Portfolio Lab By THATO KGOLE
Date: November 2025
Cloud Platform: Microsoft Azure

OVERVIEW

This project demonstrates the end-to-end deployment of a secure, scalable, and well-structured cloud infrastructure in Microsoft Azure.
It focuses on core AZ-104 Administrator skills, including resource management, networking, security, storage, identity, and cost optimization.

PROBLEM STATEMENT

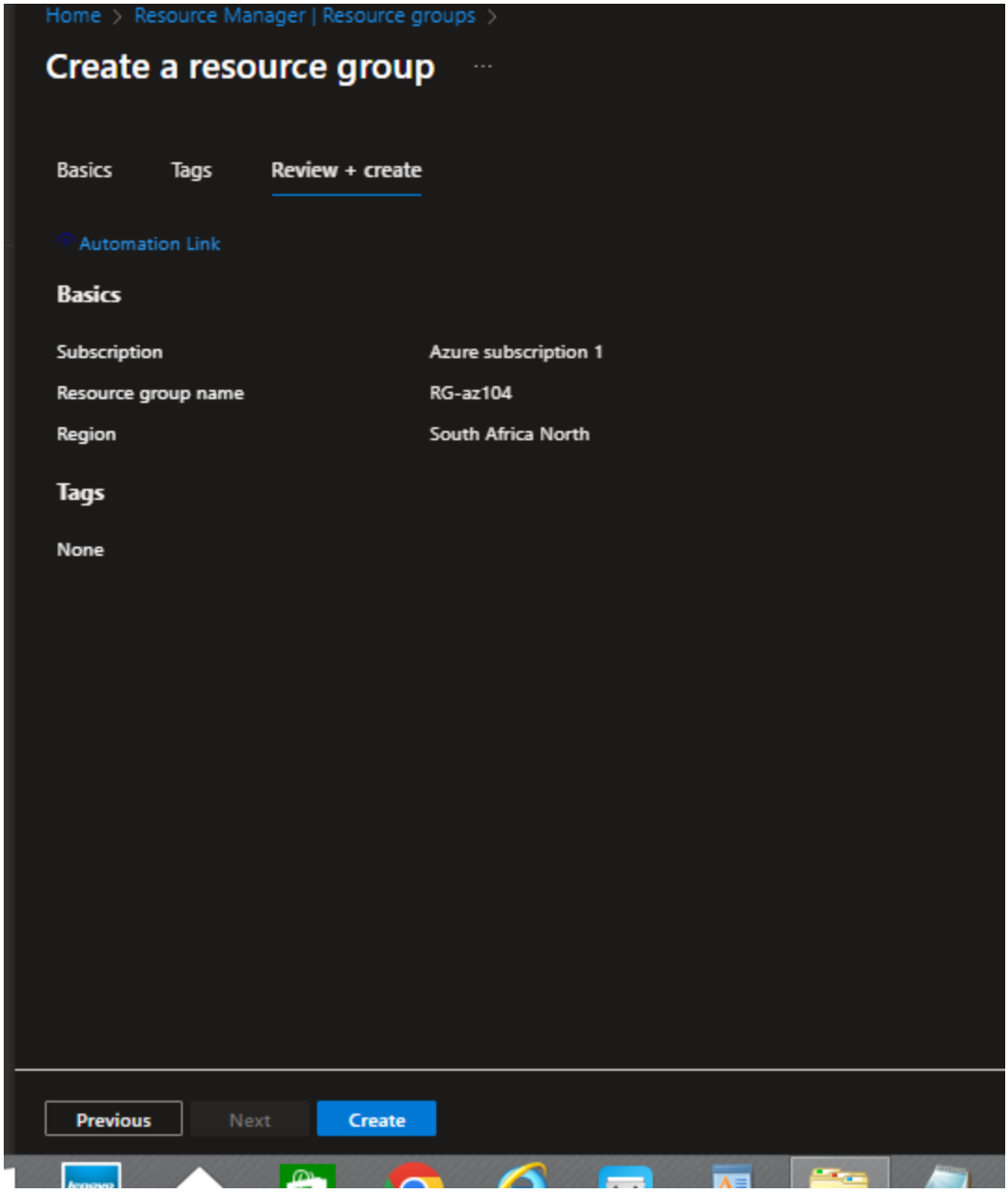
A growing startup wants to migrate its internal application to Azure.
They need an infrastructure that:

>Is secure and segmented.
>Allows controlled public access to the web app but keeps databases private.
>Has identity-based access instead of hardcoded credentials.
>Supports monitoring, cost control, and compliance.

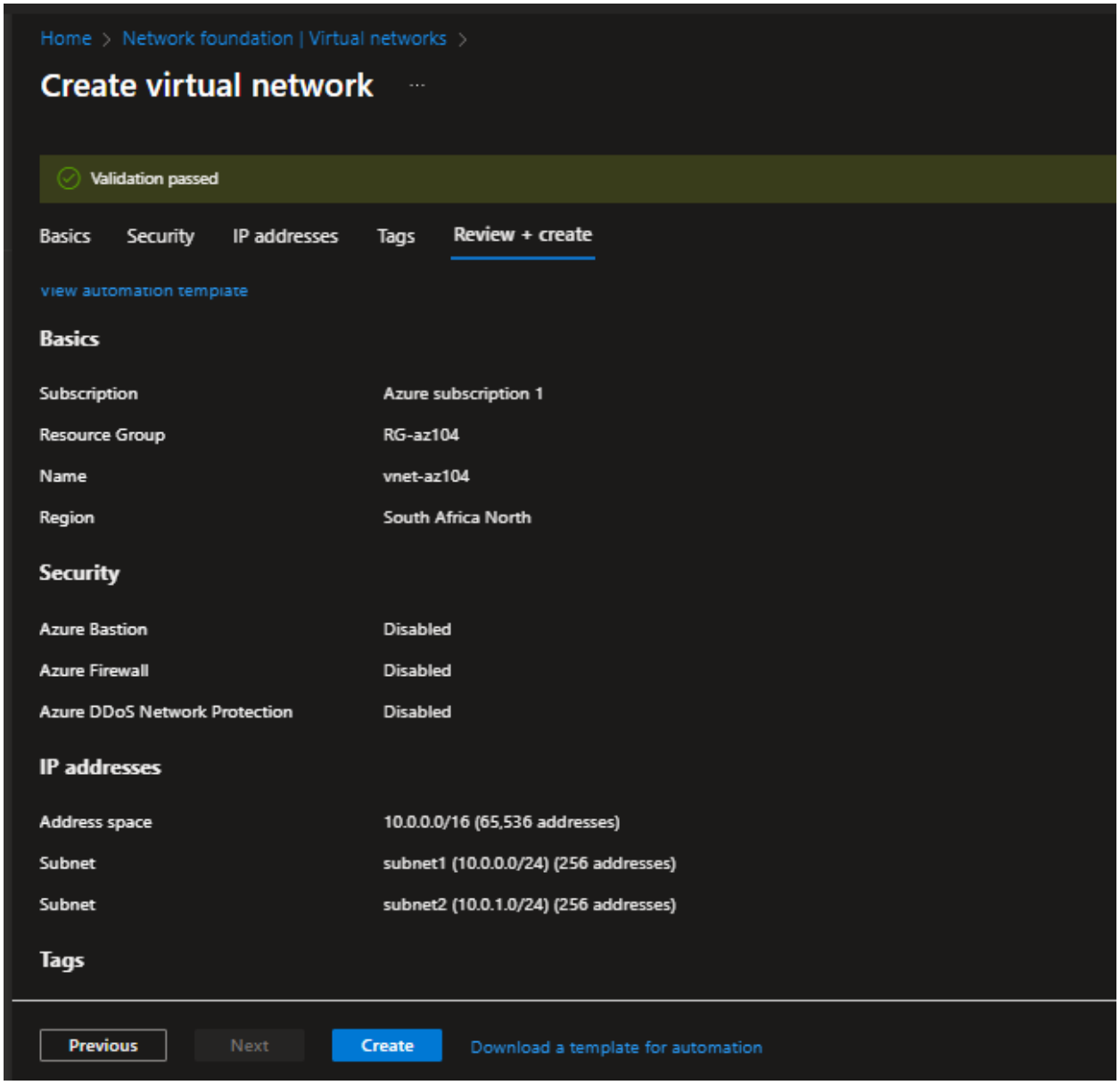
As an Azure Administrator, Your goal was to design and deploy a secure, cost-efficient, and manageable cloud environment that fulfills these requirements.

