Exam Alert: Deploy and Manage Azure Compute Resources

DEPLOY AND MANAGE AZURE COMPUTE RESOURCES "NEED TO KNOW" EXAM INFORMATION

Michael Teske
AUTHOR EVANGELIST- PLURALSIGHT
@teskemj

Exam Breakdown of Functional Group

Deploy and manage Azure compute resources (25-30%)

- Create and configure VMs
- Configure VMs for high availability and scalability
- Automate deployment and configuration of VMs
- Create and configure containers
- Create and configure Web Apps

Create and configure VMs

Create and configure VMs

Skills measured

- Configure Azure Disk Encryption
- Move VMs from one resource group to another
- Manage VM sizes
- Add data discs
- Configure networking
- Redeploy VMs

Configure Azure disk encryption

Configure Azure disk encryption

Full disk encryption of the OS and data disk.

Azure disk encryption is Integrated with Azure Key Vault

VM's must be able to connect to either Azure AD or the KeyVault endpoint

Move VMs from one resource group to another

Move VMs from one resource group to another

Moving a VM to another subscription requires moving all dependent items

VM scale sets with standard load balancers/PIPs cannot be moved

VMs integrated with key vault for disk encryption cannot be moved

```
Move-AzResource -DestinationResourceGroupName ‘ps-course-rg’ `
   -ResourceId <myResourceId,myResourceId,myResourceId>

Move-AzResource -DestinationSubscriptionId “8bc4fbf0-blah-blah-blah-foo" `
   -DestinationResourceGroupName ‘ps-course-rg’ `
   -ResourceId <myResourceId,myResourceId,myResourceId>
```

Move an Azure VM using PowerShell

Each example supports moving multiple resources via comma separated list.

Manage VM sizes

Manage VM sizes

VM will reboot after being resized

Add data disks

Add data disks

Can add a new or existing data disk

Adding managed disks allows you to choose from source types of BLOB or snapshots

Configure networking

Configure Networking

- When creating an Azure VM, you must create a virtual network or use and existing VNet
- There is no security boundary between subnets by default
- To add a NIC to an existing VM, it must first be deallocated
- A deallocated VM releases dynamically assigned public IPs
- A NIC can only be assigned to a virtual network that exists in the same location as the NIC

Redeploy VMs

Redeploy VMs

Cannot connect via RDP or SSH

Redeploy shuts down the VM and moves to new node and powers back up

Redeploy Virtual Machines

```
# PowerShell
Set-AzVM -Redeploy -ResourceGroupName ‘ps-course-rg’ -Name “linux-1“


# Azure CLI
az vm redeploy --resource-Group ps-course-rg --name linux-1
```

Configure VMs for high availability and scalability “Need to Know”

Michael Teske

AUTHOR EVANGELIST-CLOUD ENGINEER, PLURALSIGHT

@teskemj

Configure High Availability and Scalability

Skills measured

- Configure VMs for high availability
- Deploy and configure scale sets

Configure VMs for high availability

High Availability Constructs

Availability Zones

Fault Domains

Update Domains

Availability Sets

Scale Sets

Availability Zones

Availability zones distribute VMs across *Azure regions*

- 3 zones per region

Standard SKU load balancers are availability zone aware

Standard SKU PIPs are required

SLA Availability Zones

"For all Virtual Machines that have two or more instances deployed across two or more Availability Zones in the same Azure region, we guarantee you will have Virtual Machine Connectivity to at least one instance at least 99.99% of the time."

Reference: https://bit.ly/2IrIG6S

High Availability

Fault Domains

Logical group of hardware in an Azure datacenter

VMs in the same fault domain share common power source and physical network switch

Update Domains

Protect against normal maintenance updates

VMs created in the same update domain will be restarted together during planned maintenance

Only one update domain restarted at a time

Availability Sets

Availability sets group VMs to distribute across a single datacenter

5 update domains assigned by default

- Can provide up to 20

Cannot add a VM to availability set post deployment.

