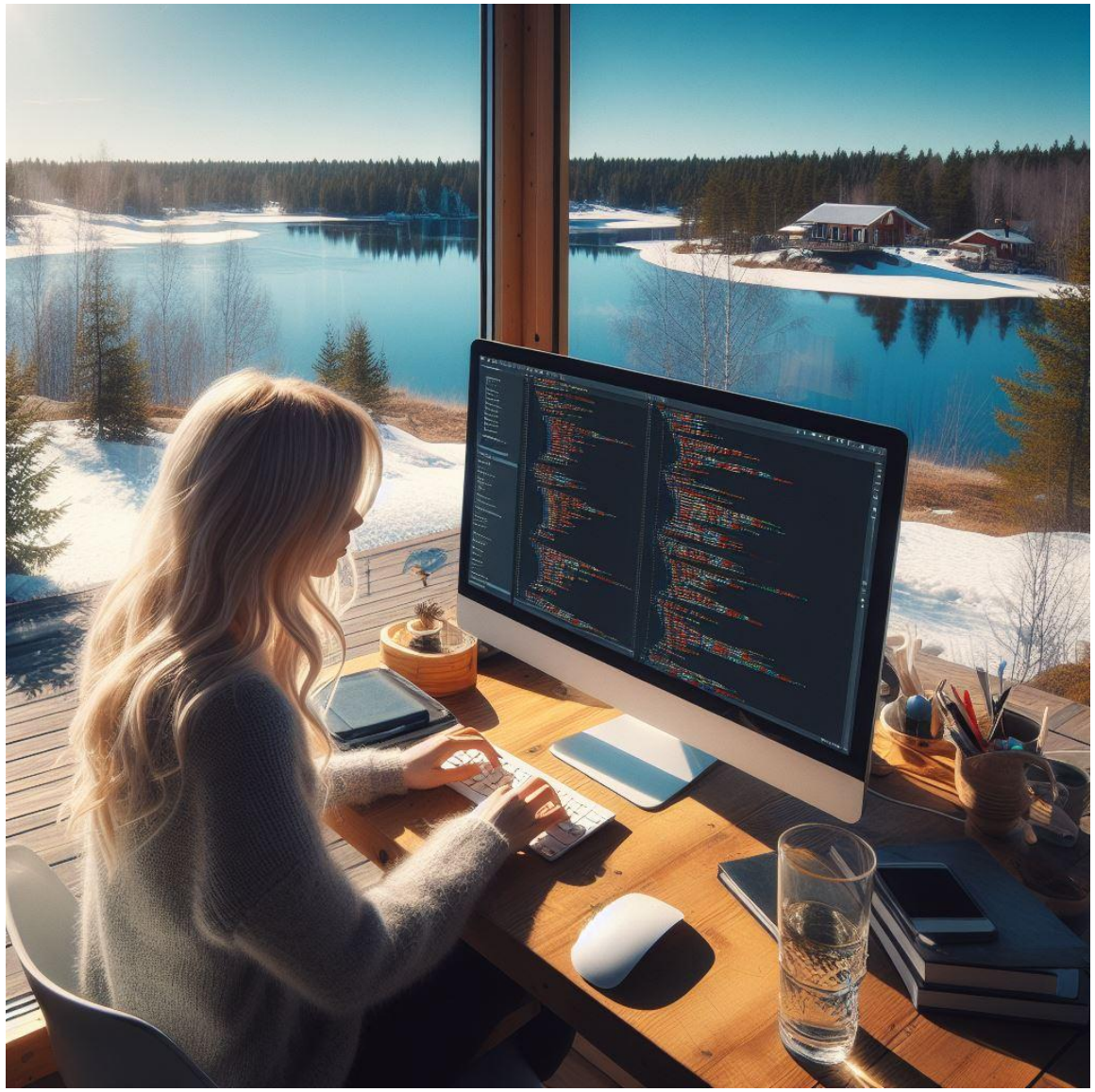
Azure IaC Training



Agenda

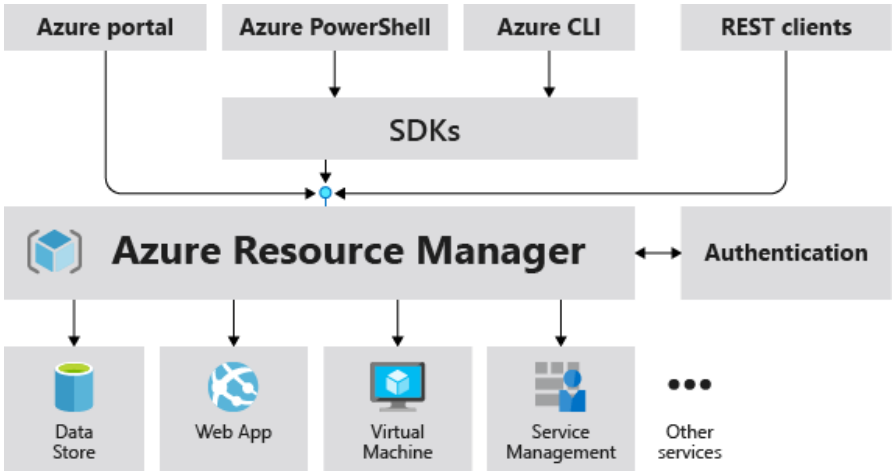
- Azure Resource Manager (ARM)
- Connecting to Azure
- ARM Templates
- Bicep
- Terraform

Learning objectives

- Understand Azure Resource Manager
- Capability to read ARM-template
- Use and modify bicep-template
- Understand Terraform
- Optional: Create and use terraform-template

Azure Resource Manager

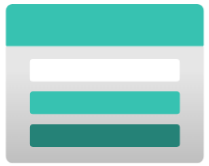
- Engine behind everything
- Handles requests and converts everything to ARM-template
- Checks permissions



Azure Deployment types

Subscription deployment

Resource group deployment



ARM Template

```
{
    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
    "contentVersion": "1.0.0.0",
    "parameters": {},
    "functions": [],
    "variables": {},
    "resources": [],
    "outputs": {}
}
```

Bicep Template

```
param <name> <type> = <default value>
var <name> = <value>
resource <name> <type>@<API-version> = {
    name: <resource name>
    ...
}
output <name> <type> = <value>
```

Login

```
Connect-AzAccount -Tenant mytenant.onmicrosoft.com
```

```
az login --tenant mytenant.onmicrosoft.com
```

Subscription context

```
Get-AzContext

Set-AzContext -Subscription <GUID>
```

```
az account show

az account set --subscription <GUID>
```

Subscription deployment

```
New-AzDeployment -Location swedencentral -TemplateFile
.\subDeployment.bicep -TemplateParameterFile
.\subDeployment.bicepparam
```

```
az deployment sub create --location swedencentral --
template-file subDeployment.bicep --parameters
subDeployment.bicepparam
```

```
az deployment sub create --location swedencentral --
template-file subDeployment.bicep --parameters
'@subDeployment.parameters.json'
```

Resource group deployment

```
New-AzResourceGroupDeployment -ResourceGroupName rg-example1-bicep -TemplateFile .\storageDeployment.bicep -TemplateParameterFile .\storageDeployment.bicepparam
