AUTOMATE YOUR AZURE INFRASTRUCTURE WITH BICEP AND AZURE DEVOPS

Toon Vanhoutte

Who am I ?

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CTO @ NOEST

Founder @ YOUR AZURE COACH

MVP Microsoft® Most Valuable Professional

NOEST YOUR AZURE COACH

Infrastructure as Code in Azure

	Technology	Supplier
☐	ARM Templates	Microsoft
☐	Bicep	Microsoft
☐	Terraform	HashiCorp
☐	Pulumi	Pulumi
☐	Azure CLI	Microsoft
☐	Azure PowerShell	Microsoft

Two approaches

Declarative:

- Functional
- Describes the *What*
- You describe the desired state
  The system executes the steps to achieve it

Imperative:

- Procedural
- Describes the *How*
- You describe an order of commands
  The system executes them

Infrastructure as Code in Azure

	Technology	Supplier	Declarative?
☐	ARM Templates	Microsoft	Yes
☐	Bicep	Microsoft	Yes
☐	Terraform	HashiCorp	Yes
☐	Pulumi	Pulumi	Yes
☐	Azure CLI	Microsoft	No
☐	Azure PowerShell	Microsoft	No

Infrastructure as Code in Azure

	Technology	Supplier	Declarative?	Idempotent?
☐	ARM Templates	Microsoft	Yes	Yes
☐	Bicep	Microsoft	Yes	Yes
☐	Terraform	HashiCorp	Yes	Yes
☐	Pulumi	Pulumi	Yes	Yes
☐	Azure CLI	Microsoft	No	Yes / No
☐	Azure PowerShell	Microsoft	No	No

