

# Lab 08 - Manage Virtual Machines

**Task 1 and Task 2: Configure Azure virtual machines by using virtual machine extensions. Deploy zone-resilient Azure virtual machines by using the Azure portal and an Azure Resource Manager template.**

The screenshot displays the Microsoft Azure portal interface. On the left, a navigation pane shows various options including 'Run command', which is currently selected. The main area is titled 'Run Command Script' and shows a PowerShell script being executed on the virtual machine 'az104-08-vm1'. The script consists of two lines: `1 Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing` and `2`. A status message at the top indicates 'Script execution complete'. Below the script, the 'Output' section displays the results of the command, showing a successful HTTP request with a 200 OK status and various headers and content details.

```
Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing
```

```
StatusCode      : 200
StatusDescription : OK
Content         : az104-08-vm0

RawContent      : HTTP/1.1 200 OK
                  Accept-Ranges: bytes
                  Content-Length: 14
                  Content-Type: text/html
                  Date: Tue, 21 Mar 2023 06:28:38 GMT
                  ETag: "eb23c5c4bd5bd91:0"
                  Last-Modified: Tue, 21 Mar 2023 06:24:19 GMT
                  Server...
```

```
Forms          :
Headers         : {[Accept-Ranges, bytes], [Content-Length, 14], [Content-Type, text/html], [Date, Tue,
21 Mar 2023    06:28:38 GMT]...}
Images          : {}
InputFields     : {}
Links           : {}
ParsedHtml      :
RawContentLength : 14
```

### Task 3: Scale compute and storage for Azure virtual machines.

The screenshot displays the Microsoft Azure portal interface. On the left, a sidebar shows the navigation menu with categories like Home, Operations, Monitoring, and Automation. The main area is titled 'Run Command Script' for the virtual machine 'az104-08-vm0'. A status bar at the top of the main area indicates 'Script execution complete'. Below this, a PowerShell script is shown, which performs the following actions:

```
1 New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -Ph
2
3 New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 2046GB -
4
5 Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
6
7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z
8
```

A 'Run' button is located below the script. The 'Output' section shows the results of the command execution:

```
DiskNumber      : 4
DriveLetter     : Z
GptType         : {ebd0a0a2-b9e5-4433-87c0-68b6b72699c7}
Guid           : {f8762f55-e6ed-4f83-a59a-d30e43ada7e9}
IsActive        : False
IsBoot          : False
IsDAX           : False
IsHidden        : False
IsOffline       : False
IsReadOnly      : False
IsShadowCopy    : False
IsSystem        : False
MbrType         :
NoDefaultDriveLetter : False
Offset          : 16777216
OperationalStatus : Online
PartitionNumber  : 2
Size            : 2196857946112
TransitionState  : 1
PSComputerName   :
Type            : Basic
DiskPath        : \\?\storage#disk#{ed22aee4-8ac5-41e7-b6dd-50dbced0deef}#{53f56307-b6bf-11d0-94f2-00a0c91efb8b}
```

Microsoft Azure

Search resources, services, and docs (G+)

StanislavNikolovNew1@...  
DEFAULT DIRECTORY

Home > az104-08-vm0

az104-08-vm0

Virtual machine

Search

Properties

Locks

Operations

Bastion

Auto-shutdown

Backup

Disaster recovery

Updates

Inventory

Change tracking

Automanage

Configuration management (Preview)

Policies

Run command

Monitoring

Insights

Alerts

Metrics

Diagnostics settings

Logs

Connection monitor (classic)

Workbooks

Automation

Tasks (preview)

Export template

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

1

New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage\*" -Ph

2

New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 2046GB -

3

Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)

4

New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z

5

6

7

8

Run

Output

FriendlyName	OperationalStatus	HealthStatus	IsPrimordial	IsReadOnly	Size	AllocatedSize
storagepool1	OK	Healthy	False	False	2 TB	512 MB

