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**BSSE – 7A**

**Lab: 08**

## **Administer Virtual Machines**

- + Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal.
- + Task 2: Manage compute and storage scaling for virtual machines.
- + Task 3: Create and configure Azure Virtual Machine Scale Sets.
- + Task 4: Scale Azure Virtual Machine Scale Sets.
- + Task 5: Create a virtual machine using Azure PowerShell (optional 1).
- + Task 6: Create a virtual machine using the CLI (optional 2).

### **## Task 1: Deploy zone-resilient Azure virtual machines by using the Azure portal**

1. Sign in to the Azure portal - '<https://portal.azure.com>'.
2. Search for and select 'Virtual machines', on the \*\*Virtual machines\*\* blade, click \*\*+ Create\*\*, and then select in the drop-down \*\*Azure virtual machine\*\*. Notice your other choices.
3. Click \*\*Next : Advanced >\*\*, take the defaults, then click \*\*Review + Create\*\*.
4. After the validation, click \*\*Create\*\*.
5. Wait for the deployment to complete, then select \*\*Go to resource\*\*.

bsse2280108@szabist.pk  
DEFAULT DIRECTORY (BSSE22801...)

Deployment succeeded

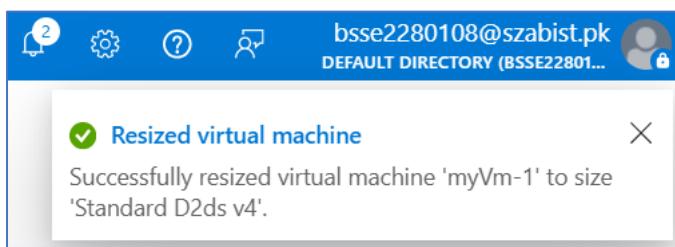
Deployment 'CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251210193601' to resource group 'az104-rg8' was successful.

Go to resource      Pin to dashboard

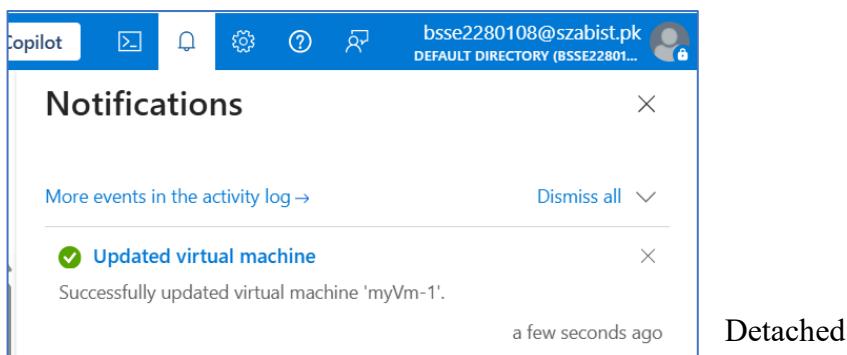
## ## Task 2: Manage compute and storage scaling for virtual machines

In this task, you will scale a virtual machine by adjusting its size to a different SKU. Azure provides flexibility in VM size selection so that you can adjust a VM for periods of time if it needs more (or less) compute and memory allocated. This concept is extended to disks, where you can modify the performance of the disk, or increase the allocated capacity.

1. On the **az104-vm1** virtual machine, in the **Availability + scale** blade, select **Size**.
2. Set the virtual machine size to **D2ds\_v4** and click **Resize**. When prompted, confirm the change.



3. In the **Settings** area, select **Disks**.
4. Under **Data disks** select **+ Create and attach a new disk**. Configure the settings (leave other settings at their default values). Click **Apply**.



A screenshot of the Microsoft Azure portal showing the Disks blade for the virtual machine **myVm-1**. The left sidebar shows navigation options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource visualizer, Connect, Bastion, Windows Admin Center, Networking, and Network settings. The main content area has tabs for **OS disk** and **Data disks**. The **OS disk** section shows one disk entry: **myVm-1\_OsDisk\_1\_4cf3e62d4**, which is a Premium SSD LRS type, 127 GiB in size, with 500 Max IOPS and 100 Max throughput, using SSE with PMK encryption, and Read/write host caching. The **Data disks** section shows a table with columns: LUN, Disk name, Storage type, Size (GiB), Max IOPS, Max throughput (...), Encryption, and Host caching. A note at the bottom says "No data disks attached".

