



How to build a virtual datacenter in 45 minutes!

Marcel Zehner | make it noble
Microsoft Azure MVP
@marcelzehner
marcelzehner.ch



What to expect from this session

- Insights into ARM templates-based deployments
- A (simplified) real-world approach to deploy to Azure
- Demos

What NOT to expect from this session

- Enough content to leave this session as an expert
- Swiss chocolate giveaways

About me

- Marcel Zehner
- make it noble
- Microsoft Azure MVP
- Speaker, writer & blogger
- Community champion
- Experts Live CH & EU



@marcelzehner



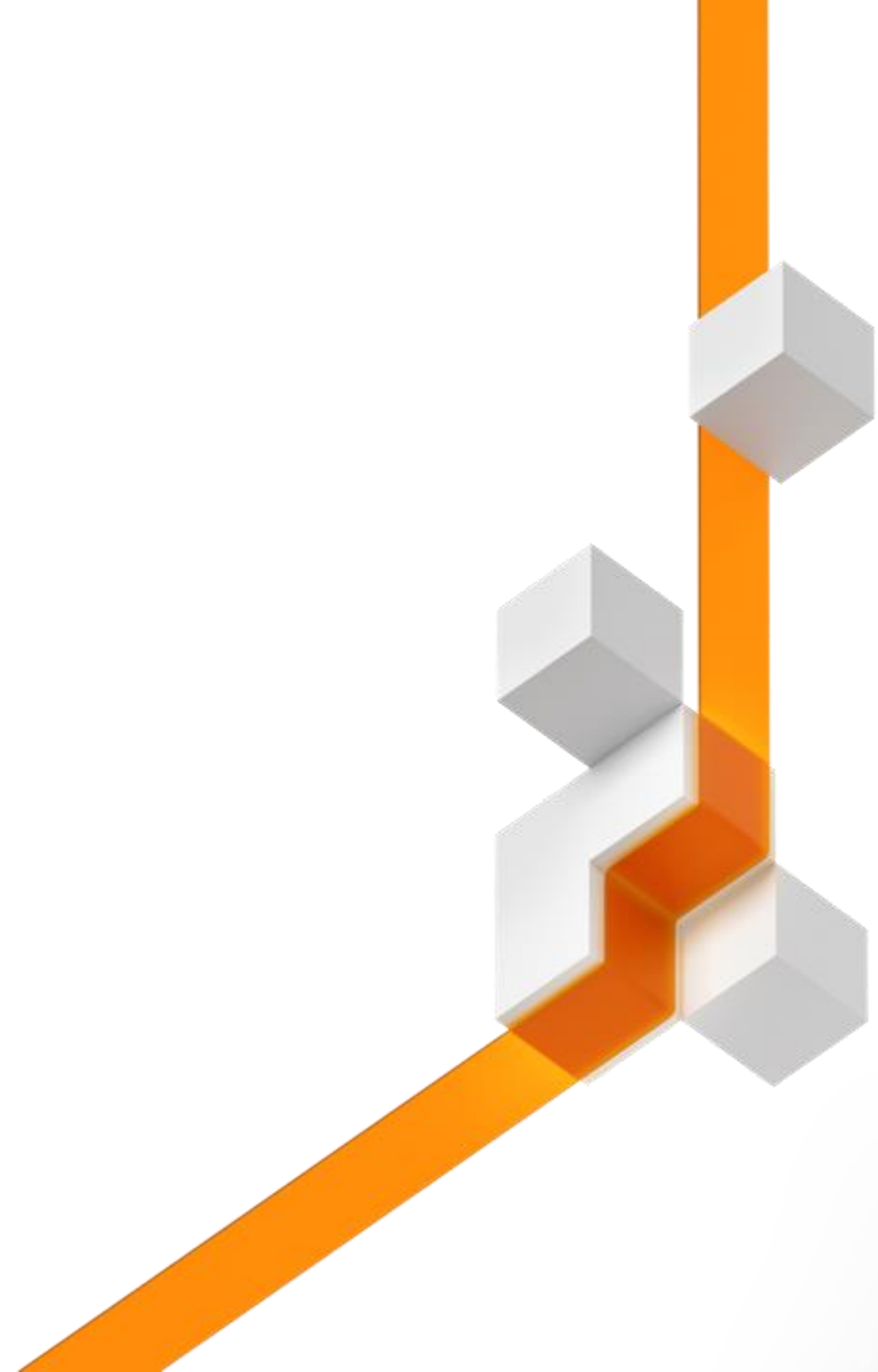
marcelzehner



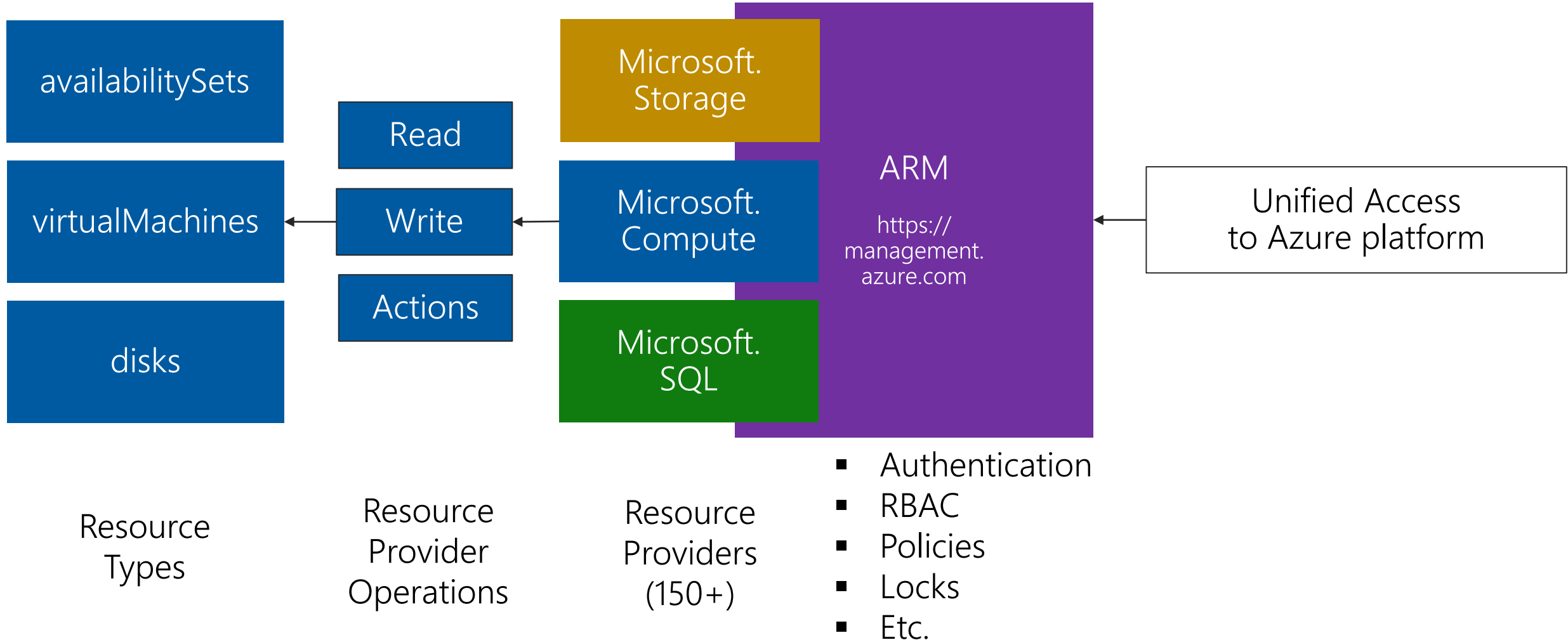
marcelzehner.ch



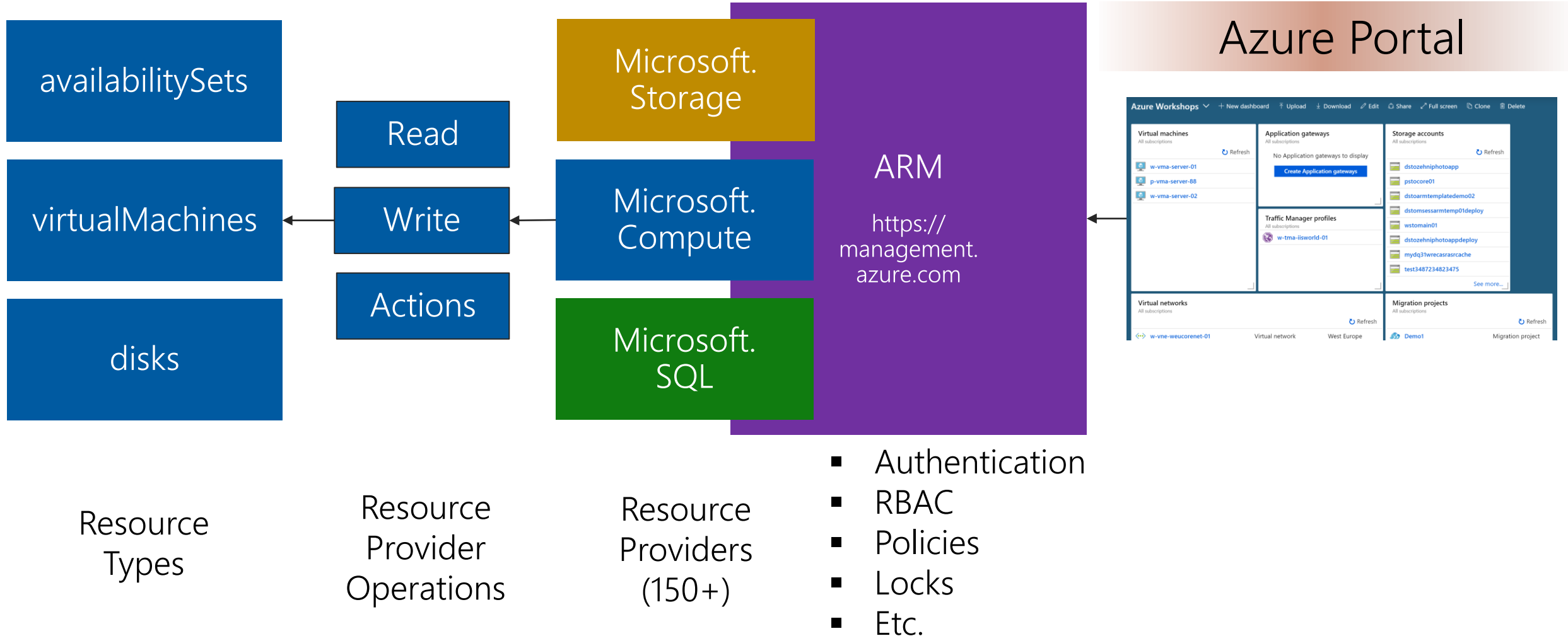
Azure Resource Manager (ARM)