SOLUTIONS

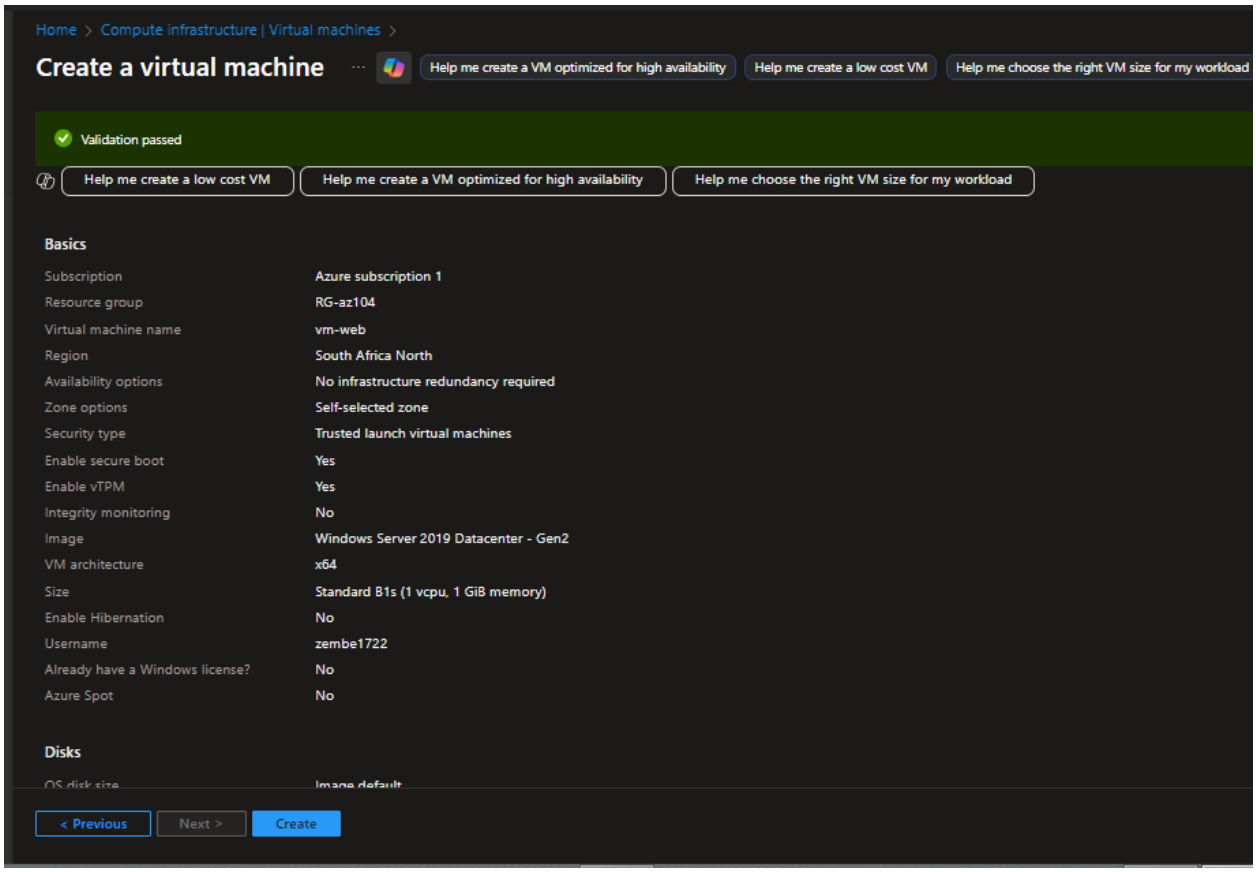
Step 1: Create Resource Group
To group all related resources together

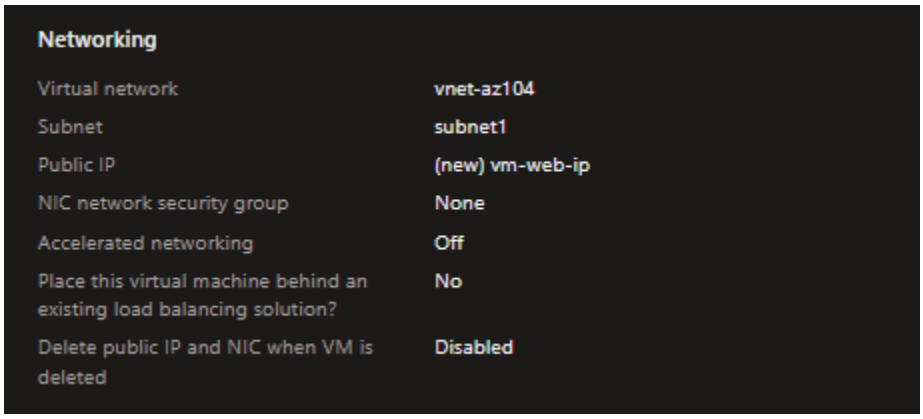


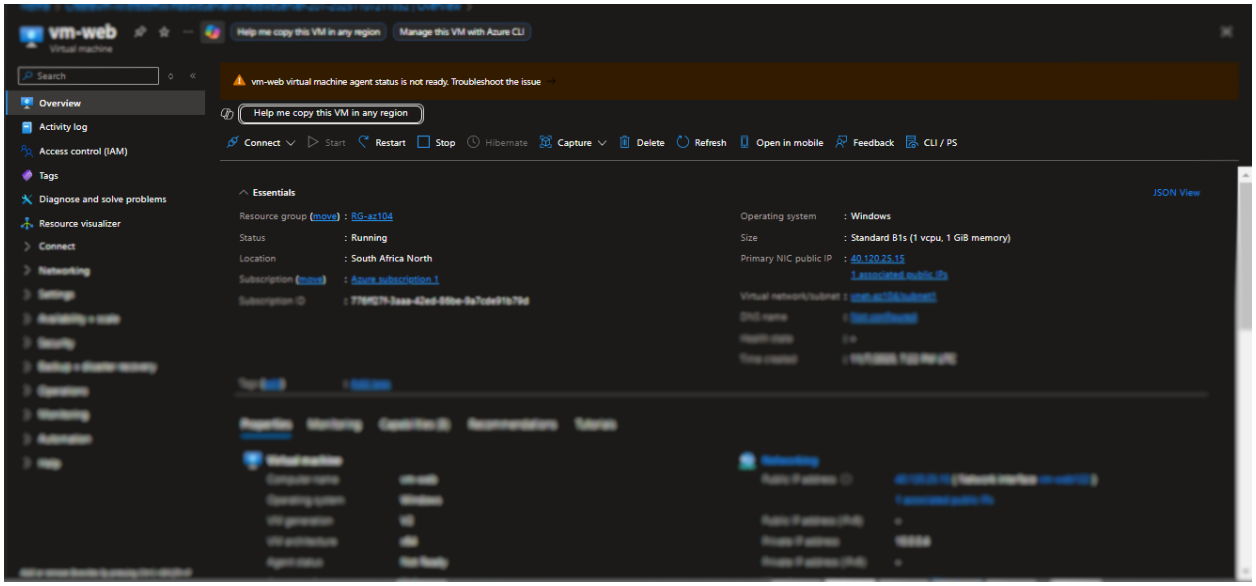
Step 2: Create Virtual Network
Configure address space
Add Subnets
Web subnet (10.0.0.0/24)
DB subnet (10.0.1.0/24)