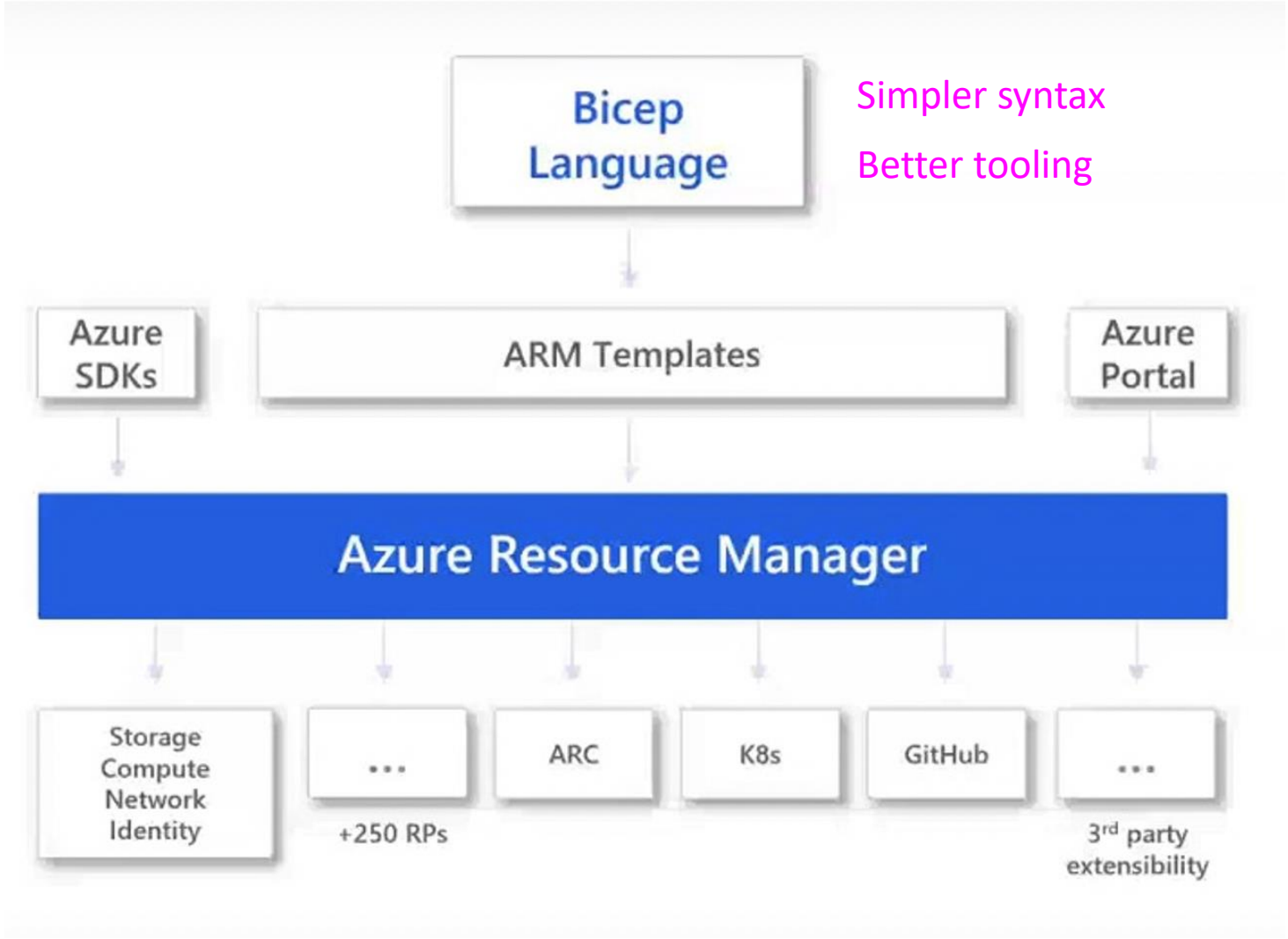
Infrastructure as Code in Azure

	Technology	Supplier	Declarative?	Idempotent?	Up to date?
☐	ARM Templates	Microsoft	Yes	Yes	Yes
☐	Bicep	Microsoft	Yes	Yes	Yes
☐	Terraform	HashiCorp	Yes	Yes	No
☐	Pulumi	Pulumi	Yes	Yes	Yes
☐	Azure CLI	Microsoft	No	Yes / No	No
☐	Azure PowerShell	Microsoft	No	No	No

Infrastructure as Code in Azure

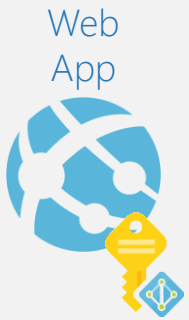
Technology	Supplier	Declarative?	Idempotent?	Up to date?	Multi-cloud?
☐ ARM Templates	Microsoft	Yes	Yes	Yes	No
☐ Bicep	Microsoft	Yes	Yes	Yes	No
☐ Terraform	HashiCorp	Yes	Yes	No	Yes
☐ Pulumi	Pulumi	Yes	Yes	Yes	Yes
☐ Azure CLI	Microsoft	No	Yes / No	No	No
☐ Azure PowerShell	Microsoft	No	No	No	No

