Assessment Title

Azure Theoretical and Practical Concepts Evaluation

CCC601| Assessment-2

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Programme
Diploma in Cloud Engineering and Cyber Security (120 Credits)

Course
CCC601: Public Cloud Administration
(Level 6, 30 Credits)

Date: 29th November 2025

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Task 1: Theoretical Evaluation: Cloud Infrastructure Planning and Cost Optimization.

Question 1: Research and evaluate Azure Virtual Machines (VMs), Azure Storage, and Azure Networking to support the college's cloud infrastructure.

Azure Virtual Machines (VMs)

Azure VMs give Yoobee College a flexible way to run servers in the cloud without buying hardware.

- They support both Windows and Linux, so they can run domain controllers, app servers, or even small lab machines.
- VM sizes can be changed later if the workload grows or shrinks, which is helpful for a college environment.
- Azure also offers availability zones and scaling features, which Yoobee can use in the future if more traffic or users come in.

Azure Storage

Azure Storage provides a straightforward place to keep all types of files securely.

- Blob Storage is useful for backups, logs, and large media files used in teaching.
- Azure File Shares let both Windows and Linux VMs connect to the same shared folder, which is handy since different teams use different platforms.
- Data is automatically replicated, so the college doesn't need to worry much about hardware failure or losing files unexpectedly.
- This works well for student files, staff resources, and shared teaching materials.

Azure Networking

Azure Networking is what connects everything together safely.

- Virtual Networks (VNets) help Yoobee create a secure cloud network that feels similar to their current on-prem layout.
- Subnets can separate domain controllers, application servers and file servers, giving better control and reducing security risks.
- Network Security Groups (NSGs) allow the college to block or allow traffic between subnets or from the internet.
- If Yoobee needs to connect the physical campus to Azure later, they can use a VPN Gateway or ExpressRoute.
- These networking features help ensure only the right users and systems can access cloud resources.

Question 2: Compare different Azure pricing models (Pay-as-you-go, Reserved Instances, Spot Instances) and recommend the most cost-effective plan.

Pay-as-you-go

- You pay for what you use, usually charged by the second or hour, and there's no long commitment.
- It's easy to start with and good when you're not sure how much capacity you actually need.
- Works well for short-term testing, student lab work, or anything that might change often.
- It can get pricey if something runs all day every day, so it's not ideal for permanent workloads.

Reserved Instances (Azure Reservations)

- This option means committing to a specific VM size or resource for 1 or 3 years.
- The main benefit is the big discount, which can be quite helpful for the college budget.
- It fits predictable workloads like domain controllers or key application servers that won't be changed often.
- The downside is less flexibility if Yoobee needs to adjust the server type later.

Spot Instances

- These use spare Azure capacity, so the price is much lower compared to the other models.
- Azure can remove the VM at any time when capacity is needed somewhere else.
- Good for things that don't matter if they get interrupted, like batch jobs, testing, or student practice servers.
- Not something you'd use for important systems like production servers or AD.

Recommendation for Yoobee College

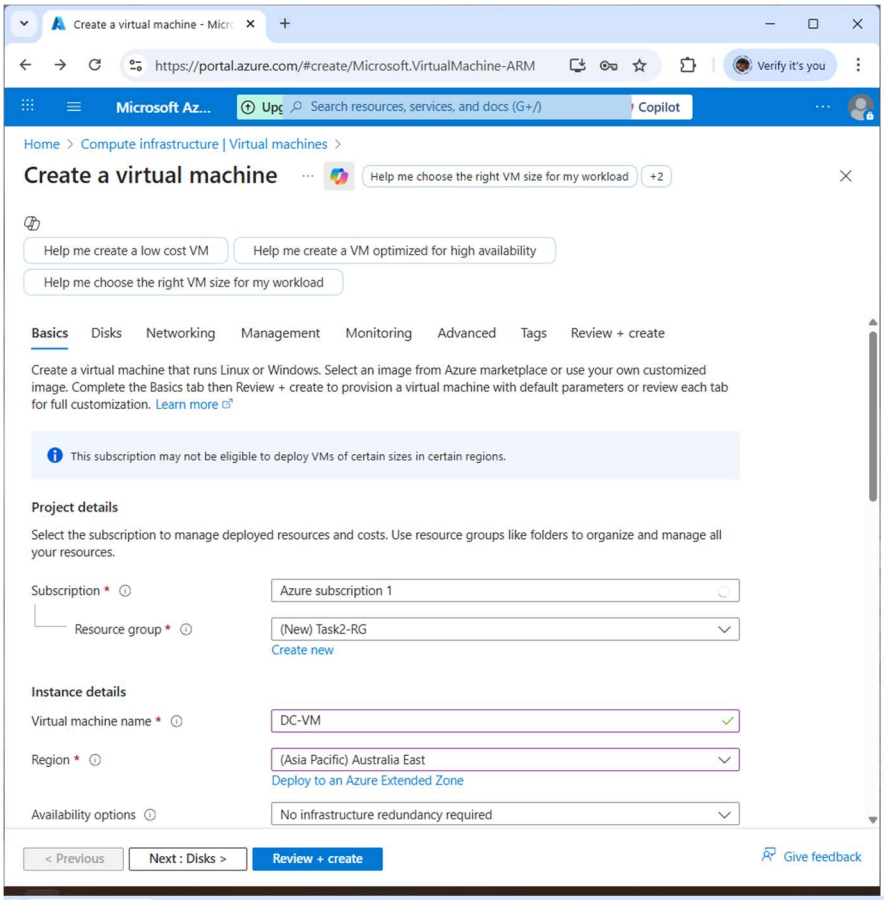
- Reserved Instances are the best choice for always-on services such as AD VMs or main application/file servers.
- Pay-as-you-go works well for temporary workloads, pilot setups, or machines that might change often.
- Spot Instances can be used for non-critical lab or training environments where interruptions are not a problem.

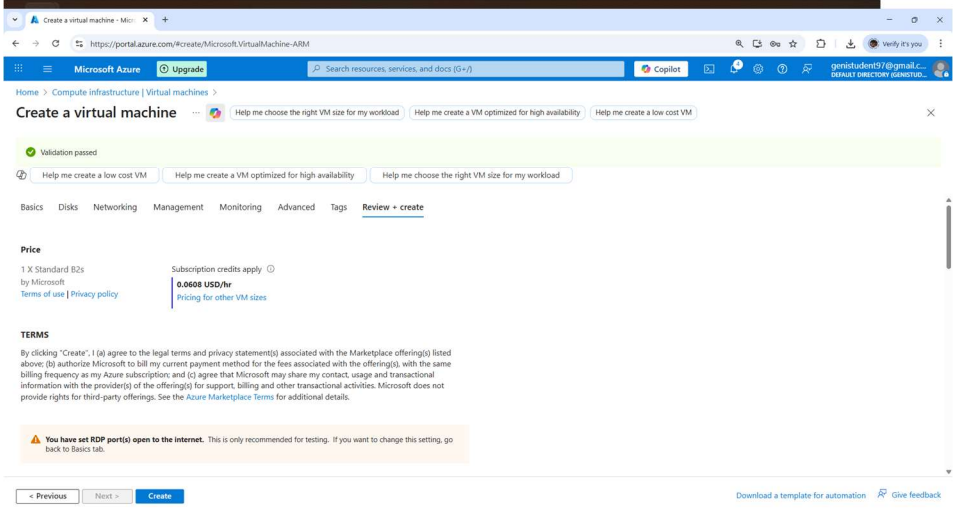
Question 3. Justify the Azure services chosen and how they align with Yoobee College's business and security requirements

