

# Building a container platform on Azure at ING

IT DevOps Platforms

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# Overview

- Introduction
- Design
- Architecture
- CI/CD
- Observability
- Lessons Learned / Future Work

# Introduction

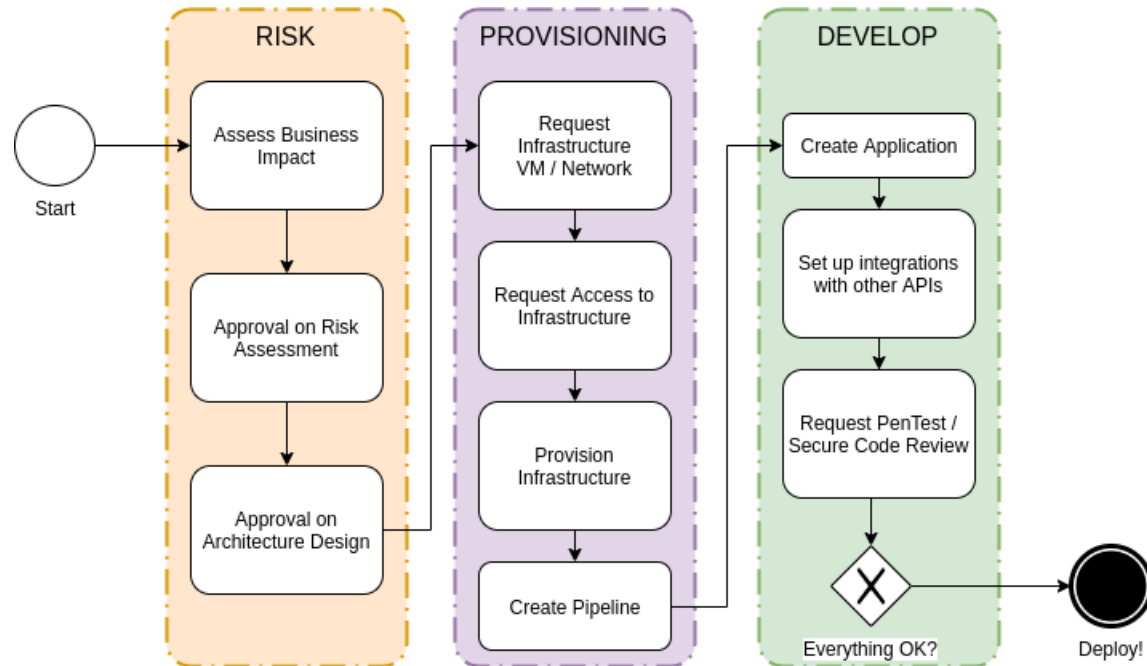
# Introduction

- How long does it take you to get a new application to production?
  - Hours?
  - Days?
  - Months?
  - Years?