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Home > Storage center

## Storage center | Azure Disks

Default Directory (bsse2280108szabist.onmicrosoft.com) Show me disks without protection in XXX region

Search Summary Resources

Overview All storage resources

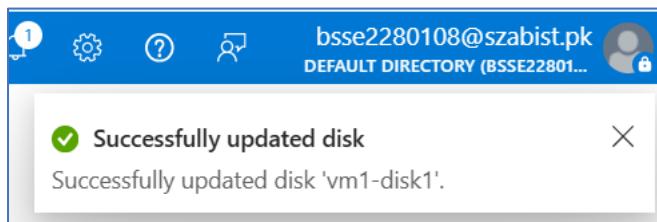
- > Object storage
- > File storage
- > Block storage
- > Data management
- > Migration
- > Partner solutions
- > Management services
- > Help

Manage view Refresh Export to CSV Open query Assign tags Add to service group Group by none

Filter for any field... Subscription equals all Resource Group equals all Location equals all Add filter

You are viewing a new version of Browse experience. Click here to access the old experience.

Name ↑	Storage type	Size (GiB)	Owner	Resource Group	Location
myVm-1_OsDisk_1_4cf3e62d4b594c98895	Premium SSD LRS	127	myVm-1	AZ104-RG8	Central India
myVm-2_OsDisk_1_a65bc633a87c409d99c	Premium SSD LRS	127	myVm-2	AZ104-RG8	Central India
vm1-disk1	Standard SSD LRS	32	myVm-1	az104-rg8	Central India



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Home > myVm-1

## myVm-1 | Disks

Virtual machine

Search Refresh Additional settings Feedback Troubleshoot

OS disk Swap OS disk

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption	Host caching
myVm-1_OsDisk_1_4cf3e62d	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

Data disks Filter by name

Showing 1 of 1 attached data disks

Create and attach a new disk Attach existing disks

LUN	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
0	vm1-disk1	Standard SSD LRS	32	500	100	SSE with PMK

Apply Discard changes

Activate Windows  
Go to Settings to activate Windows.

Add or remove favorites by pressing **Ctrl + Shift + F**

## ## Task 3: Create and configure Azure Virtual Machine Scale Sets

The screenshot shows the 'Create a Virtual Machine Scale Set (VMSS)' wizard in the Microsoft Azure portal. The 'Review + create' tab is selected. A green checkmark indicates 'Validation passed'. The configuration details are as follows:

Setting	Value
Subscription	Azure for Students
Resource group	az104-rg8
Virtual machine scale set name	vmss1
Region	Central India
Orchestration mode	Uniform
Availability zone	2,3
Image	Windows Server 2019 Datacenter - Gen2
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Scaling mode	Manually update the capacity
Instance count	1
Security type	Standard
Enable Hibernation	No

At the bottom, there are 'Previous', 'Next >', and 'Create' buttons. To the right, there is an 'Activate Windows' section with a link to download a template for automation.

The screenshot shows a deployment confirmation dialog box. It displays a green checkmark icon and the text 'Deployment succeeded'. Below it, it says 'Deployment 'CreateVmss-MicrosoftWindowsServer.WindowsServer-2-20251210203129' to resource group 'az104-rg8' was successful.' At the bottom, there are two buttons: 'Go to resource' and 'Pin to dashboard'.

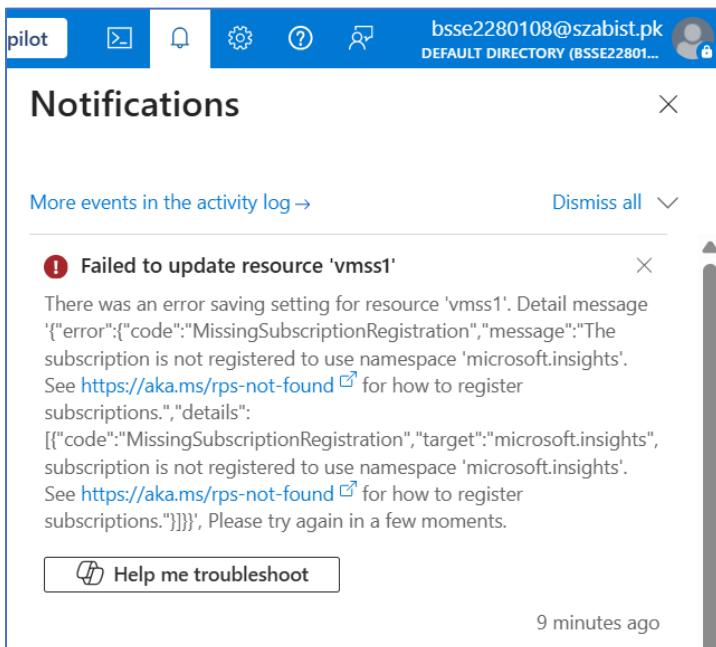
- I reduced the instance count to 1 to avoid the public IP quota issue.
- VMSS now only creates as many VM instances as the instance count you specified.
- In my case → 1 instance.