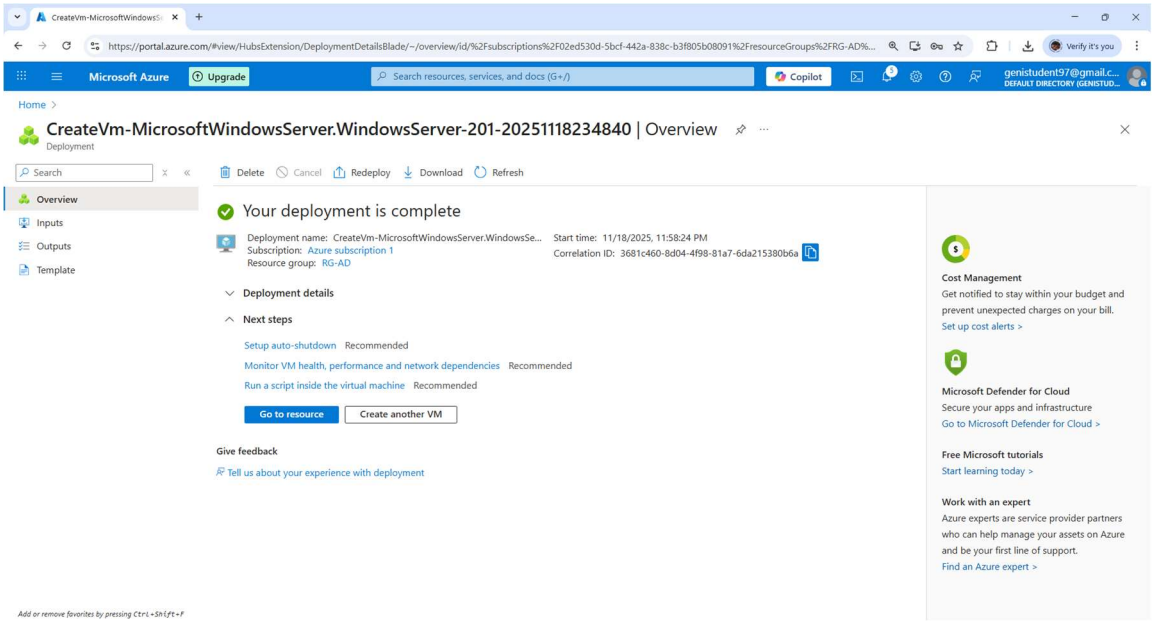
When I looked into Azure for Yoobee College, I realised the college mainly needs something secure and stable but also not too expensive. Azure Virtual Machines make sense because they let us move things like Active Directory and any older apps without changing everything. It also feels more familiar to manage a normal server in the cloud instead of setting up new tools.
For storage, Azure Storage is pretty straightforward. The college already has lots of shared files and teaching materials, so putting them in Azure Files makes it easier for everyone to reach the same place. I tested it on Windows and Linux, and both could access it, which is helpful since people use different systems.
Networking in Azure also helps keep things tidy. By using VNets, subnets and NSGs, we can separate things properly so not everything is open to everyone. It's basically the same idea as organising rooms in a building.
For the cost side, I think Reserved Instances work well for things that always stay on, while Pay-as-you-go is fine for stuff that might change later. Spot could be useful only for testing. Overall, these choices match what Yoobee needs without making the setup too complicated.

Task 2: Theoretical and Practical Evaluation: Active Directory Migration to Azure

VM Creation






Microsoft Azure
Upgrade
Search resources, services, and docs (G+/)
Copilot
Home
CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251118234840 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...
Subscription: Azure subscription 1
Resource group: RG-AD
Start time: 11/18/2025, 11:58:24 PM
Correlation ID: 3681c460-8d04-4f98-81a7-6da215380b6a
Deployment details
Next steps
Setup auto-shutdown Recommended
Monitor VM health, performance and network dependencies Recommended
Run a script inside the virtual machine Recommended
Go to resource
Create another VM
Give feedback
Tell us about your experience with deployment
Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
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Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
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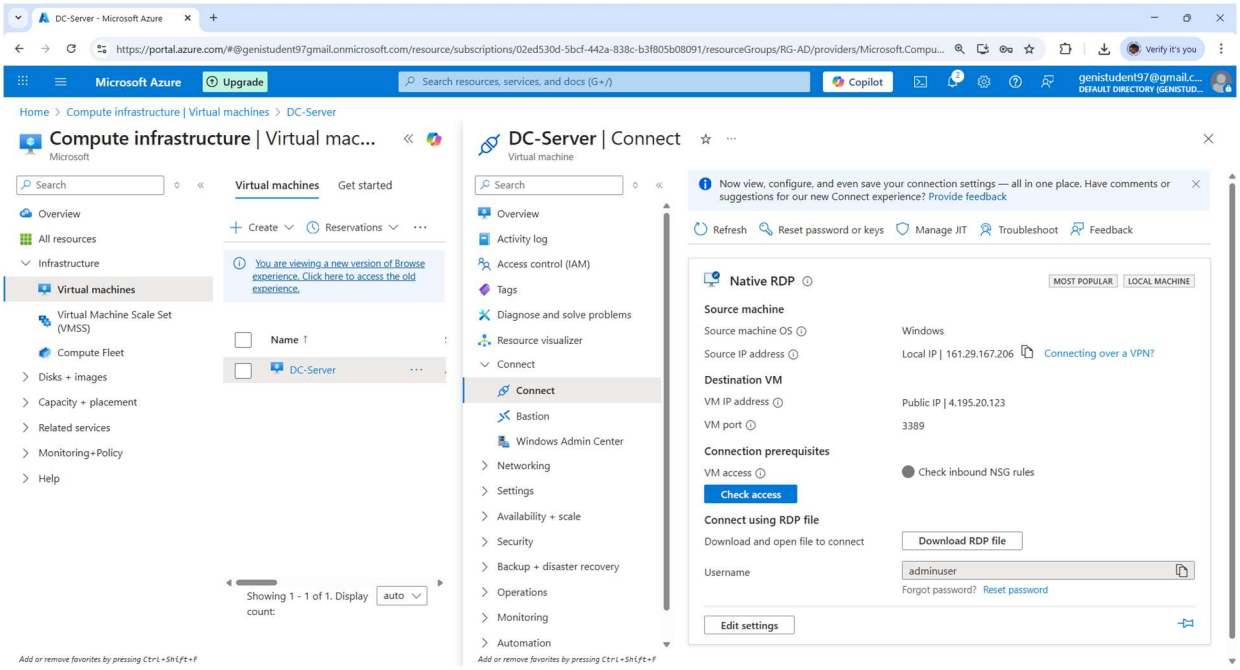
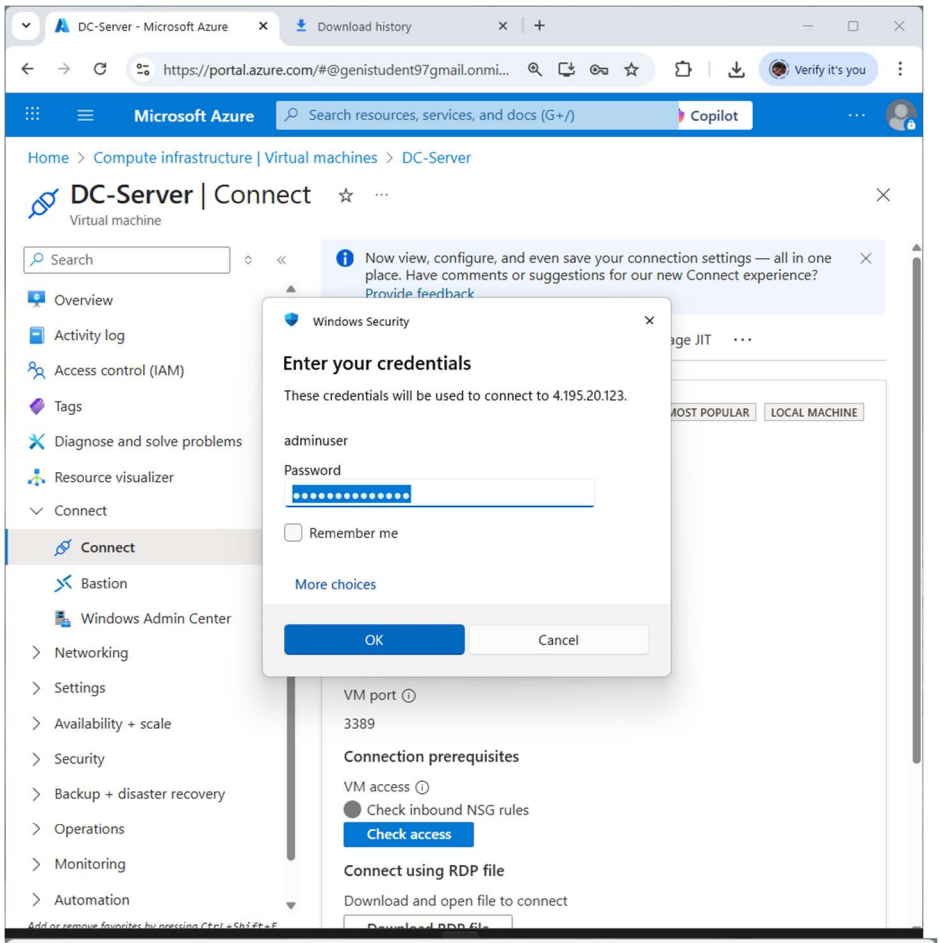
AD Setup