Bicep



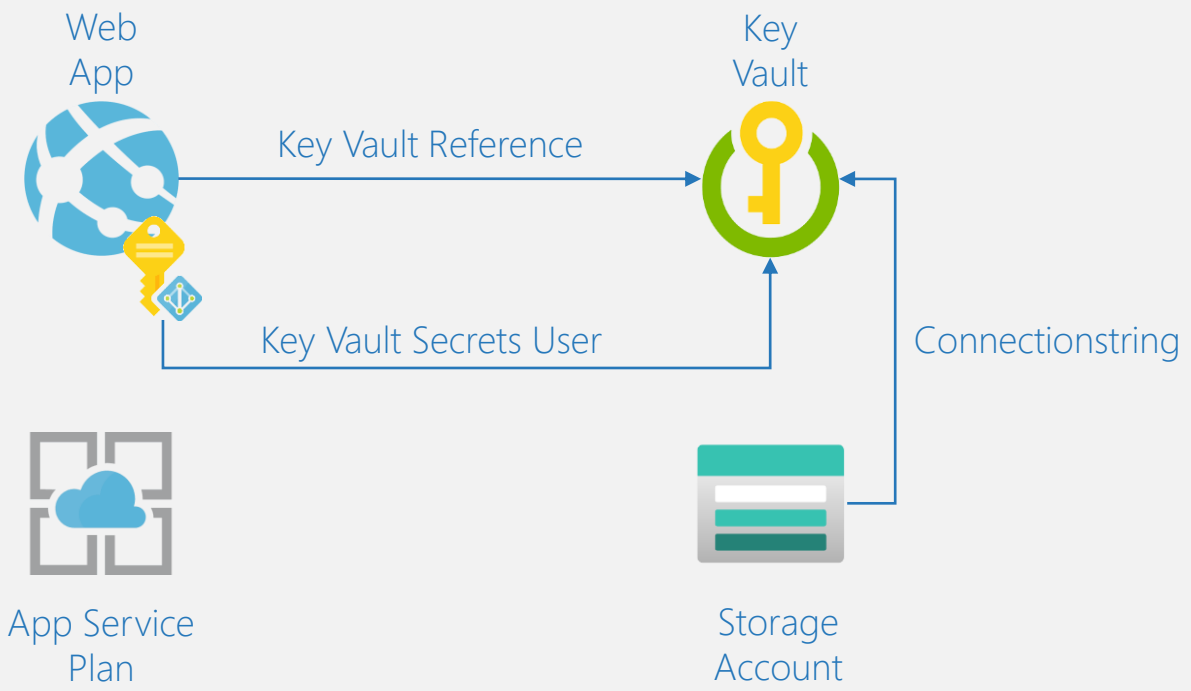
Demo #1

Create resources



Demo #2

Handle connection string



Runs Branches Analytics

#20210909.27 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 633256e3 — Yesterday, 10s

#20210909.26 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main 34036652 — Yesterday, 12s

#20210909.25 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 34036652 — Yesterday, 8s

#20210909.24 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main 9e206037 — Yesterday, 25s

#20210909.23 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 9e206037 — Yesterday, 42s