ObjectId : {1}\az104-08-vm0\root\Microsoft\Windows\Storage\Providers\_v2\SPACE  
S\_VirtualDisk.0b  
jectId="{67e1d64b-c79d-11ed-8e88-806e6f6e6963}:VD:{99468808-53e5-40  
2e-8399-c21f4c8c  
414f}{ed22aee4-8ac5-41e7-b6dd-50dbc0deef}"  
PassThroughClass :  
PassThroughIds :  
PassThroughNamespace :  
PassThroughServer :  
UniqueId : E4AE22EDC58AE74186DD50BCED0DEEF  
Access : Read/Write  
AllocatedSize : 2196875771904  
AllocationUnitSize : 1073741824  
ColumnIsolation : PhysicalDisk  
DetachedReason : None  
FaultDomainAwareness : PhysicalDisk  
FootprintOnPool : 2196875771904  
FriendlyName : virtualdisk1  
HealthStatus : Healthy  
Interleave : 262144  
IsDeduplicationEnabled : False

Microsoft Azure

Search resources, services, and docs (G+)

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DEFAULT DIRECTORY

Home > az104-08-vm1

az104-08-vm1 | R

Virtual machine

Search

Bastion

Auto-shutdown

Backup

Disaster recovery

Updates

Inventory

Change tracking

Automanage

Configuration management (Preview)

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Run command

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Connection monitor (classic)

Workbooks

Automation

Tasks (preview)

Export template

Help

Resource health

Boot diagnostics

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

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1 New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -Ph
2
3 New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 2046GB -
4
5 Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
6
7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z
8
```

Run

Output

```
Usage : Data
WriteCacheSize : 0
PSComputerName :

ObjectId : {1}\\az104-08-vm1\root\Microsoft\Windows\Storage\Providers_v2\WSP_Partition.Object
ctId="{90be974b-
c7ae-11ed-8e88-806e6f6e6963}";PR:{00000000-0000-0000-0000-000100000000}\\?\storag
e#disk#{09000693
-bc92-4550-8f91-eac15c052445}#{53f56307-b6bf-11d0-94f2-00a0c91efb8b}"
PassThroughClass :
PassThroughIds :
PassThroughNamespace :
PassThroughServer :
UniqueId : {00000000-0000-0000-0000-000100000000}9306000992BC50458F91EAC15C052445
AccessPaths : {Z:\, \\?\Volume{23ece112-0b46-43fa-97e7-93d110e63d11}\}
DiskId : \\?\storage#disk#{09000693-bc92-4550-8f91-eac15c052445}#{53f56307-b6bf-11d0-94f2
-00a0c91efb8b}
DiskNumber : 4
DriveLetter : Z
GptType : {ebd0a0a2-b9e5-4433-87c0-68b6b72699c7}
Guid : {23ece112-0b46-43fa-97e7-93d110e63d11}
IsActive : False
IsBoot : False
IsDAX : False
```

Microsoft Azure Search resources, services, and docs (G+)

Home > az104-08-vm1 | Run Command Script

Virtual machine

Search

Bastion

Auto-shutdown

Backup

Disaster recovery

Updates

Inventory

Change tracking

Automanage

Configuration management (Preview)

Policies

Run command

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Connection monitor (classic)

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Automation

Tasks (preview)

Export template

Help

Resource health

Root diagnostics

### Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

```
1 New-StoragePool -FriendlyName storagepool1 -StorageSubsystemFriendlyName "Windows Storage*" -Ph
2
3 New-VirtualDisk -StoragePoolFriendlyName storagepool1 -FriendlyName virtualdisk1 -Size 2046GB -
4
5 Initialize-Disk -VirtualDisk (Get-VirtualDisk -FriendlyName virtualdisk1)
6
7 New-Partition -DiskNumber 4 -UseMaximumSize -DriveLetter Z
8
```

Run

Output

FriendlyName	OperationalStatus	HealthStatus	IsPrimordial	IsReadOnly	Size	AllocatedSize
storagepool1	OK	Healthy	False	False	2 TB	512 MB

```
ObjectId : {1}\az104-08-vm1\root\Microsoft\Windows\Storage\Providers_v2\SPACE
S_VirtualDisk.Ob
jectId="{90be974b-c7ae-11ed-8e88-806e6f6e6963}:VD:{c11e6aa4-e760-49
bf-b35c-327ef220
7cdb}{09000693-bc92-4550-8f91-eac15c052445}"
PassThroughClass :
PassThroughIds :
PassThroughNamespace :
PassThroughServer :
UniqueId : 9306000992BC50458F91EAC15C052445
Access : Read/Write
AllocatedSize : 2196875771904
AllocationUnitSize : 1073741824
ColumnIsolation : PhysicalDisk
DetachedReason : None
FaultDomainAwareness : PhysicalDisk
FootprintOnPool : 2196875771904
FriendlyName : virtualdisk1
HealthStatus : Healthy
Interleave : 262144
IsDeduplicationEnabled : False
```

#### Task 4: Register the Microsoft.Insights and Microsoft.AlertsManagement resource providers.

