Day2

Create Azure key vault

Lab - Azure Key Vault Service

Create a key vault ...

Basics   Access configuration   Networking   Tags   **Review + create**

◎ View Automation Template

Basics

Subscription	Azure subscription 1
Resource group	app-rg
Key vault name	appkeyvault4545
Region	North Europe
Pricing tier	Standard
Soft-delete	Enabled
Purge protection during retention period	Enabled
Days to retain deleted vaults	7 days

Access configuration

Previous   Next   Create

Disk Encryption Sets

SSE with PMk – server side encryption with Platform manage key

	Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (	Encryption ⓘ	Host caching ⓘ
⇄ Swap OS disk							
	appvm02_disk1_ff1b502921524b	Premium SSD LRS	127	500	100	SSE with PMK	Read/write

Data disks

🔍 Filter by name

Showing 2 of 2 attached data disks

➕ Create and attach a new disk   💾 Attach existing disks

Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (	Encryption ⓘ
atadisk02	Premium SSD LRS	8	120	25	SSE with PMK
atadisk01	Premium SSD LRS	8	120	25	SSE with PMK

Lab Disk Encryption Sets

1.Create key vault

2.Role based access control set for key vault

Home > appkeyvault4545 | Access control (IAM) >

Add role assignment ···

Role   Members   Conditions   Review + assign

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. Learn more ↗

Job function roles   Privileged administrator roles

Grant access to Azure resources based on job function, such as the ability to create virtual machines.

🔍 key vault admin   ✕   Type : **All**   Category : **All**

Name ↑↓	Description ↑↓	Type ↑↓	Category ↑↓	Details
Key Vault Administrator	Perform all data plane operations on a key vault and all objects in it, including certificates, keys, and secrets. Ca... BuiltInRole		Security	View
Key Vault Data Access Administrator	Manage access to Azure Key Vault by adding or removing role assignments for the Key Vault Administrator, Key... BuiltInRole		None	View

Showing 1 - 2 of 2 results.

Home > appkeyvault4545 | Access control (IAM) >

Add role assignment ···

Role   **Members**   Conditions   Review + assign

Selected role   Key Vault Administrator

Assign access to   ⦿ User, group, or service principal
                       ○ Managed identity

Members   ➕ Select members

Name	Object ID	Type
No members selected		

Description   Optional

Select members   ✕

🔍 Search by name or email address

MB manisha b(Guest)
manishabalid179_gmail.com#EXT#@manishabalid179gmail.onmicrosoft.com

Selected members:

MB manisha b(Guest)
manishabalid179_gmail.com#EXT#@manishabalid179gmail.onmicro... 🗑

Add role assignment ...

Role | Members | Conditions | **Review + assign**

Role	Key Vault Administrator
Scope	/subscriptions/b435e57d-913c-4896-baf9-12e1971e7539/resourceGroups/app-rg/providers/Microsoft.KeyVault/vaults/appkeyvault4545
Members	

Name	Object ID	Type
manisha b(Guest)	b914430b-9993-4314-9fda-940916122630	User

Description	No description

Review + assign **Previous** Next

Create key encryption

🔑 Create a key ...

Options	Generate ⌄
Name * ⓘ	encryptionkey ✓
Key type ⓘ	⦿ RSA ○ EC
RSA key size	○ 2048 ○ 3072 ⦿ 4096
Set activation date ⓘ	☐
Set expiration date ⓘ	☐
Enabled	**Yes** No
Tags	0 tags

Create Cancel

🔑 appkeyvault4545 | Keys ☆ …
Key vault

🔍 Search

- 🎯 Overview
- 📄 Activity log
- 🎟️ Access control (IAM)
- 🏷️ Tags

➕ Generate/Import   ↻ Refresh   ⤒ Restore Backup   🔗 Manage deleted keys

Name	Status	Expiration date
encryptionkey	✓ Enabled	

Now cre

ate disk encryption set

Add resource group, disk encryption name, kevault name, key and version and create