The screenshot shows the 'Instances' page for the 'vmss1' virtual machine scale set. The left sidebar has 'Instances' selected. The main area shows a table of virtual machine instances:

Instance	Computer name	Status	Protection policy	Provisioning state	Health state	Latest model
vmss1_0	vmss1lzw000000	Running		Succeeded		Yes

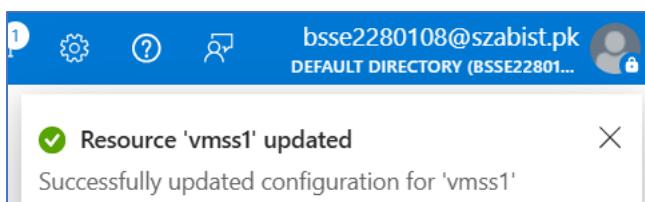
## ## Task 4: Scale Azure Virtual Machine Scale Sets

You got the error because your Azure for Students subscription cannot register the Microsoft.Insights provider, which is required for Custom Autoscale; using Manual scale avoids this limitation.

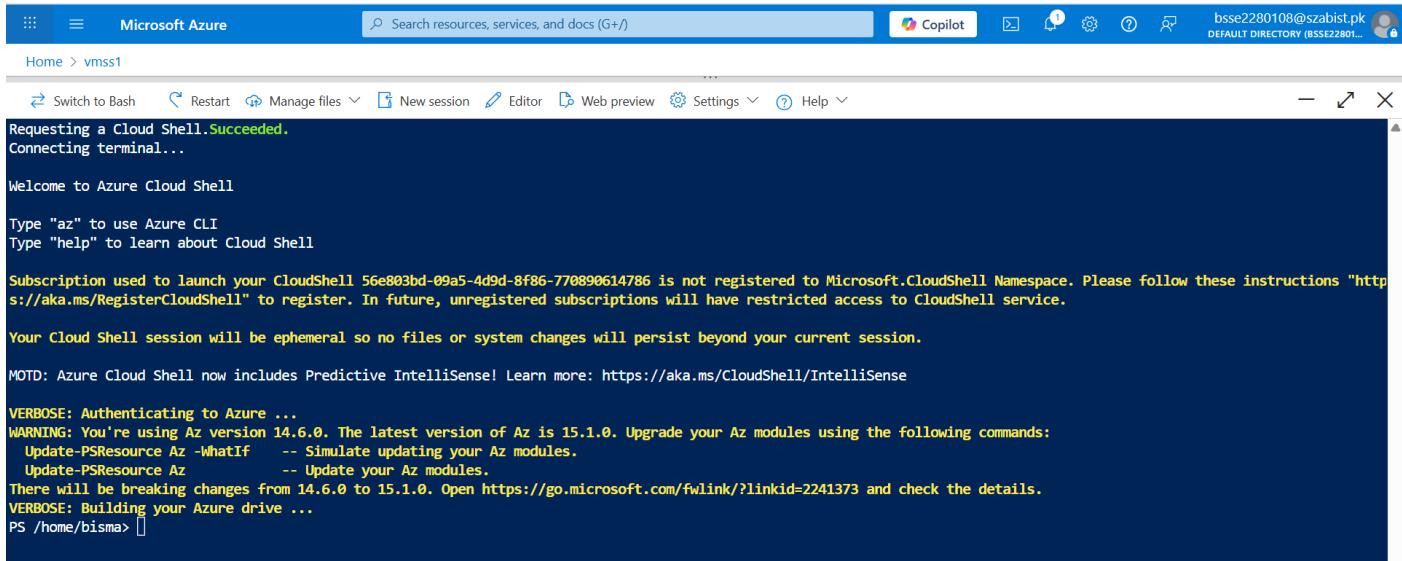


The screenshot shows the Microsoft Azure Compute Infrastructure | Virtual Machine Scale Set (VMSS) configuration page for 'vmss1'. The top navigation bar includes 'Microsoft Azure', a search bar, and various icons. The main content area is titled 'vmss1 | Scaling' and shows the 'Scaling' tab selected in the sidebar. The sidebar also lists other options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Instances, Resource visualizer, Networking, Settings, Availability + scale, and Security.