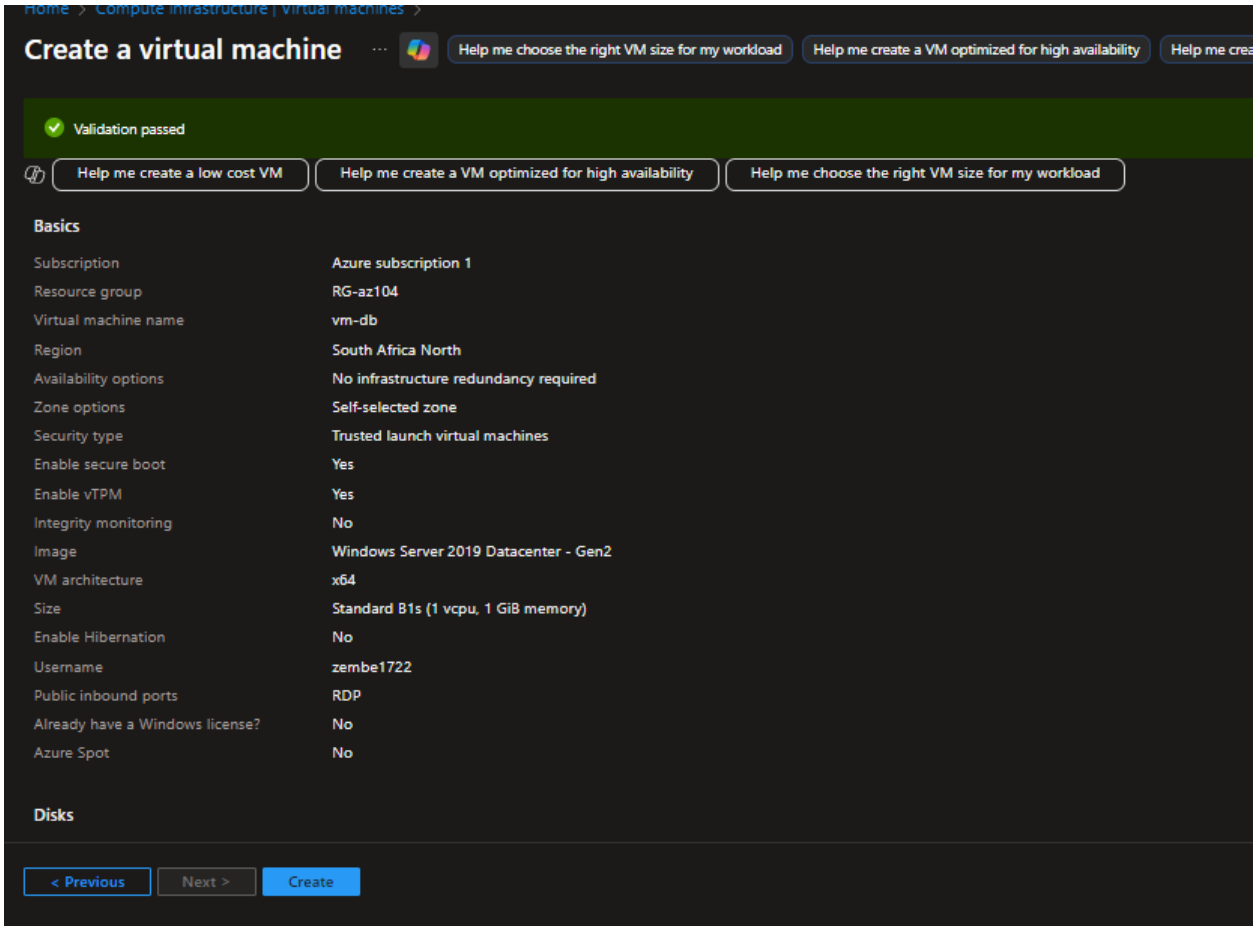
Step 4: Deploy Virtual Machine
Web VM (public IP)
DB VM (private subnet)

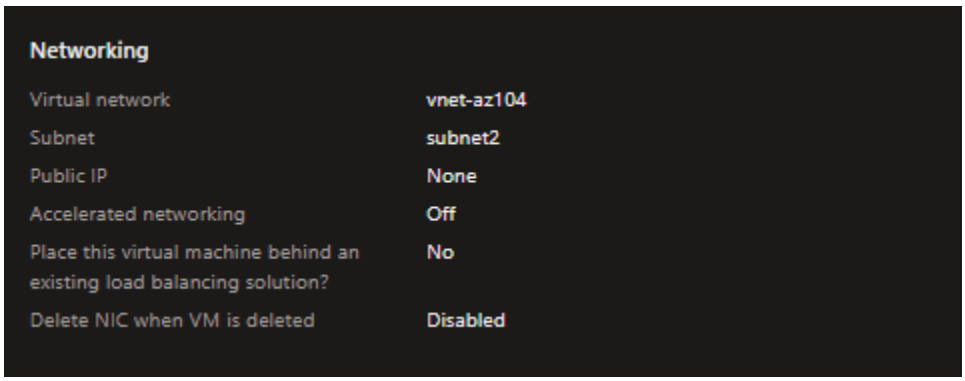

Home > Compute infrastructure | Virtual machines >
Create a virtual machine
Help me create a VM optimized for high availability
Help me create a low cost VM
Help me choose the right VM size for my workload
Validation passed
Help me create a low cost VM
Help me create a VM optimized for high availability
Help me choose the right VM size for my workload
Basics
Subscription Azure subscription 1
Resource group RG-az104
Virtual machine name vm-web
Region South Africa North
Availability options No infrastructure redundancy required
Zone options Self-selected zone
Security type Trusted launch virtual machines
Enable secure boot Yes
Enable vTPM Yes
Integrity monitoring No
Image Windows Server 2019 Datacenter - Gen2
VM architecture x64
Size Standard B1s (1 vcpu, 1 GiB memory)
Enable Hibernation No
Username zembe1722
Already have a Windows license? No
Azure Spot No
Disks
OS disk size Image default
< Previous
Next >
Create

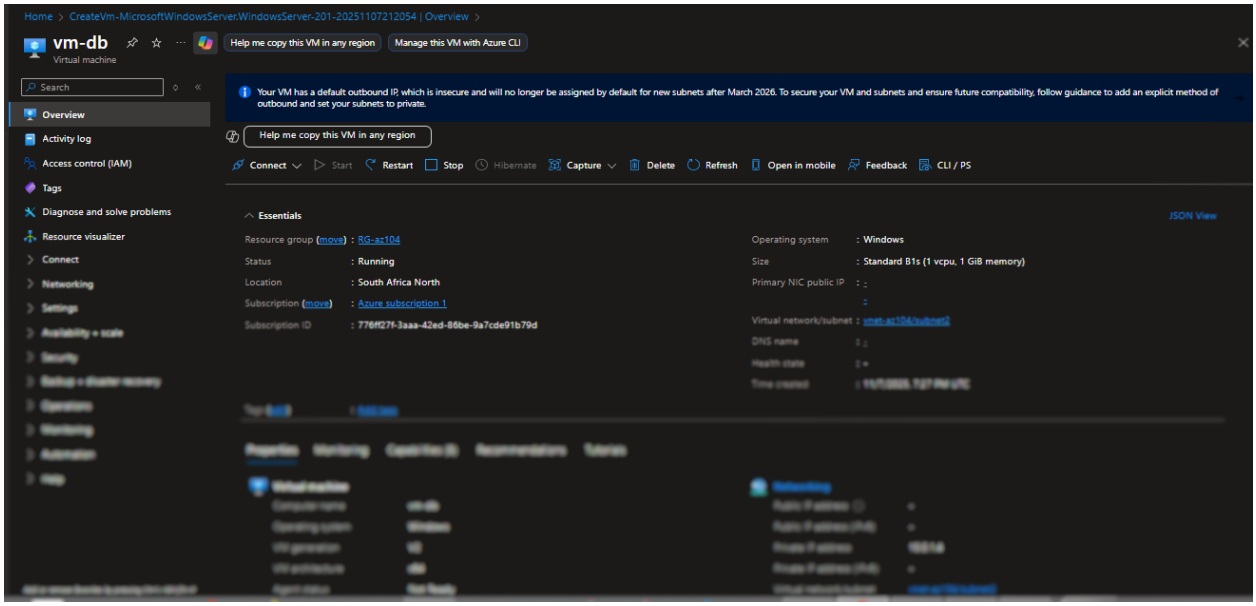

Networking
Virtual network vnet-az104
Subnet subnet1
Public IP (new) vm-web-ip
NIC network security group None
Accelerated networking Off
Place this virtual machine behind an existing load balancing solution? No
Delete public IP and NIC when VM is deleted Disabled


