

## Case Study Tasks - Walk through

Task-1: Creating Two Resource groups using Azure CLI.

Solution: Command: `az group create --name WEBRG. --location Eastus`

```
mohammadsufiyan@MacBook-Air ~ % az group create --name WEBRG --location eastus
{
  "id": "/subscriptions/6b05fa10-33a6-41a2-a3e2-4f930813f6ae/resourceGroups/WEBRG",
  "location": "eastus",
  "managedBy": null,
  "name": "WEBRG",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
[mohammadsufiyan@MacBook-Air ~ % az group create --name SCRG --location Southcentralus
{
  "id": "/subscriptions/6b05fa10-33a6-41a2-a3e2-4f930813f6ae/resourceGroups/SCRG",
  "location": "southcentralus",
  "managedBy": null,
  "name": "SCRG",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
mohammadsufiyan@MacBook-Air ~ %
```

Task-2:- Creating two Virtual “ WEBVNET & SCVNET “ networks using Azure CLI:

Solution: Command: `az network vnet create --name WEBVNET --resource-group WEBRG --subnet-name default`

`az network vnet create --name SCVNET --resource-group SCRG --subnet-name default`

```

mohammadsufiyan@MacBook-Air ~ % az network vnet create --name WEBVNET --resource-group WEBRG --subnet-name default
{
  "newVNet": {
    "addressSpace": {
      "addressPrefixes": [
        "10.0.0.0/16"
      ]
    },
    "bgpCommunities": null,
    "ddosProtectionPlan": null,
    "dhcpOptions": {
      "dnsServers": []
    },
    "enableDdosProtection": false,
    "enableVmProtection": null,
    "etag": "W/\"5cf038bc-148b-4b20-bb4e-9ed55b0dffd4\"",
    "extendedLocation": null,
    "flowTimeoutInMinutes": null,
    "id": "/subscriptions/6b05fa10-33a6-41a2-a3e2-4f930813f6ae/resourceGroups/WEBRG/providers/Microsoft.Network/virtualNetworks/WEBVNET",
    "ipAllocations": null,
    "location": "eastus",
    "name": "WEBVNET",
    "provisioningState": "Succeeded",
    "resourceGroup": "WEBRG",
    "resourceGuid": "95203650-3a85-4497-862e-8b5058fae99c",
    "subnets": [
      {
        "addressPrefix": "10.0.0.0/24",
        "addressPrefixes": null,
        "applicationGatewayIpConfigurations": null,
        "delegations": [],
        "etag": "W/\"5cf038bc-148b-4b20-bb4e-9ed55b0dffd4\"",
        "id": "/subscriptions/6b05fa10-33a6-41a2-a3e2-4f930813f6ae/resourceGroups/WEBRG/providers/Microsoft.Network/virtualNetworks/WEBVNET/subnets/default",
        "ipAllocations": null,
        "ipConfigurationProfiles": null,
        "ipConfigurations": null,
        "name": "default",
        "natGateway": null,
        "networkSecurityGroup": null,
        "privateEndpointNetworkPolicies": "Enabled",
        "privateEndpoints": null,
        "privateLinkServiceNetworkPolicies": "Enabled",
        "provisioningState": "Succeeded",
        "purpose": null,
        "resourceGroup": "WEBRG",
        "resourceNavigationLinks": null,
        "routeTable": null,
        "serviceAssociationLinks": null,
        "serviceEndpointPolicies": null,
        "serviceEndpoints": null,
        "type": "Microsoft.Network/virtualNetworks/subnets"
      }
    ],
    "tags": {},
    "type": "Microsoft.Network/virtualNetworks",
    "virtualNetworkPeerings": []
  }
}

```

Task-3: Creating two windows servers “ VWEBV001 & VWEBV0002 “ using Azure CLI and installed IIS in EastUS Region.