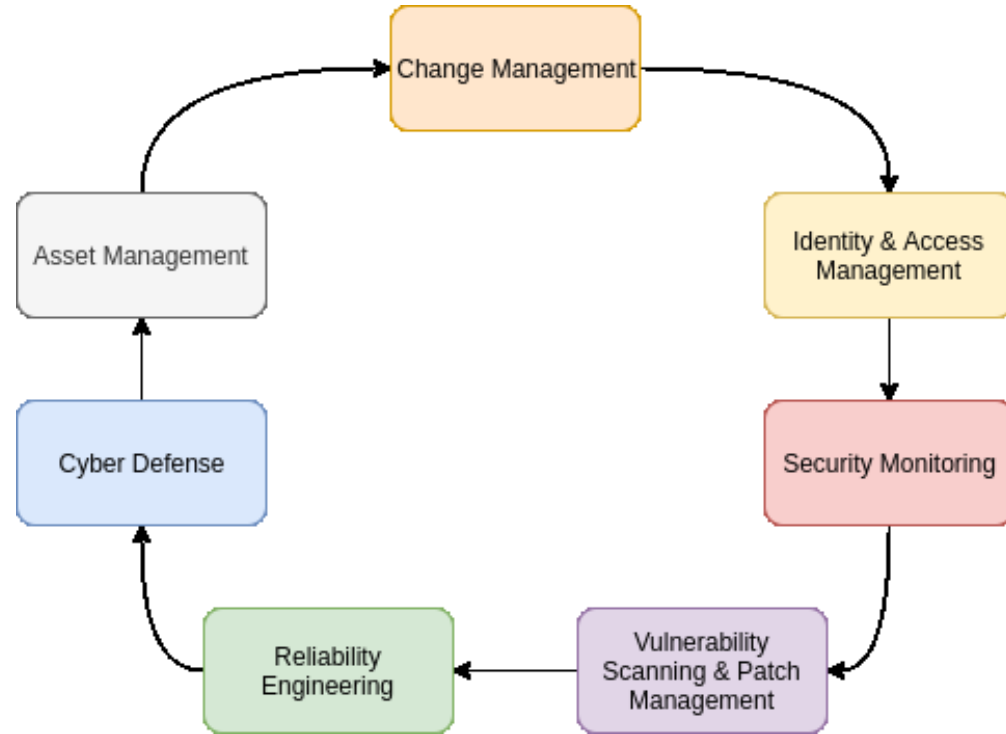
# Introduction

- Going to production at ING



# Introduction

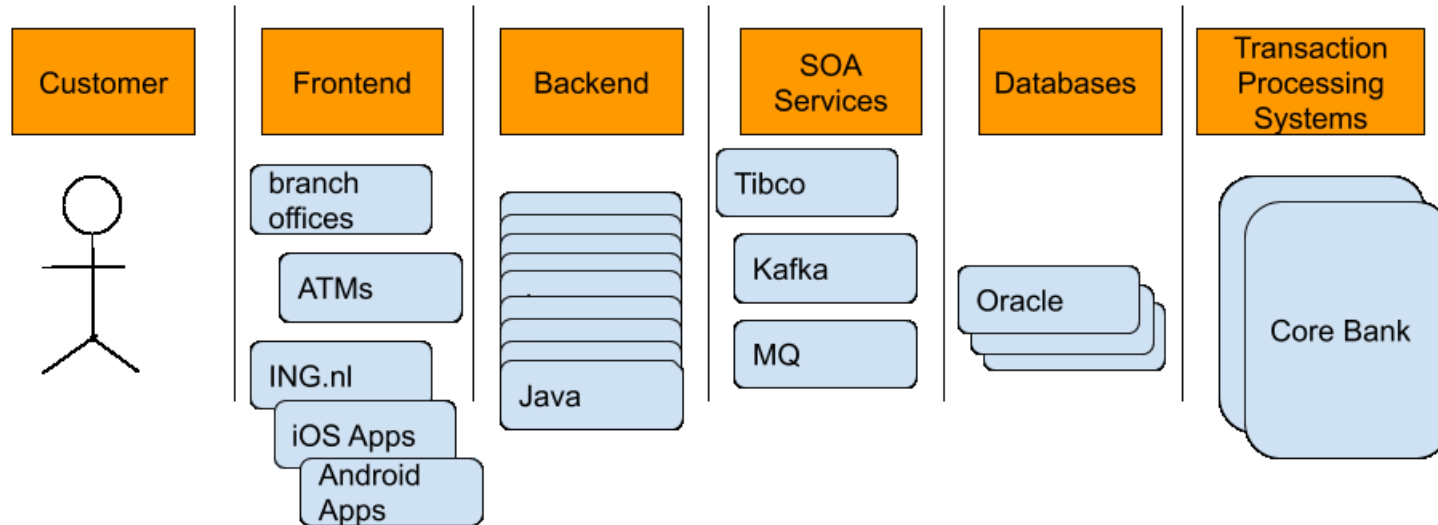
