

Infrastructure as Code

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the art of getting service

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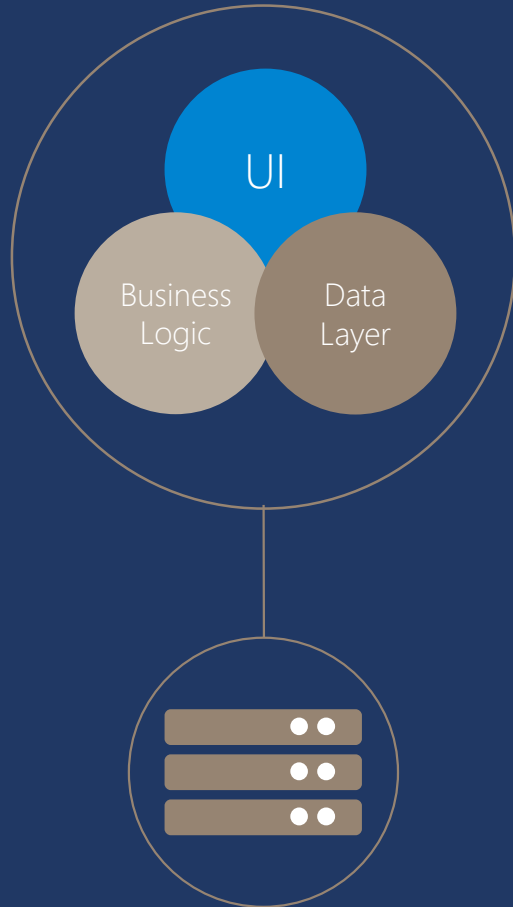


Session focus and goals

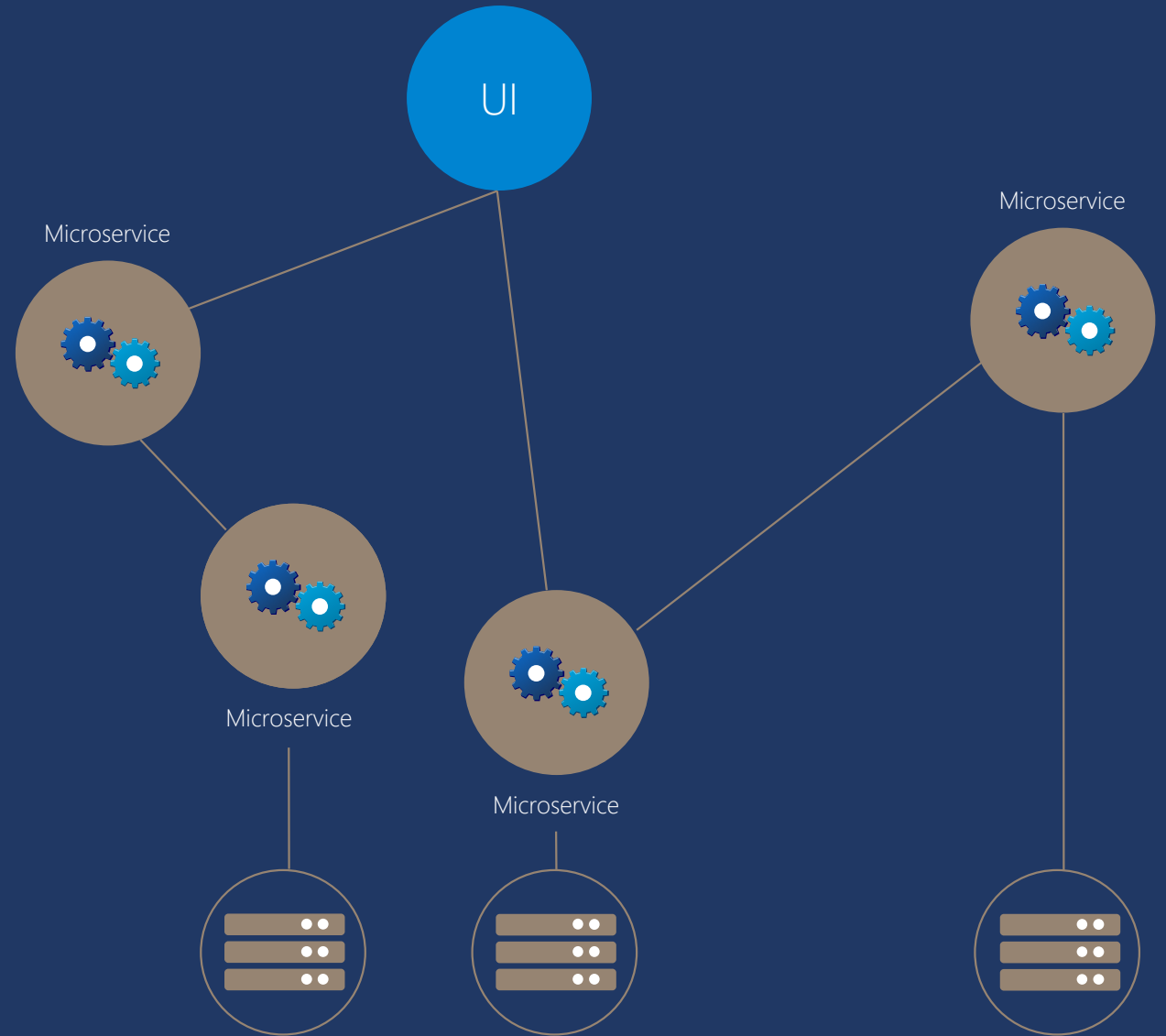
- Why IaC should be used
- Azure Resource Manager
- Terraform
- Simple-to-follow demos
- Lift your IaC skills from Level 0 up to 200