- Must be done at creation

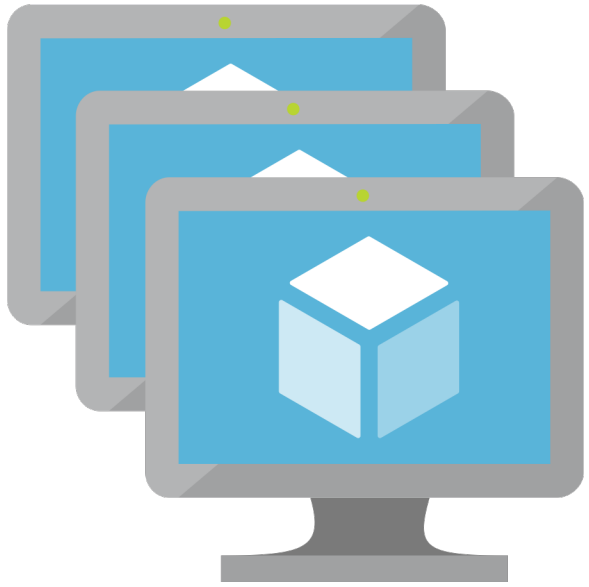
SLA for Availability Sets

For all Virtual Machines that have two or more instances deployed in the same Availability Set or in the same Dedicated Host Group, we guarantee you will have Virtual Machine Connectivity to at least one instance at least 99.95% of the time.