Microsoft Azure
Upgrade
Search resources, services, and docs (G+/)
Copilot
Home > Compute infrastructure | Virtual machines > DC-Server
Compute infrastructure | Virtual mac...
Microsoft
Search
Overview
All resources
Infrastructure
Virtual machines
Virtual Machine Scale Set (VMSS)
Compute Fleet
Disks + images
Capacity + placement
Related services
Monitoring+Policy
Help
Virtual machines
Get started
Create
Reservations
You are viewing a new version of Browse experience. Click here to access the old experience.
Name
DC-Server
Showing 1 - 1 of 1. Display count:
auto
DC-Server | Connect
Virtual machine
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Connect
Bastion
Windows Admin Center
Networking
Settings
Availability + scale
Security
Backup + disaster recovery
Operations
Monitoring
Automation
Now view, configure, and even save your connection settings — all in one place. Have comments or suggestions for our new Connect experience? Provide feedback
Refresh
Reset password or keys
Manage JIT
Troubleshoot
Feedback
Native RDP
MOST POPULAR
LOCAL MACHINE
Source machine
Source machine OS
Windows
Source IP address
Local IP | 161.29.167.206
Connecting over a VPN?
Destination VM
VM IP address
Public IP | 4.195.20.123
VM port
3389
Connection prerequisites
VM access
Check inbound NSG rules
Check access
Connect using RDP file
Download and open file to connect
Download RDP file
Username
adminuser
Forgot password?
Reset password
Edit settings
Add or remove favorites by pressing Ctrl+Shift+F