Reasons for IaC

Apps are changing



Monolithic Architecture



Microservice Architecture

How services can be delivered

Containers

- Process encapsulation
- Dependency-hell elimination
- Simplified lifecycle management (upgrades & rollbacks)
- High density
- Portable
- Azure offers lots of container services

PaaS

- Ready-to-use platform
- Underlying infrastructure is abstracted
- Often based on containers
- Runs all the time

Serverless

- Ready-to-use platform
- Underlying infrastructure is abstracted
- Triggered by events, otherwise the service does not run
- Pay what you "really" use with (micro billing)

IaaS

- App runs in a traditional VM
- Hybrid networking
- Firewalling and secure access
- Protection & recovery
- Business continuity
- Updates management

Challenges

- More components to deploy and manage
- Manual configuration issues
 - High release cadence
 - Transition from “dev” to “prod” might be complex
 - Configuration drifts
 - Humans have too many permissions
 - Error prone, slow, inconsistent and boring
- Less time, budget and resources
- And one or two more ...

How to address this?

- Automated infrastructure and components deployment
- Full lifecycle management
 - Initial deployment
 - Updates
 - Decommissioning

Infrastructure as Code

Imperative

- Scripts, workflows and runbooks contain the configuration logic
- Step-by-step approach
- Deployment is simple, updating more complex

Declarative

- Final state of platform is described
- Automation process makes it so
- Configuration logic lives in the platform where components are deployed to
- The code is your documentation

Azure Resource Manager

Azure Resource Manager

- Manages Azure resources
 - Consistent RBAC
- Multiple resource providers
- Resource providers manage Azure resources
 - Azure virtual network
 - Azure SQL database
 - Azure LogicApp
 - Azure virtual machine
 - Etc.