vm-web
Virtual machine
Help me copy this VM in any region
Manage this VM with Azure CLI
Search
vm-web virtual machine agent status is not ready. Troubleshoot the issue
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Networking
Help me copy this VM in any region
Connect
Start
Restart
Stop
Hibernate
Capture
Delete
Refresh
Open in mobile
Feedback
CLI / PS
Essentials
JSON View
Resource group (move) : RG-az104
Status : Running
Location : South Africa North
Subscription (move) : Azure subscription 1
Operating system : Windows
Size : Standard B1s (1 vcpu, 1 GiB memory)
Primary NIC public IP : 40.120.25.15
1 associated public IPs

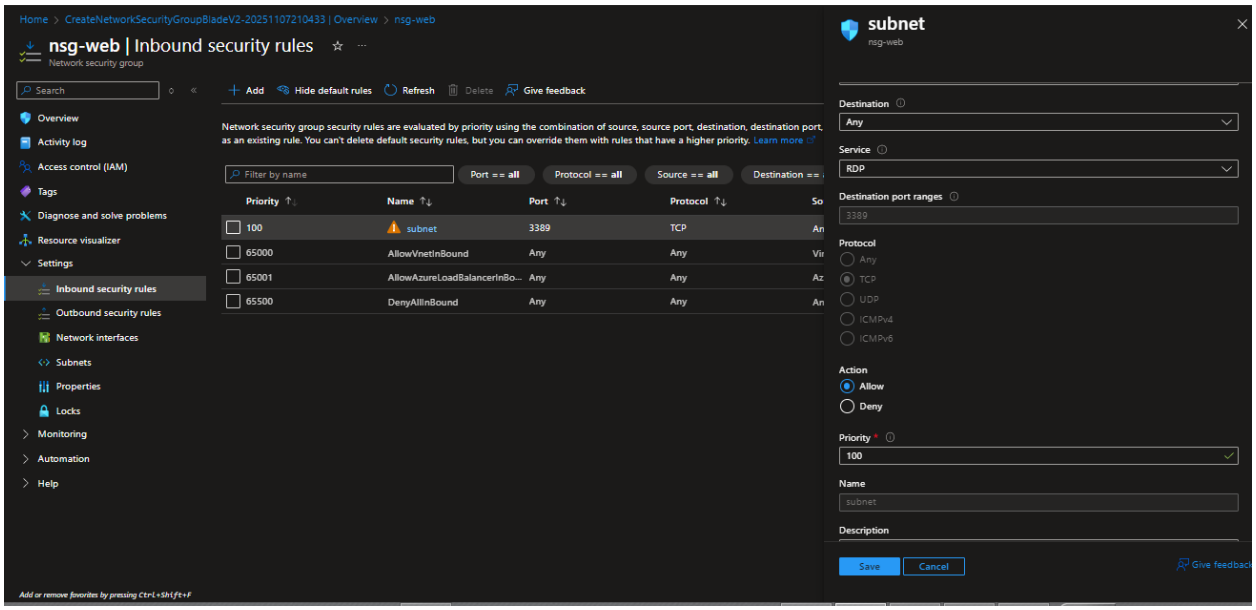
DB VM

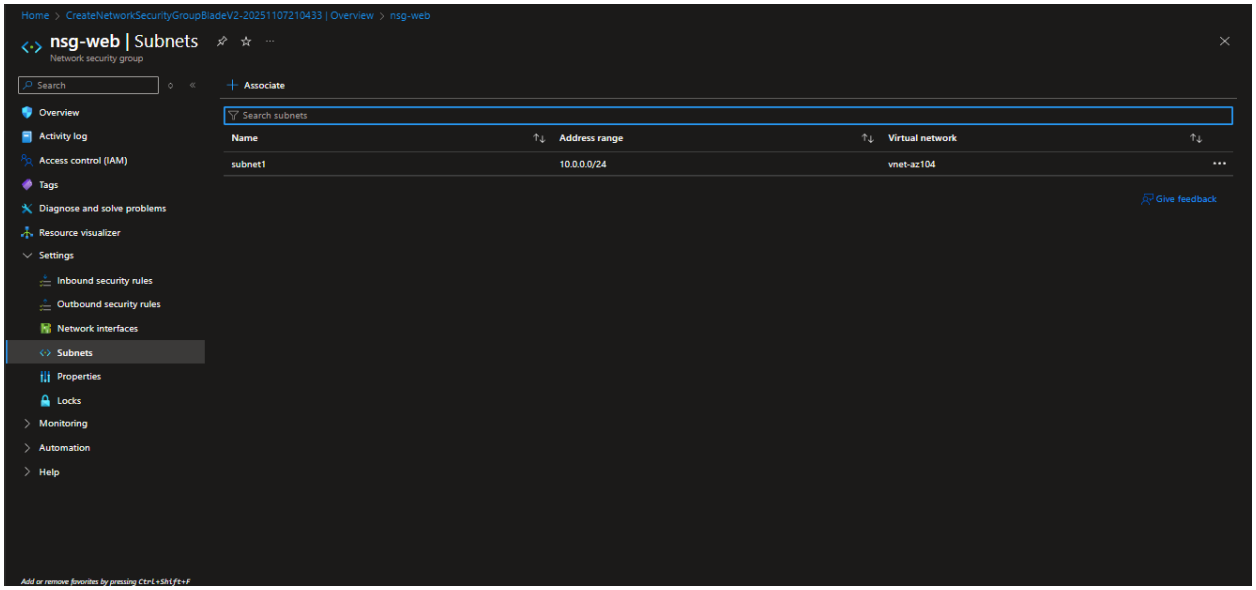

Home > Compute infrastructure | Virtual machines >
Create a virtual machine
Help me choose the right VM size for my workload
Help me create a VM optimized for high availability
Validation passed
Help me create a low cost VM
Help me create a VM optimized for high availability
Help me choose the right VM size for my workload
Basics
Subscription Azure subscription 1
Resource group RG-az104
Virtual machine name vm-db
Region South Africa North
Availability options No infrastructure redundancy required
Zone options Self-selected zone
Security type Trusted launch virtual machines
Enable secure boot Yes
Enable vTPM Yes
Integrity monitoring No
Image Windows Server 2019 Datacenter - Gen2
VM architecture x64
Size Standard B1s (1 vcpu, 1 GiB memory)
Enable Hibernation No
Username zembe1722
Public inbound ports RDP
Already have a Windows license? No
Azure Spot No
Disks
< Previous
Next >
Create


Networking
Virtual network vnet-az104
Subnet subnet2
Public IP None
Accelerated networking Off
Place this virtual machine behind an existing load balancing solution? No
Delete NIC when VM is deleted Disabled