Reference: https://bit.ly/2IrIG6S

Deploy and configure scale sets

Virtual Machine Scale Sets



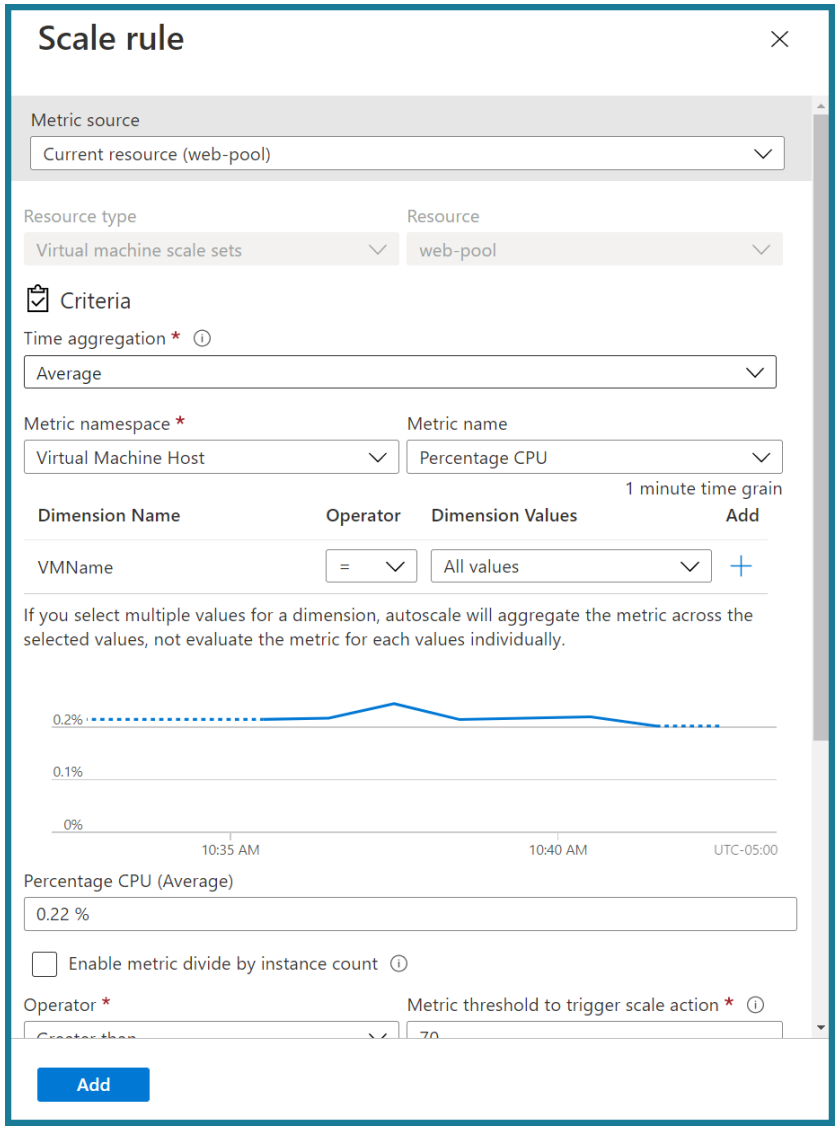
Group of load balanced virtual machines

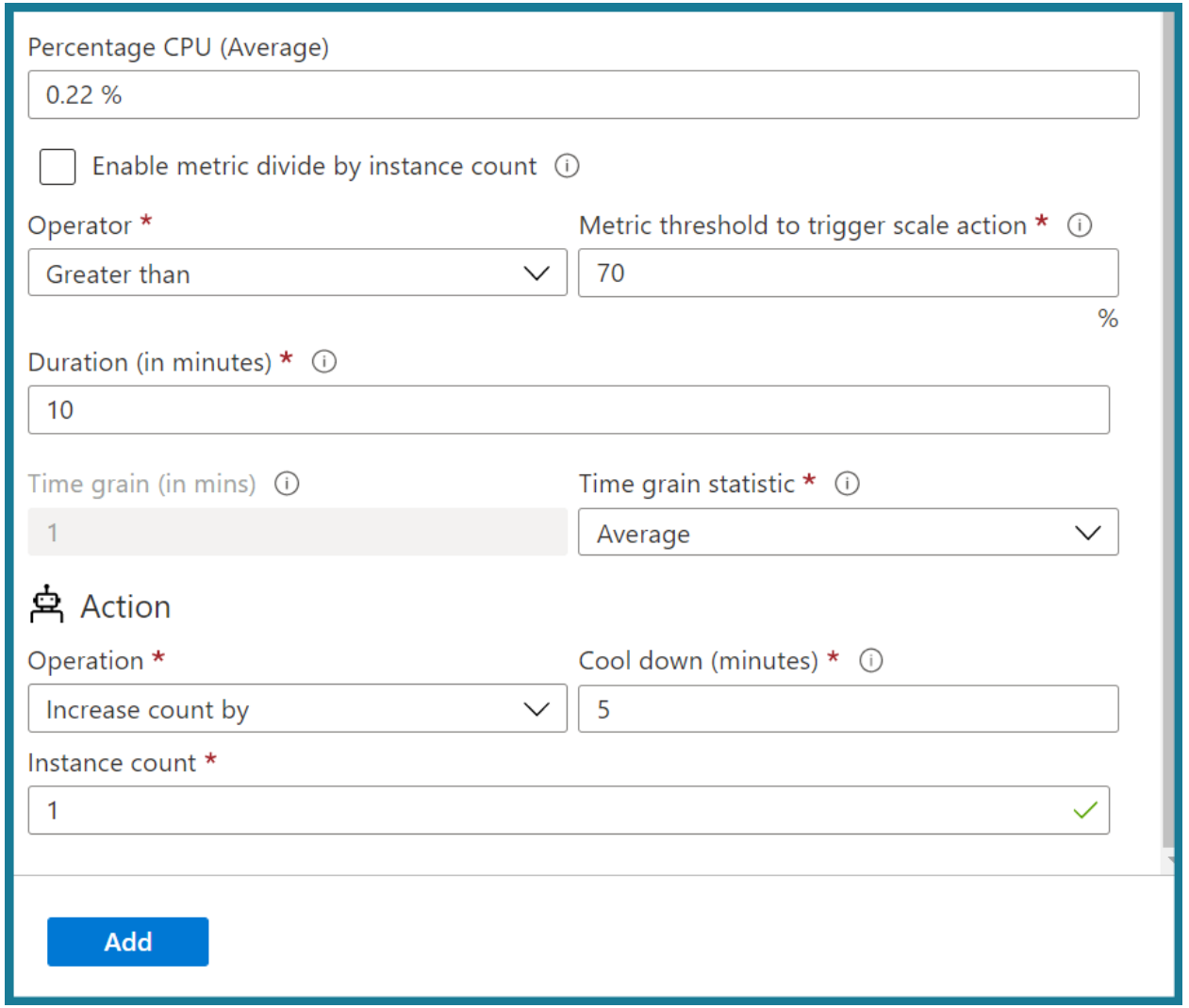
Can scale automatically based on demand or schedule

2 or more VMs recommended

Can be deployed across multiple update/fault domains

Virtual Machine Scale Sets





Automate deployment and configuration of VMs “Need to Know:

Michael Teske

AUTHOR EVANGELIST-CLOUD ENGINEER, PLURALSIGHT

@teskemj

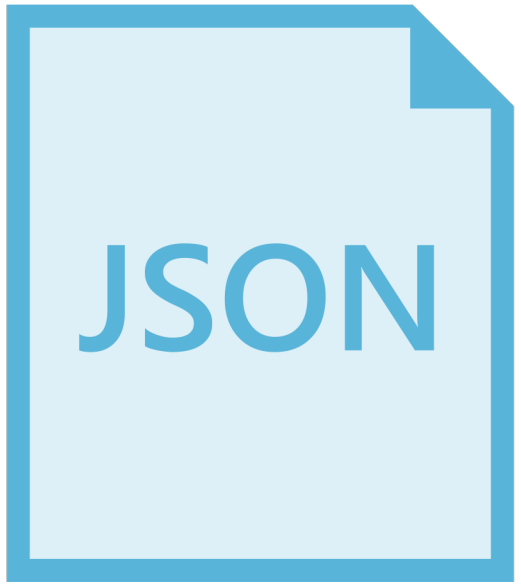
Automate deployment and configuration of VMs