#20210909.22 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main 078c8318 — Yesterday, 10s

#20210909.21 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 078c8318 — Yesterday, 23s

#20210909.20 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main 52036291 — Yesterday, 24s

#20210909.19 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 52036291 — Yesterday, 44s

#20210909.18 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main 6711e7f6 — Yesterday, 22s

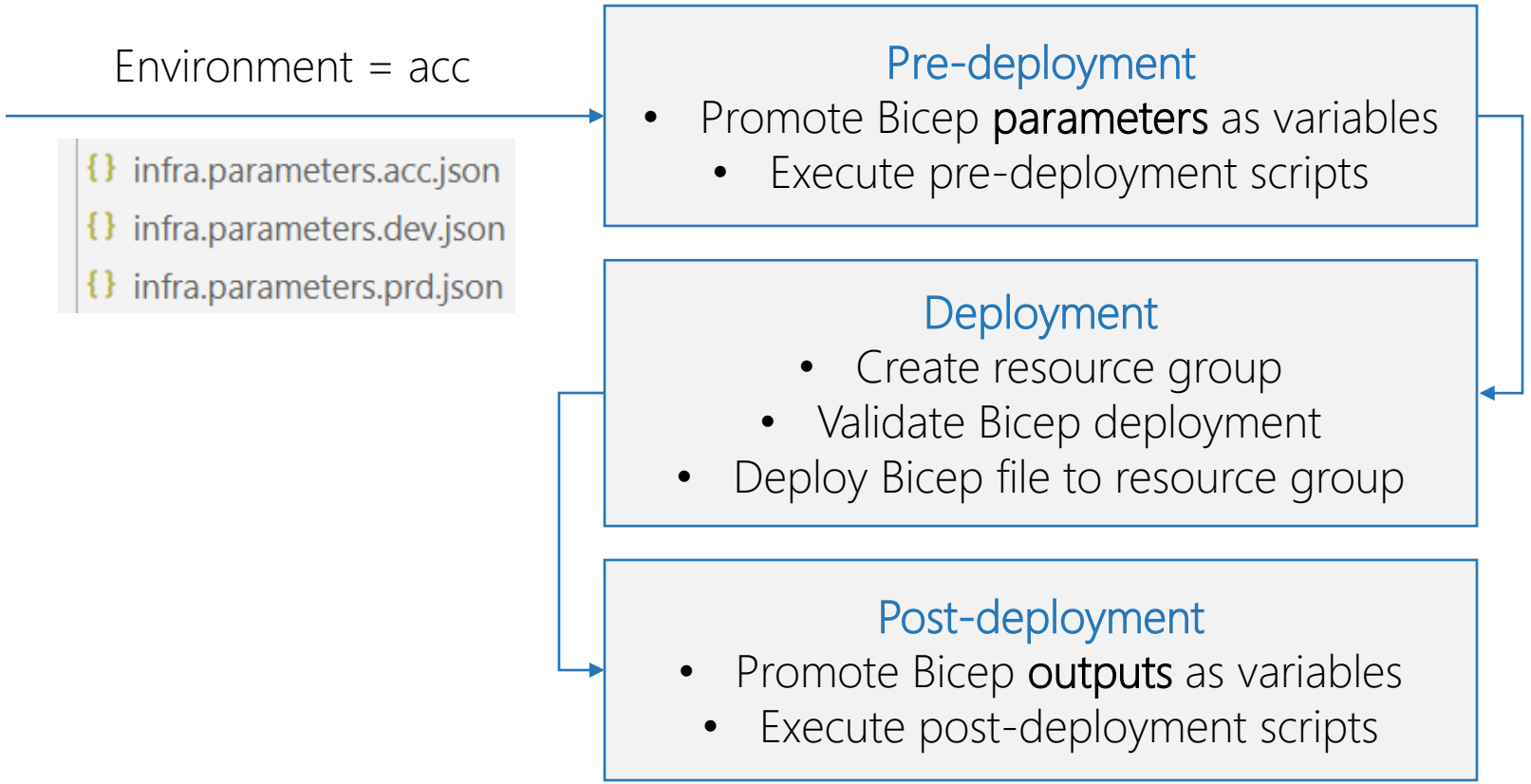
#20210909.17 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main 6711e7f6 — Yesterday, 22s