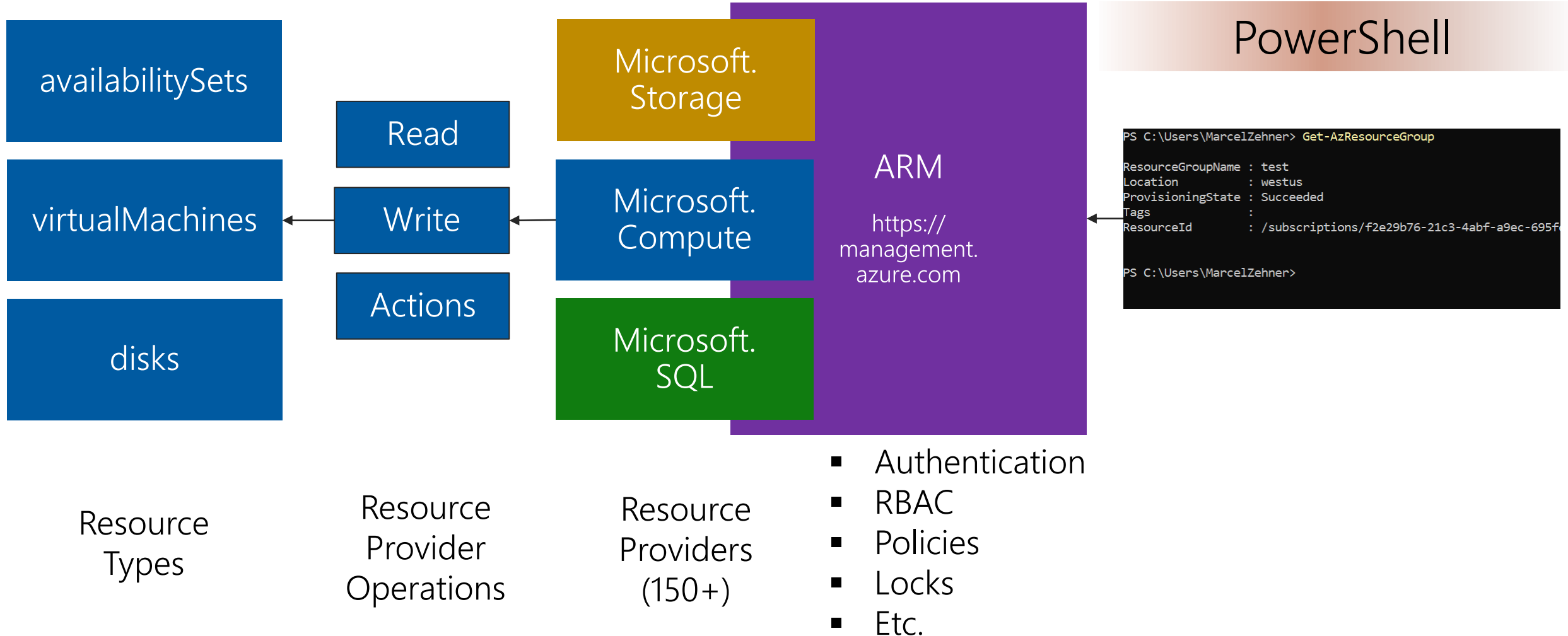
Azure Resource Manager Overview



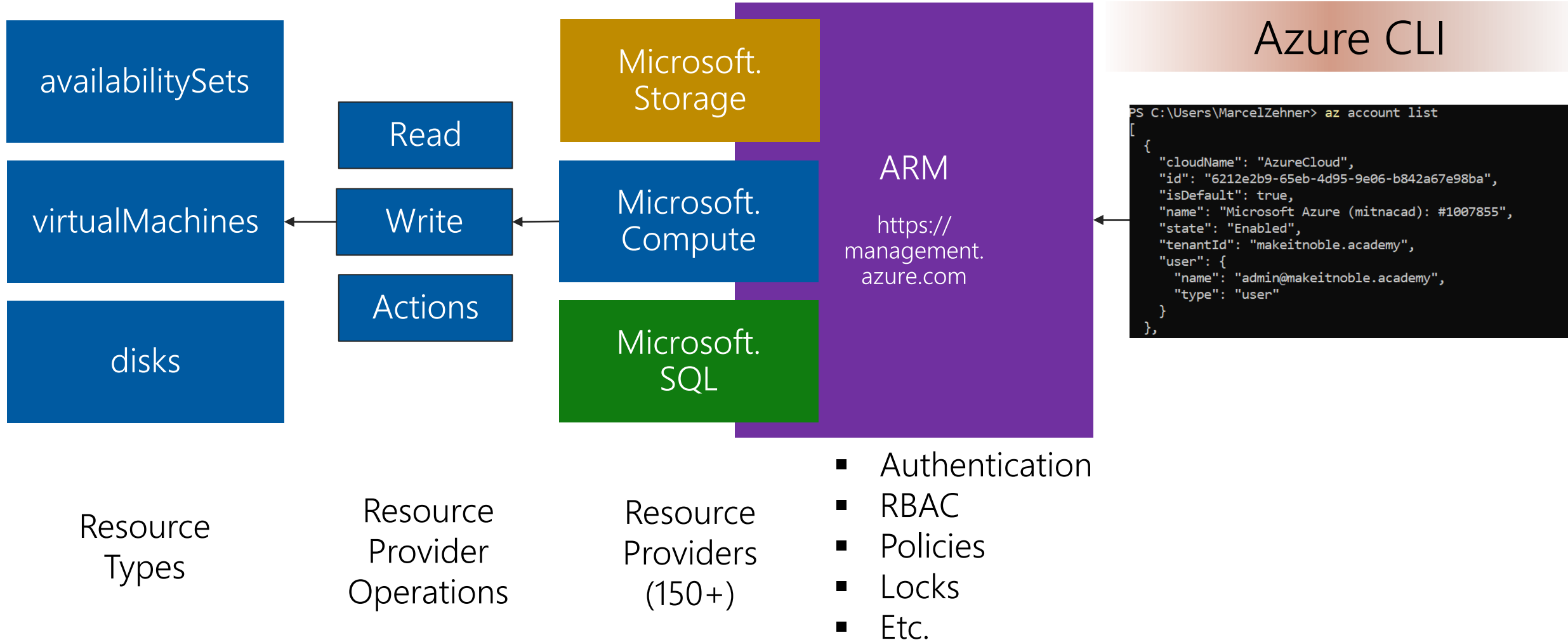
Azure Resource Manager Overview



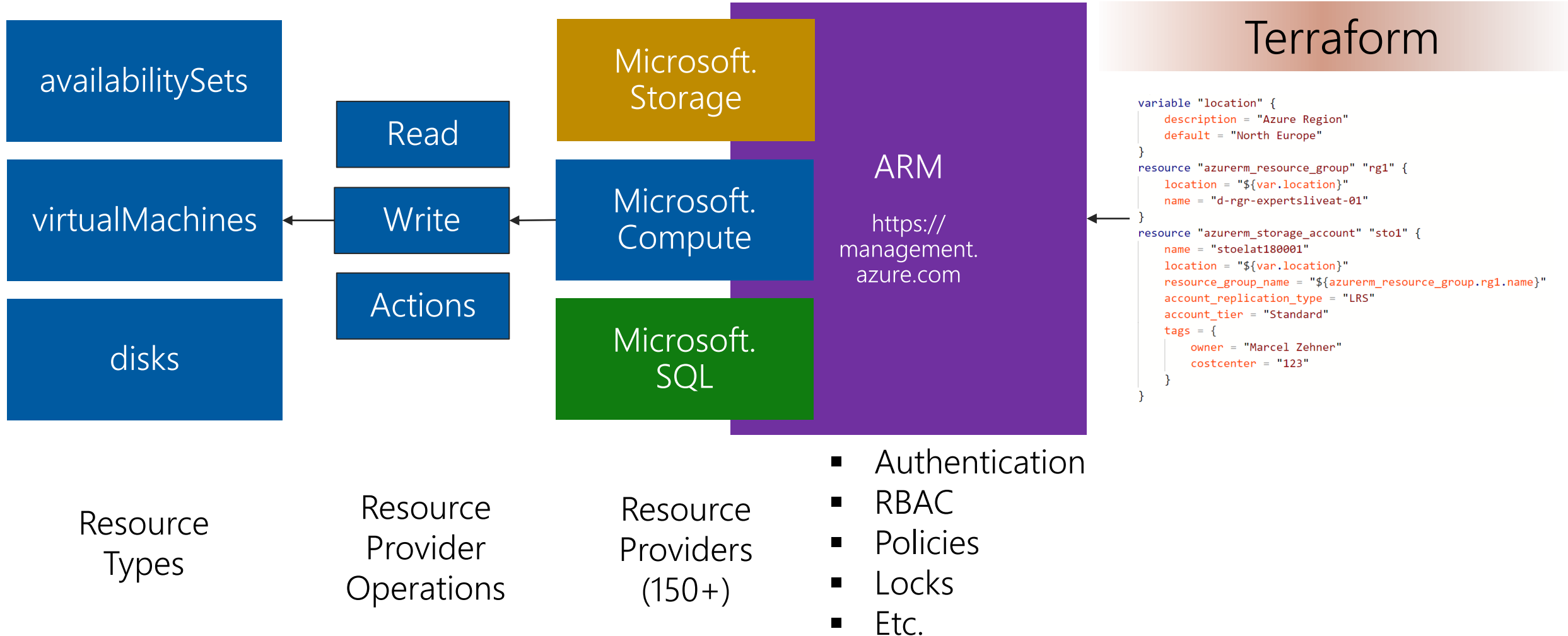
Azure Resource Manager Overview



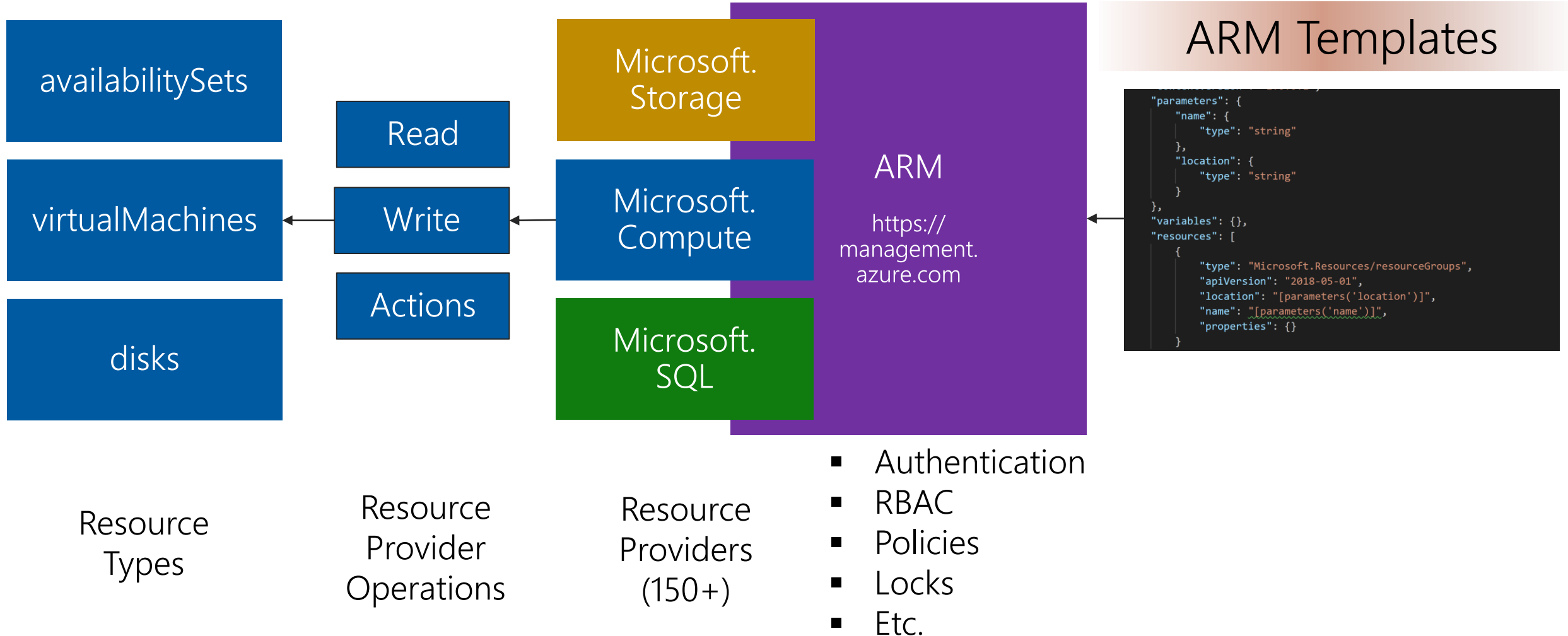
Azure Resource Manager Overview



Azure Resource Manager Overview



Azure Resource Manager Overview



ARM templates

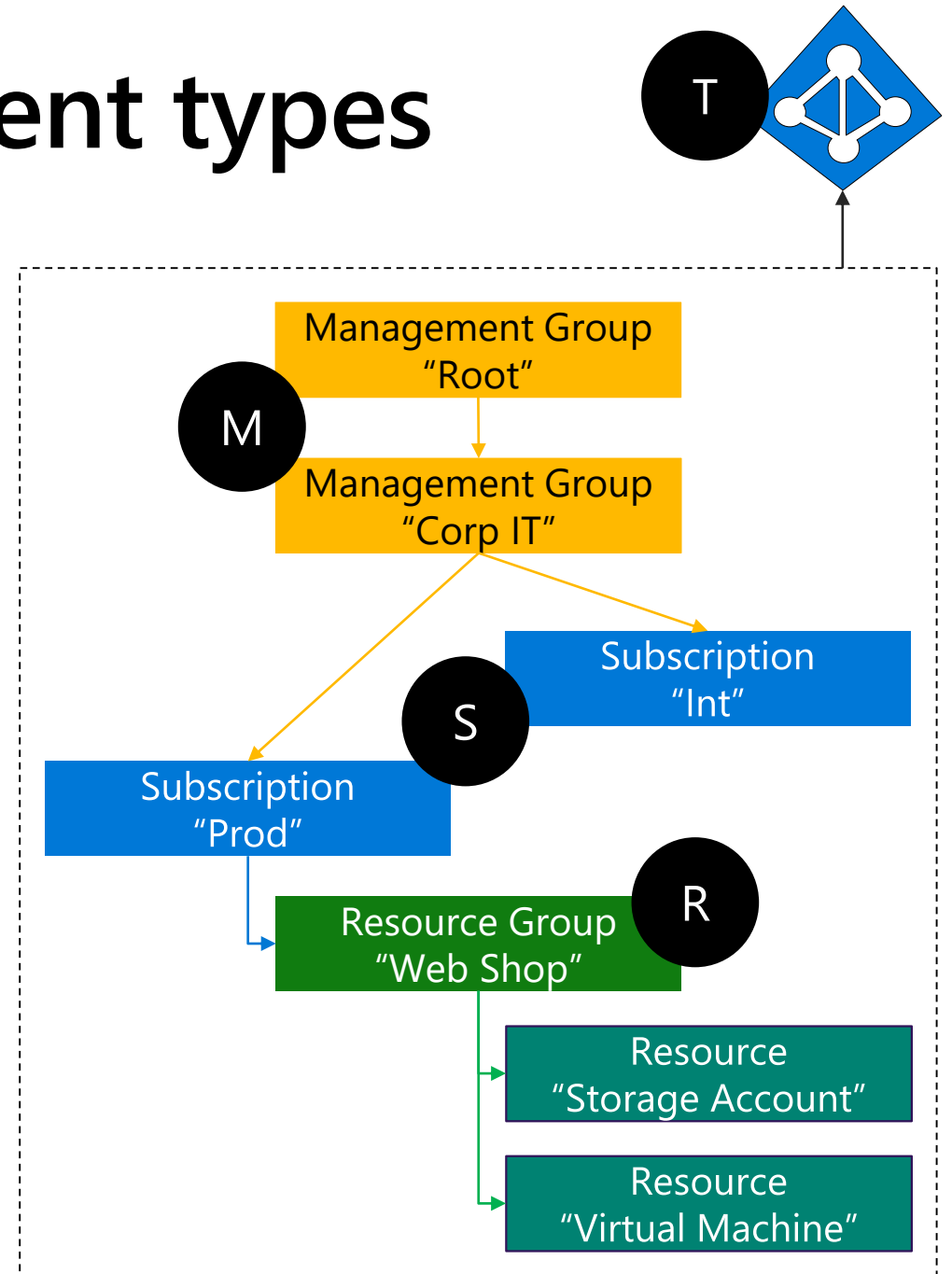


ARM templates introduction

- Azure-native solution
- Declarative approach to manage infrastructure
 - Describe the full service