Solution: To create VM with Availability Zone:

`az vm create --resource-group WEBRG --name VWEBV001 --image win2016datacenter --admin-username WEBUSSER1 --zone 2`

To Open port 80:

`az vm open-port --port 80 --resource-group WEBRG --name VWEBV001`

```
mohammadsufiyan@MacBook-Air ~ % az vm create --resource-group WEBRG --name VWEBV001 --image win2016datacenter --admin-username WEBUSSER1 --zone 2
Admin Password:
Confirm Admin Password:
{
  "fqdns": "",
  "id": "/subscriptions/6b05fa10-33a6-41a2-a3e2-4f930813f6ae/resourceGroups/WEBRG/providers/Microsoft.Compute/virtualMachines/VWEBV001",
  "location": "eastus",
  "macAddress": "00-0D-3A-9A-87-FB",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.4",
  "publicIpAddress": "20.55.99.131",
  "resourceGroup": "WEBRG",
  "zones": "2"
}
mohammadsufiyan@MacBook-Air ~ % az vm open-port --port 80 --resource-group WEBRG --name VWEBV001
{
  "defaultSecurityRules": [
    {
      "access": "Allow",
      "description": "Allow inbound traffic from all VMs in VNET",
      "destinationAddressPrefix": "VirtualNetwork",
      "destinationAddressPrefixes": [],
      "destinationApplicationSecurityGroups": null,
```

Installing IIS on the box:

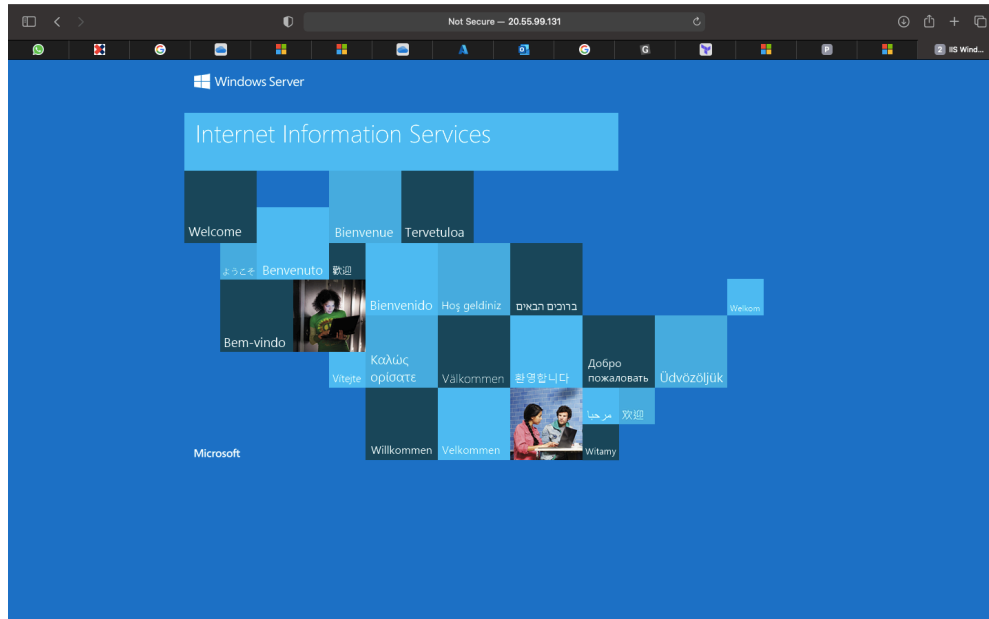
```
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\WEBUSSER1> Install-WindowsFeature -name Web-Server -IncludeManagementTools

Success Restart Needed Exit Code      Feature Result
-----
True      No              Success      {Common HTTP Features, Default Document, D...
```

“Install-WindowsFeature -name Web-Server -IncludeManagementTools” from Powershell console on the box.

Similarly Created for other VM - VWEBV002 and also JUMP SERVER IN DIFFERENT REGION:



Task-4:Created Backup for WEBServers:

Solution: From recovery Services Vault I have created a vault and added two web servers to backup with default policy.

[Home](#) > [Recovery Services vaults](#) > [WEBSERVERSBACKUP](#) >

## Configure Backup ...

WEBSERVERSBACKUP

Backup policy \* ⓘ

DefaultPolicy ▼

[Create a new policy](#)

### Policy Details

Full Backup

#### Backup Frequency

Daily at 4:30 AM UTC

#### Instant Restore

Retain instant recovery snapshot(s) for 2 day(s)

#### Retention of daily backup point

Retain backup taken every day at 4:30 AM for 30 Day(s)

### Virtual machines

| Name     | Resource Group | OS Disk Only             |
|----------|----------------|--------------------------|
| VWEBV001 | WEBRG          | <input type="checkbox"/> |
| VWEBV002 | WEBRG          | <input type="checkbox"/> |

Add

**i OS Disk only backup** option allows you to backup Azure Virtual Machine with only OS disk and exclude all the data disks. You can use Selective Disk Backup feature through Powershell or CLI to include or exclude specific data disks. Know more about Selective Disk Backup feature, its limitation and pricing- [Learn more](#).