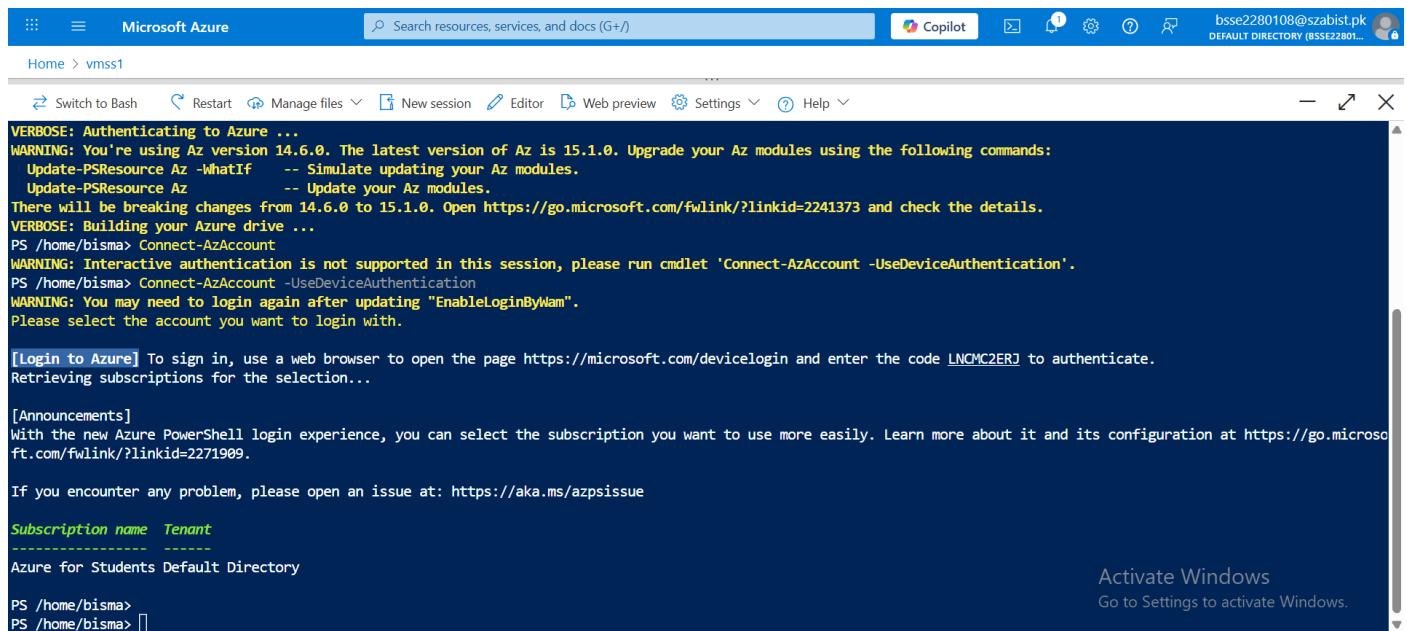
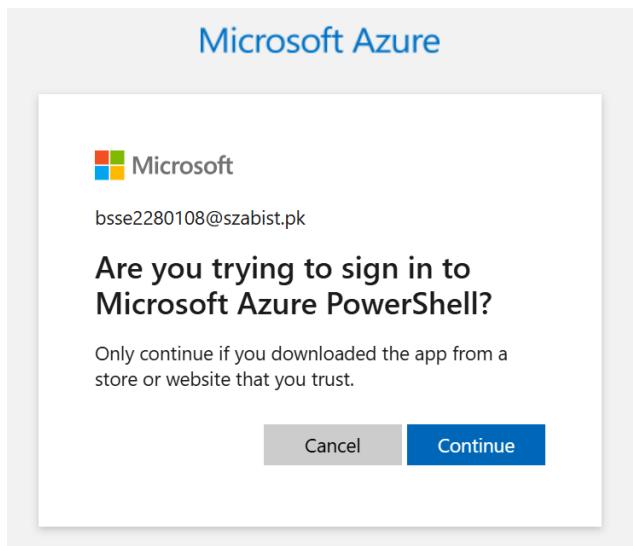
The main content area has tabs for 'Configure', 'Scale-In Policy', 'Predictive charts', 'Run history', 'JSON', 'Notify', and 'Diagnostic settings'. The 'Configure' tab is active, displaying information about Autoscale and two scaling options: 'Manual scale' and 'Custom autoscale'. The 'Manual scale' option is selected, showing a slider for 'Instance count' set to 1. An 'Override condition' section is also visible.



