Microsoft Azure Developer: Implement IaaS Solutions

PROVISIONING AND CONFIGURING AZURE VIRTUAL MACHINES

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Course Overview

Provisioning and Configuring Azure Virtual Machines

Creating and Running Containers in Azure

Course Coverage for Certification Objectives

Implement IaaS Solutions

Provision Virtual Machines

Configure, validate, and deploy ARM templates

Create container images for solutions

Publish an image to the Azure Container Registry

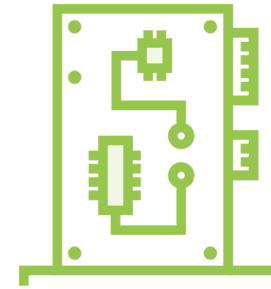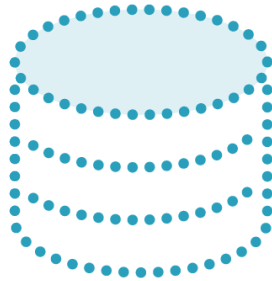Run containers by using Azure Container Instances

https://docs.microsoft.com/en-us/learn/certifications/azure-developer

Virtual Machine Components
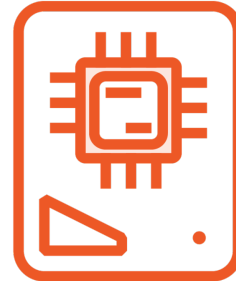
Resource Group

VM Size

Network

Images

Virtual Disk

Methods to Create an Azure Virtual Machine

Azure Portal

Azure CLI

Azure PowerShell (Az Module)

Azure ARM Templates

Creating a Virtual Machine in the Azure Portal

Basics   Disks   Networking   Management   Advanced   Tags   Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Learn more ⬈

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

| Demonstration Account | ⌄ |

      Resource group * ⓘ

| (New) psdemo-rg | ⌄ |

Create new

Creating a Virtual Machine in the Azure Portal

Instance details

Virtual machine name * ⓘ	psdemo-win-portal ✓
Region * ⓘ	(US) West US ⌄
Availability options ⓘ	No infrastructure redundancy required ⌄
Image * ⓘ	Windows Server 2016 Datacenter - Gen1 ⌄
	Browse all public and private images
Azure Spot instance ⓘ	☐
Size * ⓘ	Standard_D2s_v3 - 2 vcpus, 8 GiB memory ($85.41/month) ⌄
	Select size

Creating a Virtual Machine in the Azure Portal

Administrator account

Username * ⓘ

Password * ⓘ

Confirm password * ⓘ

Creating a Virtual Machine in the Azure Portal

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * ⓘ   ◯ None   ⦿ Allow selected ports

Select inbound ports *

RDP (3389)   ⌃

- ☐ HTTP (80)
- ☐ HTTPS (443)
- ☐ SSH (22)
- ☑ RDP (3389)

Lab Environment

Azure Account and Subscription

https://azure.microsoft.com/en-us/account/

Ability to create resources in Azure

Resource Groups

Virtual Machines and Containers

Storage Accounts

Networking Elements

Container Registries

Lab Environment

Azure CLI

https://docs.microsoft.com/en-us/cli/azure/install-azure-cli

Azure PowerShell (Az Module)

https://docs.microsoft.com/en-us/powershell/azure/install-az-ps

Docker

https://docs.docker.com/engine/install/

Demo

Creating a Virtual Machine in the Azure Portal

Accessing a VM Remotely

Creating VMs Programmatically

Add consistency to your deployments and VM creation

Any production system should be implemented using automation

Construct similar down-level environments, such as DEV/TEST

Tools for Creating a VM Programmatically

Azure CLI

**Azure PowerShell
(Az Module)**

ARM Templates

Creating a VM Programmatically

Create a Resource Group	Create the Virtual Machine
Ensure Remote Access Port is Open	Retrieve the Public IP address

Provisioning Microsoft Azure Virtual Machines

Creating a VM with Azure CLI

```
az group create \
    --name "psdemo-rg" \
    --location "centralus"


az vm create \                              az vm create \
    --resource-group "psdemo-rg" \              --resource-group "psdemo-rg" \
    --name "psdemo-win-cli" \                   --name "psdemo-linux-cli" \
    --image "win2019datacenter" \               --image "UbuntuLTS" \
    --admin-username "demoadmin" \              --admin-username "demoadmin" \
    --admin-password "password123$%^&*"         --authentication-type "ssh" \
                                                --ssh-key-value ~/.ssh/id_rsa.pub
```

https://docs.microsoft.com/en-us/cli/azure/vm#az_vm_create

Enabling Remote Access with Azure CLI

```
az vm open-port \
    --resource-group "psdemo-rg" \
    --name "psdemo-win-cli" \
    --port "3389"
```

```
az vm open-port \
    --resource-group "psdemo-rg" \
    --name "psdemo-linux-cli" \
    --port "22"
```

```
az vm list-ip-addresses \
    --resource-group "psdemo-rg" \
    --name "psdemo-linux-cli"
```

Demo

Creating a VM with Azure CLI

Enable remote access using Azure CLI

Creating a VM with Azure PowerShell

```powershell
$username = 'demoadmin'
$password = ConvertTo-SecureString 'password123$%^&*' -AsPlainText -Force
$WindowsCred = New-Object System.Management.Automation.PSCredential ($username, $password)

New-AzVM `
    -ResourceGroupName 'psdemo-rg' `
    -Name 'psdemo-win-az' `
    -Image 'Win2019Datacenter' `
    -Credential $WindowsCred `
    -OpenPorts 3389

Get-AzPublicIpAddress `
    -ResourceGroupName 'psdemo-rg' `
    -Name 'psdemo-win-az' | Select-Object IpAddress
```
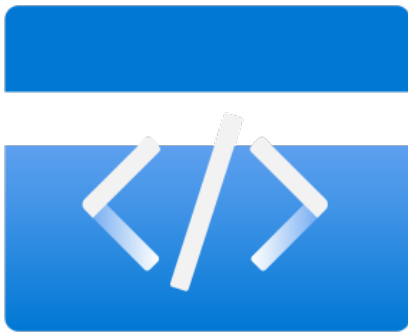
https://docs.microsoft.com/en-us/azure/virtual-machines/linux/quick-create-powershell

Demo

Creating a VM with Azure PowerShell

ARM Templates

- JSON file that defines your resources

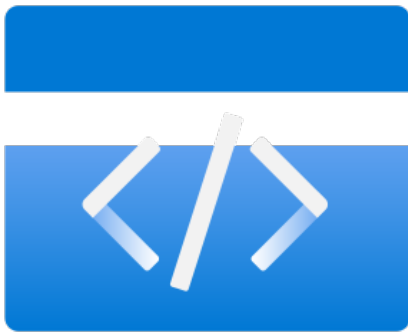- Building block for automation

- Templates are submitted to ARM for provisioning

- Export a ARM Template in Azure Portal

- Write your own

- Deploy from the Quickstart template library

Deploying ARM Templates

Azure Portal

Azure CLI

PowerShell (Az Module)

REST API

Azure Cloud Shell

ARM Template Format

```
{
   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/.
   deploymentTemplate.json#",
   "contentVersion": "",
   "apiProfile": "",
   "parameters": {  },
   "variables": {  },
   "functions": [  ],
   "resources": [  ],
   "outputs": {  }
}
```

**https://docs.microsoft.com/en-us/azure/azure-resource-manager/
templates/template-functions**

Demo

Configure, validate, and deploy ARM template

Up Next:
Creating and Running Containers in Azure