Task-5: Created CPU Usage Alert on two web servers:

Solution:

Home > Virtual machines > VWEBV001 >

## Alert rules

+ New alert rule Edit columns Manage actions View classic alerts Refresh | Enable Disable Delete

Subscription : Free Trial Resource group : WEBRG Resource type : All Resource : VWEBV001 Signal type : All signal types Status : Enabled

Displaying 1 - 1 rules out of total 1 rules

Search alert rules based on rule name and condition...

| Name                                 | Condition                             | Status  | Target resource | Target resource type | Signal type |
|--------------------------------------|---------------------------------------|---------|-----------------|----------------------|-------------|
| <input type="checkbox"/> CPUUSAGE_80 | Whenever the count of percentage c... | Enabled | VWEBV001        | Virtual machines     | Metrics     |

Task:6: Created Load Balancer for web servers:

Solution:

Home > Load balancing - help me choose (Preview) >

## webloadbalancer

Load balancer

Search (Cmd+/) Move Delete Refresh Give feedback

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
  - Frontend IP configuration
  - Backend pools
  - Health probes

### Essentials

Resource group (change) : WEBRG Backend pool : WEBserverpool (2 virtual machines)

Location : East US Load balancing rule : WEBLBRULE (Tcp/80)

Subscription (change) : Free Trial Health probe : WebloadHP (Tcp:80)

Subscription ID : 6b05fa10-33a6-41a2-a3e2-4f930813f6ae NAT rules : 0 inbound

SKU : Standard Public IP address : 20.84.68.203 (webIP)

Tags (change) : Click here to add tags

**Configure high availability and scalability for your applications**

Create highly-available and scalable applications in minutes by using built-in load balancing for cloud services and virtual machines. Azure

Backend Pool:

Load balancing - help me choose (Preview) > webloadbalancer

webloadbalancer | Backend pools

Load balancer

Search (Cmd+ /)

<<

+ Add

Refresh

Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

ings

Frontend IP configuration

Backend pools

Health probes

Load balancing rules

Inbound NAT rules

Outbound rules

Filter by name...

Backend pool == allResource Name == allResource Status == allIP address == allNetwork interface == allAvailability zone == all

Group by Backend pool

| Backend pool    | Resource Name | Resource Status       | IP Address | Network interface | Availability zone |
|-----------------|---------------|-----------------------|------------|-------------------|-------------------|
| ▼ WEBserverpool |               |                       |            |                   |                   |
| WEBserverpool   | VWEBV001      | Running               | 10.0.0.4   | VWEBV001VMNic     | 2                 |
| WEBserverpool   | VWEBV002      | Stopped (deallocated) | 10.0.0.5   | VWEBV002VMNic     | 2                 |

Loadbalancer rules:

Load balancing - help me choose (Preview) > webloadbalancer >

webloadbalancer | Load balancing rules

Load balancer

Search (Cmd+ /)

<<

+ Add

Refresh

Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

tings

Frontend IP configuration

Backend pools

Health probes

Load balancing rules

Inbound NAT rules

Outbound rules

Properties

Locks

Filter by name...

| Name ↑↓   | Load balancing rule ↑↓ | Backend pool ↑↓ | Health probe ↑↓ |
|-----------|------------------------|-----------------|-----------------|
| WEBLBRULE | WEBLBRULE (TCP/80)     | WEBserverpool   | WebloadHP       |

Task-7: VNet peering to connect between two regions:

Solution: Created peering network between subnets of eastus and south central US:

me > Virtual networks > SCVNET

### SCVNET | Peerings

Virtual network

Search (Cmd+/) << + Add Refresh

Filter by name...

| Name ↑↓    | Peering status ↑↓ | Peer ↑↓ | Gateway transit ↑↓ |
|------------|-------------------|---------|--------------------|
| sctoeastus | Connected         | WEBVNET | Disabled           |

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Address space

Connected devices

Subnets

DDoS protection

Firewall

Security

DNS servers

Peerings



## WEBVNET | Peerings

Virtual network



Add



Refresh

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

### Settings

Address space

Connected devices

Subnets

DDoS protection

Firewall

Security

DNS servers

Peerings

Service endpoints

| Name ↑↓    | Peering status ↑↓ | Peer ↑↓ | Gateway transit ↑↓ |
|------------|-------------------|---------|--------------------|
| eastustoSC | Connected         | SCVNET  | Disabled           |