```

```
az deployment group create --resource-group rg-example1-bicep --template-file .\storageDeployment.bicep --parameters .\storageDeployment.bicepparam
```

```
az deployment group create --resource-group rg-example1-bicep --template-file .\storageDeployment.bicep --parameters '@storageDeployment.parameters.json'
```

Deployment modes

Complete

Incremental

Bicep thoughts

- What-if is useless... 🗑️
- Scripting capabilities are.... 🤭
- Great resource support (straight from ARM)
- Supports newest technologies immediately
- Reduces a lot of code
- Easy to learn and use 💖

Terraform fundamentals

- Adds another abstraction layer to Azure
- Handles the whole environment like **Complete**-mode in ARM/bicep
- Deployment scope are .tf-files that you have in the working directory

Terraform fundamentals

- Multi-cloud support means that you have to understand each cloud separately and use only the same syntax on .tf-files
- Stores deployment state to state-file that **MUST** be secured
- Loose resource API version management

Terraform Template

```
variable <name> {
  type        = <type>
  default       = <default value>
}

resource <resource provider type> <name> {
  name          = <resource name>
  ...
}

output <name> {
  value         = <value content>
}
```

Terraform run

```
terraform init
```

```
terraform plan -var-file="myVariables.tfvars"
```

```
terraform apply -var-file="myVariables.tfvars"
```

Terraform thoughts

- Great validation support
- Scripting capabilities 👍
- Terraform plan 💖
- Breaks Azure's concept of resource versions
- State file makes an *extra layer* for status of environment and might include sensitive data in plain text
- New capabilities are not supported immediately
- Multi-cloud is not a real reason

IaC template schemas

- Azure resource reference - Bicep, ARM template & Terraform AzAPI reference | Microsoft Learn