#20210909.16 Update azure-pipelines.yml for Azure Pipelines
Manually triggered for TM main ce59f896 — Yesterday, 9s

#20210909.15 Update azure-pipelines.yml for Azure Pipelines
Individual CI for TM main ce59f896 — Yesterday, 20s

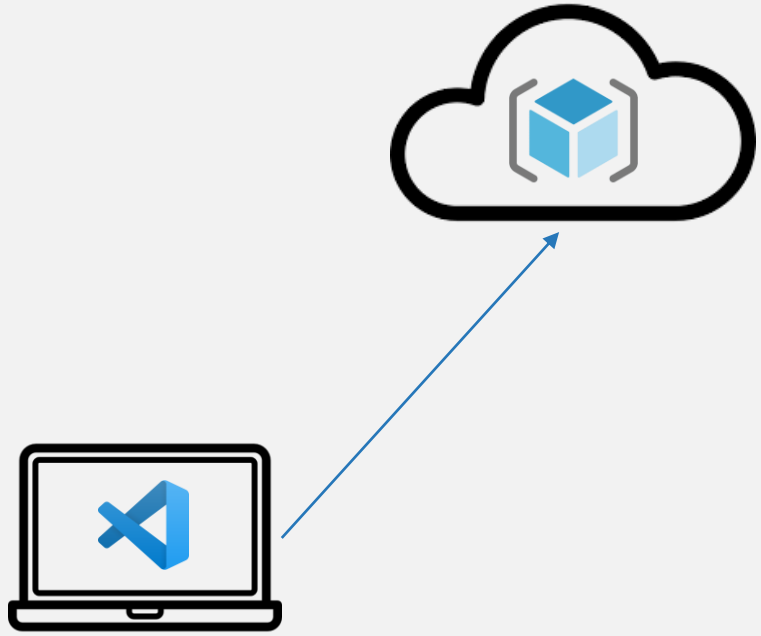
Allign local and cloud deployment

PowerShell Script