```
PowerShell
Type "help" to learn about Cloud Shell

MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense

VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/stanislaw> Register-AzResourceProvider -ProviderNamespace Microsoft.Insights

ProviderNamespace : microsoft.insights
RegistrationState : Registering
ResourceTypes : {components, components/query, components/metadata, components/metrics...}
Locations : {East US, South Central US, North Europe, West Europe...}
```

```
PS /home/stanislaw> Register-AzResourceProvider -ProviderNamespace Microsoft.AlertsManagement

ProviderNamespace : Microsoft.AlertsManagement
RegistrationState  : Registered
ResourceTypes     : {alerts, alertsSummary, smartGroups, smartDetectorAlertRules...}
Locations         : {global, North Central US, East US, East US 2...}

PS /home/stanislaw>
```

## Task 5: Deploy zone-resilient Azure virtual machine scale sets by using the Azure portal.

Diagnostics storage account \* ⓘ

Home >

**az104-08-rg02** ☆ ⋮  
Resource group

Search << + Create ⚙️ Manage view ▾ 🗑️ Delete resource group 🔄 Refresh ⬇️ Export to CSV 🔗 Open query ⋮

**Overview** | Essentials | JSON View

Activity log  
Access control (IAM)  
Tags  
Resource visualizer  
Events

**Settings**

Deployments  
Security  
Policies  
Properties  
Locks

**Monitoring**

Insights (preview)  
Alerts  
Metrics  
Diagnostic settings  
Logs  
Advisor recommendations  
Workbooks

**Automation**

Export template

**Help**

New Support Request

**Essentials**

Subscription ([move](#))  
[Azure Pass - Sponsorship](#)  
Subscription ID  
c983dec5-cde0-4991-9469-c26f8cf60056  
Deployments  
[1 Succeeded](#)  
Location  
East US  
Tags ([edit](#))  
[Click here to add tags](#)

**Resources** Recommendations

Filter for any field... Type equals **all** × Location equals **all** × + Add filter

Showing 1 to 5 of 5 records. ☐ Show hidden types ⓘ No grouping ▾ List view ▾

<input type="checkbox"/> Name ↑↓	Type ↑↓	Location ↑↓	
<input type="checkbox"/> az104-08-rg02-vnet	Virtual network	East US	...
<input type="checkbox"/> az10408vmss0	Virtual machine scale set	East US	...
<input type="checkbox"/> az10408vmss0-lb	Load balancer	East US	...
<input type="checkbox"/> az10408vmss0-lb-publicip	Public IP address	East US	...
<input type="checkbox"/> az10408vmss0-nsg	Network security group	East US	...

< Page 1 of 1 >

[Give feedback](#)

## Task 6: Configure Azure virtual machine scale sets by using virtual machine extensions.

Public IP address \* az10408vmss0-lb-publicip (20.242.195.147)

Home > Load balancing | Load Balancer >

**az10408vmss0-lb** Load balancer

Search << → Move Delete Refresh Give feedback

**Overview**

- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

**Settings**

- Frontend IP configuration
- Backend pools
- Health probes
- Load balancing rules
- Inbound NAT rules
- Outbound rules
- Properties
- Locks

**Monitoring**

- Insights
- Diagnostic settings
- Logs
- Alerts
- Metrics

**Automation**

- Tasks (preview)
- Export template

**Essentials** JSON View

Resource group ([move](#))  
[az104-08-rg02](#)

Location  
East US

Subscription ([move](#))  
[Azure Pass - Sponsorship](#)

Subscription ID  
c983dec5-cde0-4991-9469-c26f8cf60056

SKU  
Standard

Backend pool  
bepool (2 virtual machines)

Load balancing rule  
az10408vmss0-lb-lbrule01 (Tcp/80)

Health probe  
az10408vmss0-lb-probe01 (Tcp/80)

NAT rules  
1 inbound

Tier  
Regional

Public IP address  
[20.242.195.147 \(az10408vmss0-lb-publicip\)](#)

Tags ([edit](#))  
[Click here to add tags](#)

[See less](#)

**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 Load Balancer supports TCP/UDP-based protocols and protocols used for real-time voice and video messaging applications. [Learn more](#)

**Balance IPv4 and IPv6 addresses**

Native dual-stack endpoints help meet regulatory requirements and address the fast-growing number of devices in mobile and IoT. [Learn more](#)

[View frontend IP configuration](#)

[View backend pools](#)

**Build highly reliable applications**

Load Balancer improves application uptime by routing traffic to healthy nodes. [Learn more](#)

[View health probes](#)

[View load balancing rules](#)

## Task 7: Scale compute and storage for Azure virtual machine scale sets.

**Scale rule**

Resource type: Virtual machine scale sets | Resource: az10408vmss0

☒ Criteria

Metric namespace: Virtual Machine Host | Metric name: Network In Total | 1 minute time grain

Dimension Name	Operator	Dimension Values	Add
VMName	=	All values	+

If you select multiple values for a dimension, autoscale will aggregate the metric across the selected values, not evaluate the metric for each values individually.

Network In Total (Average)

Scale mode: 39.43 kB

☐ Enable metric divide by instance count

Rules

Operator: Greater than | Metric threshold to trigger scale action: 10 bytes

Duration (minutes): 10 | Time grain (minutes): 1

Time grain statistic: Average | Time aggregation: Average

Instance limit

Action

Operation: Increase count by | Cool down (minutes): 5

Instance count: 1

Buttons: Update, Delete

Search virtual machine instances

Instance	Computer name	Status	Protection policy	Provisioning sta...	Health st
<input type="checkbox"/> az10408vmss0_0	az10408vm000000	Running		Succeeded	
<input type="checkbox"/> az10408vmss0_1	az10408vm000001	Running		Succeeded	
<input type="checkbox"/> az10408vmss0_2	az10408vm000002	Running		Succeeded	