DC-Server - Microsoft Azure
Download history
https://portal.azure.com/#@genistudent97gmail.onmi...
Verify it's you
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
Home > Compute infrastructure | Virtual machines > DC-Server
DC-Server | Connect
Virtual machine
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
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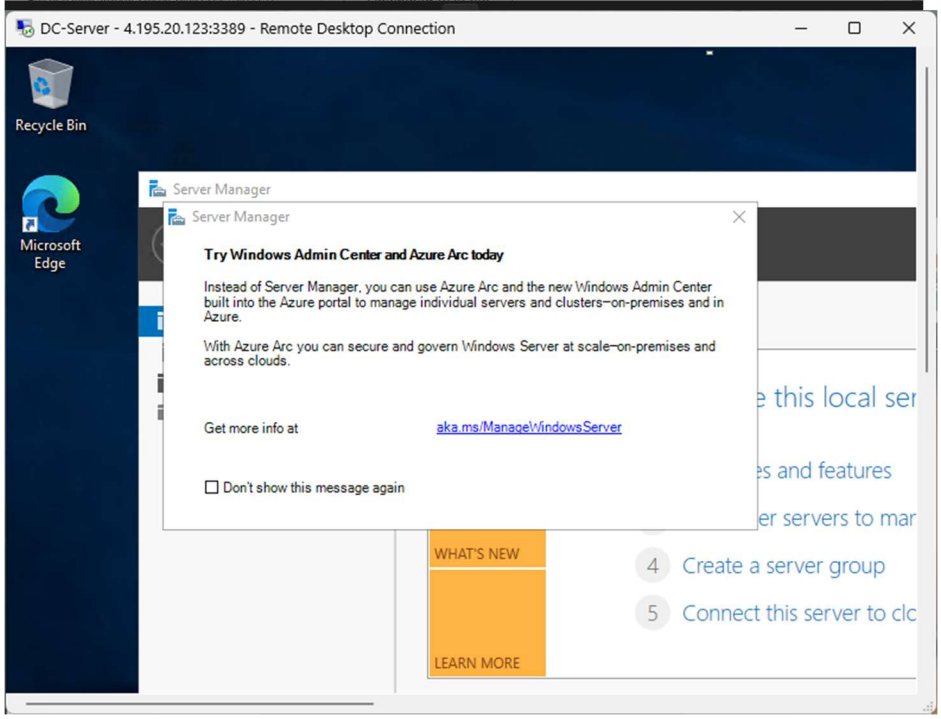
Connect
Bastion
Windows Admin Center
Networking
Settings
Availability + scale
Security
Backup + disaster recovery
Operations
Monitoring
Automation
Now view, configure, and even save your connection settings — all in one place. Have comments or suggestions for our new Connect experience?
Provide feedback
Windows Security
Enter your credentials
These credentials will be used to connect to 4.195.20.123.
adminuser
Password
Remember me
More choices
OK
Cancel
VM port
3389
Connection prerequisites
VM access
Check inbound NSG rules
Check access
Connect using RDP file
Download and open file to connect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Microsoft Edge
Server Manager
Server Manager
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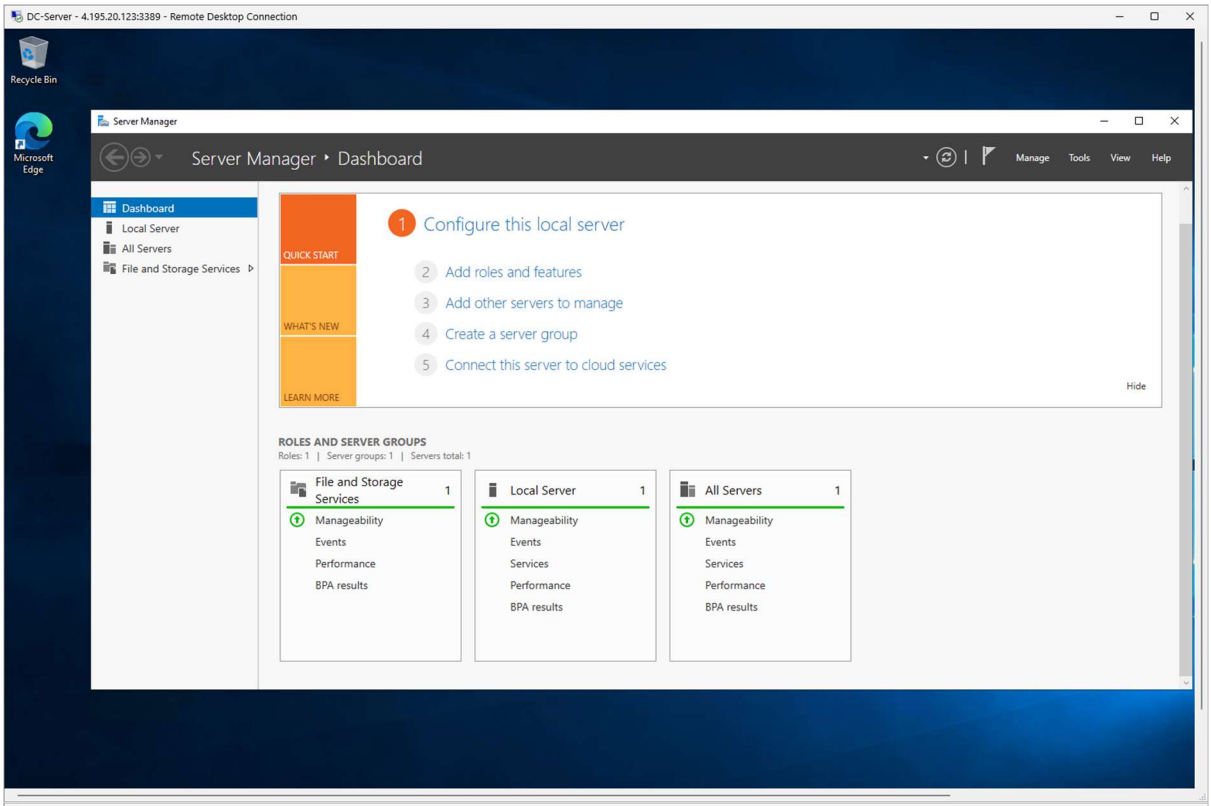
Instead of Server Manager, you can use Azure Arc and the new Windows Admin Center built into the Azure portal to manage individual servers and clusters–on-premises and in Azure.
With Azure Arc you can secure and govern Windows Server at scale–on-premises and across clouds.
Get more info at
aka.ms/ManageWindowsServer
Don't show this message again
WHAT'S NEW
LEARN MORE
4 Create a server group
5 Connect this server to clc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Recycle Bin
Microsoft Edge
Server Manager
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Manage Tools View Help
Dashboard
Local Server
All Servers
File and Storage Services
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
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BPA results
Local Server 1
Manageability
Events
Services
Performance
BPA results
All Servers 1
Manageability
Events
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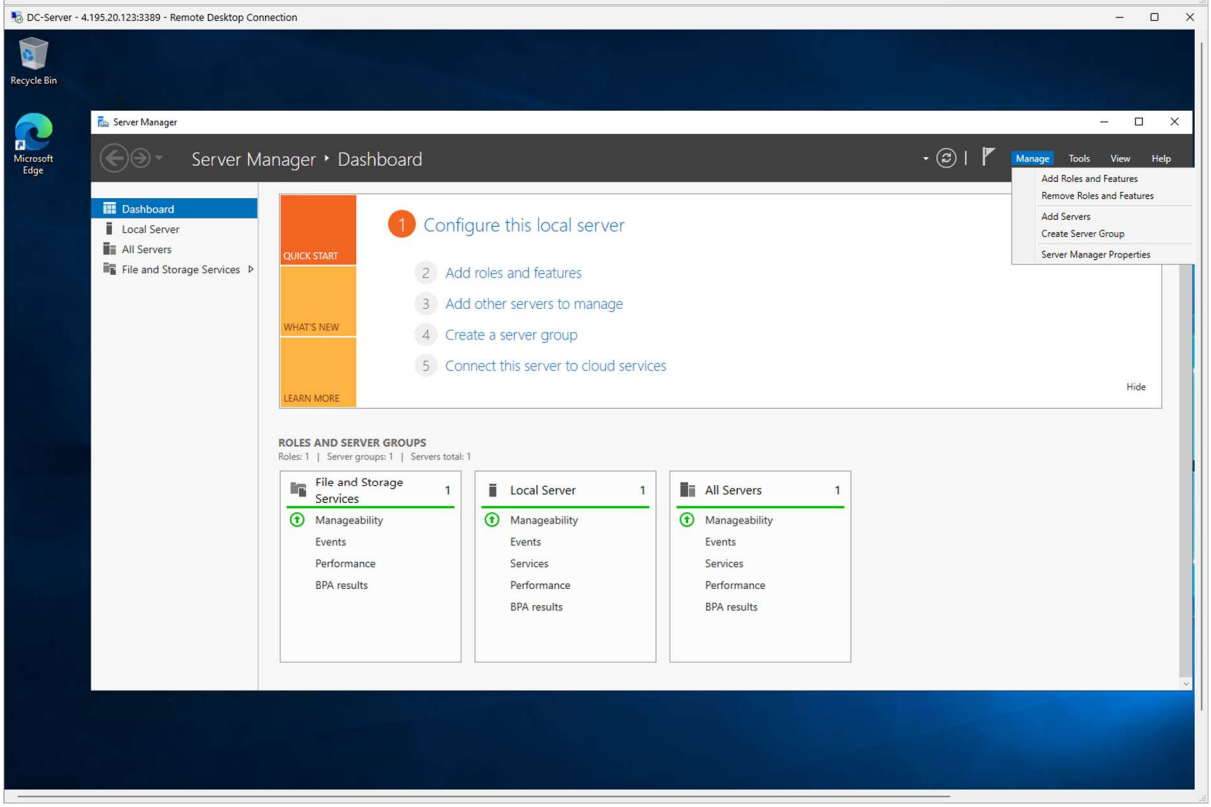
DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
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Server Manager
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Manage Tools View Help
Add Roles and Features
Remove Roles and Features
Add Servers
Create Server Group
Server Manager Properties
Dashboard
Local Server
All Servers
File and Storage Services
QUICK START
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Local Server 1
Manageability
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All Servers 1
Manageability
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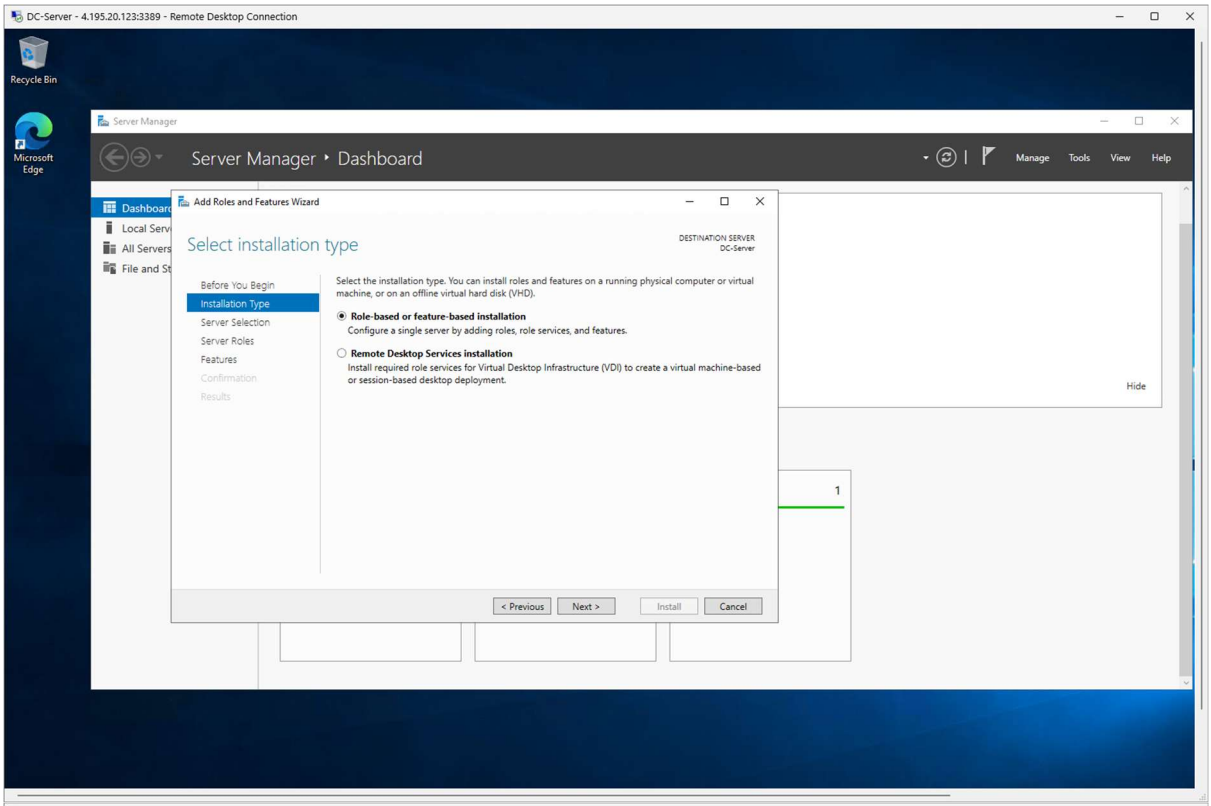
BPA results


DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
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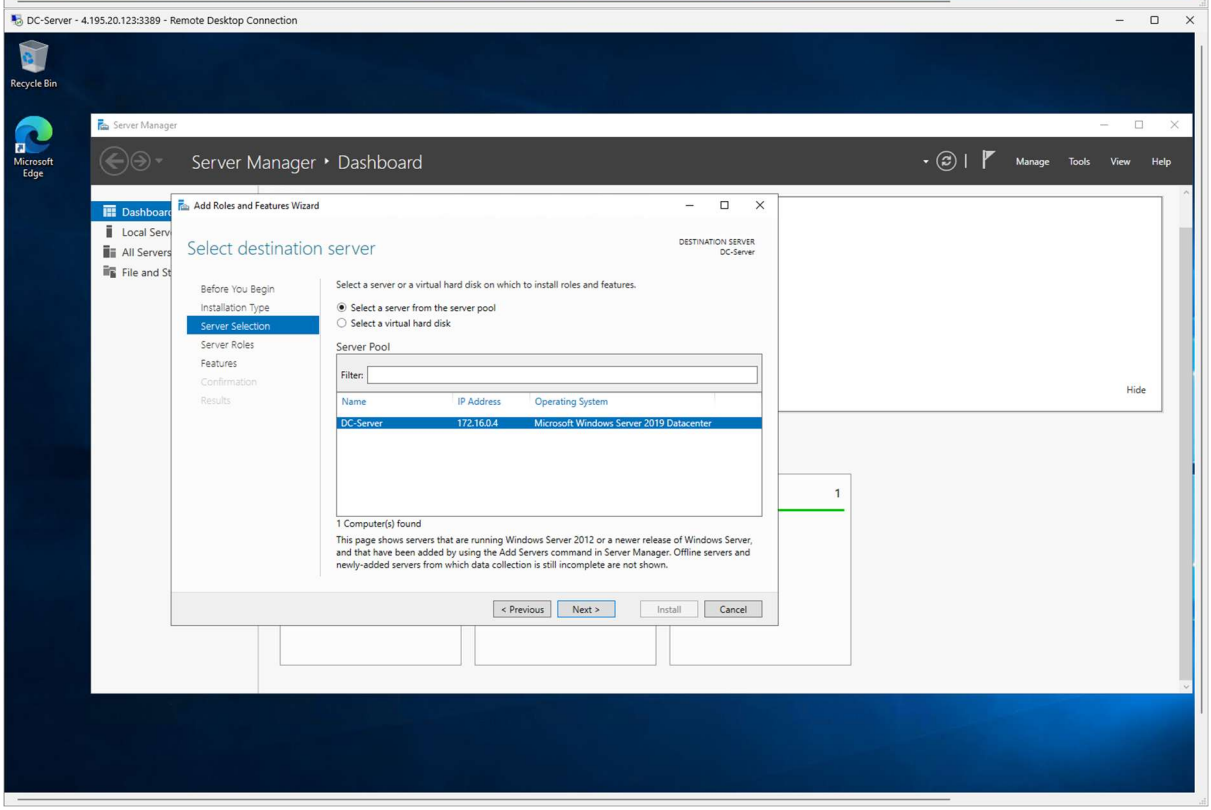
Server Manager • Dashboard
Manage Tools View Help
Add Roles and Features Wizard
Select installation type
DESTINATION SERVER
DC-Server
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).
Role-based or feature-based installation
Configure a single server by adding roles, role services, and features.
Remote Desktop Services installation
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.
< Previous
Next >
Install
Cancel
Hide


DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
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Manage Tools View Help
Add Roles and Features Wizard
Select destination server
DESTINATION SERVER
DC-Server
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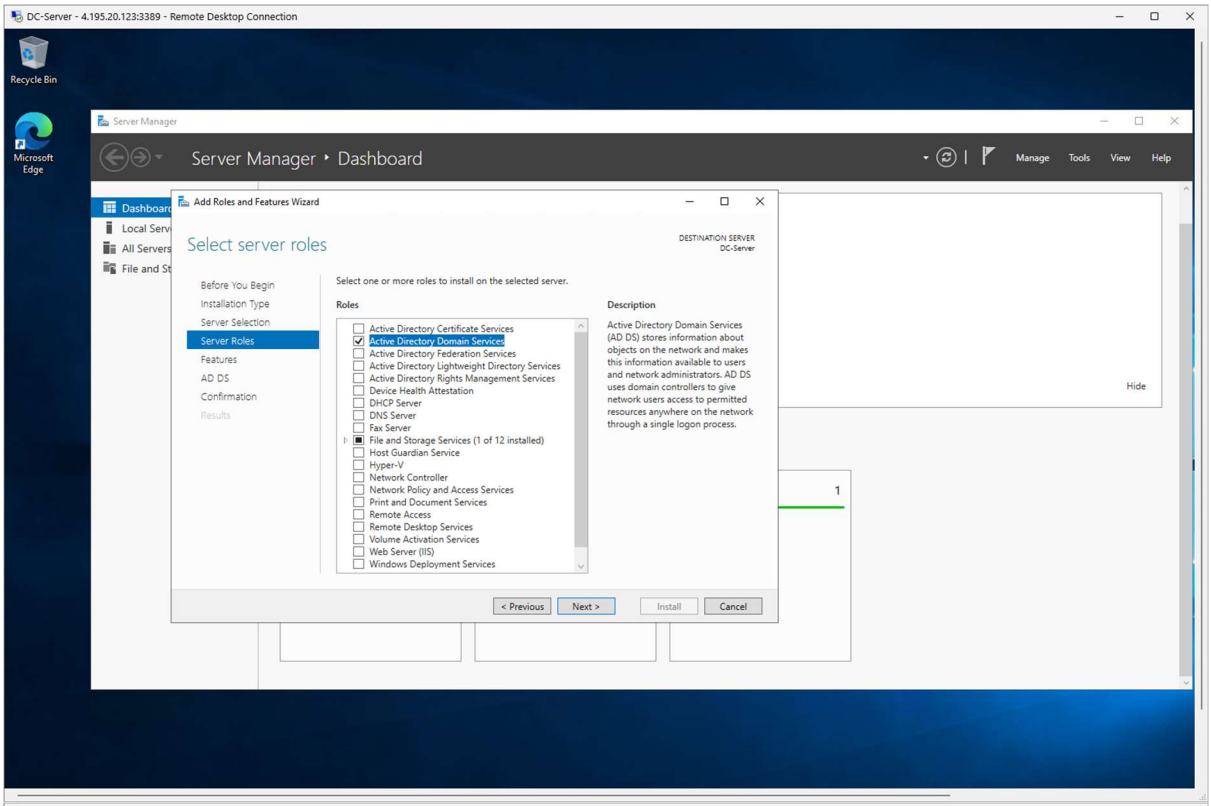
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Select a server or a virtual hard disk on which to install roles and features.
Select a server from the server pool
Select a virtual hard disk
Server Pool
Filter:
Name
IP Address
Operating System
DC-Server
172.16.0.4
Microsoft Windows Server 2019 Datacenter
1 Computer(s) found
This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.
< Previous
Next >
Install
Cancel
Hide


DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
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Server Manager
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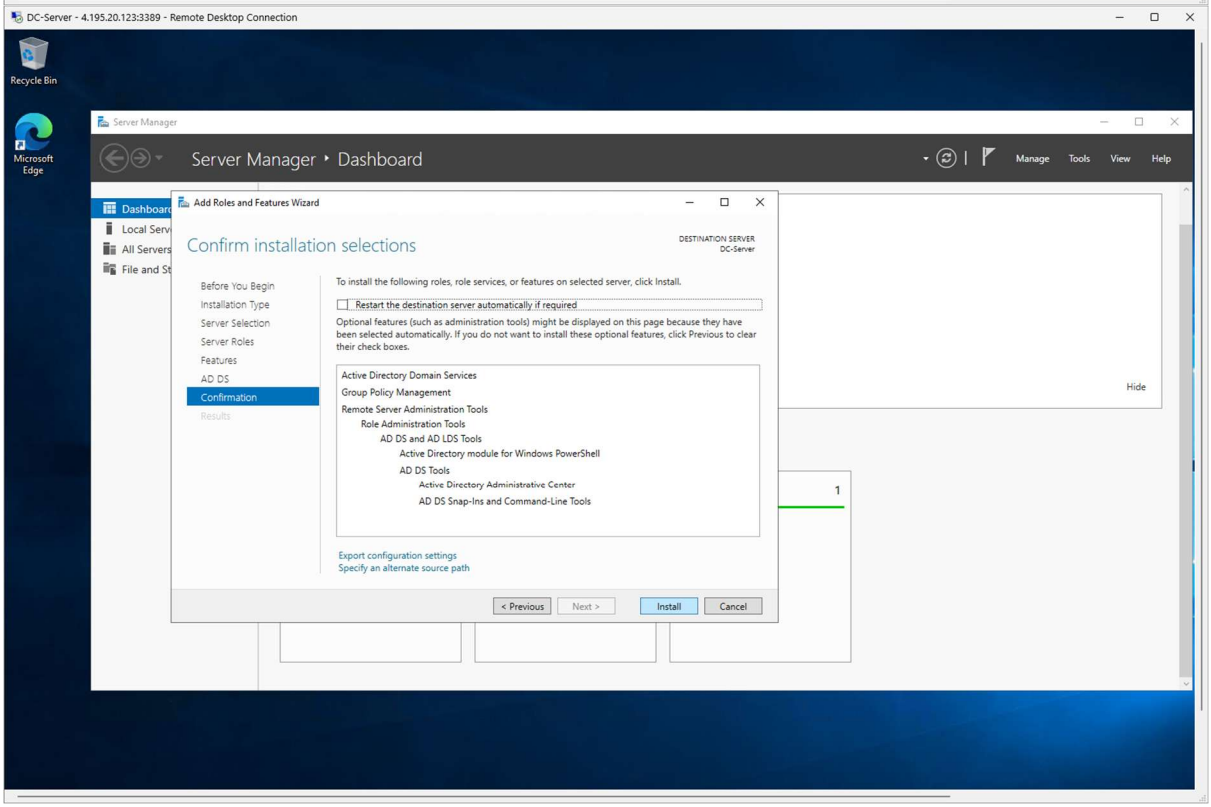
Manage Tools View Help
Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
DC-Server
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Select one or more roles to install on the selected server.
Roles
Active Directory Certificate Services
Active Directory Domain Services
Active Directory Federation Services
Active Directory Lightweight Directory Services
Active Directory Rights Management Services
Device Health Attestation
DHCP Server
DNS Server
Fax Server
File and Storage Services (1 of 12 installed)
Host Guardian Service
Hyper-V
Network Controller
Network Policy and Access Services
Print and Document Services
Remote Access
Remote Desktop Services
Volume Activation Services
Web Server (IIS)
Windows Deployment Services
Description
Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.
< Previous
Next >
Install
Cancel
Hide
1


DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
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Server Manager • Dashboard
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Add Roles and Features Wizard
Confirm installation selections
DESTINATION SERVER
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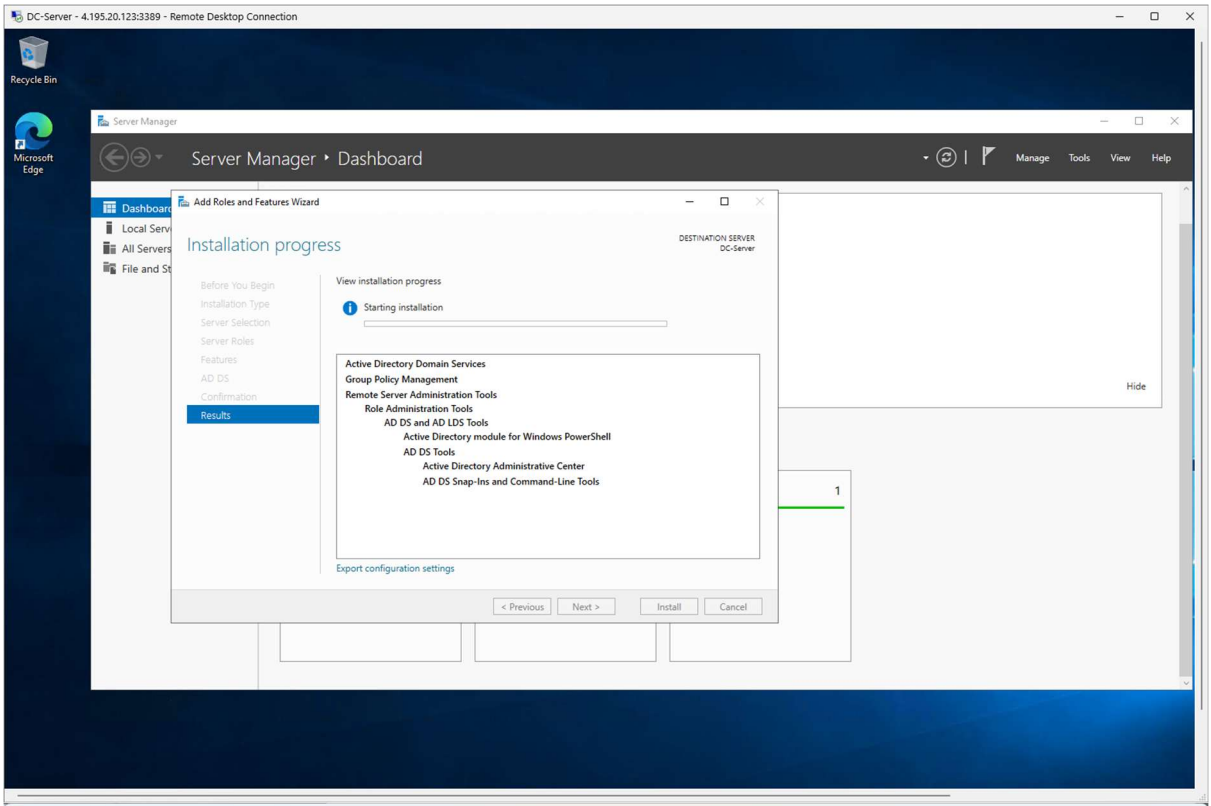
Features
AD DS
Confirmation
Results
To install the following roles, role services, or features on selected server, click Install.
Restart the destination server automatically if required
Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.
Active Directory Domain Services
Group Policy Management
Remote Server Administration Tools
Role Administration Tools
AD DS and AD LDS Tools
Active Directory module for Windows PowerShell
AD DS Tools
Active Directory Administrative Center
AD DS Snap-Ins and Command-Line Tools
Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel
Hide
1


