

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 the 'Run command' option selected under the 'az104-08-vm1' virtual machine. The main area is titled 'Run Command Script' and shows a PowerShell script being executed. The script is a single line: `Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing`. A status message at the top indicates 'Script execution complete'. Below the script, the 'Output' section displays the results of the command, including status codes, headers, and content details.

Run Command Script
RunPowerShellScript

Script execution complete

PowerShell Script

```
1 Invoke-WebRequest -URI http://10.80.0.4 -UseBasicParsing
2
```

Run

Output

```
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, the navigation pane shows the 'Run command' option selected under the 'Operations' section. The main area is titled 'Run Command Script' and shows the execution of a PowerShell script on the virtual machine 'az104-08-vm0'. The script is as follows:

```
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
```

The 'Run' button has been clicked, and the output is displayed below. The output shows the details of the created disk:

```
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

S_VirtualDisk.0b

2e-8399-c21f4c8c

jectId="{67e1d64b-c79d-11ed-8e88-806e6f6e6963}:VD:{99468808-53e5-40414f}{ed22aee4-8ac5-41e7-b6dd-50dbced0deef}"

PassThroughClass

PassThroughIds

PassThroughNamespace

PassThroughServer

UniqueId

Access

AllocatedSize

AllocationUnitSize

ColumnIsolation

DetachedReason

FaultDomainAwareness

FootprintOnPool

FriendlyName

HealthStatus

Interleave

IsDeduplicationEnabled

: {1}\\az104-08-vm0\root\Microsoft\Windows\Storage\Providers_v2\SPACE

E4AE22EDC58AE741B6DD50DBCED0DEEF

Read/Write

2196875771904

1073741824

PhysicalDisk

None

PhysicalDisk

2196875771904

virtualdisk1

Healthy

262144

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

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Help

Resource health

Boot diagnostics

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

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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

Monitoring

Insights

Alerts

Metrics

Dagnostic settings

Logs

Connection monitor (classic)

Workbooks

Automation

Tasks (preview)

Export template

Help

Resource health

Root diagnostics

Run Command Script

RunPowerShellScript

Script execution complete

PowerShell Script

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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

- 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 JSON View

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](#)

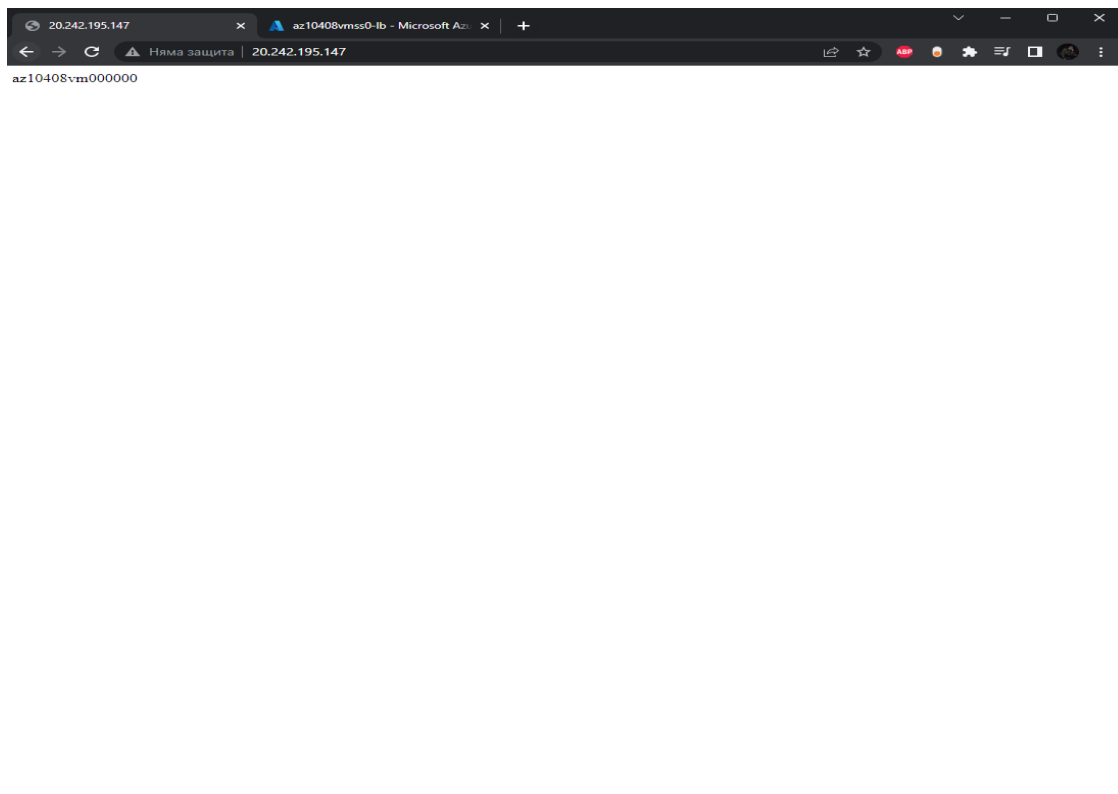
[View backend pools](#)

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.

Microsoft Azure

Search resources, services, and docs (G+/)

Home > az10408vmss0

az10408vmss0 | Scaling

Virtual machine scale set

Search

Save

Tags

Diagnose and solve problems

Settings

Instances

Networking

Scaling

Disks

Operating system

Microsoft Defender for Cloud

Guest + host updates

Size

Extensions + applications

Continuous delivery

Configuration

Upgrade policy

Health and repair

Identity

Properties

Locks

Monitoring

Insights

Alerts

Metrics

Logs

Workbooks

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.

Default*

146,48KiB

97,66KiB

48,83KiB

0B

9:45 AM

9:50 AM

UTC+02:00

Network In Total (Average)

39,43 kB

☐ Enable metric divide by instance count

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

Action

Operation *

Increase count by

Cool down (minutes) *

5

Instance count *

1

✓

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
```