Home > Disk Encryption Sets >

Create a disk encryption set …

✅ Validation passed

Basics   **Tags**   **Review + create**

Basics

Subscription	Azure subscription 1
Resource group	app-rg
Region	North Europe
Disk encryption set name	encryptionset
Encryption type	Customer-managed key
Key vault	appkeyvault4545
Key	encryptionkey
Version	b7819223c30d449cac722b2e3dfb7cc5
Auto key rotation	Disabled
User-assigned identity	-
Multi-tenant application	-

Create   < Previous   Next >   Download a template for automation

Once disk encryption created –

On overview its shows grant permission -> click on it and provide permission

Permission assigned

Now goto appvm02-> disk and detach **datadisk02** -> click on apply

Goto data disk encryption set -> encryption -> and select key management "customer-managed key:encryptionset "

Lab - Azure Disk Encryption

How to change encryption setting(os and disk)

1.click on datadisk02 and click on additional settings-> add kevault name, key and version and click on save

Once deployment completed ->login to vm and check data valume encryption
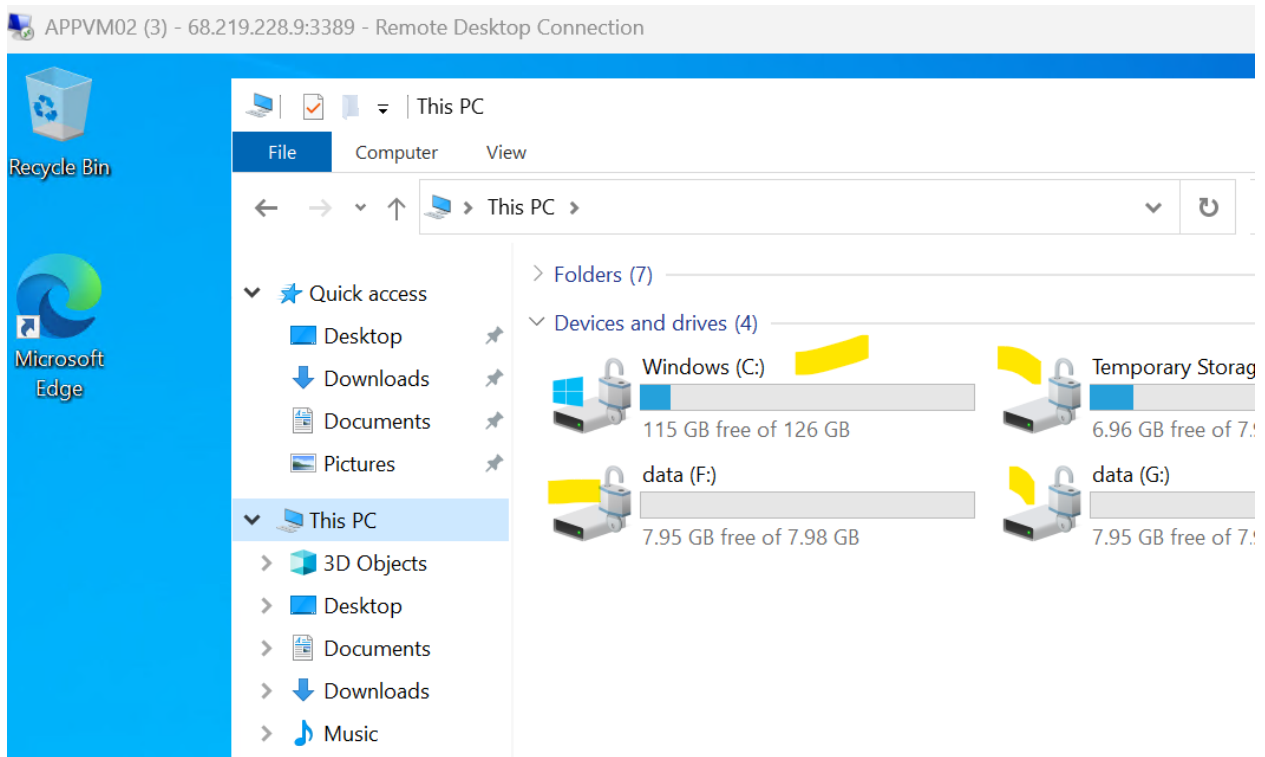
Custom script extensions