Skills measured

- Modify ARM template
- Deploy from template
- Save a deployment as an ARM template
- Automate configuration management by using custom script extension
- Configure VHD template

Modify ARM template

ARM Templates



JSON format

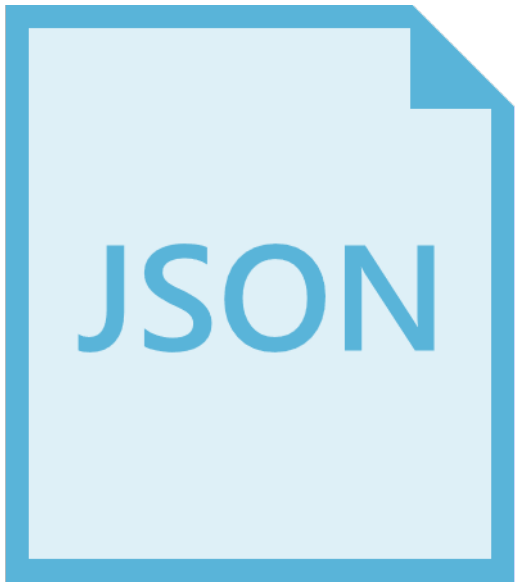
Used to create or modify resources in Azure

Submit template to the Azure Resource Manager

ARM Template

```
11      "resources": [
12          {
13              "type": "Microsoft.Network/networkSecurityGroups",
14              "apiVersion": "2020-05-01",
15              "name": "[parameters('networkSecurityGroups_web_nsg_name')]",
16              "location": "centralus",
17              "tags": {
18                  "environment": "production"
19              },
20              "properties": {
21                  "securityRules": [
22                      {
23                          "name": "Port_443",
24                          "properties": {
25                              "protocol": "*",
26                              "sourcePortRange": "*",
27                              "destinationPortRange": "443",
28                              "sourceAddressPrefix": "*",
29                              "destinationAddressPrefix": "*",
30                              "access": "Allow",
31                              "priority": 100,
32                              "direction": "Inbound",
33                              "sourcePortRanges": [],
34                              "destinationPortRanges": [],
35                              "sourceAddressPrefixes": [],
36                              "destinationAddressPrefixes": []
37                          }
38                      }
39                  ]
```

Modify ARM Template

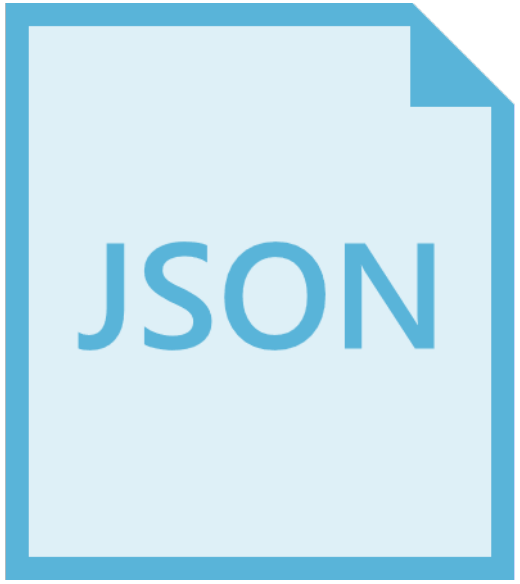


Can modify existing template in portal

- Choose Export template under Automation
- Select Deploy to edit template
- Make changes and save

Deploy from template

Deploy from Template



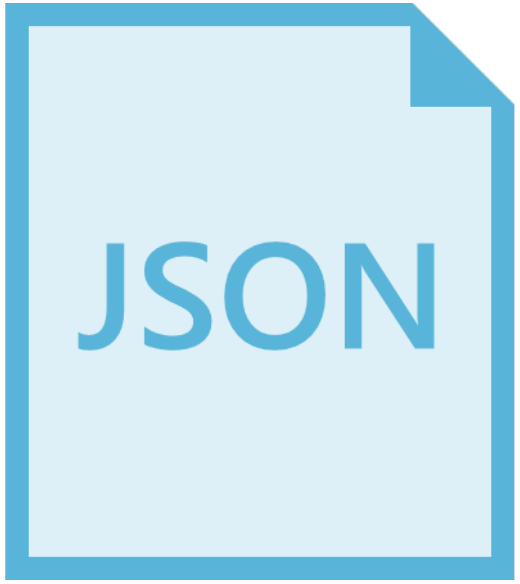
Generate a template in the portal

Download the template

Edit and deploy modified template

Save a deployment as an ARM template

Save a Deployment as an ARM Template



Locate resource group in the portal

Choose Export template

Download template

Automate configuration management by using custom script extension

Scripts can be located anywhere

Scripts can be deployed with ARM templates

Script will only run once

Configure VHD template

Configure VHD Template

- Sysprep managed image with support up to 20 simultaneous deployments
- Capture image, provide image name
- Choose to have VM deleted after capture
- Provide virtual machine name to confirm the process