 - Json files
- Support the full lifecycle
 - Initial service provisioning
 - Service maintenance
- Hand over to the platform to 'make it so'

ARM templates deployment types

- Tenant level (T)
- Management group level (M)
- Subscription level (S)
- Resource group level (R)



ARM template skeleton

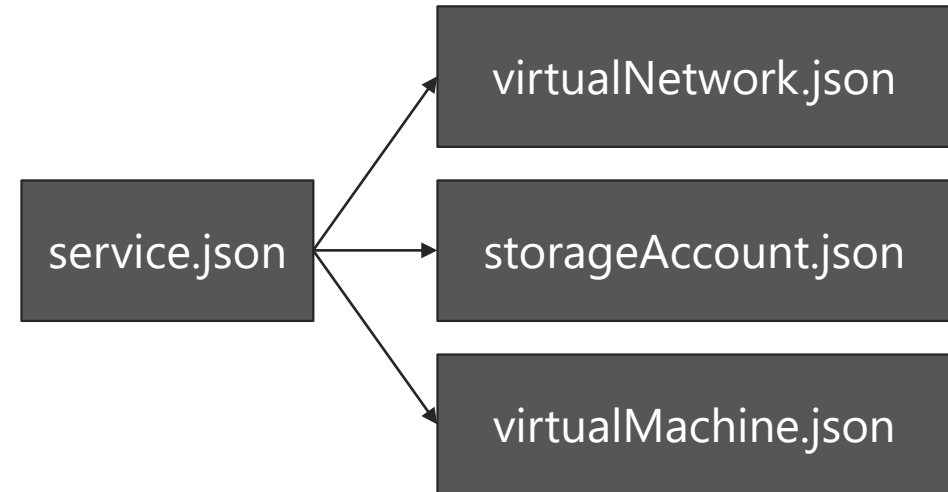
- Resources > Describe resources & dependencies
- Parameters > Parametrize deployment
- Variables > Calculate values before they are used
- Functions > User-defined functions, no code repetition
- Outputs > Output data from resources

```
{  
  "$schema": "https://schema.management.azure.com/schemas/2018-05-01/subscriptionDeploymentTemplate.json#",  
  "contentVersion": "1.0.0.1",  
  "parameters": {},  
  "variables": {},  
  "resources": [],  
  "functions": [],  
  "outputs": {}  
}
```

Deployment approaches

- Single templates
 - For very simple services
 - One files to describe the full service
- Linked templates
 - For more complex services
 - Multiple, reusable resource templates
 - One deployment template per service
 - Resource templates access using a URI