- Day2 operations



# Where to start?

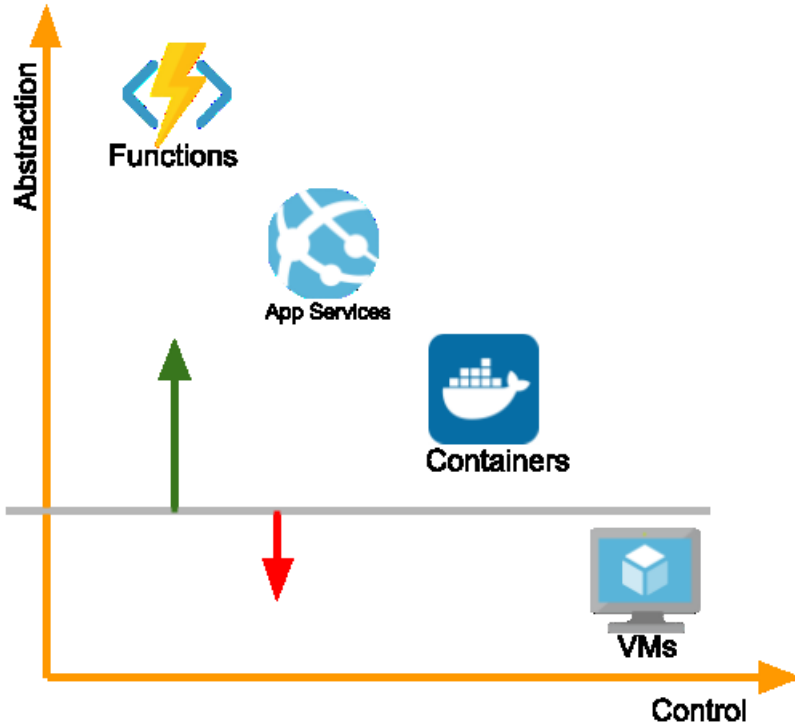
# ING Landscape

+300 DevOps teams working on 1000's of services ...