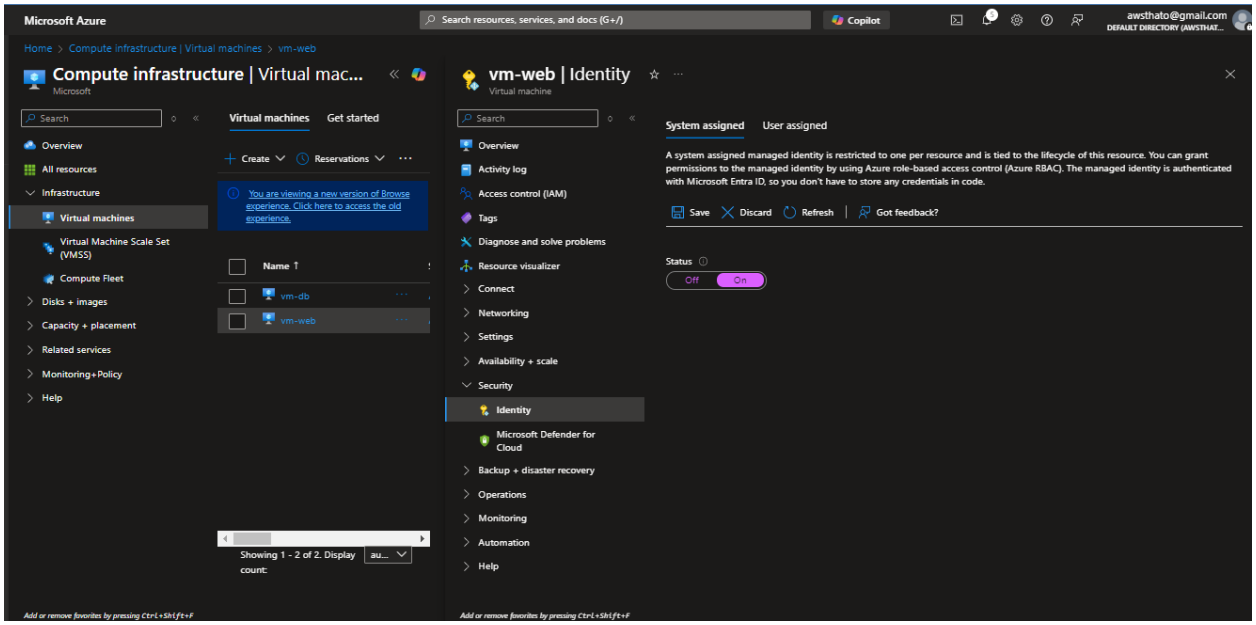


Step 5: Configure NSG Rules
Allow RDP only from your IP

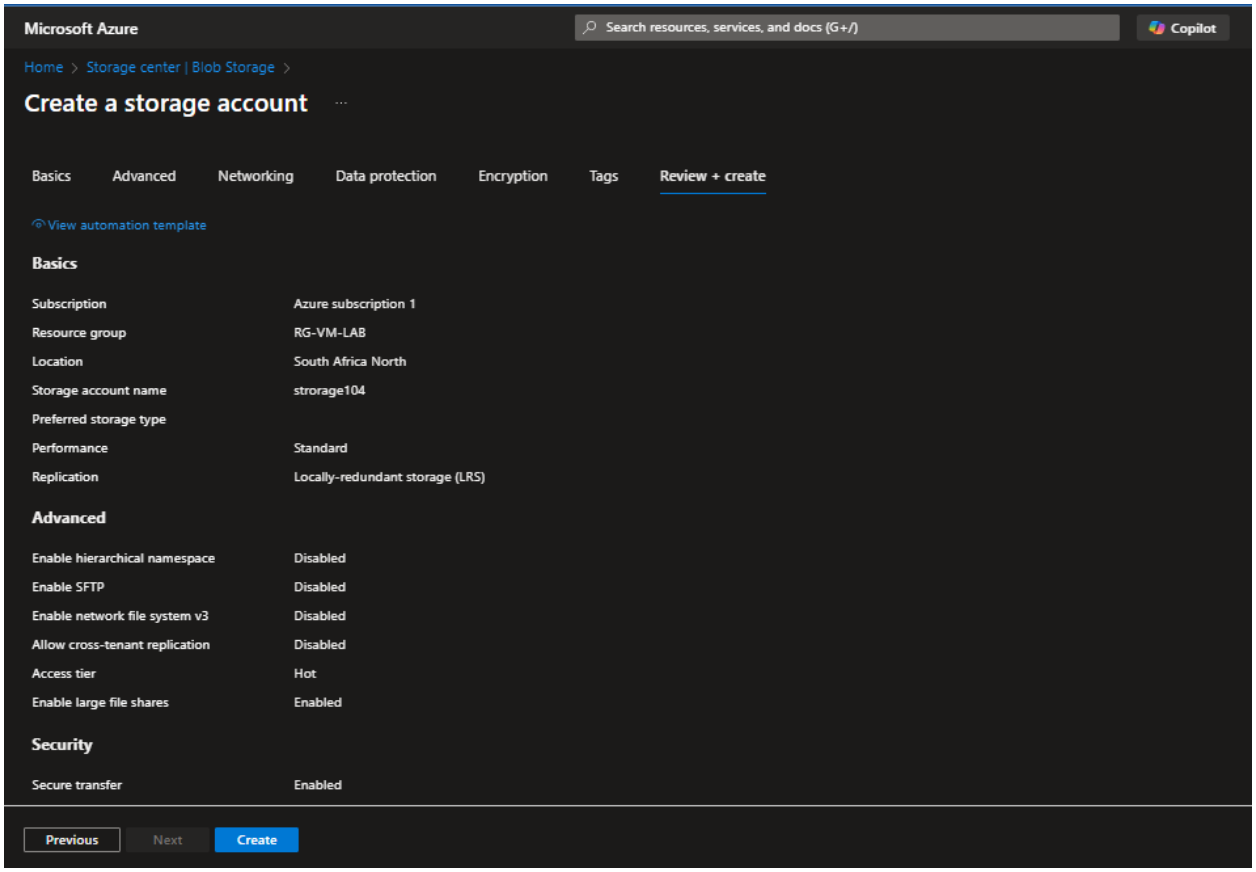


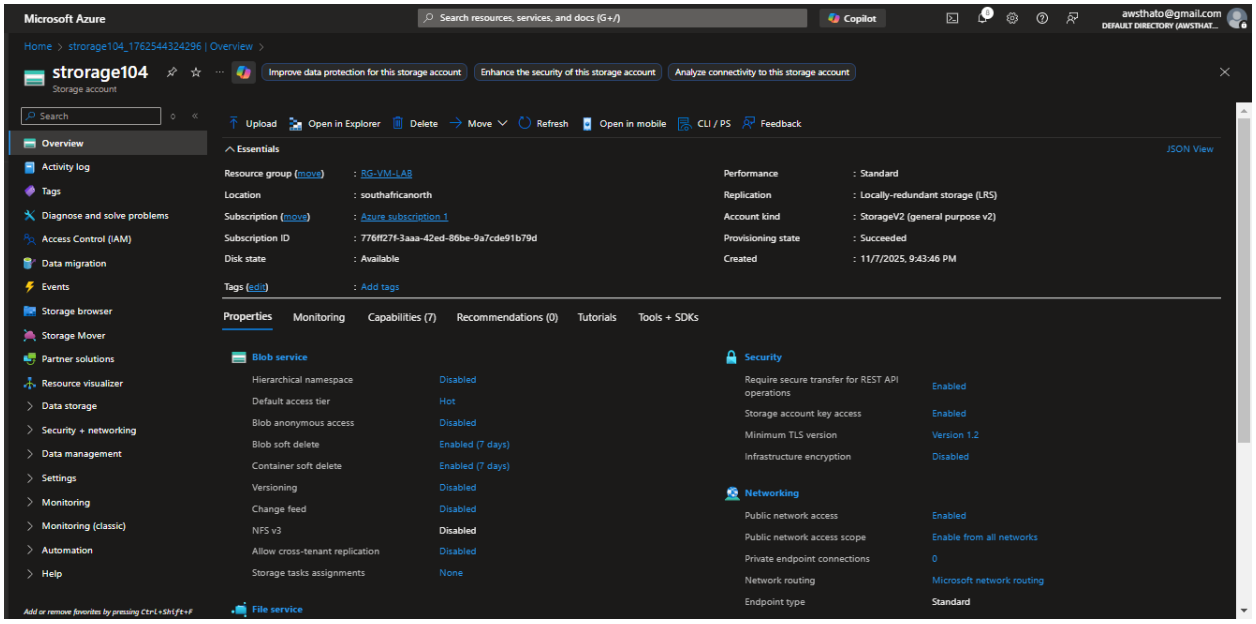


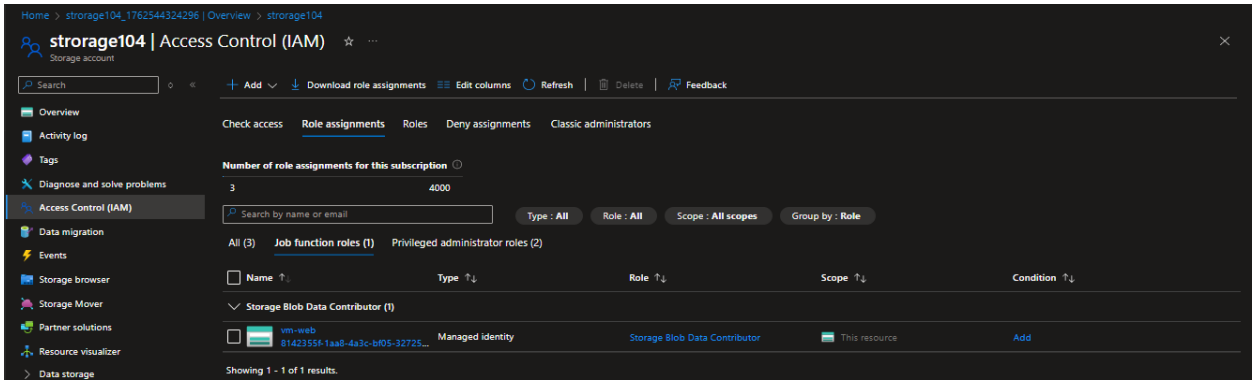
Step 6: Enable Managed Identity
Assign identity to both VMs



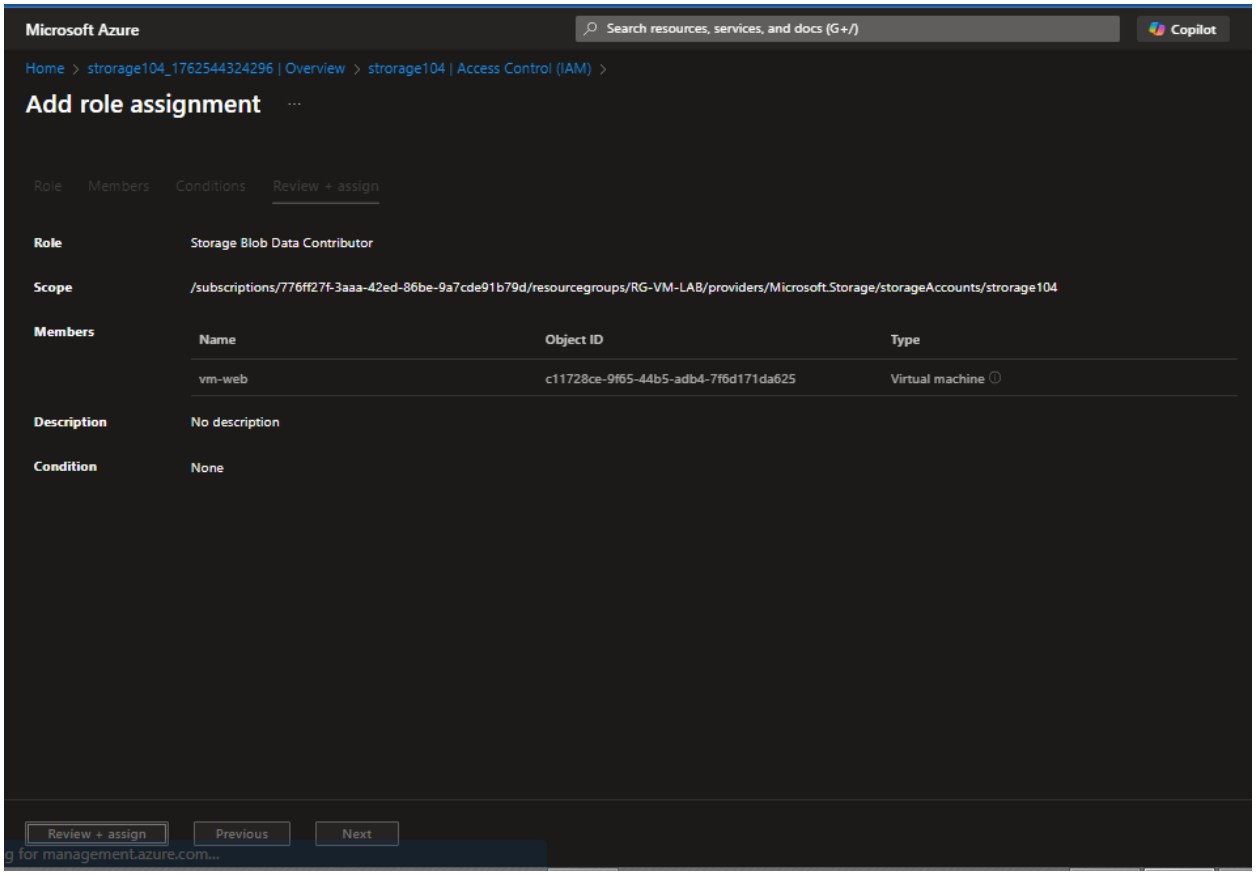
Step 7: Create Storage Account
Use for logs/backups


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
Home > Storage center | Blob Storage >
Create a storage account
Basics
Advanced
Networking
Data protection
Encryption
Tags
Review + create
View automation template
Basics
Subscription
Azure subscription 1
Resource group
RG-VM-LAB
Location
South Africa North
Storage account name
storage104
Preferred storage type
Performance
Standard
Replication
Locally-redundant storage (LRS)
Advanced
Enable hierarchical namespace
Disabled
Enable SFTP
Disabled
Enable network file system v3
Disabled
Allow cross-tenant replication
Disabled
Access tier
Hot
Enable large file shares
Enabled
Security
Secure transfer
Enabled
Previous
Next
Create