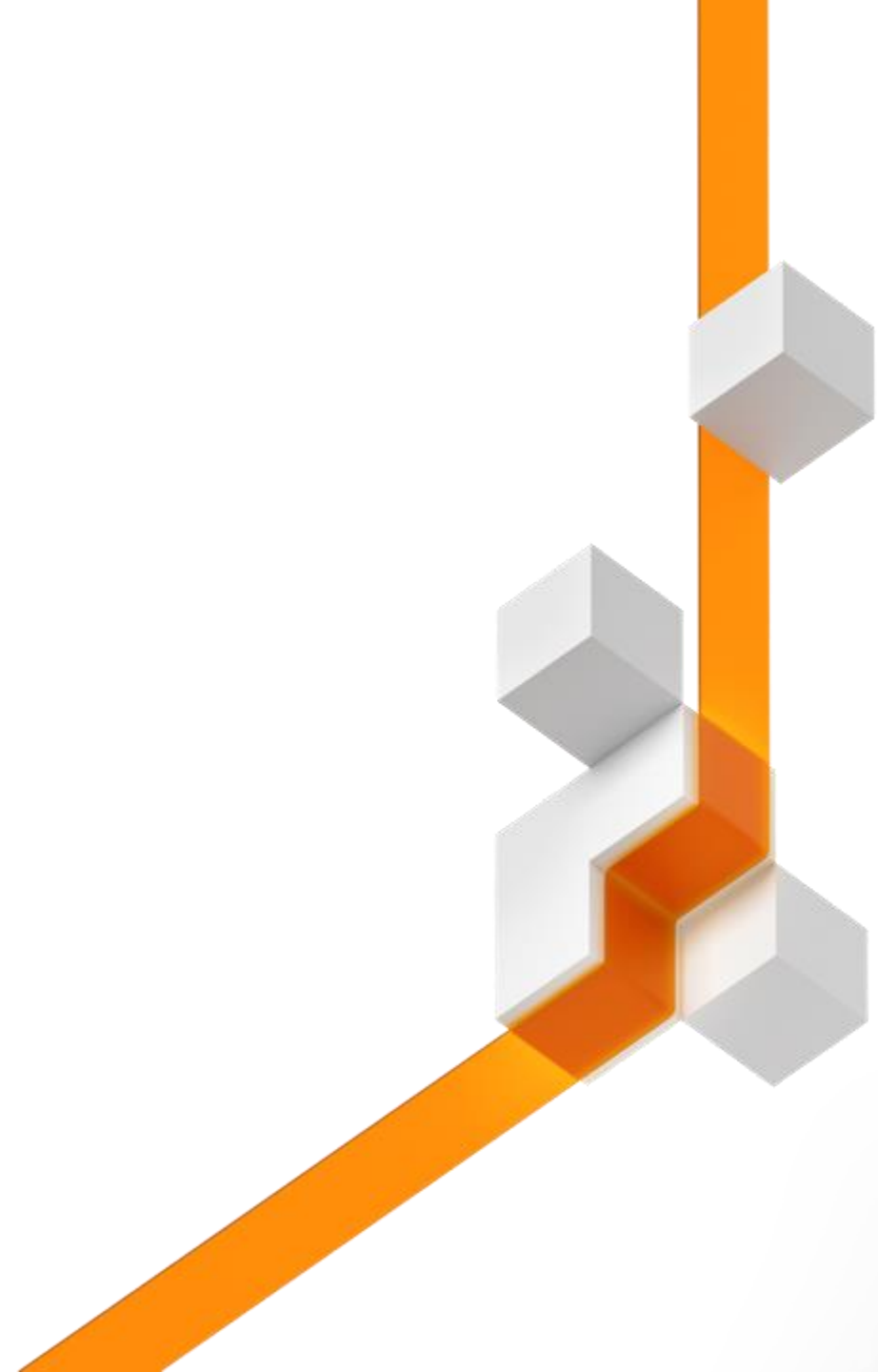
service.json



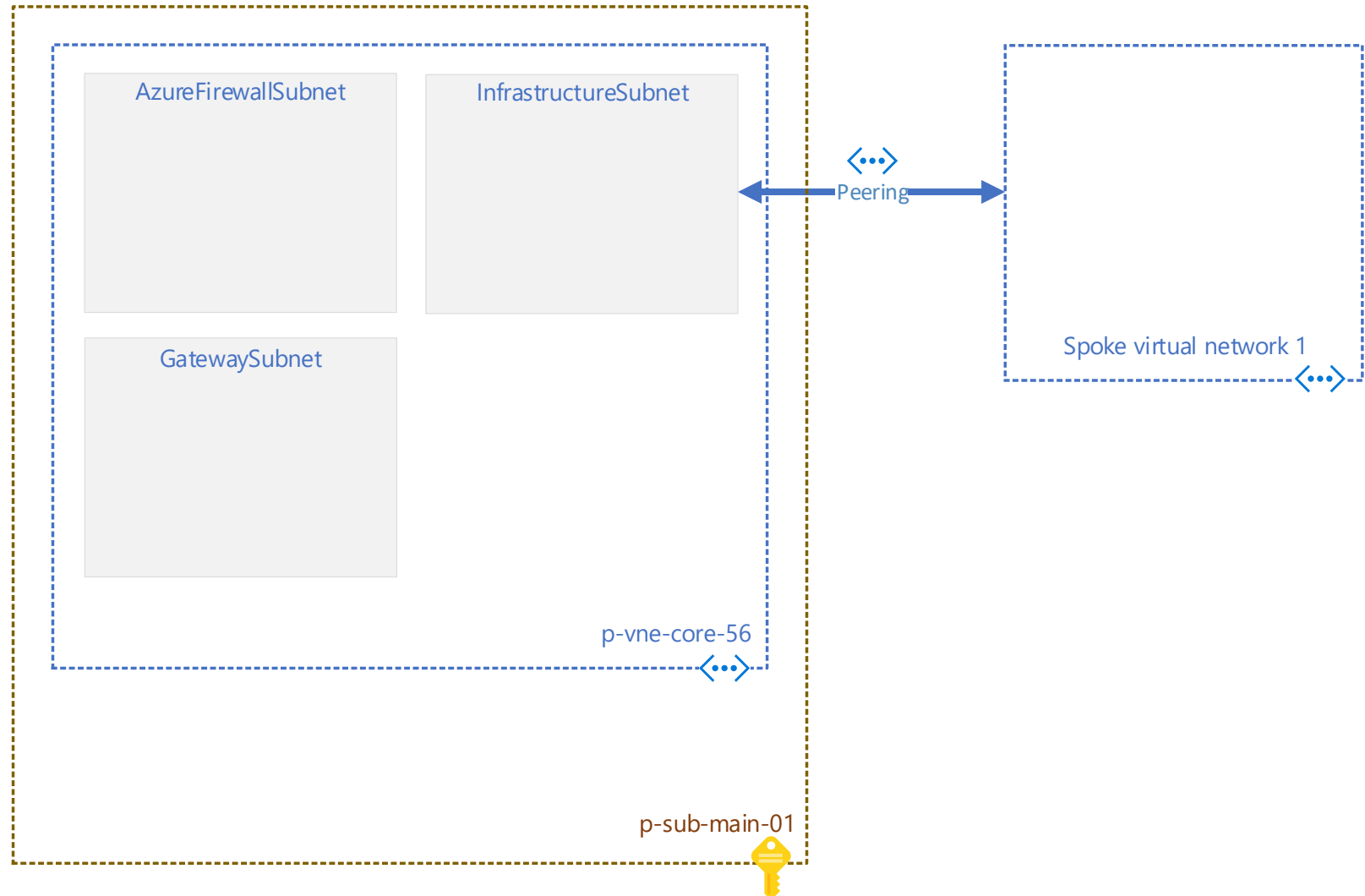
Deploying ARM templates

- Azure Portal
- PowerShell
- Azure CLI