For Jump server to communicate:

## jumpRG-vnet | Peerings

Virtual network



Add



Refresh

DNS servers

Peerings

Service endpoints

Private endpoints

Properties

Locks

### Monitoring



Alerts

| Name ↑↓      | Peering status ↑↓ | Peer ↑↓ | Gateway transit ↑↓ |
|--------------|-------------------|---------|--------------------|
| JumpTOEASTUS | Connected         | WEBVNET | Disabled           |
| JUMPTOSC     | Connected         | SCVNET  | Disabled           |






Task-8: Created Storage account in zone -redundant storage for residency in case of data centre failure

Solution:

> [Storage accounts](#) >

 **generalstorageaccoun**  ...

Storage account

Search (Cmd+/) <<  Open in Explorer  Delete  Move  Refresh  Feedback

**Overview**

Activity log

Tags


Diagnose and solve problems

Access Control (IAM)


Data migration

Events

Storage Explorer (preview)

 Microsoft recommends upgrading to the new alerts platform to ensure no interruptions in your alerts. Classic alerts will be retired starting in 2021. Upgrade to the new alerts platform. [Learn more](#)

^ Essentials [JSON View](#)

|   |   |                         |                                  |
|---|---|-------------------------|----------------------------------|
| Resource group <a href="#">(change)</a> | : <a href="#">SCRG</a>  | Performance/Access tier | : Standard/Hot                   |
| Location                                | : South Central US  | Replication             | : Zone-redundant storage (ZRS)   |
| Subscription <a href="#">(change)</a>   | : <a href="#">Free Trial</a>  | Account kind            | : StorageV2 (general purpose v2) |
| Subscription ID                         | : 6b05fa10-33a6-41a2-a3e2-4f930813f6ae  | Provisioning state      | : Succeeded                      |
| Disk state                              | : Available  | Created                 | : 14/07/2021, 17:18:42           |

Tags [\(change\)](#) :

Task-9: Created a fileshare for salesmanager to access files:

Solution:

We can mount the drive in respective system , using the commands below:

The screenshot shows the Microsoft Azure portal interface. On the left, the navigation pane includes 'Overview', 'Diagnose and solve problems', 'Access Control (IAM)', 'Settings', 'Properties', 'Operations', 'Snapshots', and 'Backup'. The main area displays the 'Connect' dialog for the file share 'sharedrivesalesmanager'. The 'Authentication method' section has two options: 'Active Directory' (unselected) and 'Storage account key' (selected). A note states: 'Connecting to a share using the storage account key is only appropriate for admin access. Mounting the Azure file share with the Active Directory identity of the user is preferred. [Learn more](#)'. Below this, a PowerShell script is provided for mounting the drive. The script checks for network connectivity to port 445 and mounts the drive as 'Z' if successful, or displays an error message if not. A note at the bottom states: 'Note: The script will only work on Windows Server 2012 and above.'

```
$connectTestResult = Test-NetConnection -ComputerName
generalstorageaccoun.file.core.windows.net -Port 445
if ($connectTestResult.TcpTestSucceeded) {
    # Save the password so the drive will persist on reboot
    cmd.exe /C "cmdkey /add:"generalstorageaccoun.file.core.windows.net"
    /user:"localhost\generalstorageaccoun"
    /pass:"2AqAZyU3y+WQUAm4762hQPEr9cpEwcW4euf4843dagsPavenc7pHck6/60JX
r3ZJdCEnxh+XwY9E21FjarhTKQ=="
    # Mount the drive
    New-PSDrive -Name Z -PSProvider FileSystem -Root
    "\\generalstorageaccoun.file.core.windows.net\sharedrivesalesmanager" -Persist
} else {
    Write-Error -Message "Unable to reach the Azure storage account via port 445.
Check to make sure your organization or ISP is not blocking port 445, or use Azure
P2S VPN, Azure S2S VPN, or Express Route to tunnel SMB traffic over a different
port."
}
```

This script will check to see if this storage account is accessible via TCP port 445, which is the port SMB uses. If port 445 is available, your Azure file share will be persistently mounted. Your organization or internet service provider (ISP) may block port 445, however you may use Azure [Point-to-Site \(P2S\) VPN](#), Azure [Site-to-Site \(S2S\) VPN](#), or [ExpressRoute](#) to tunnel SMB traffic to your Azure file share over a different port.