## ## Task 5: Create a virtual machine using Azure PowerShell (option1)



```
Microsoft Azure Search resources, services, and docs (G+) Copilot Home > vmss1 ... Switch to Bash Restart Manage files New session Editor Web preview Settings Help Requesting a Cloud Shell. Succeeded. Connecting terminal... Welcome to Azure Cloud Shell Type "az" to use Azure CLI Type "help" to learn about Cloud Shell Subscription used to launch your CloudShell 56e803bd-09a5-4d9d-8f86-770890614786 is not registered to Microsoft.CloudShell Namespace. Please follow these instructions "http://aka.ms/RegisterCloudShell" to register. In future, unregistered subscriptions will have restricted access to CloudShell service. Your Cloud Shell session will be ephemeral so no files or system changes will persist beyond your current session. MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense VERBOSE: Authenticating to Azure ... WARNING: You're using Az version 14.6.0. The latest version of Az is 15.1.0. Upgrade your Az modules using the following commands: Update-PSResource Az -WhatIf -- Simulate updating your Az modules. Update-PSResource Az -- Update your Az modules. There will be breaking changes from 14.6.0 to 15.1.0. Open https://go.microsoft.com/fwlink/?linkid=2241373 and check the details. VERBOSE: Building your Azure drive ... PS /home/bisma> 
```



```
Microsoft Azure Search resources, services, and docs (G+) Copilot Home > vmss1 ... Switch to Bash Restart Manage files New session Editor Web preview Settings Help VERBOSE: Authenticating to Azure ... WARNING: You're using Az version 14.6.0. The latest version of Az is 15.1.0. Upgrade your Az modules using the following commands: Update-PSResource Az -WhatIf -- Simulate updating your Az modules. Update-PSResource Az -- Update your Az modules. There will be breaking changes from 14.6.0 to 15.1.0. Open https://go.microsoft.com/fwlink/?linkid=2241373 and check the details. VERBOSE: Building your Azure drive ... PS /home/bisma> Connect-AzAccount WARNING: Interactive authentication is not supported in this session, please run cmdlet 'Connect-AzAccount -UseDeviceAuthentication'. PS /home/bisma> Connect-AzAccount -UseDeviceAuthentication WARNING: You may need to login again after updating "EnableLoginByWam". Please select the account you want to login with. [Login to Azure] To sign in, use a web browser to open the page https://microsoft.com/devicelogin and enter the code LNCMC2ERJ to authenticate. Retrieving subscriptions for the selection... [Announcements] With the new Azure PowerShell login experience, you can select the subscription you want to use more easily. Learn more about it and its configuration at https://go.microsoft.com/fwlink/?linkid=2271909. If you encounter any problem, please open an issue at: https://aka.ms/azpsissue Subscription name Tenant ----- Azure for Students Default Directory PS /home/bisma> PS /home/bisma> 
```

```

PS /home/bisma> New-AzResourceGroup -Name "az104-rg-new" -Location "Central India"
ResourceGroupName : az104-rg-new
Location          : centralindia
ProvisioningState : Succeeded
Tags              :
ResourceId        : /subscriptions/56e803bd-09a5-4d9d-8f86-770890614786/resourceGroups/az104-rg-new
PS /home/bisma> []

```

```

PS /home/bisma> New-AzVm ` 
>> -ResourceGroupName "az104-rg8" ` 
>> -Name "myPSVM" ` 
>> -Location "Central India" ` 
>> -Image "Win2019Datacenter" ` 
>> -Zone "2" ` 
>> -Size "Standard_D2s_v3" ` 
>> -Credential (Get-Credential)

PowerShell credential request
Enter your credentials.
User: bisma
Password for user bisma: *****