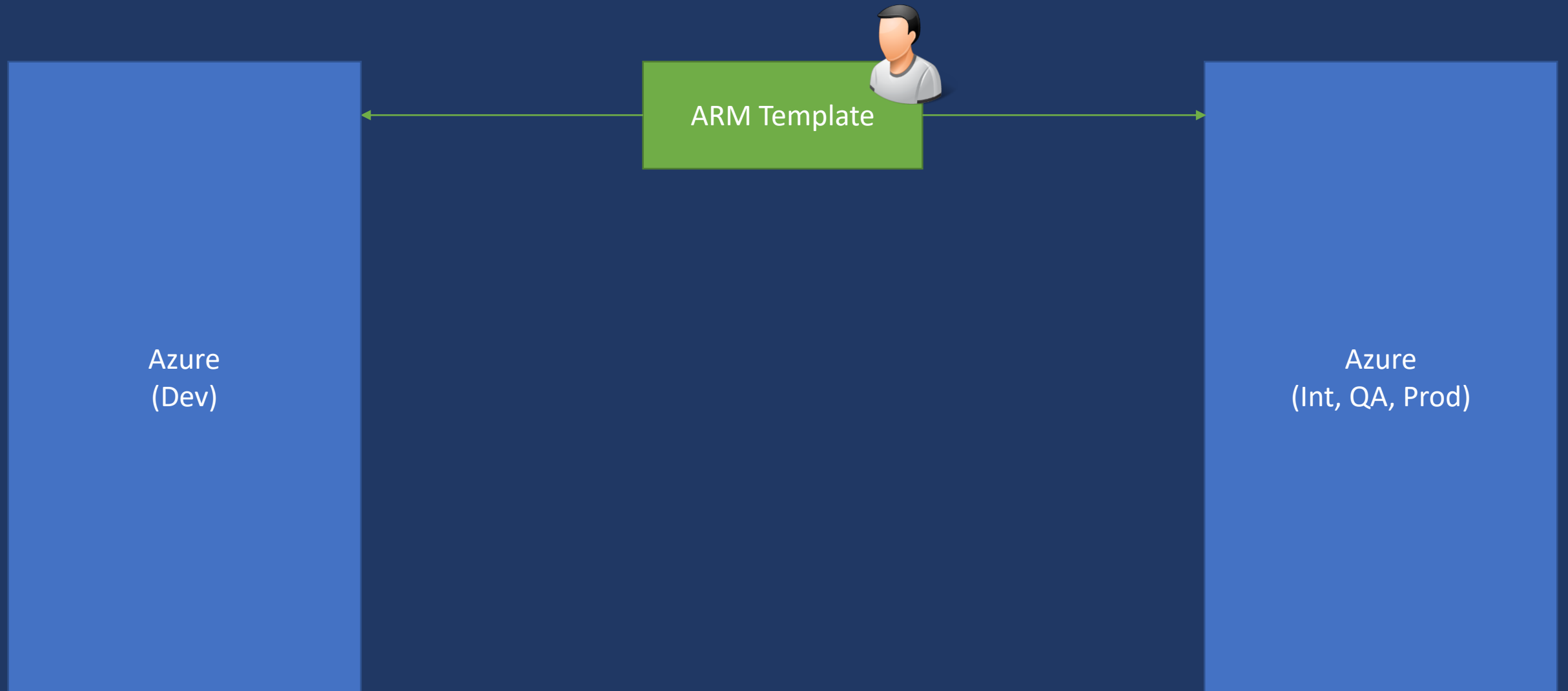
Azure Resource Providers

- Resource providers offer APIs
 - Used by Azure portal, tools, scripts, CLIs etc.
 - Create, update and delete resources
- ARM is also used in Azure Stack
 - On-premise extension of Azure
 - Consistent hybrid cloud platform
 - Same resource providers, APIs, tools, portals etc.