Note: The script will only work on Windows Server 2012 and above.

Task 10: The storage should be accessible by applications with secure access. provide access urls and keys

Solution: After creating storage account , we can share access keys with whichever application has to read data .

2.If we need to share any particular file , then URL from properties will work.

The screenshot shows the 'Access keys' page for an Azure Storage account named 'generalstorageaccount'. The page is divided into a left-hand navigation pane and a main content area. The navigation pane includes links to 'Overview', 'Activity log', 'Logs', 'Diagnose and solve problems', 'Access Control (IAM)', 'Data migration', 'Events', 'Storage Explorer (preview)', 'Storage', 'Containers', 'File shares', 'Queues', 'Blobs', 'Static + networking', 'Networking', 'Azure CDN', and 'Access keys' (which is highlighted). The main content area has a title 'generalstorageaccount | Access keys' and a subtitle 'Storage account'. Below the title are three icons: 'Show keys', 'Set rotation reminder', and 'Refresh'. A text block explains that access keys authenticate requests to the storage account and should be kept in a Key Vault. It also mentions that keys should be updated with any Azure resources and apps that use the storage account. Below this, the 'Storage account name' is shown as 'generalstorageaccount'. There are two key sections, 'key1' and 'key2'. Each section displays the 'Last rotated' date as '14/07/2021 (0 days ago)' and a 'Rotate key' button. The 'Key' field is masked with dots, and the 'Connection string' field is also masked with dots and an ellipsis.

generalstorageaccount | Access keys ...

Storage account

Search (Cmd+/) <<

Overview  
Activity log  
Logs  
Diagnose and solve problems  
Access Control (IAM)  
Data migration  
Events  
Storage Explorer (preview)  
**Storage**  
Containers  
File shares  
Queues  
Blobs  
Static + networking  
Networking  
Azure CDN  
Access keys

Show keys Set rotation reminder Refresh

Access keys authenticate your applications' requests to this storage account. Keep your keys in a secure Key Vault, and replace them often with new keys. The two keys allow you to replace one while still maintaining access to the other.

Remember to update the keys with any Azure resources and apps that use this storage account. [Learn more](#)

Storage account name  
generalstorageaccount

**key1**  
Last rotated: 14/07/2021 (0 days ago)  
Rotate key  
Key  
.....  
Connection string  
.....

**key2**  
Last rotated: 14/07/2021 (0 days ago)  
Rotate key  
Key  
.....  
Connection string  
.....

Task-11: Created two Users Backup\_Admin and Vmadmin:

Solution: Created. Users in AD and roles at subscription level for VM admin and RG level for backup admin to meet the condition.

[Default Directory](#) >

### Users | All users (Preview)

Default Directory - Azure Active Directory

users (Preview)

leted users (Preview)

isword reset

er settings

gnore and solve problems

r

n-ins

dit logs

k operation results

+ New user

+ New guest user

Bulk operations

Refresh

Reset password

Per-user MFA

Delete user

Columns

Preview info

This page includes previews available for your evaluation. View previews →

Search users

Add filters

3 users found

|                                     | Name             | User principal name  | User type | Directory synced | Identity issuer         | Comp |
|-------------------------------------|------------------|--|-----------|------------------|-------------------------|------|
| <input checked="" type="checkbox"/> | BA Backup_Admin  | Backup_Admin@sufiyanilearn3outlook.onmicrosoft.com                 | Member    | No               | Sufiyanilearn3outlook.ι |      |
| <input type="checkbox"/>            | MS Mohammad S... | Sufiyan_ilearn3_outlook.com#EXT#@Sufiyanilearn3outlook.onmicros... | Member    | No               | Sufiyanilearn3outlook.ι |      |
| <input checked="" type="checkbox"/> | VM VMAdmin       | VMAdmin@sufiyanilearn3outlook.onmicrosoft.com                      | Member    | No               | Sufiyanilearn3outlook.ι |      |

[Home](#) > [Resource groups](#) > [WEBRG](#) >

### Add role assignment

Role

Members

Review + assign

Selected role

Backup Contributor

Assign access to

☒ User, group, or service principal

☐ Managed identity

Members

+ Select members

| Name         | Object ID                            | Type |
|--------------|--------------------------------------|------|
| Backup_Admin | 965b8f55-73db-437a-a4c4-41a5a899f37d | User |

Description

Optional