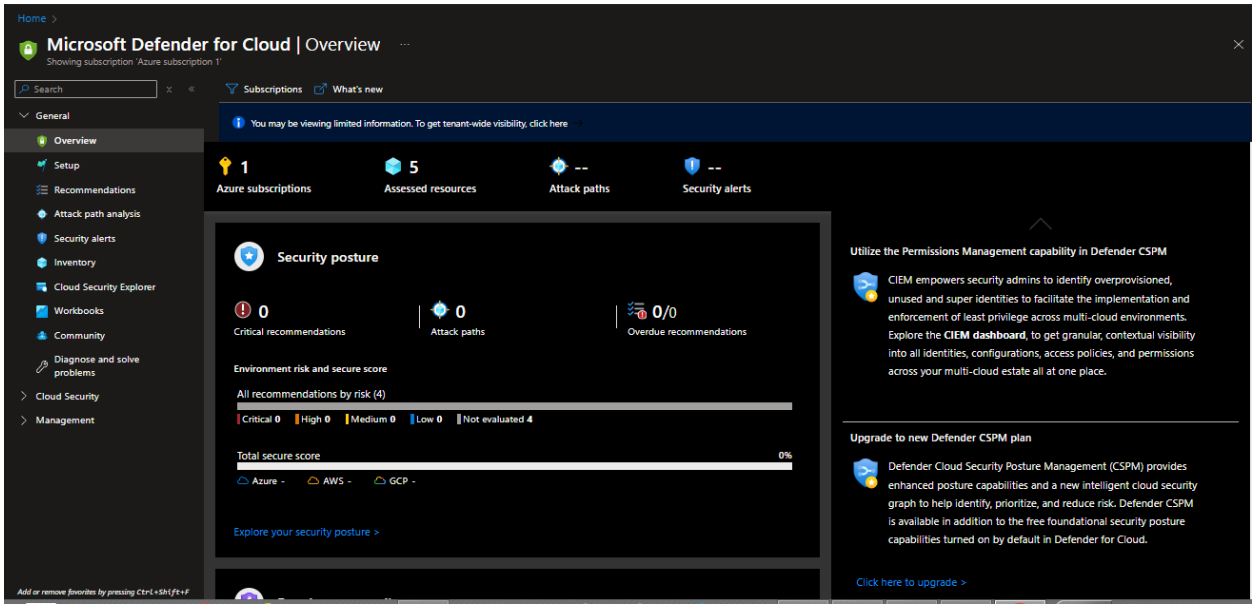

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
awsthato@gmail.com
DEFAULT DIRECTORY (AWSTHAT...
Home > storage104_1762544324296 | Overview >
storage104
Storage account
Improve data protection for this storage account
Enhance the security of this storage account
Analyze connectivity to this storage account
Search
Overview
Activity log
Tags
Diagnose and solve problems
Access Control (IAM)
Data migration
Events
Storage browser
Storage Mover
Partner solutions
Resource visualizer
Data storage
Security + networking
Data management
Settings
Monitoring
Monitoring (classic)
Automation
Help
Upload
Open in Explorer
Delete
Move
Refresh
Open in mobile
CLI / PS
Feedback
Essentials
JSON View
Resource group (move) : RG-VM-LAB
Location : southafricanorth
Subscription (move) : Azure subscription 1
Subscription ID : 776ff27f-3aaa-42ed-86be-9a7cde91b79d
Disk state : Available
Tags (edit) : Add tags
Performance : Standard
Replication : Locally-redundant storage (LRS)
Account kind : StorageV2 (general purpose v2)
Provisioning state : Succeeded
Created : 11/7/2025, 9:43:46 PM
Properties
Monitoring
Capabilities (7)
Recommendations (0)
Tutorials
Tools + SDKs
Blob service
Hierarchical namespace Disabled
Default access tier Hot
Blob anonymous access Disabled
Blob soft delete Enabled (7 days)
Container soft delete Enabled (7 days)
Versioning Disabled
Change feed Disabled
NFS v3 Disabled
Allow cross-tenant replication Disabled
Storage tasks assignments None
Security
Require secure transfer for REST API operations Enabled
Storage account key access Enabled
Minimum TLS version Version 1.2
Infrastructure encryption Disabled
Networking
Public network access Enabled
Public network access scope Enable from all networks
Private endpoint connections 0
Network routing Microsoft network routing
Endpoint type Standard
File service



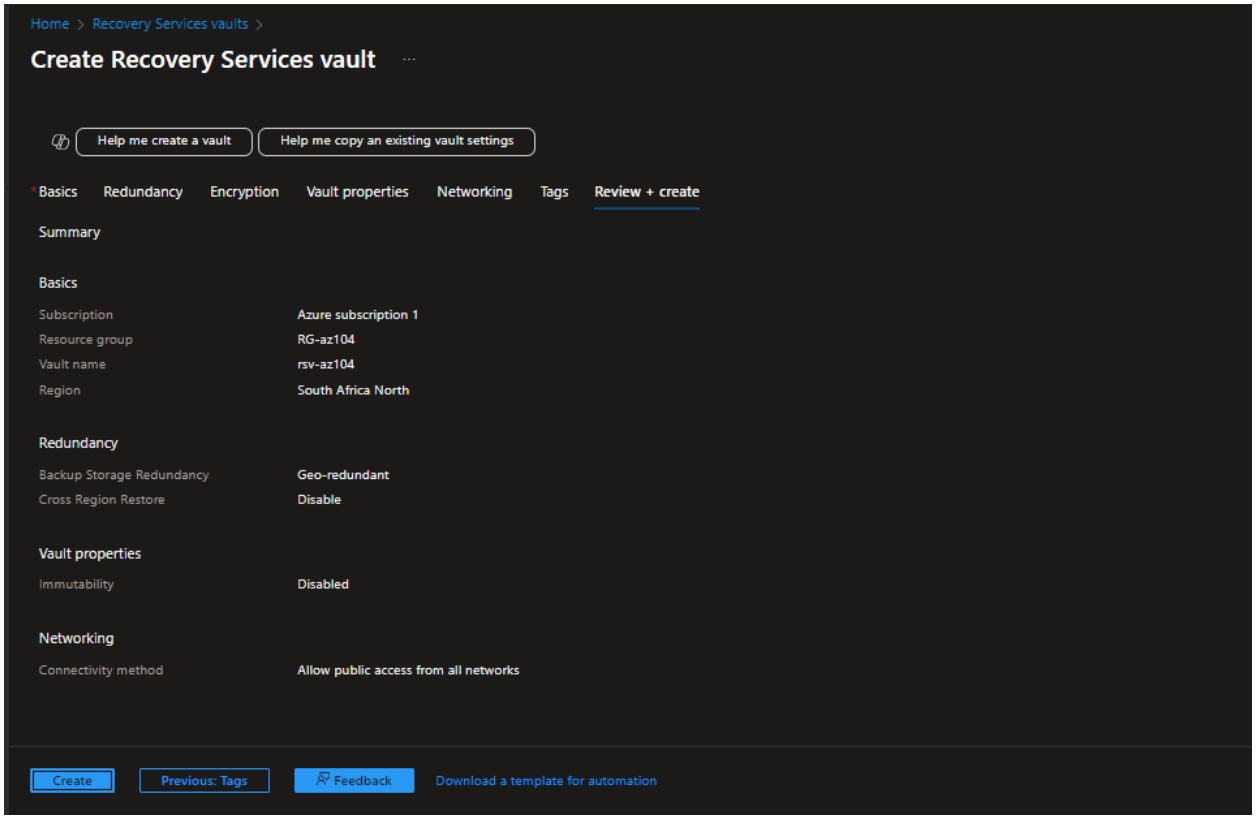
Step 8: Assign RBAC Role
"Storage Blob Contributor" to Managed Identity