```

```

PS /home/bisma>
PS /home/bisma>
PS /home/bisma> New-AzVm ` 
>> -ResourceGroupName 'az104-rg8' ` 
>> -Name 'myPSVM' ` 
>> -Location 'Central India' ` 
>> -Image 'Win2019Datacenter' ` 
>> -Zone '1' ` 
>> -Size 'Standard_D2s_v3' ` 
>> -Credential (Get-Credential)

PowerShell credential request
Enter your credentials.
User: bisma
Password for user bisma: *****

```

**WARNING:** Upcoming breaking changes in the cmdlet 'New-AzVM' :  
The default VM size will change from 'Standard\_D2s\_v3' to 'Standard\_D2s\_v5'.  
- This change will take effect on '11/1/2025'  
- The change is expected to take effect in Az version : '15.0.0'  
- The change is expected to take effect in Az.Compute version : '11.0.0'  
Note : Go to <https://aka.ms/azps-changewarnings> for steps to suppress this breaking change warning, and other details.

You can reference <https://aka.ms/findImagePS> on how to find VM Images using PowerShell.

```

ResourceGroupName      : az104-rg8
Id                   : /subscriptions/56e803bd-09a5-4d9d-8f86-770890614786/resourceGroups/az104-rg8/providers/Microsoft.Compute/virtualMachines/myPSVM
VmId                : 3ced90f4-4f8d-4540-86eb-7f50cca4e7a1
Name                 : myPSVM
Type                 : Microsoft.Compute/virtualMachines
Location             : centralindia
Tags                :
HardwareProfile       : {VmSize}
NetworkProfile        : {NetworkInterfaces}
OSProfile             : {ComputerName, AdminUsername, WindowsConfiguration, Secrets, AllowExtensionOperations}
ProvisioningState     : Succeeded
StorageProfile        : {ImageReference, OsDisk, DataDisks, AlignRegionalDisksToVMZone}
Zones                : {2}
FullyQualifiedDomainName : mypsvm-a00923.Central India.cloudapp.azure.com
TimeCreated           : 12/10/2025 4:54:40 PM
Etag                 : "2"

```

```
PS /home/bisma> []
```

```
PS /home/bisma> Get-AzVM -ResourceGroupName "az104-rg8" -Status
ResourceGroupName Name Location VmSize OsType NIC Provisioning Zone PowerState MaintenanceAllowed
----- ----- ----- -----
az104-rg8 myPSVM centralindia Standard_D2s_v3 Windows myPSVM Succeeded 2 VM running
PS /home/bisma>
```

```
PS /home/bisma> Stop-AzVM -ResourceGroupName "az104-rg8" -Name "myPSVM" -Force
OperationId : 16f124a0-8c14-4e37-927b-7f8ff4393d69
Status : Succeeded
StartTime : 12/10/2025 4:56:23 PM
EndTime : 12/10/2025 4:57:05 PM
Error :
```

```
PS /home/bisma>
PS /home/bisma> Get-AzVM -ResourceGroupName "az104-rg8" -Status
ResourceGroupName Name Location VmSize OsType NIC Provisioning Zone PowerState MaintenanceAllowed
----- ----- ----- -----
az104-rg8 myPSVM centralindia Standard_D2s_v3 Windows myPSVM Succeeded 2 VM deallocated
```

The screenshot shows the Azure Resource Manager portal interface. The left sidebar lists the 'az104-rg8' resource group with its components: Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Deployments, Security, Deployment stacks, Policies, and Properties. The main content area shows the 'Essentials' section with a table of resources:

	Name	Type	Location
<input type="checkbox"/>	myPSVM	Virtual machine	Central India
<input type="checkbox"/>	myPSVM	Network Interface	Central India
<input type="checkbox"/>	myPSVM	Network security group	Central India
<input type="checkbox"/>	myPSVM	Virtual network	Central India
<input type="checkbox"/>	myPSVM_disk1_b6c33bc6588840c783416200baecb551	Disk	Central India

## ## Key takeaways

**Congratulations on completing the lab. Here are the main takeaways for this lab.**

- + Azure virtual machines are on-demand, scalable computing resources.
- + Azure virtual machines provide both vertical and horizontal scaling options.
- + Configuring Azure virtual machines includes choosing an operating system, size, storage and networking settings.
- + Azure Virtual Machine Scale Sets let you create and manage a group of load balanced VMs.
- + The virtual machines in a Virtual Machine Scale Set are created from the same image and configuration.
- + In a Virtual Machine Scale Set the number of VM instances can automatically increase or decrease in response to demand or a defined schedule.