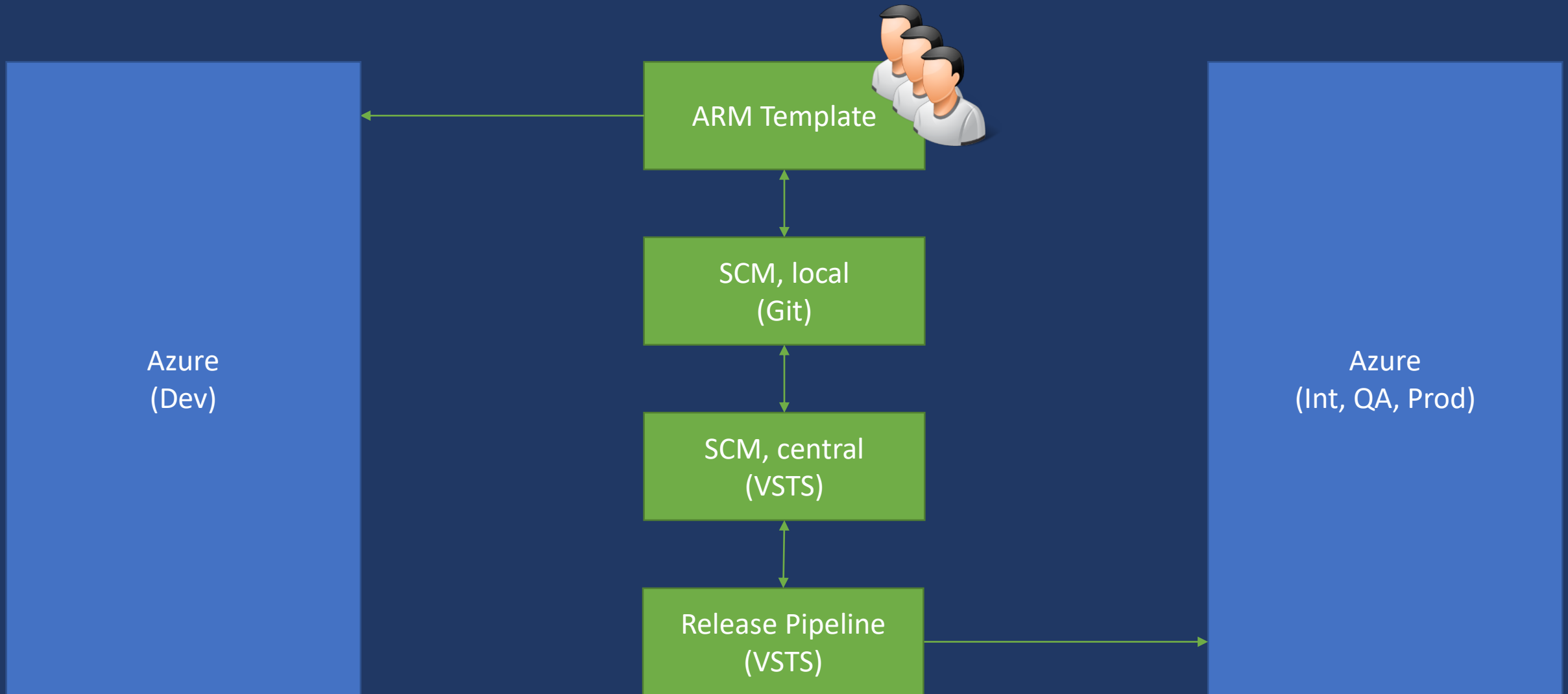
ARM Templates

- ARM resource provider APIs accept human-readable JSON Files
- Can be created in a variety of tools
 - Visual Studio
 - Visual Studio Code
 - Etc.
- Full lifecycle management
 - Deploy through a variety of options
 - Portal, PowerShell, Cloud Shell, Azure CLI etc.

How to develop and deploy



How to develop and deploy



Demo: ARM Templates

Terraform

Welcome to the real world

- It's not only about Azure ...
- What er are seeing
 - Hybrid Cloud
 - Public Cloud services
 - Combined with on-premises workloads
 - Multi Cloud
 - Not only Azure but AWS, Google etc.
- ARM might not be enough ...

Introducing Terraform

- From HashiCorp
- Build, plan, change and destroy infrastructure
- Not only Azure, multiple providers
 - AWS, Docker, Kubernetes etc.
 - Many others
 - Custom providers can be developed if needed

Demo: Terraform

Recap

Recap

- Use declarative approach wherever possible
 - Check out available options – use whatever works best
 - Remove deployment complexity and errors
- Use source control and versioning
 - Git, VSTS etc.
- Use release pipelines
 - Structured, standardized release process
 - Less permissions for humans, more control

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