Create and Configure Containers "Need to Know"

Michael Teske

AUTHOR EVANGELIST-CLOUD ENGINEER, PLURALSIGHT

@teskemj

Create and Configure Containers

Skills measured

- Create and Configure Azure Containers
- Create and Configure Azure Kubernetes Service

Create and Configure Containers

Create and Configure Containers

Restart policies

- Always
- On failure
- Never

```
# Create a resource group
az group create --name ps-course-rg --location centralus

# Create and deploy container

az container create --resource-group ps-course-rg --name mycontainer \

--image mcr.microsoft.com/azuredocs/aci-helloworld --dns-name-label az104-demo \

--ports 80 --restart-policy Always
```

Creating an Azure Container Instance

Azure CLI

Create and Configure Azure Kubernetes Service

Create and Configure Azure Kubernetes Service

The AKS cluster must use virtual machine scale sets for the nodes for autoscaling and multiple node pools

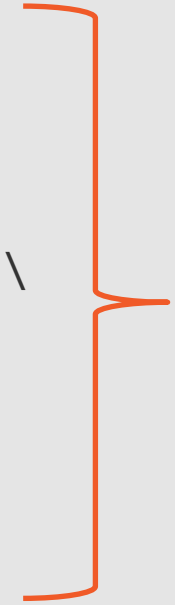
All node pools must reside in the same virtual network

AKS cluster must use the *Standard SKU* load balancer to use multiple node pools

Create a AKS Single Node Cluster

```
# Create a basic single-node AKS cluster

az aks create \
    --resource-group ps-course-rg \
    --name PSAKSCluster \
    --vm-set-type VirtualMachineScaleSets \
    --node-count 2 \
    --generate-ssh-keys \
    --load-balancer-sku standard
```



Create and Configure Web Apps "Need to Know"

Michael Teske

AUTHOR EVANGELIST-CLOUD ENGINEER, PLURALSIGHT

@teskemj

Create and Configure Web Apps

Skills measured

- Create and configure App Service Plans
- Create and configure App Service

Create and configure App Service Plans

Create and Configure App Service Plans

Features	Free/shared	Standard	Premium v2	Premium v3
Custom domain	Shared D, B	Yes	Yes	Yes
Scale	B manual (3)	Auto 10	Auto 20	Auto 30
Staging slots	--	5	20	20
Daily backups	--	10	50	50
Traffic Manager	--	Yes	Yes	Yes

```
# Create resource group

az group create --name ps-app-rg --location centralus

# Create app service plan

az appservice plan create --name psasp --resource-group ps-app-rg --sku F1 --is-linux

# Create web app

az webapp create --name dotnetapp --resource-group ps-app-rg --plan psasp
```

Create App Service using Azure CLI

Create and configure App Service

Create and configure App Service

Web app and App Service Plan needs to be in the same region

You can't mix Windows and Linux apps in the same App Service plan

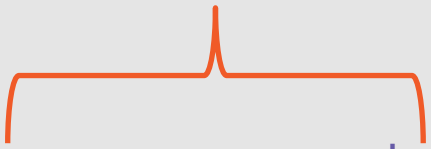
.Net Core is supported on both Windows and Linux

Autoscaling is determined by rules based on threshold metrics defined

Additional Learning

Creating a VM using PowerShell

```
New-AzResourceGroup –Name ‘ps-course-rg’ –Location ‘CentralUS’
New-AzVm -ResourceGroupName ‘ps-course-rg’ -Name ‘windows-1’`
    -Location ‘CentralUS’ -VirtualNetworkName ‘main-vnet’`
    -SubnetName ‘backend’ -SecurityGroupName ‘myNetworkSecurityGroup’`
    -PublicIpAddressName ‘myPublicIpAddress’-OpenPorts 80,3389
```



```
az group create --name ps-course-rg --location centralus

az vm create --resource-Group ps-course-rg --name windows-1 \

    --image win2016datacenter --admin-username azureuser
```

Creating a VM Using Azure CLI

Exam Strategy

Schedule your exam

Know what product SKUs are required for services

- Availability zones
- App service plans

Be familiar with implementations in portal and with code

Check out Pluralsight's hands on labs

Good luck! You got this!