Step 9: Enable Azure Defender
Security Center - Defender Plans

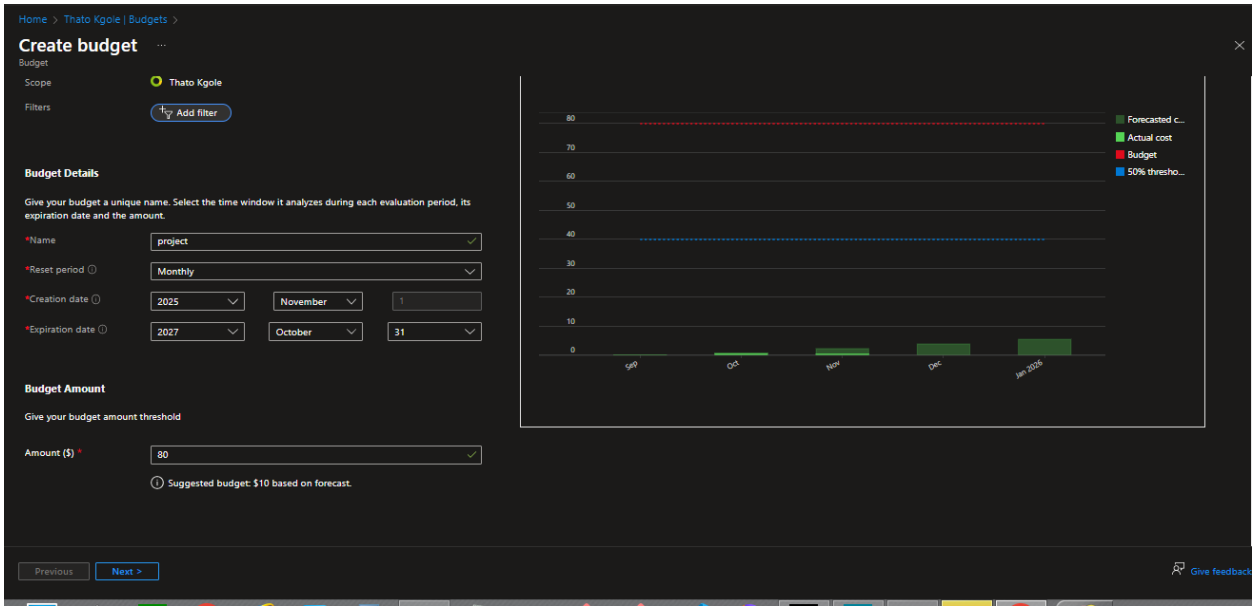


Step 10: Create Recovery Service Vault

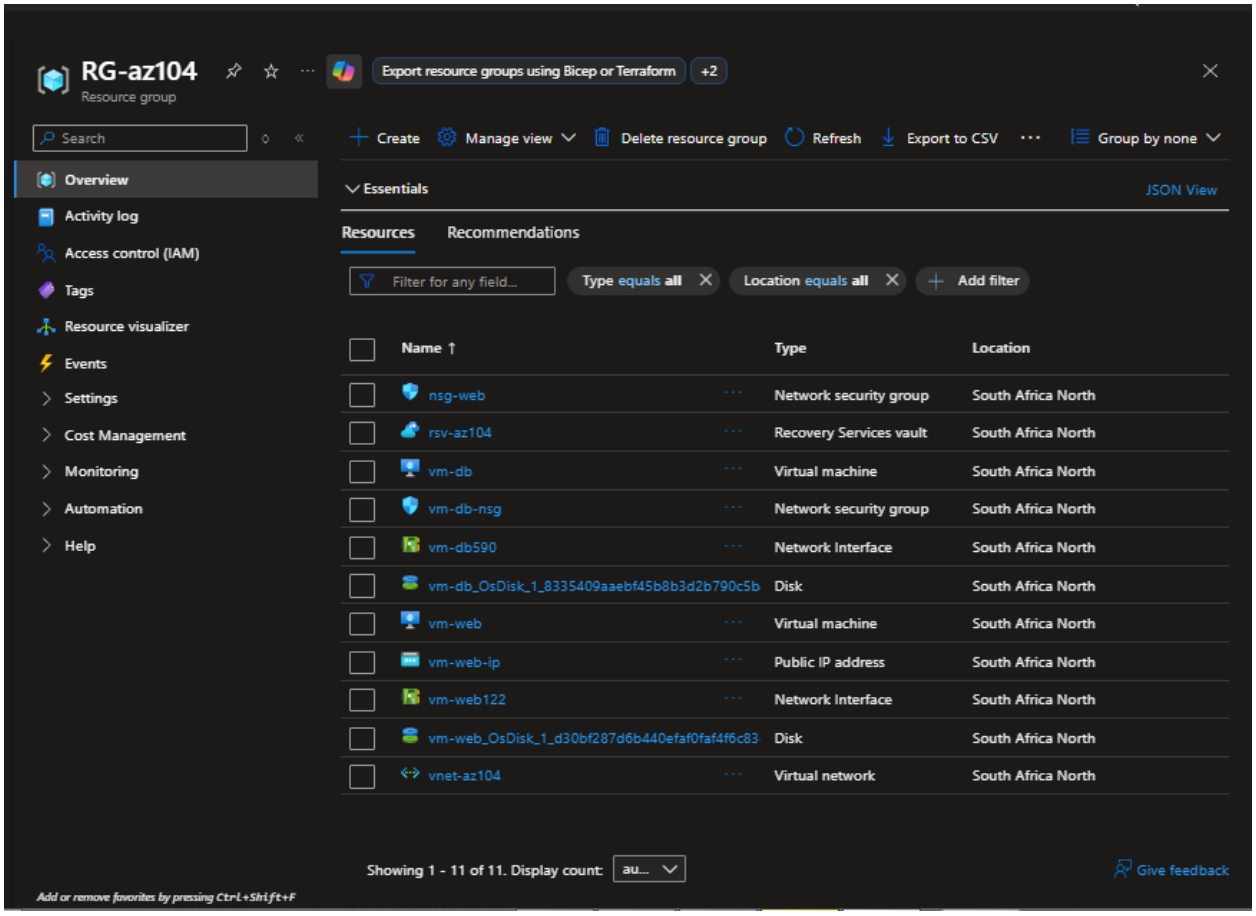


Step 11: Set Budget & Alerts

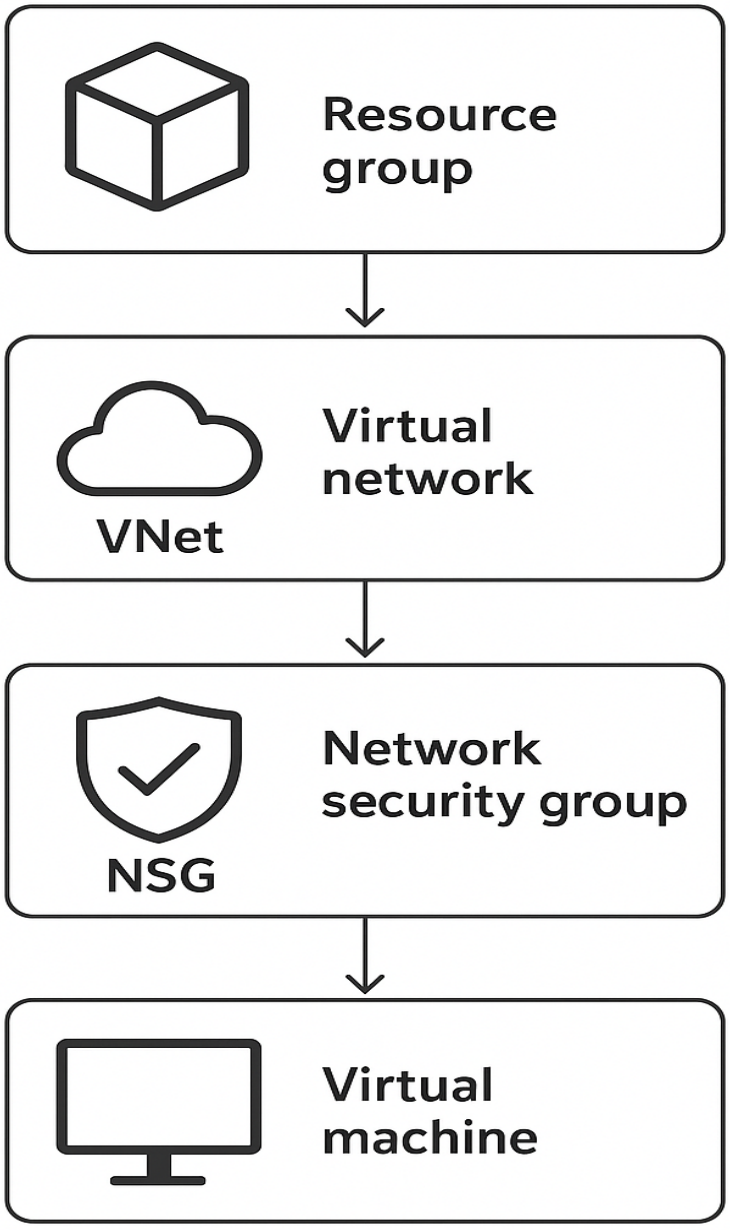
Configure monthly cost limit and email alert



Step 12: Resource Group showing All related content



DIAGRAM



LEARNING OUTCOME

.Deploy Azure Resources
.Understanding Networking, Security, Identity and cost control