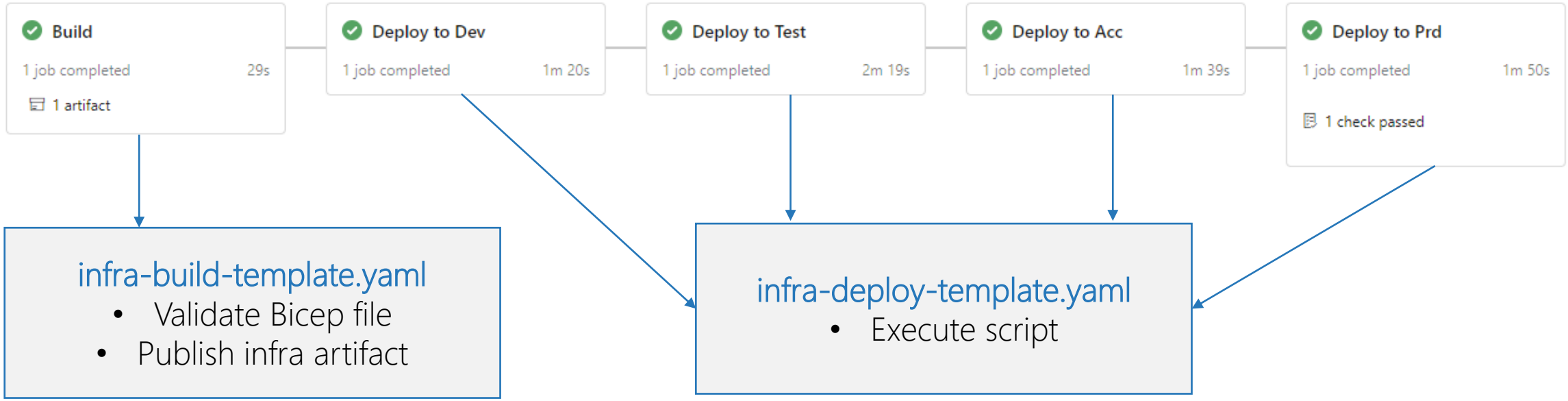
Demo #3

Local deploy



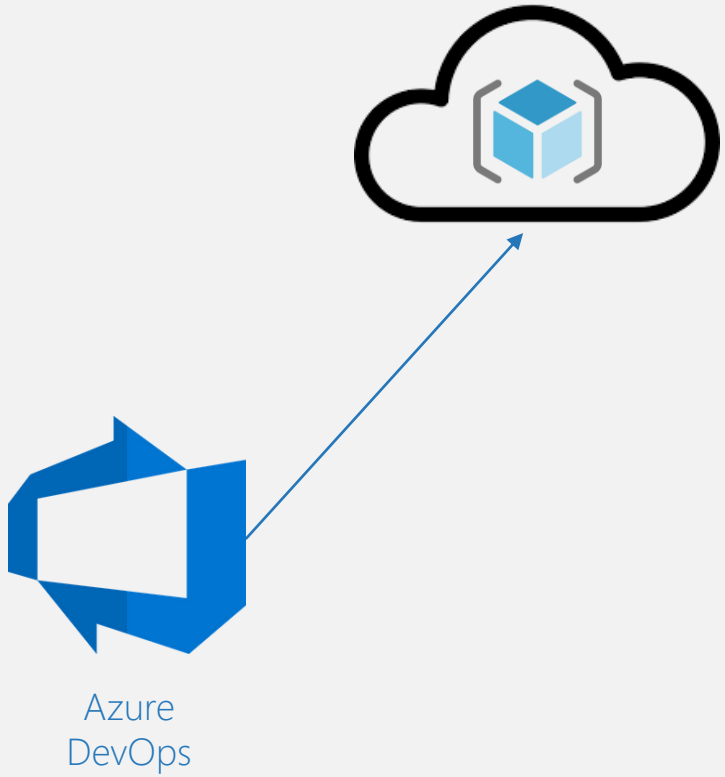
Multi-stage pipeline

azure-pipelines.yaml



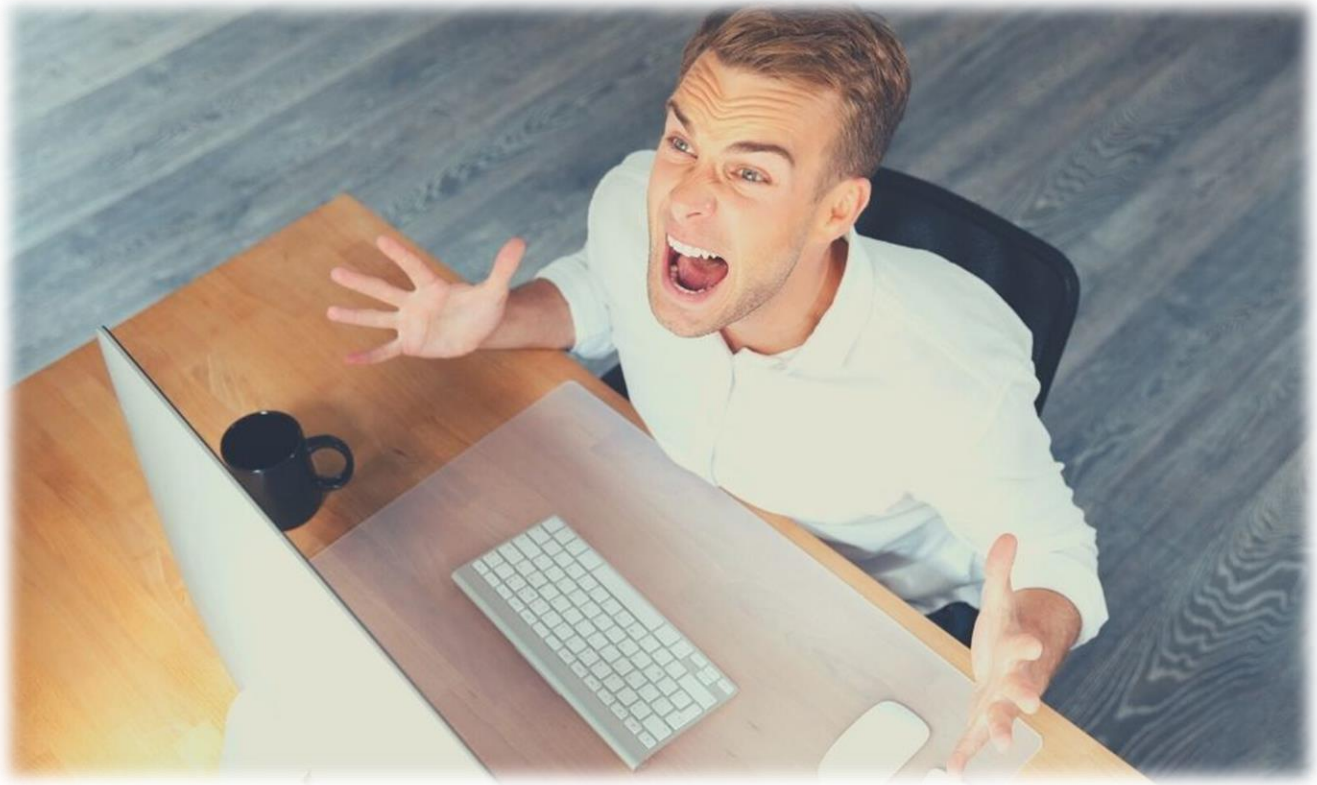
Demo #4

Azure DevOps release



Lessons learned along the way

- All environment abbreviations must have the same length
  - Example: dev – acc – prod