```
PS /home/stanislav> ./az104-08-configure_VMSS_disks.ps1
```

```
ResourceGroupName      : az104-08-rg02
Sku                    :
  Name                  : Standard_DS1_v2
  Tier                  : Standard
  Capacity              : 3
UpgradePolicy          :
  Mode                  : Manual
ProvisioningState      : Succeeded
Overprovision          : False
DoNotRunExtensionsOnOverprovisionedVMs : False
UniqueId              : b14748ec-1d1b-423c-b4a5-75051f6cee3f
SinglePlacementGroup   : False
ZoneBalance            : False
PlatformFaultDomainCount : 5
ScaleInPolicy          :
  Rules[0]             : Default
ForceDeletion          : False
Zones[0]               : 1
Zones[1]               : 2
Zones[2]               : 3
Id                     : /subscriptions/c983dec5-cde0-4991-9469-c26f8cf60056/resourceGroups/az104-08-rg02/providers/Microsoft.Compute/virtualMachineScaleSets/az10408vmss0
Name                   : az10408vmss0
Type                   : Microsoft.Compute/virtualMachineScaleSets
Location               : eastus
Tags                   : {}
VirtualMachineProfile :
  OsProfile             :
    ComputerNamePrefix  : az10408vm
    AdminUsername       : Student
    WindowsConfiguration :
      ProvisionVMAgent  : True
```