DC-Server - 4.195.20.123:3389 - Remote Desktop Connection
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Microsoft Edge
Server Manager
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Manage Tools View Help
Add Roles and Features Wizard
Installation progress
DESTINATION SERVER
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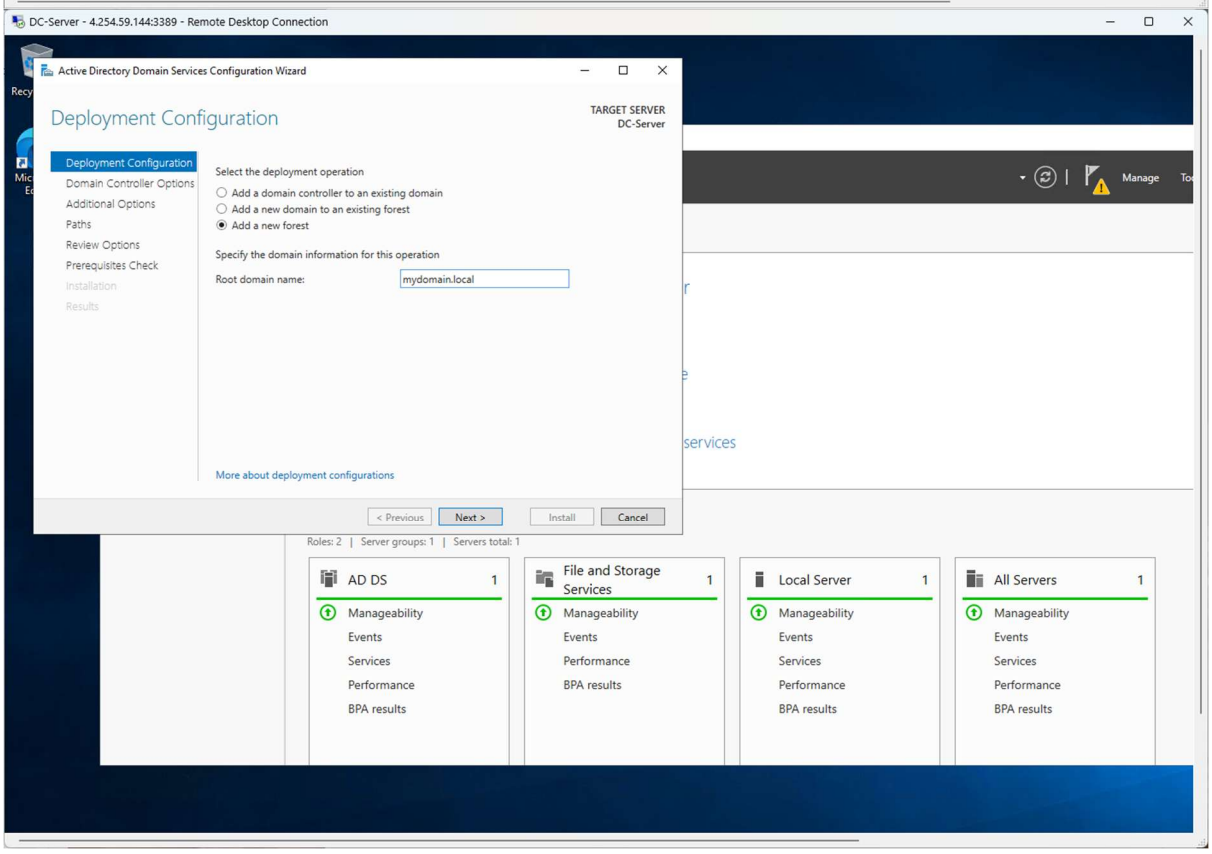
View installation progress
Starting installation
Active Directory Domain Services
Group Policy Management
Remote Server Administration Tools
Role Administration Tools
AD DS and AD LDS Tools
Active Directory module for Windows PowerShell
AD DS Tools
Active Directory Administrative Center
AD DS Snap-Ins and Command-Line Tools
Export configuration settings
< Previous
Next >
Install
Cancel
Hide


DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Active Directory Domain Services Configuration Wizard
Deployment Configuration
TARGET SERVER
DC-Server
Deployment Configuration
Domain Controller Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
Select the deployment operation
Add a domain controller to an existing domain
Add a new domain to an existing forest
Add a new forest
Specify the domain information for this operation
Root domain name:
mydomain.local
More about deployment configurations
< Previous
Next >
Install
Cancel
Manage
Roles: 2 | Server groups: 1 | Servers total: 1
AD DS 1
File and Storage Services 1
Local Server 1
All Servers 1
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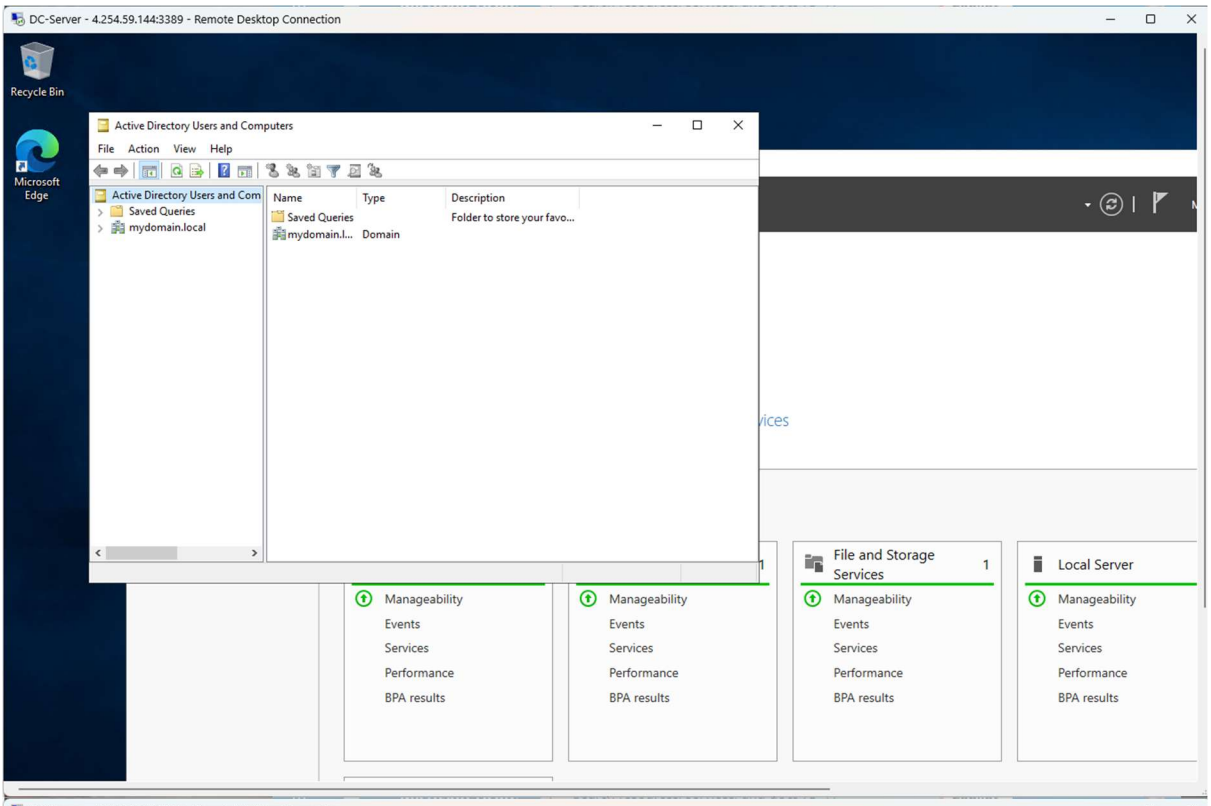
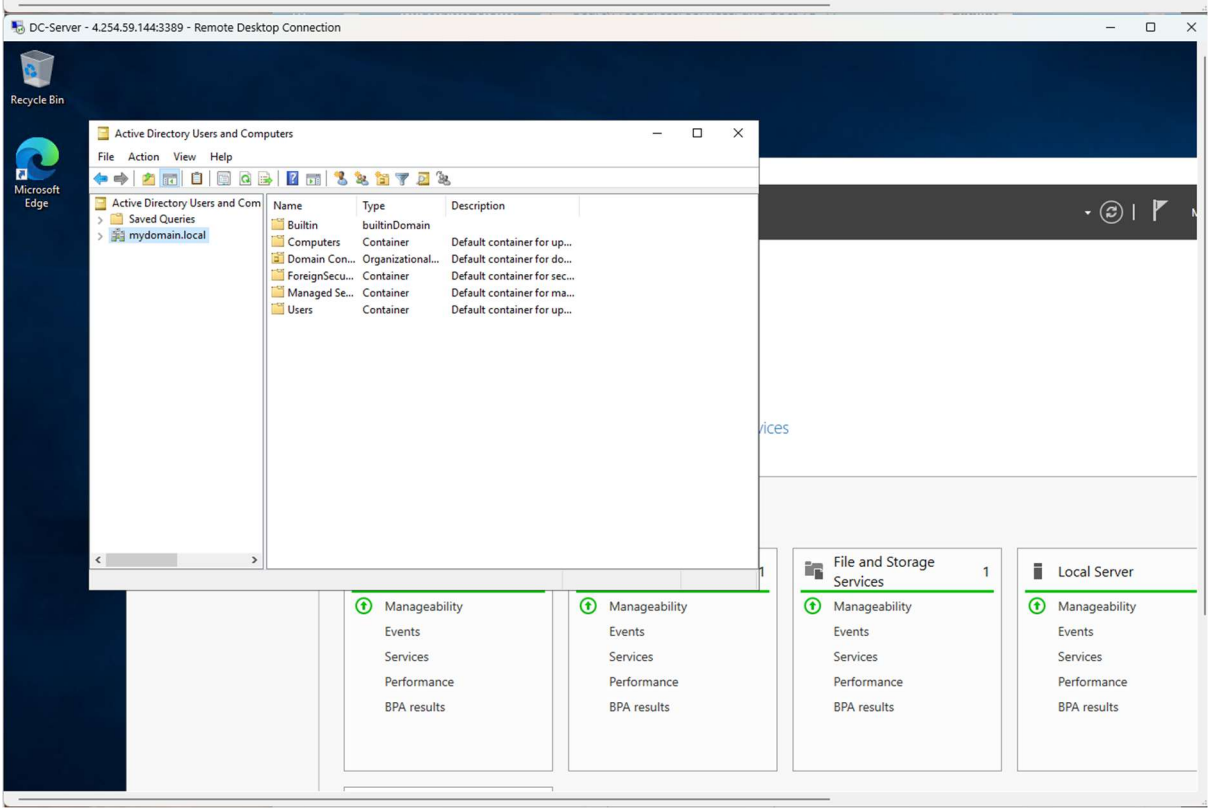
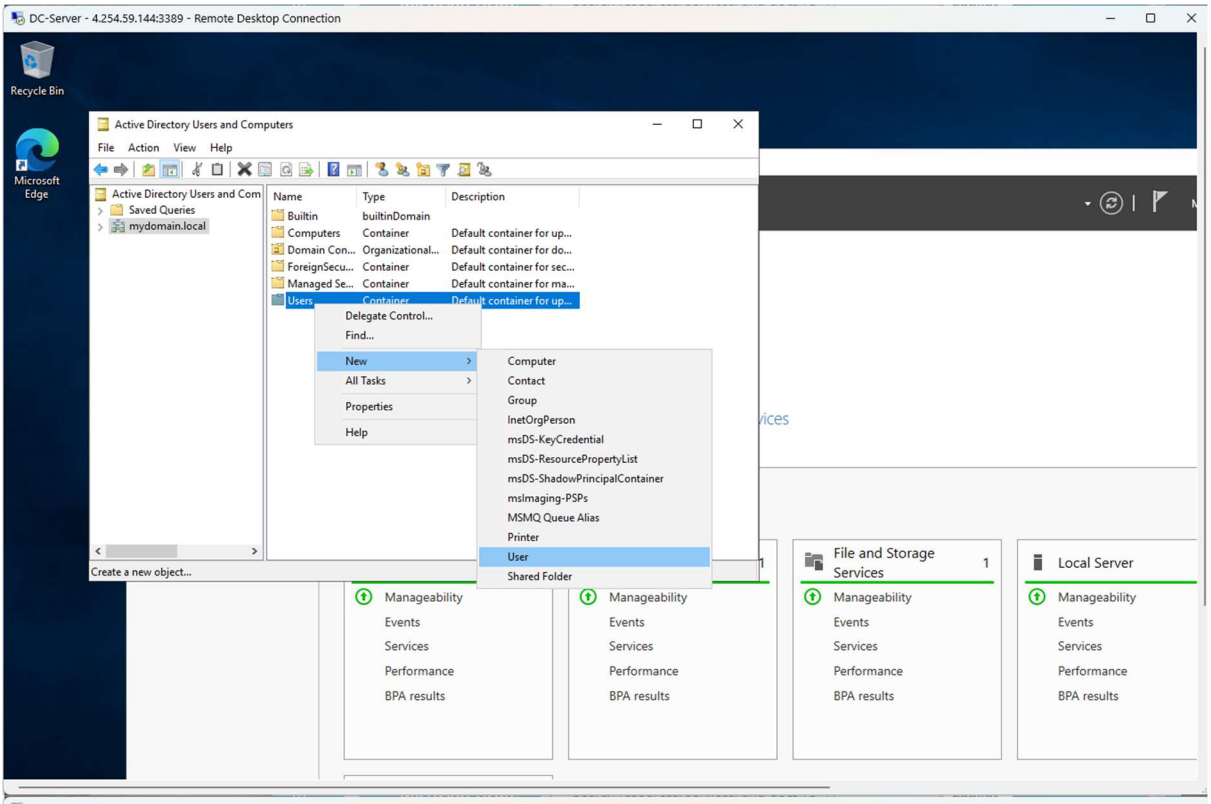
BPA results