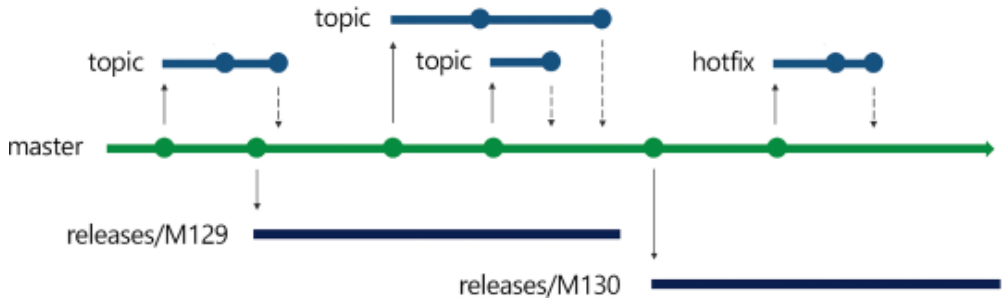
Lessons learned along the way

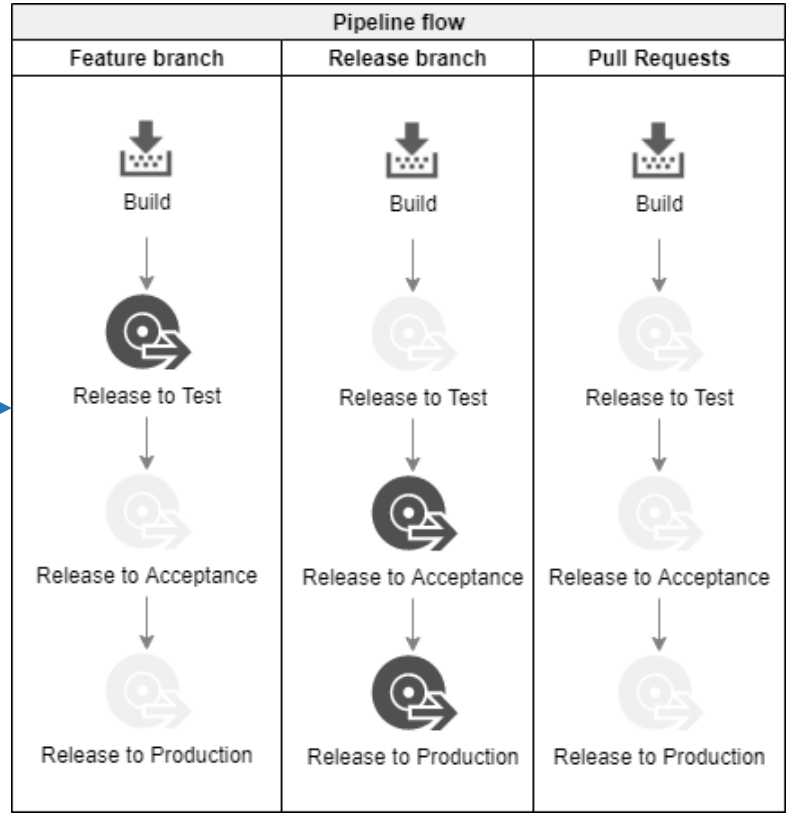
- Adjust stage conditions, based on branching strategy (more info)

```
- stage: 'Dev'
  displayName: 'Deploy to Dev'
  dependsOn: Build
  condition: |
    and
    (
      succeeded(),
      eq(variables['Build.SourceBranchName'], variables['developBranchName']),
      ne(variables['Build.Reason'], 'PullRequest')
    )
```

Lessons learned along the way

- Adjust stage conditions, based on branching strategy (more info)
  - Example: *Release Flow*





No possibility to manually trigger stages in YAML pipelines

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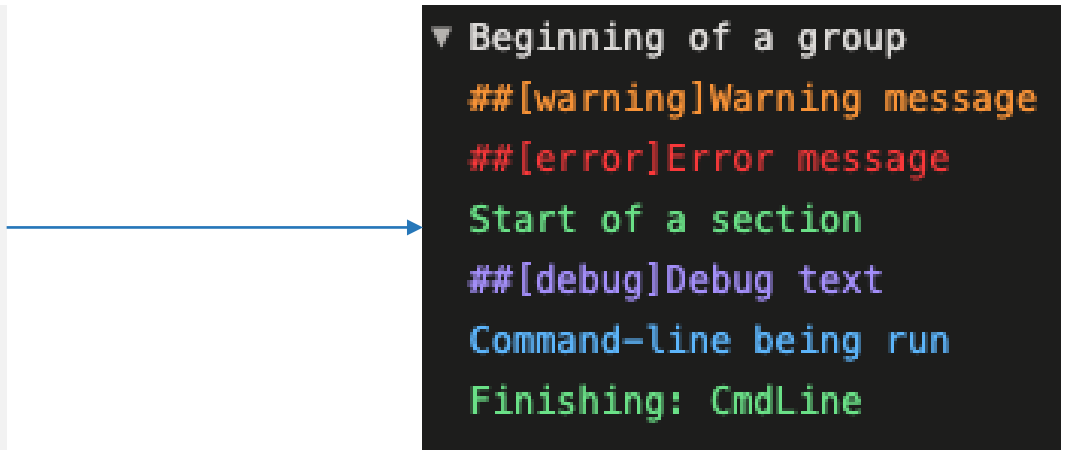
Lessons learned along the way