- Azure DevOps Pipelines

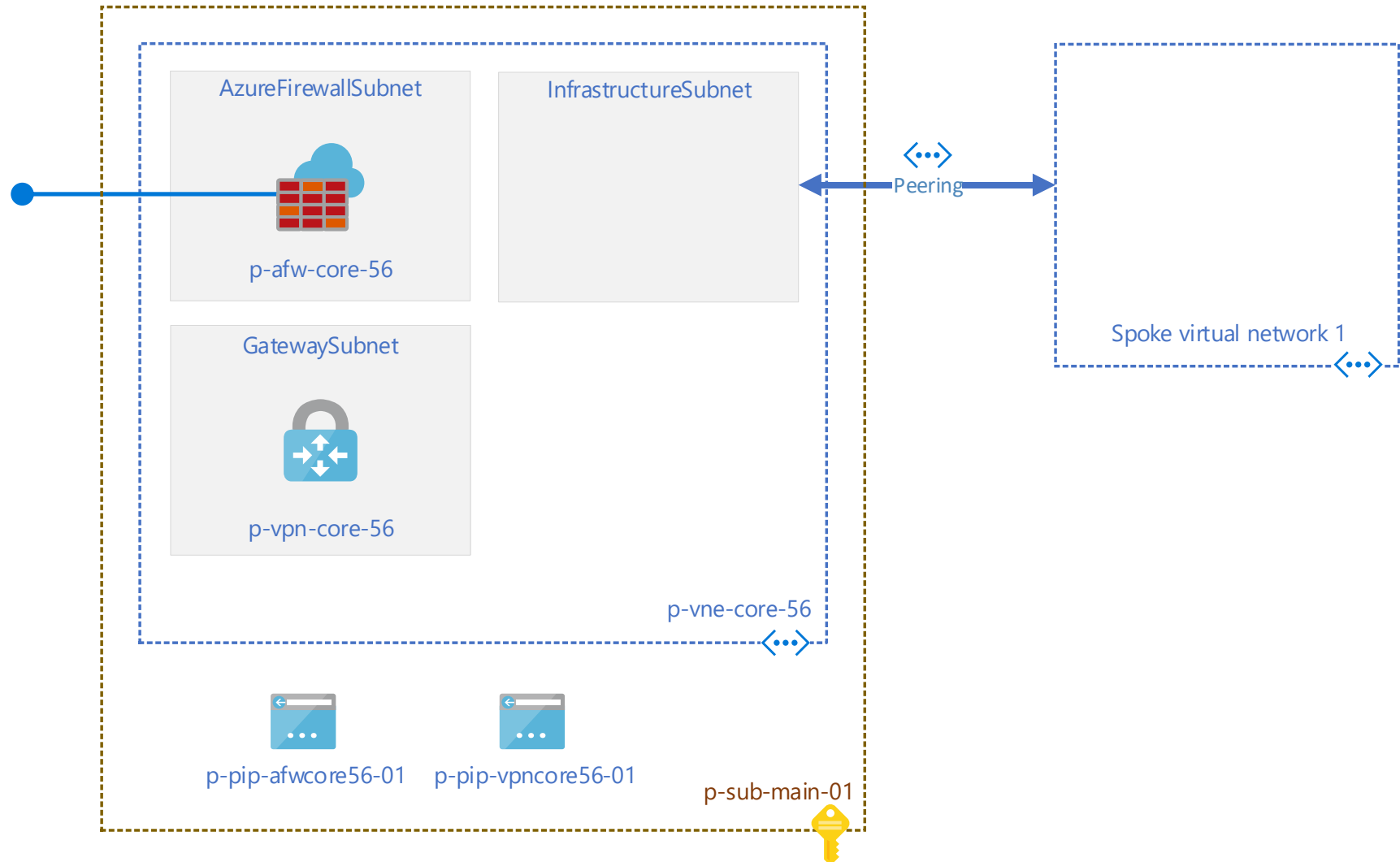
What we will build ...



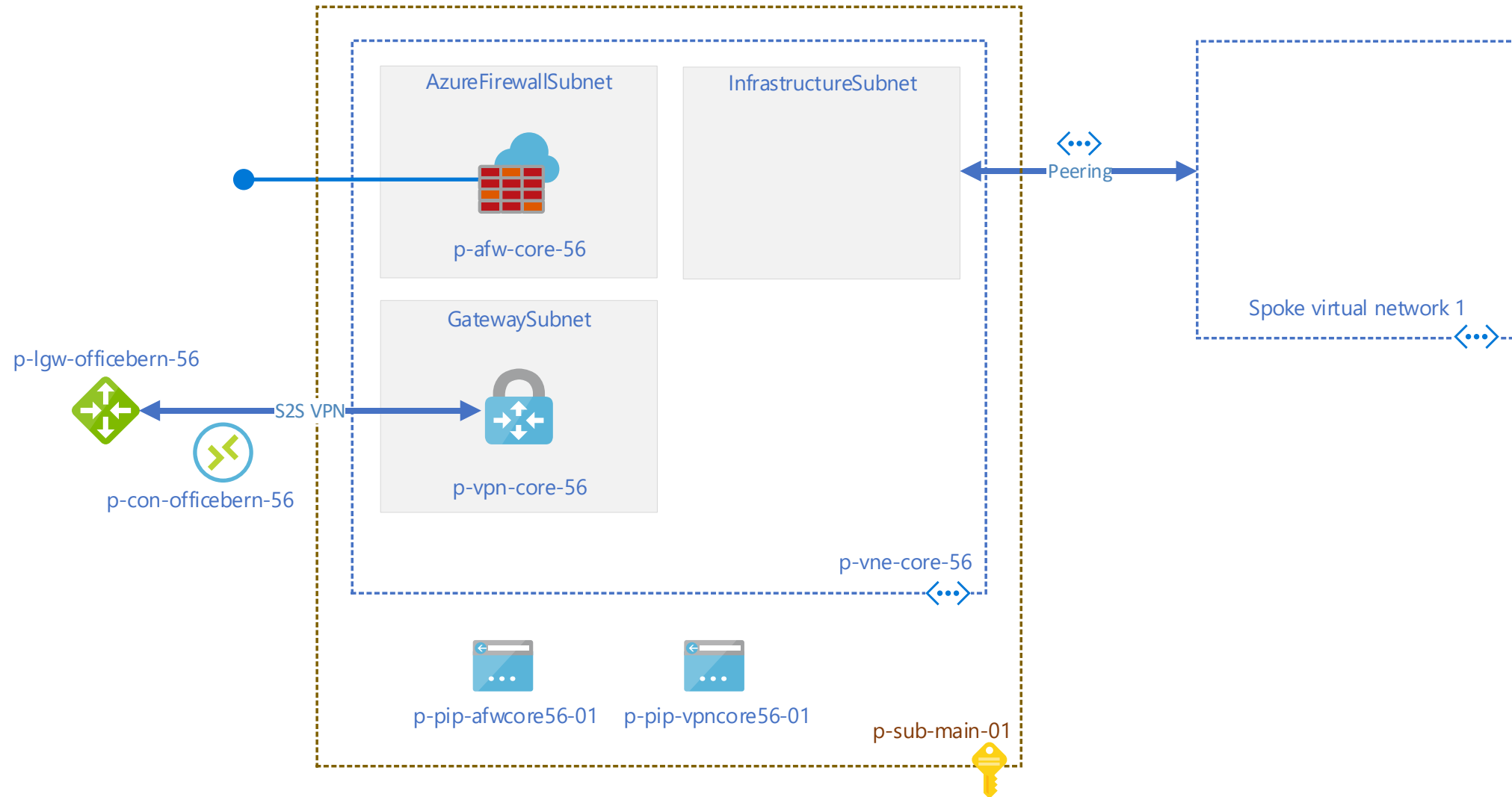
Building a virtual datacenter in 45 minutes