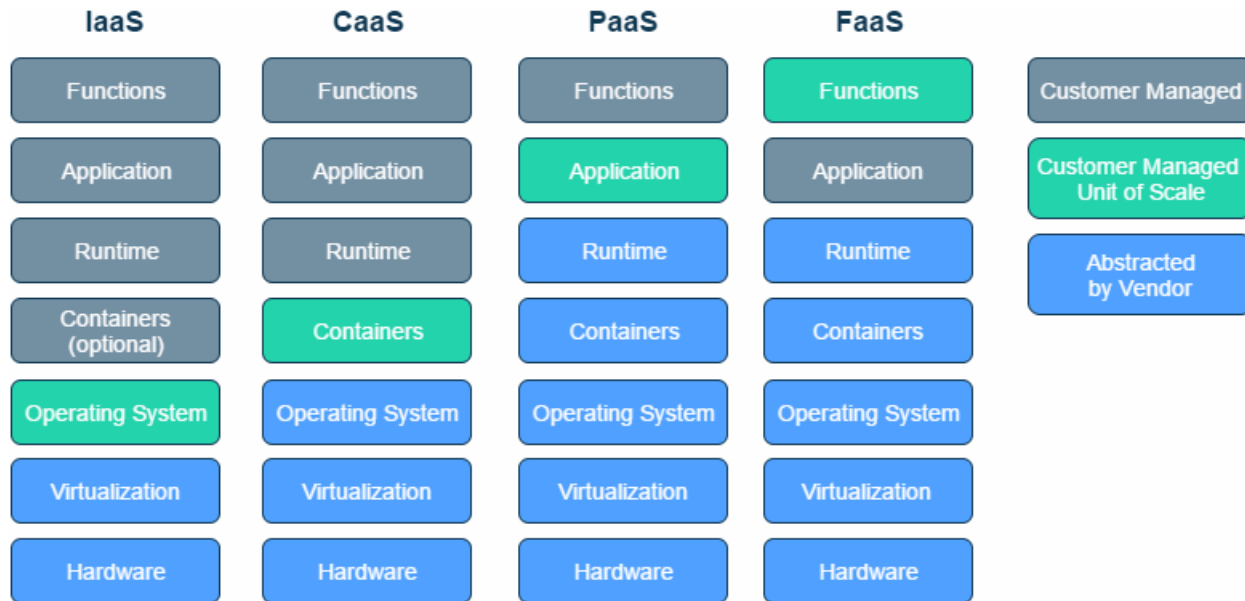


# Deciding on an initial target platform



- Finding the right balance between abstraction and control

# Tradeoffs

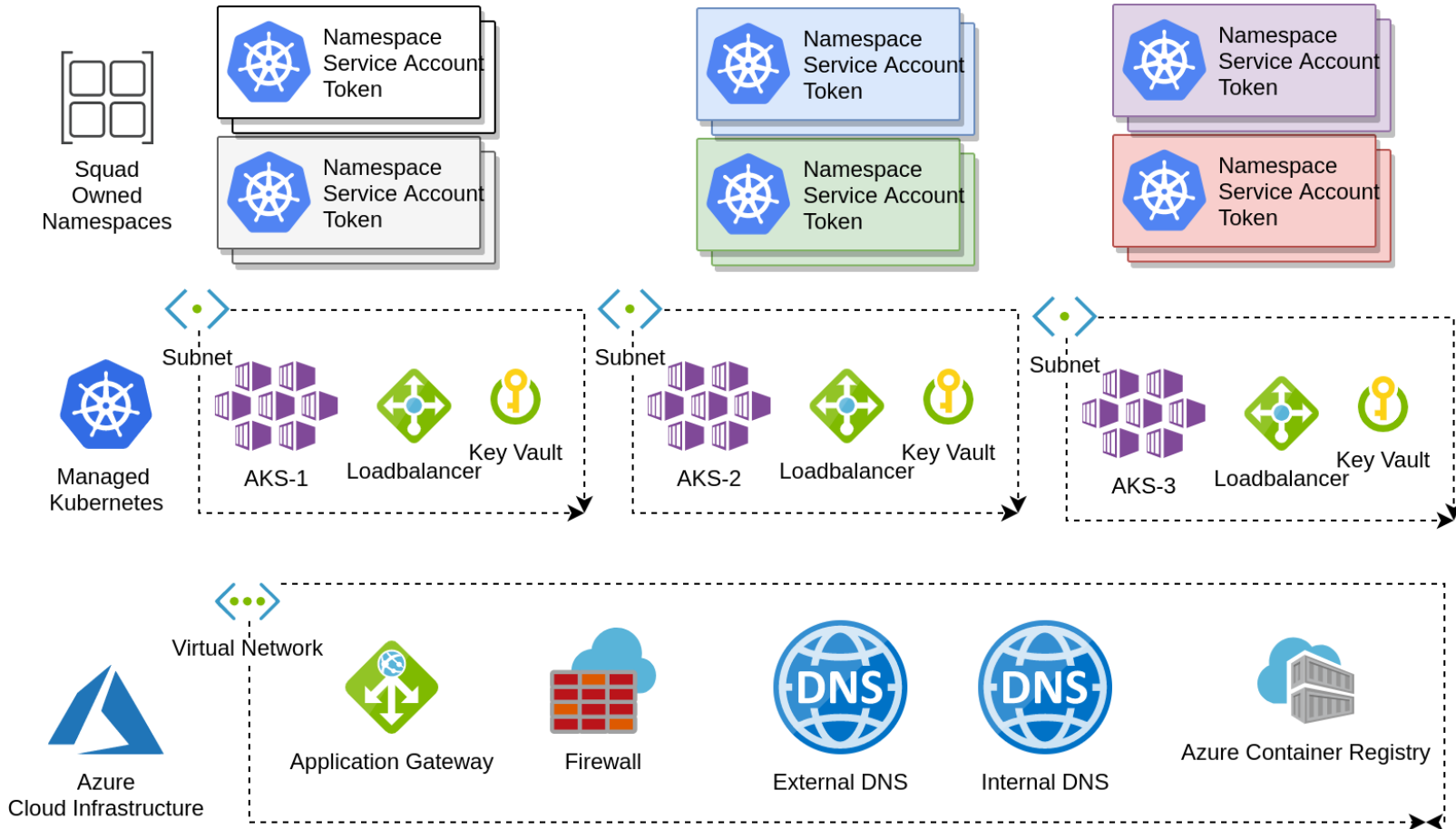


- Migration path
- Easy of use
- Compliance
- Security
- Observability

<https://serverless.zone/abstracting-the-back-end-with-faas-e5e80e837362>

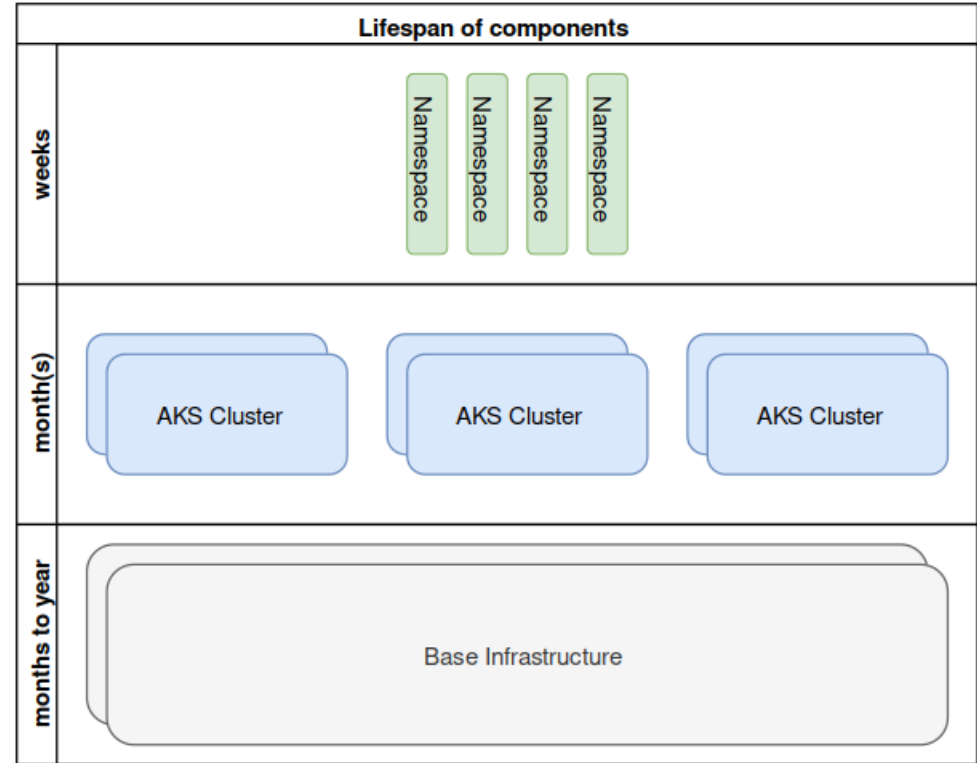
# Architecture

# Architecture



# Composable Architecture

- Lifecycle management of systems
- Separation of failure domains
- Separation of concerns
- Separation of business processes



# How to achieve composability?

- Infrastructure as Code
- ARM vs Terraform

```
resource "azurerm_network_interface" "basicvm" {
  name          = "${local.networkInterfaceName}"
  location      = "${var.resource_group_location}"
  resource_group_name = "${azurerm_resource_group.basicvm.name}"

  ip_configuration {
    name          = "ipconfig1"
    subnet_id     = "${azurerm_subnet.basicvm.id}"
    private_ip_address_allocation = "dynamic"
    public_ip_address_id = "${azurerm_public_ip.basicvm.id}"
  }
}
```

Terraform

```
{
  "name": "[variables('networkInterfaceName')]",
  "type": "Microsoft.Network/networkInterfaces",
  "apiVersion": "2016-09-01",
  "location": "[parameters('location')]",
  "dependsOn": [
    "[concat('Microsoft.Network/virtualNetworks/', variables('virtualNetworkName'))]",
    "[concat('Microsoft.Network/publicIpAddresses/', variables('publicIpAddressName'))]",
    "[concat('Microsoft.Network/networkSecurityGroups/', variables('networkSecurityGroupName'))]"
  ],
  "properties": {
    "ipConfigurations": [
      {
        "name": "ipconfig1",
        "properties": {
          "subnet": {
            "id": "[variables('subnetRef')]"
          },
          "privateIPAllocationMethod": "Dynamic",
          "publicIpAddress": {
            "id": "[resourceId(resourceGroup().name, 'Microsoft.Network/publicIpAddresses', variables('pu
          })
        }
      }
    ],
    "networkSecurityGroup": {
      "id": "[resourceId(resourceGroup().name, 'Microsoft.Network/networkSecurityGroups', variables('net
    }
  }
}
```