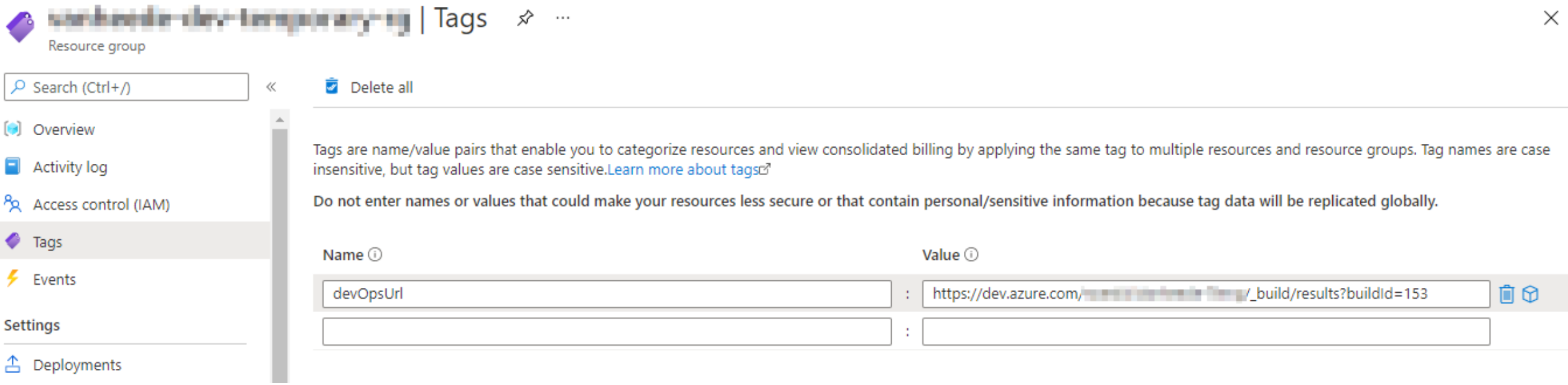
- Use rendered logging commands in Azure DevOps scripts (more info)

```
##[group]Beginning of a group
##[warning]Warning message
##[error]Error message
##[section]Start of a section
##[debug]Debug text
##[command]Command-line being run
##[endgroup]
```



Lessons learned along the way

- Foresee end-to-end traceability between Azure <> Azure DevOps (more info)



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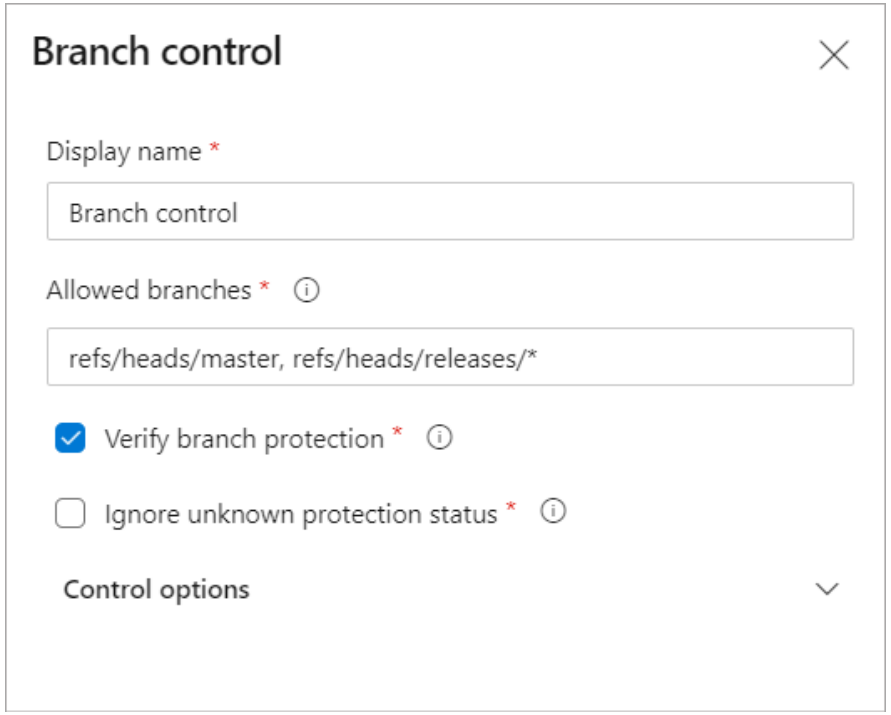
Lessons learned along the way

- Avoid accidental deployments with Approvals and Branch Conbtrol
  - On environments
  - On service connections (!)



Lessons learned along the way

- Give your modules a unique / meaningful name
  - This name is the deployment name in Azure!

```
//Describe Resource Group
module rg 'modules/resource-group.bicep' = {
  name: '${appName}-resourceGroup-${buildId}'
  params: {
```

THANK YOU !!!

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