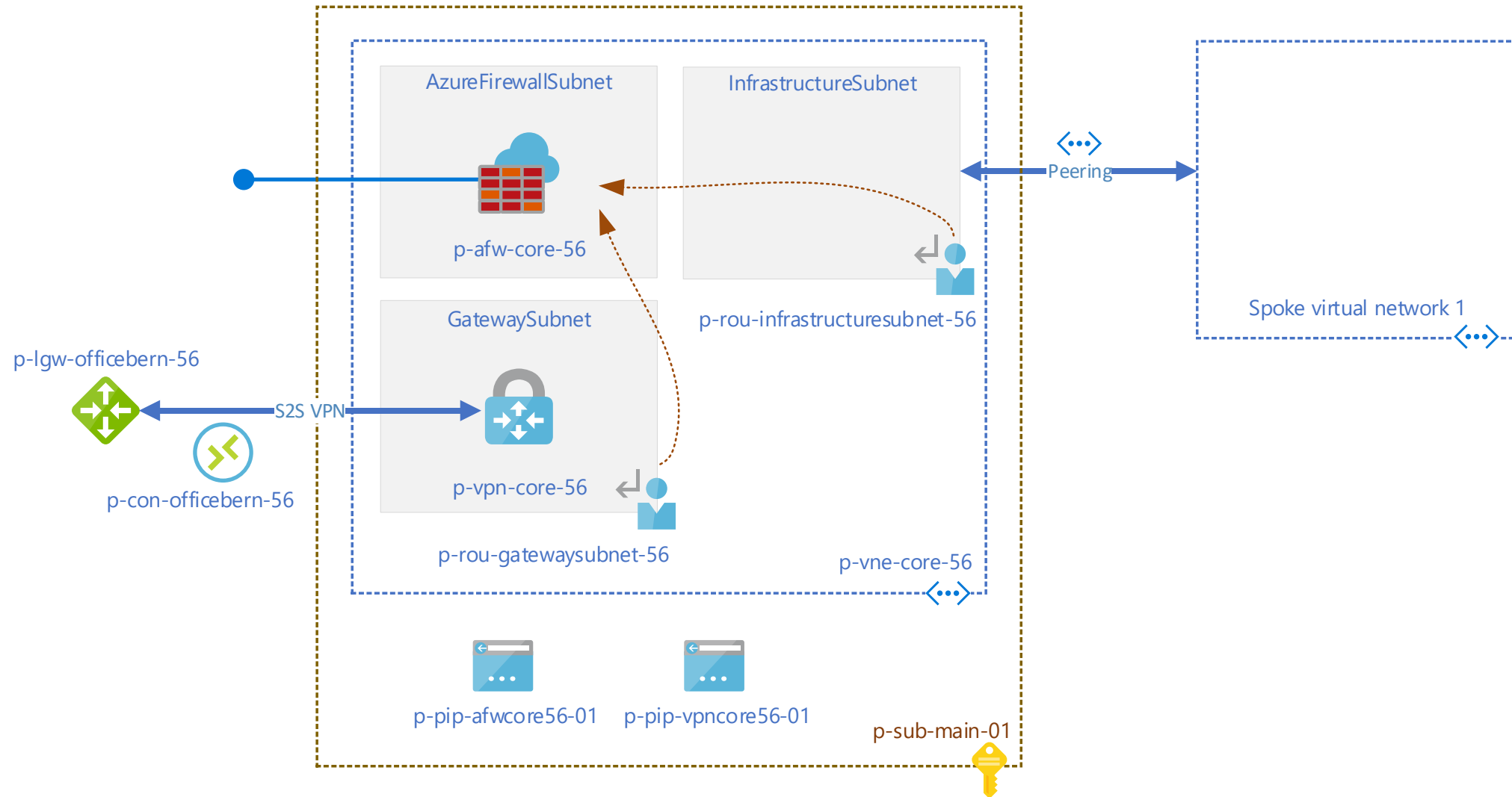
Building a virtual datacenter in 45 minutes



Building a virtual datacenter in 45 minutes



Building a virtual datacenter in 45 minutes



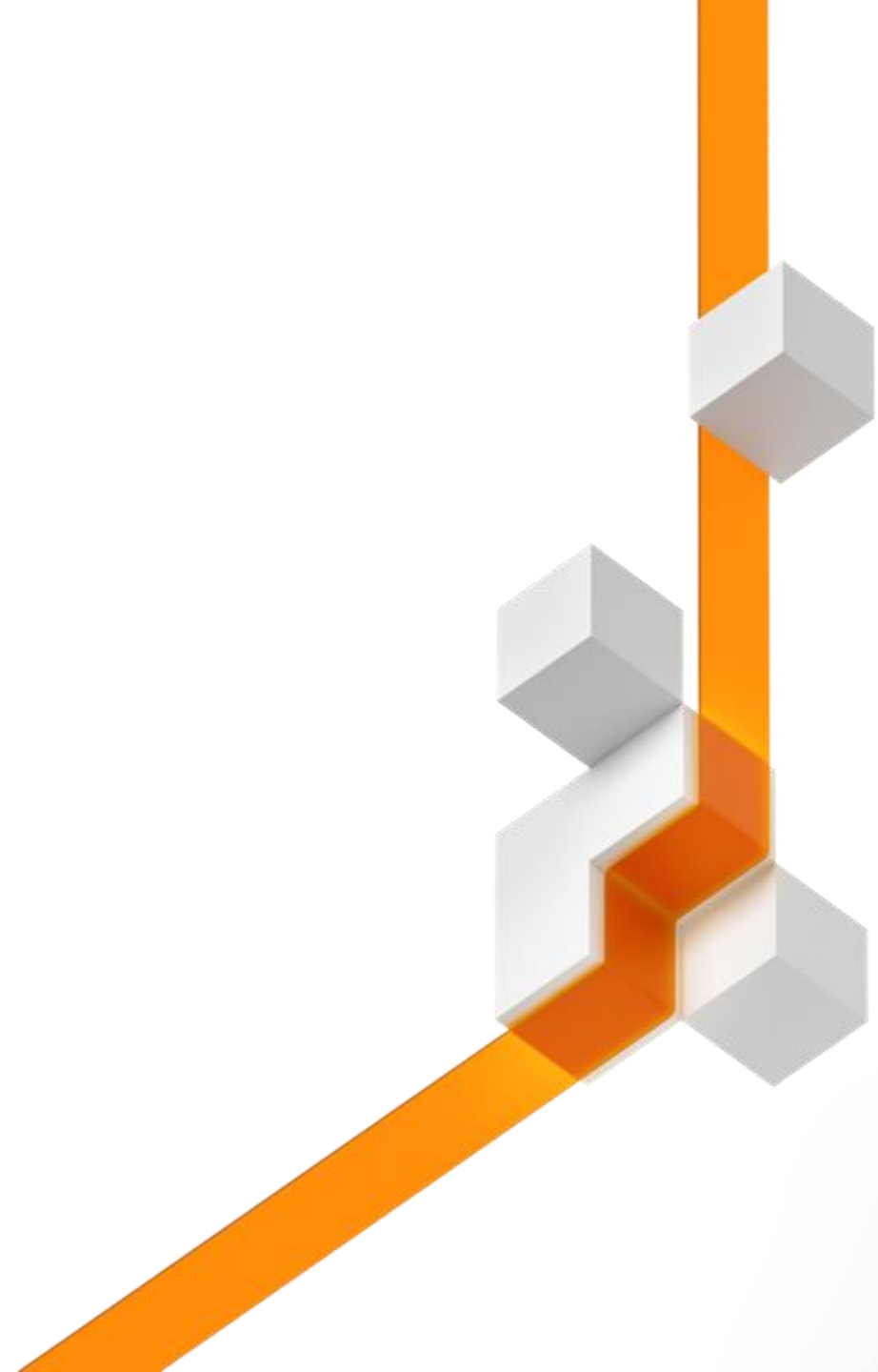
Building a virtual datacenter in 45 minutes