This feature can be used to download and run scripts on azure virtual machines

Now will create powershell script fill that will automate the installation on internet information services

Lab - Custom Script Extensions

1. Create storage account to stotoring powershell script

2. Upload powershell

scripts
Container

Search

- Overview
- Diagnose and solve problems
- Access Control (IAM)
- > Settings

+ Add Directory ↑ Upload 🔒 Change access level 🔄 Refresh | 🗑 Delete 📄 Copy 📋 Paste Rename Acquire lease Break lease Edit columns

scripts

Authentication method: Access key (Switch to Microsoft Entra user account)

Add filter

Search blobs by prefix (case-sensitive)

Only show active blobs

Showing all 1 items

	Name	Last modified	Access tier	Blob type	Size	Lease state	
	IIS.ps1	8/25/2025, 1:37:45 PM	Hot (Inferred)	Block blob	80 B	Available	...

Create vm

Add information -> click on advanced -> select an extension to install

Home >

Create a virtual machine

Help me choose the right VM size for my workload | Help me create a low cost VM | Help me create a VM optimized for high

Basics Disks Networking Management Monitoring **Advanced** Tags Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Extensions

Extensions provide post-deployment configuration and automation.

Extensions ⓘ   Select an extension to install

VM applications

VM applications contain application files that are securely and reliably downloaded on your VM after deployment. In addition to the application files, an install and uninstall script are included in the application. You can easily add or remove applications on your VM after create. Learn more

Select a VM application to install

Custom data

Search "Custom script extension" and brows file storage account name and container

Install an Extension   ✕

Custom script extension   ✕

Custom script extension

Microsoft Corp.

Custom script handler extension for windows

Custom script extension
Publisher: Microsoft Corp.

Overview

Custom script extension is a tool that can be used to automatically launch and execute VM customization tasks post configuration. When this Extension is added to a Virtual Machine, it can download Powershell scripts and files from Azure storage and launch a Powershell script on the VM which in turn can download additional software components. Custom Script Extension tasks can also be automated using the Azure Powershell cmdlets.

Next

---

scripts
Container

⬆ Upload   ↻ Refresh | ↪ Give feedback

Authentication method: Access key (Switch to Microsoft Entra user account)
Location: scripts

Search blobs by prefix (case-sensitive)   ⬤ Show deleted blobs

⊕ Add filter

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
📄 IIS.ps1	8/25/2025, 1:37:45 PM	Hot (Inferred)		Block blob	80 B	Available

---

Create a virtual machine   ...   🛠   [Help me choose the right VM size for my workload] [Help me create a low cost VM] [Help me create a VM op

Basics   Disks   Networking   Management   Monitoring   **Advanced**   Tags   Review + create

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Extensions ⓘ   🟦 Custom script extension   ✏ 🗑
                              Microsoft Corp.
                              Select an extension to install

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Create vm

Create a virtual machine ··· ⊞ [Help me choose the right VM size for my workload] [Help me create a low cost VM]

✅ Validation passed

Basics   Disks   Networking   Management   Monitoring   Advanced   Tags   **Review + create**

Price

1 X Standard B2s
by Microsoft
Terms of use | Privacy policy

Subscription credits apply ⓘ
0.0536 USD/hr
Pricing for other VM sizes

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the Azure Marketplace Terms for additional details.

[< Previous]   [Next >]   [Create]

Once deployment completed copy public ip of windows vm machin and check

Lab - Custom Script Extensions for Linux Virtual Machines

1.upload script on storage account

2 create linuxvm -> add extension

Install an Extension ...

🔍 Custom script for linux ✕

Custom script for linux

Microsoft Corp.