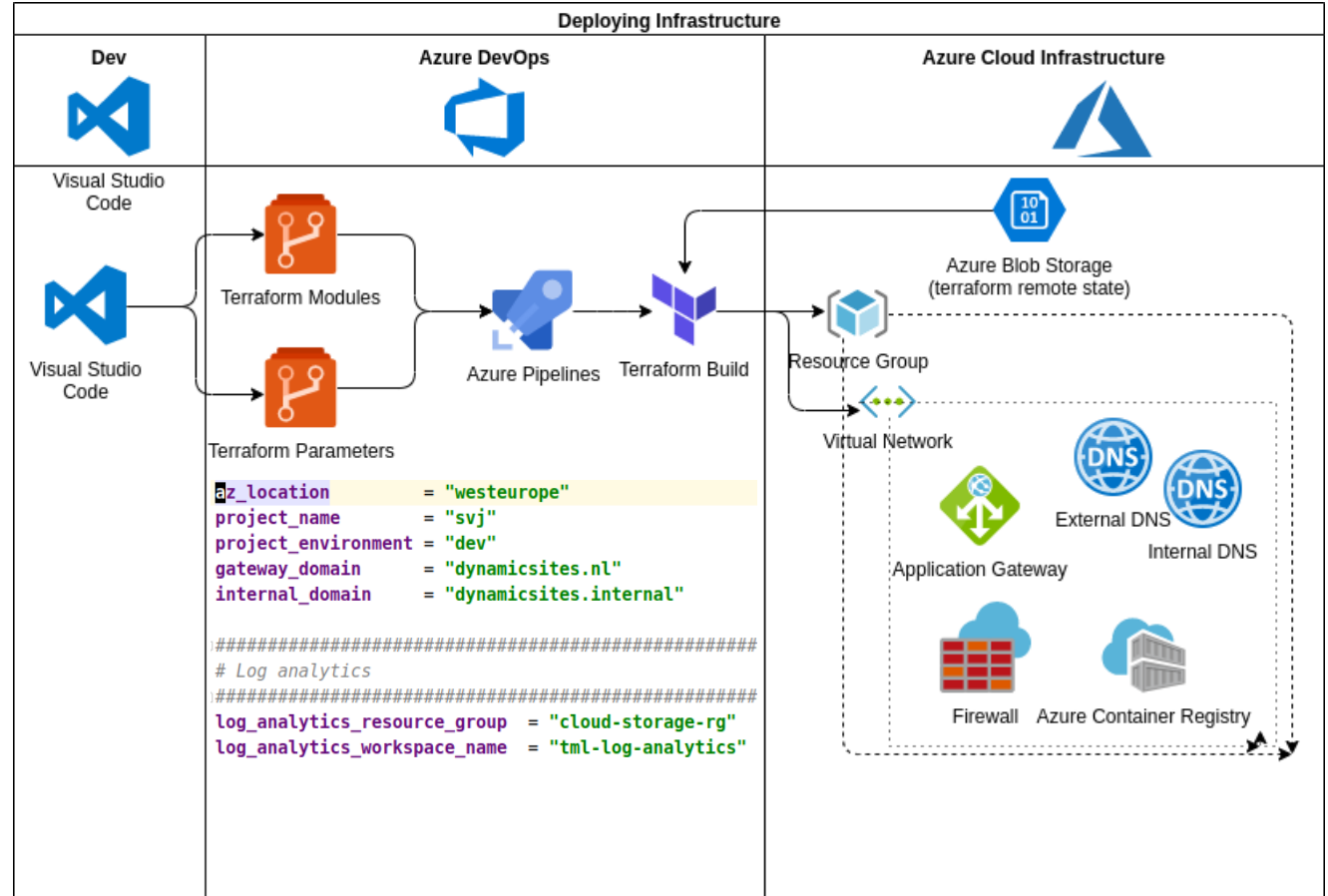
ARM

# CI/CD || Pipeline

# Pipeline for infrastructure

Minimum set of parameters

- Region
- Domain
- Project name
- Project environment
- Network size

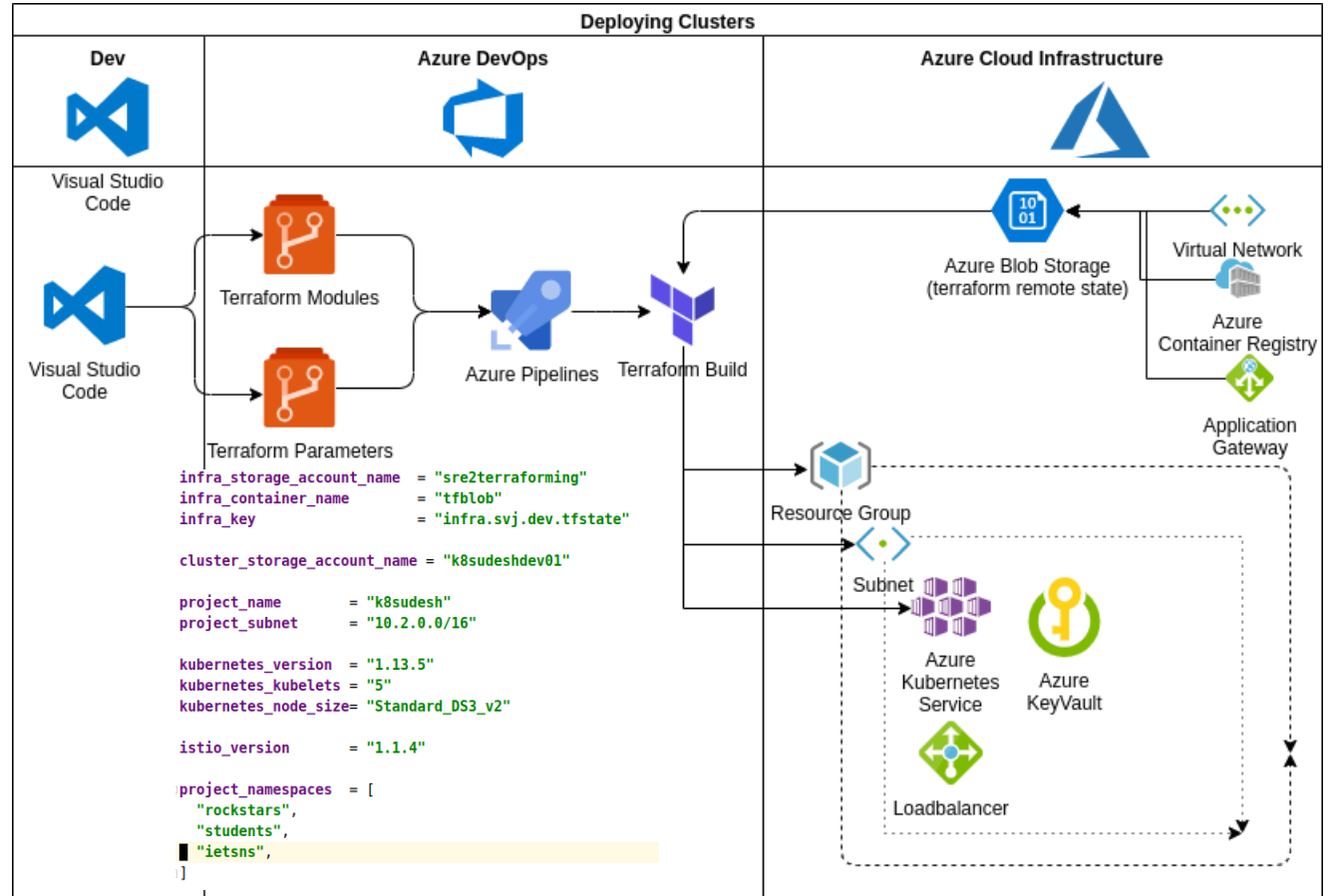




# Pipeline for clusters

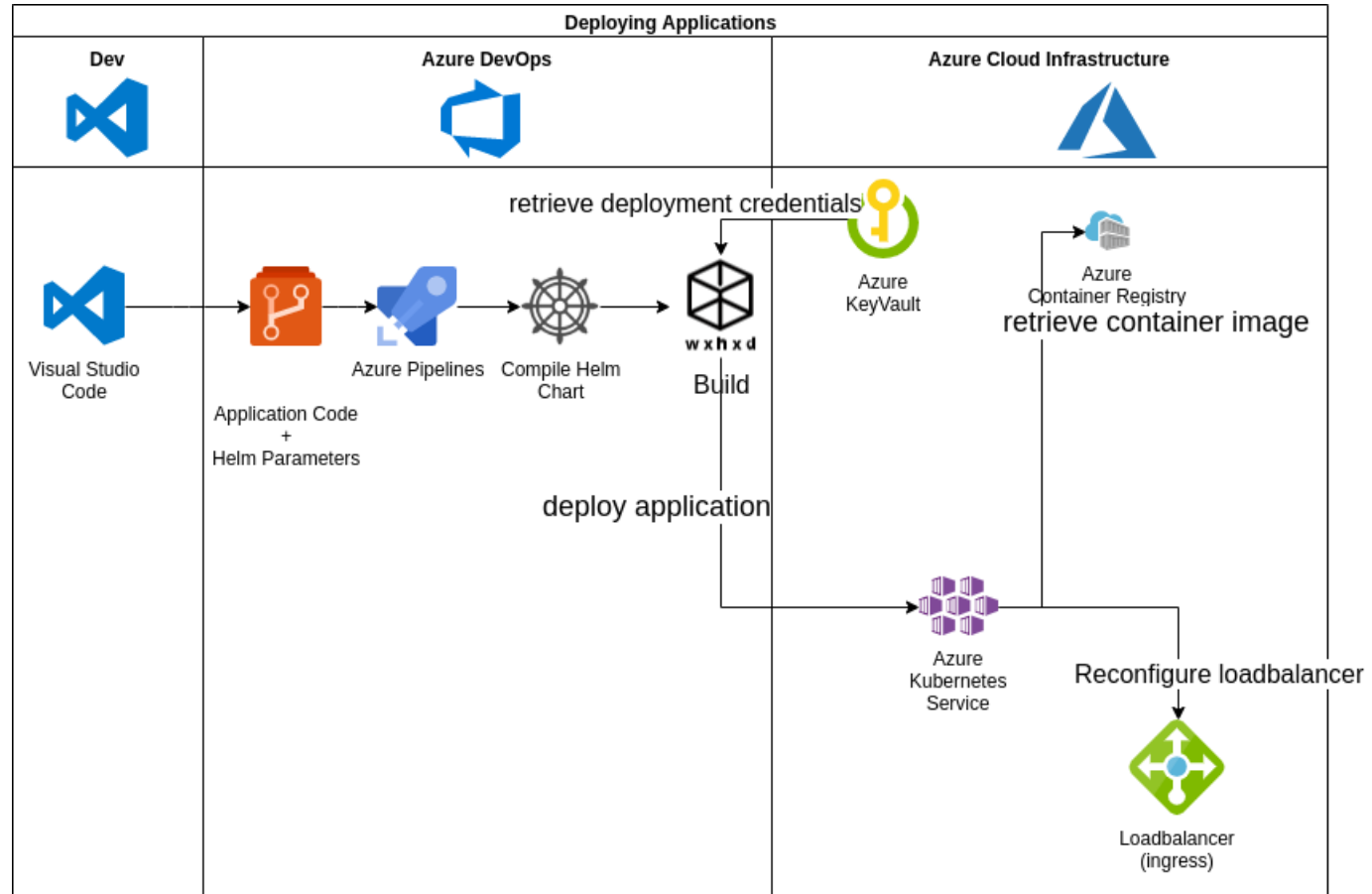
Minimum set of parameters

- Terraform state
- Project name
- Project environment
- Networking info
- Kubernetes version
- Istio version
- # Nodes
- Namespaces



# Pipeline for application developers

- Build application
- Compile chart
- Retrieve credentials
- Deploy!



# Minimum set of parameters

```
--- deployment, service
```

```
image:  
  repository: acrinfrasvjdev.azurecr.io/tml-istio  
  repositoryProject: hellosudesh  
  tag: latest
```

```
replicaCount: 2
```

```
resources:
```

```
  requests:
```

```
    memory: 256Mi
```

```
  limits:
```

```
    memory: 512Mi
```

```
service:
```

```
  name: helloing
```

```
  version: v0.1
```

```
  namespace: rockstars
```

```
  externalport: 80
```

```
  containerPort: 8080
```

```
  prometheusPort: 9090
```

```
--- virtualservice
```

```
virtualService:
```

```
  ingressName: ing-gateway.istio-system
```

```
  hostName: k8sudesh.dynamicsites.nl
```

```
  endpoints:
```

```
    - uri: hellosudesh
```

```
      destinationService: hellosudesh-service
```

```
      destinationNamespace: rockstars
```

```
      destinationPort: 8080
```

# Observability

# Lessons Learned

# Future work