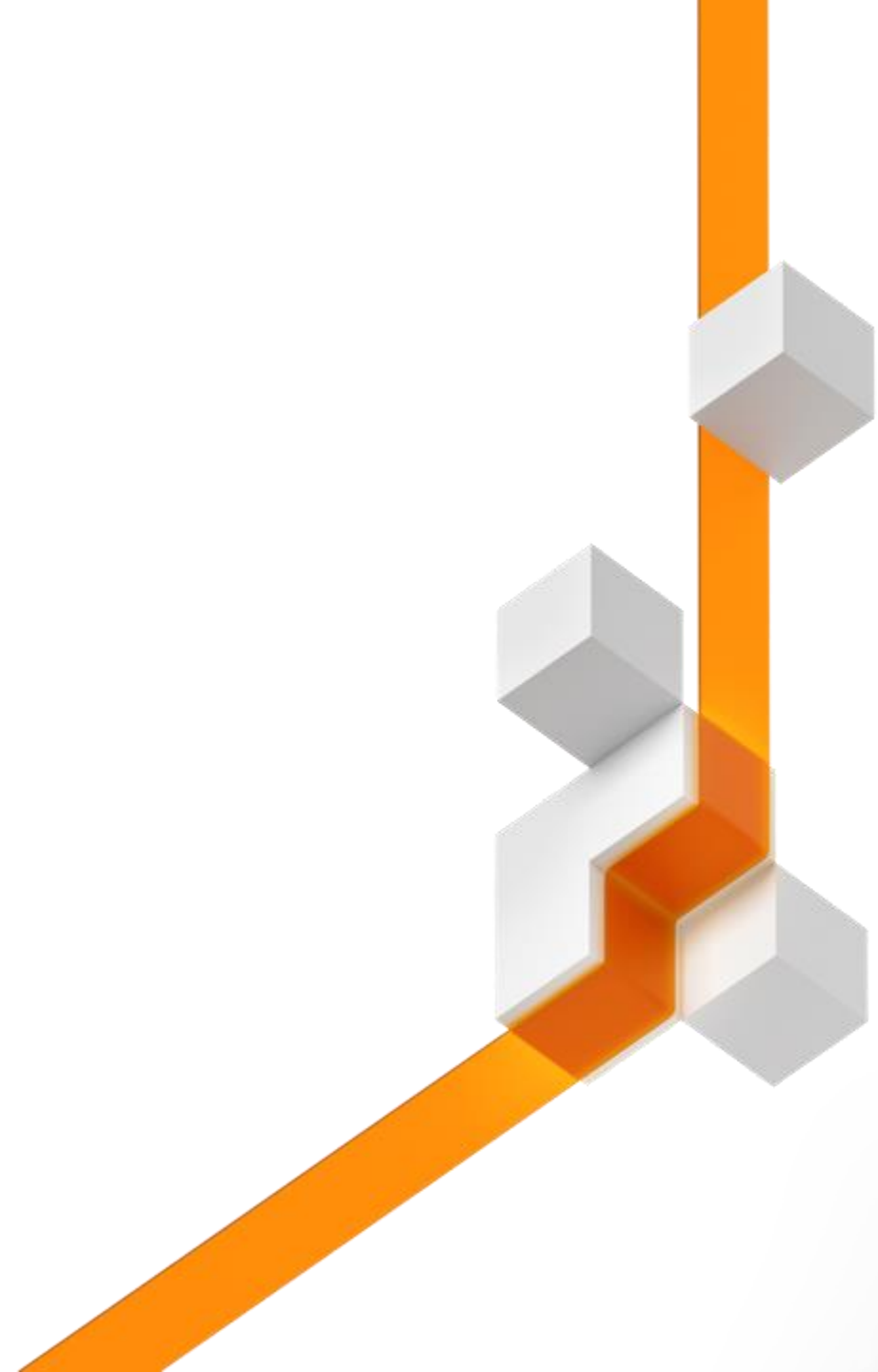
Proper planning is key

Area	Resource/Object Type	Name	Description	Details	Azure Region	Subscription	Resource Group	Resource Template
Hierarchy	Management Group	p-mag-root	Root Management Group	Existing	---	---	---	---
Hierarchy	Management Group	p-mag-it		Existing	---	---	---	---
Hierarchy	Subscription	p-sub-main-01		Existing	---	---	---	---
Hierarchy	Resource Group	p-rgr-corenetwork-01	Resource Group for Core Network		Switzerland North	p-sub-main-01	---	---
Network	Virtual Network	p-vne-core-01	Core Network	Address Range: 172.16.0.0/16 DNS Servers: Default DDOS Protection: Basic	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	virtualNetwork.json
Network	Subnet	AzureFirewallSubnet		Address Range: 172.16.11.0/24	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	virtualNetworkSubnet.json
Network	Subnet	GatewaySubnet		Address Range: 172.16.12.0/24	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	virtualNetworkSubnet.json
Network	Subnet	InfrastructureSubnet		Address Range: 172.16.81.0/24	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	virtualNetworkSubnet.json
Network	Route Table	p-rou-gatewaysubnettofirewall-01	Routes GatewaySubnet traffic. If destination is for the Azure IP range, traffic is forwarded to Azure Firewall. Traffic for on-premises IP-Ranges is sent through the VPN tunnel.	Destination IP Range: 172.16.0.0/16 Next Hop Type: VirtualAppliance Next Hop IP Address: Azure Firewall Private IP	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	routeTable.json
Network	Route Table	p-rou-infrastructuresubnettofirewall-01	Routes InfrastructureSubnet traffic. All traffic is sent to Azure Firewall.	Destination IP Range: 0.0.0.0/0 Next Hop Type: VirtualAppliance Next Hop IP Address: Azure Firewall Private IP	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	routeTable.json
Network	Public IP Address	p-pip-afwcore01-51	Public IP Address for Azure Firewall	Sku: Standard Allocation Method: Static	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	publicIpAddress.json
Network	Public IP Address	p-pip-vgwcore01-51	Public IP Address for Virtual Network Gateway	Sku: Basic Allocation Method: Dynamic	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	publicIpAddress.json
Network	Azure Firewall	p-afw-core-01		Subnet: AzureFirewallSubnet Availability Zone: None	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	azureFirewall.json
Network	Virtual Network Gateway	p-vgw-core-01		Subnet: GatewaySubnet Gateway Type: VPN Generation: 2 Sku: VpnGw2 Type: Route-based Active-Active: Disabled BGP ASN: Disabled	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	vpnGateway.json
Network	Local Network Gateway	p-lgw-officebern-01		Public IP Address: 174.97.102.64 Address Ranges: 10.0.0.0/8 BGP Settings: None	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	vpnLocalGateway.json
Network	Connection	p-con-officebern-01		Type: Site-to-Site Virtual Network Gateway: p-vgw-core-01 Local Network Gateway: p-lgw-onpremises-01	Switzerland North	p-sub-main-01	p-rgr-corenetwork-01	vpnConnection.json

Demo



Key takeaways



Key takeaways

- If you want to master the cloud, go with infrastructure as code
 - Initial service deployment & service maintenance
- Understand the Azure Resource Manager architecture to better understand ARM templates
- Proper planning is key
- Learn, test, test, learn more, test & test again



How to build a virtual datacenter in 45 minutes!

Marcel Zehner | make it noble
Microsoft Azure MVP
@marcelzehner
marcelzehner.ch