Custom script extension for linux
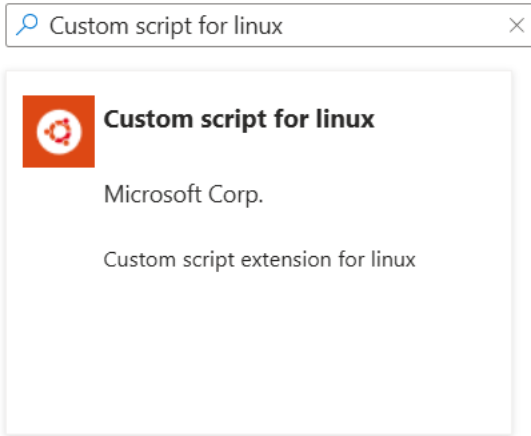
Create a virtual machine ...

Help me create a VM optimized for high availability   Help me create a low cost VM   Help me choose the right VM size for my workload

Basics   Disks   Networking   Management   Monitoring   **Advanced**   Tags   Review + create

Add additional configuration, agents, scripts or applications via virtual machine extensions or cloud-init.

Extensions

Extensions provide post-deployment configuration and automation.

Extensions ⓘ   Custom script for linux   ✏️ 🗑️
                                Microsoft Corp.

Select an extension to install

VM applications

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Select a VM application to install

Custom data and cloud init

Pass a cloud-init script, configuration file, or other data into the virtual machine **while it is being provisioned**. The data will be saved on the VM in a known location. Learn more about custom data for VMs ↗

< Previous   Next : Tags >   Review + create

Create a virtual machine

Help me create a VM optimized for high availability   Help me create a k

✅ Validation passed

Basics   Disks   Networking   Management   Monitoring   Advanced   Tags   **Review + create**

Price

1 X Standard B1s
by Microsoft
Terms of use | Privacy policy

Subscription credits apply ⓘ
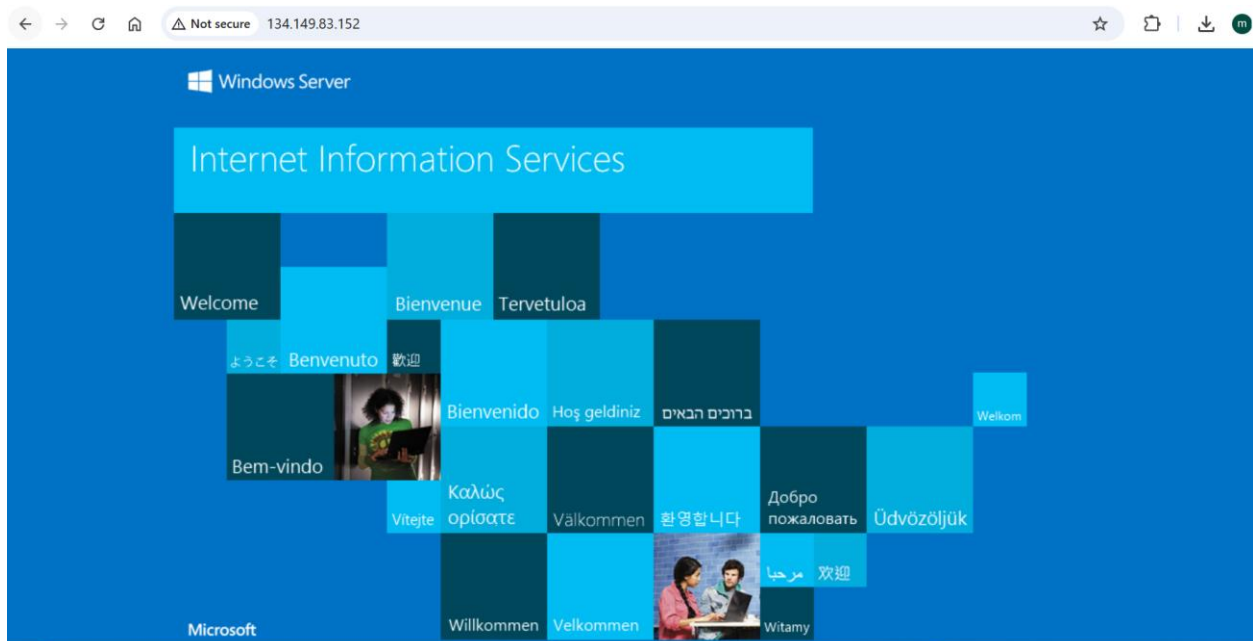**0.0113 USD/hr**
Pricing for other VM sizes