```
OsDisk                  :
  Caching                : ReadWrite
  WriteAcceleratorEnabled : False
  CreateOption           : FromImage
  DiskSizeGB             : 127
  OsType                 : Windows
  ManagedDisk             :
    StorageAccountType   : Premium_LRS
DataDisks[0]            :
  Lun                    : 0
  Caching                : None
  CreateOption           : Empty
  DiskSizeGB             : 32
  ManagedDisk             :
    StorageAccountType   : Standard_LRS
NetworkProfile           :
  NetworkInterfaceConfigurations[0] :
    Name                  : az104-08-rg02-vnet-nic01
    Primary               : True
    EnableAcceleratedNetworking : True
    DisableTcpStateTracking : False
    NetworkSecurityGroup   :
      Id                  : /subscriptions/c983dec5-cde0-4991-9469-c26f8cf60056/resourceGroups/az104-08-rg02/providers/Microsoft.Network/networkSecurityGroups/az10408vmss0-nsg
    DnsSettings           :
      IpConfigurations[0] :
        Name              : az104-08-rg02-vnet-nic01-defaultIpConfiguration
        Subnet             :
          Id              : /subscriptions/c983dec5-cde0-4991-9469-c26f8cf60056/resourceGroups/az104-08-rg02/providers/Microsoft.Network/virtualNetworks/az104-08-rg02-vnet/subnets/subnet0
        Primary           : True
        PublicIPAddressConfiguration :
          Name            : publicIp-az104-08-rg02-vnet-nic01
          IdleTimeoutInMinutes : 15
          PublicIPAddressVersion : IPv4
          PrivateIPAddressVersion : IPv4
        LoadBalancerBackendAddressPools[0] :
          Id              : /subscriptions/c983dec5-cde0-4991-9469-c26f8cf60056/resourceGroups/az104-08-rg02/providers/Microsoft.Network/loadBalancerBackendAddressPools/az10408vmss0-lb-backend
```

```
VirtualMachineProfile :
  OsProfile             :
    ComputerNamePrefix  : az10408vm
    AdminUsername       : Student
    WindowsConfiguration :
      ProvisionVMAgent  : True
      EnableAutomaticUpdates : True
      EnableVMAgentPlatformUpdates : False
      AllowExtensionOperations : True
      RequireGuestProvisionSignal : True
  StorageProfile         :
    ImageReference       :
      Publisher          : MicrosoftWindowsServer
      Offer              : WindowsServer
      Sku                 : 2016-datacenter-gensecond
      Version            : latest
    OsDisk               :
      Caching            : ReadWrite
      WriteAcceleratorEnabled : False
      CreateOption       : FromImage
      DiskSizeGB         : 127
      OsType             : Windows
      ManagedDisk         :
        StorageAccountType : Premium_LRS
    DataDisks[0]         :
      Lun                : 0
      Caching            : None
      CreateOption       : Empty
      DiskSizeGB         : 32
      ManagedDisk         :
        StorageAccountType : Standard_LRS
  NetworkProfile         :
    NetworkInterfaceConfigurations[0] :
```

```
ers/Microsoft.Network/virtualNetworks/az104-08-rg02-vnet/subnets/subnet0
  Primary : True
  PublicIPAddressConfiguration :
    Name : publicIp-az104-08-rg02-vnet-nic01
    IdleTimeoutInMinutes : 15
    PublicIPAddressVersion : IPv4
    PrivateIPAddressVersion : IPv4
  LoadBalancerBackendAddressPools[0] :
    Id : /subscriptions/c983dec5-cde0-4991-9469-c26f8cf60056/resourceGroups/az104-08-rg02/provid
ers/Microsoft.Network/loadBalancers/az10408vmss0-lb/backendAddressPools/bepool
  EnableIPForwarding : False
  DiagnosticsProfile :
    BootDiagnostics :
      Enabled : True
      StorageUri : https://az10408rg01diag396.blob.core.windows.net/
  ExtensionProfile :
    Extensions[0] :
      Name : customScript
      Publisher : Microsoft.Compute
      Type : CustomScriptExtension
      TypeHandlerVersion : 1.8
      AutoUpgradeMinorVersion : False
      Settings : {"fileUri":["https://raw.githubusercontent.com/Azure-Samples/compute-automation-config
urations/master/prepare_vm_disks.ps1"],"commandToExecute":"powershell -ExecutionPolicy Unrestricted -File prepare_vm_disks.ps1"}
    Extensions[1] :
      Name : customScript
      Publisher : Microsoft.Compute
      Type : CustomScriptExtension
      TypeHandlerVersion : 1.8
      Settings : System.Collections.Hashtable
  OrchestrationMode : Uniform
  TimeCreated : 3/21/2023 7:10:29 AM
```