TERMS

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Name   manisha b

< Previous   Next >   Create

Once deployment complete – goto linux machin and copy public ip and check on browser, it will shows below output

← → C ⌂ ⚠ Not secure 74.234.110.135   ☆ ⛶ | Ⓜ ⋮

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

Lab - Linux Virtual Machines - Cloud init

Create linuxvm -> add required details

Add below script in advanced tab **"Custom data and cloud init"** click and review click on create

#cloud-config

package_upgrade: true

packages:

 - nginx

Once deployment completed -> goto linuxvm -> copy publicip and browse

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

Virtual Machine - Boot Diagnostics

boot diagnostics to check logs for vm to check why vm is not starting

we can check details boot diagnostics->

[Azure boot diagnostics - Azure Virtual Machines | Microsoft Learn](#)

linuxvm | Boot diagnostics ☆ ⋯
Virtual machine

🔍 Search

○ Refresh   ⚙ Settings   🔧 Troubleshoot

> Automation
∨ Help
  💗 Resource health
  📊 Boot diagnostics
  🖥 Serial console
  🔑 Reset password
  🖥 Connection troubleshoot
  🖥 Performance diagnostics
  🖥 VM Inspector (Preview)
  🅾 Ubuntu Advantage support plan
  🔧 Redeploy + reapply
  ⑦ Support + Troubleshooting

Screenshot   Serial log

Updated: Monday, August 25, 2025 at 9:06:31 AM UTC   Download screenshot

```
Ubuntu 24.04.3 LTS linuxvm tty1

linuxvm login: _
```

linuxvm | Boot diagnostics ☆ ⋯
Virtual machine

🔍 Search

○ Refresh   ⚙ Settings   🔧 Troubleshoot

> Automation
∨ Help
  💗 Resource health
  📊 Boot diagnostics
  🖥 Serial console
  🔑 Reset password
  🖥 Connection troubleshoot
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  🅾 Ubuntu Advantage support plan
  🔧 Redeploy + reapply
  ⑦ Support + Troubleshooting

Screenshot   **Serial log**

Updated: Monday, August 25, 2025 at 9:05:31 AM UTC   Download serial log

```
[  OK  ] Finished cloud-init-local.service ...ud-init: Local Stage
(pre-network).

[  OK  ] Reached target network-pre.target - Preparation for Network.

         Starting systemd-networkd.service - Network Configuration...

[  OK  ] Started systemd-networkd.service - Network Configuration.

[  OK  ] Reached target network.target - Network.

         Starting systemd-networkd-wait-onl...ait for Network to be Configured...

[  OK  ] Finished systemd-networkd-wait-onl... Wait for Network to be
Configured.
```

Add or remove favorites by pressing Ctrl+Shift+F

Lab - Virtual Machine - Run command

We can execute command from operations -run command

Can't connect to your virtual machine?

Redeploy vm

Availability Sets

This is logical grouping of machines that helps to reduce the chances of multiple vm's going down because of hardware issues

Fault domains are used to define the group of virtual machines that share a common source and network switch. You can have up to 3 fault domains.

Update domains are used to group virtual machines and physical hardware that can be rebooted at the same time. You can have up to 20 update domains.

Lab - Availability Sets

Create a virtual machine

··· 🔷 | Help me create a low cost VM | Help me choose the right VM size for my workload

Resource group * ⓘ	app-rg ▾

Create new

Instance details

Virtual machine name * ⓘ	linuxvm ✓
Region * ⓘ	(Europe) North Europe ▾

Deploy to an Azure Extended Zone

Availability options ⓘ	Availability set ▾

🔵 Based on your input, you might want to consider creating this resource as a virtual machine scale set, which allows you to manage, configure and scale load balanced virtual machines. Create as VMSS ⧉

Availability set * ⓘ	No existing availability sets in current resource group and location. ▾

Create new

Security type ⓘ	Trusted launch virtual machines ▾

[< Previous] [Next : Disks >] [Review + create]

Create availability set   ✕

Group two or more VMs in an availability set to ensure that at least one is available during planned or unplanned maintenance events. Learn more

Name *

appset	✓

Fault domains ⓘ

————————●————————— [2]

Update domains ⓘ

——————●————————————— [5]

Use managed disks ⓘ

[No (Classic)] [Yes (Aligned)]

[OK]

Create a virtual machine   ···   ⬡

[Help me create a low cost VM]   [Help me choose the rig

✅ Validation passed

Region	North Europe
Availability options	Availability set
Zone options	Self-selected zone
Availability set	(new) appset
Security type	Trusted launch virtual machines
Enable secure boot	Yes
Enable vTPM	Yes
Integrity monitoring	No
Image	Ubuntu Server 24.04 LTS - Gen2
VM architecture	x64
Size	Standard B1s (1 vcpu, 1 GiB memory)
Enable Hibernation	No
Authentication type	Password
Username	linuxvm
Public inbound ports	SSH
Azure Spot	No

[< Previous]   [Next >]   [Create]

appset
Availability set

[Suggest VM sizes for hosting my application] [Find optimal VM size for my compute needs] [Recommend sizes for VMs in this set]

🔍 Search

🗑 Delete ⟳ Refresh

- Overview
- Activity log
- Access control (IAM)
- Tags
- Resource visualizer
- > Settings
- > Automation
- > Help

ℹ Enjoy more features at the same price with a VM Scale Set (VMSS). While availability sets offer high availability only, a flexible VMSS provides automatic scaling, optimization, and recovery, along with simple, central group management for up to 2,000 VMs-at no added cost. Pay only for capacity you use, while mixing VM sizes, zones, and fault domains. | Click to learn more

∧ Essentials   JSON View

Resource group (move)	: APP-RG	Fault domains	: 2
Location	: North Europe	Update domains	: 5
Subscription (move)	: Azure subscription 1	Virtual machines	: 2
Subscription ID	: b435e57d-913c-4896-baf9-12e1971e7539	Managed	: Yes
		Colocation status	: N/A

🔽 Search virtual machines

Name	Status	Colocation status	Fault Domain	Update Domain
linuxvm	✅ Running		0	0
linuxvm02	✅ Running		1	1

Availability Zones

Avaibility zone is a group of data centers there are fast links across availability zones to ensure low latency

Azure region has multiple avaibility zones

Availability Zones Review

- This features help provides better availability for your application by protecting them from datacenter failures.

- Each Availability zone is a unique physical location in an Azure region.

- Each zone comprises of one or more data centers that has independent power, cooling, and networking

- Hence the physical separation of the Availability Zones helps protect applications against data center failures

- Using Availability Zones, you can be guaranteed an availability of 99.99% for your virtual machines. You need to ensure that you have 2 or more virtual machines running across multiple availability zones.

Lab - Azure Virtual Machine Scale Sets

Create a Virtual Machine Scale Set (VMSS) ···

✅ Validation passed

Basics   Spot   Disks   Networking   Management   Health   Advanced   Tags   **Review + create**

Basics

Subscription	Azure subscription 1
Resource group	app-rg
Virtual machine scale set name	appscaleset
Region	North Europe
Orchestration mode	Uniform
Availability zone	None
Image	Ubuntu Server 24.04 LTS - Gen2
Size	Standard B1s (1 vcpu, 1 GiB memory)
Scaling mode	Manually update the capacity
Instance count	1
Security type	Trusted launch virtual machines
Enable secure boot	Yes

< Previous   Next >   **Create**