AD Users & Group Setup






DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
Active Directory Users and Computers
File Action View Help
Active Directory Users and Com
Saved Queries
mydomain.local
Name
Type
Description
Builtin
builtinDomain
Computers
Container
Default container for up...
Domain Con...
Organizational...
Default container for do...
ForeignSecu...
Container
Default container for sec...
Managed Se...
Container
Default container for ma...
Users
Container
Default container for up...
Delegate Control...
Find...
New
All Tasks
Properties
Help
Computer
Contact
Group
InetOrgPerson
msDS-KeyCredential
msDS-ResourcePropertyList
msDS-ShadowPrincipalContainer
msImaging-PSPs
MSMQ Queue Alias
Printer
User
Shared Folder
Create a new object...
File and Storage Services
Local Server
Manageability
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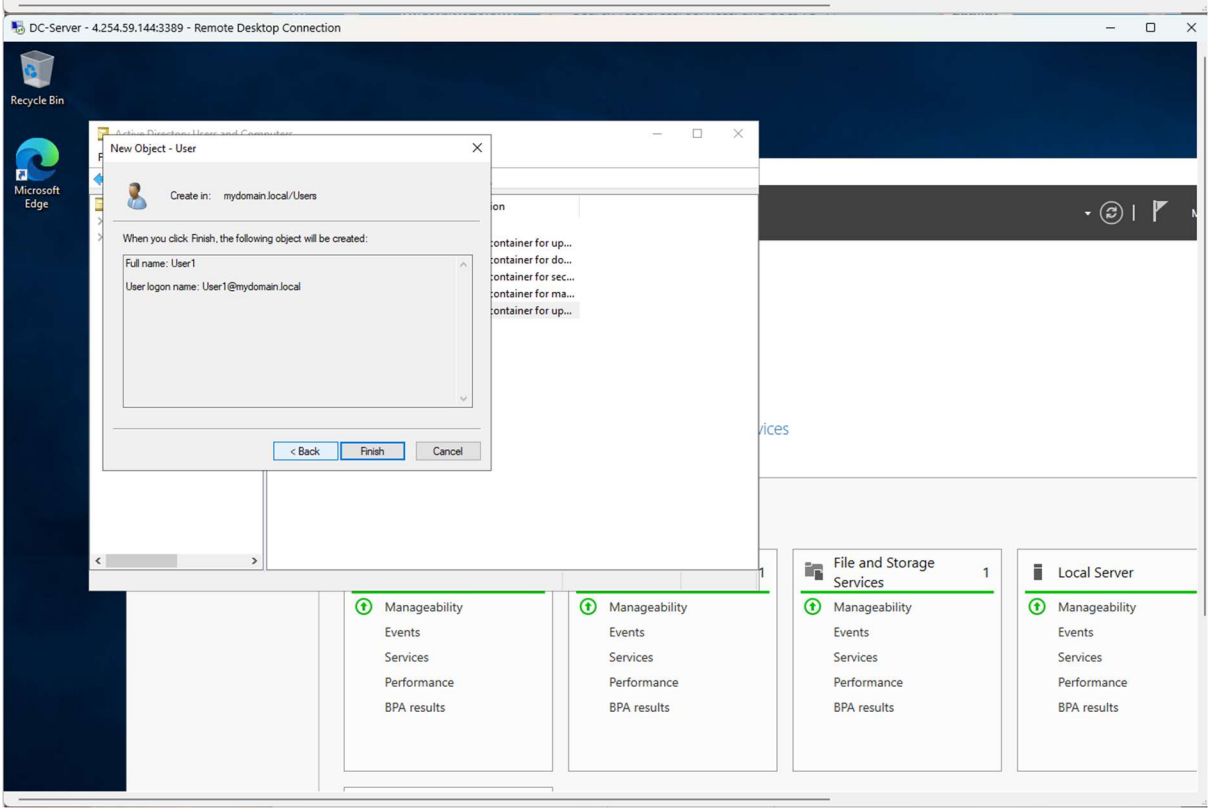
DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
New Object - User
Create in: mydomain.local/Users
When you click Finish, the following object will be created:
Full name: User1
User logon name: User1@mydomain.local
< Back
Finish
Cancel
File and Storage Services
Local Server
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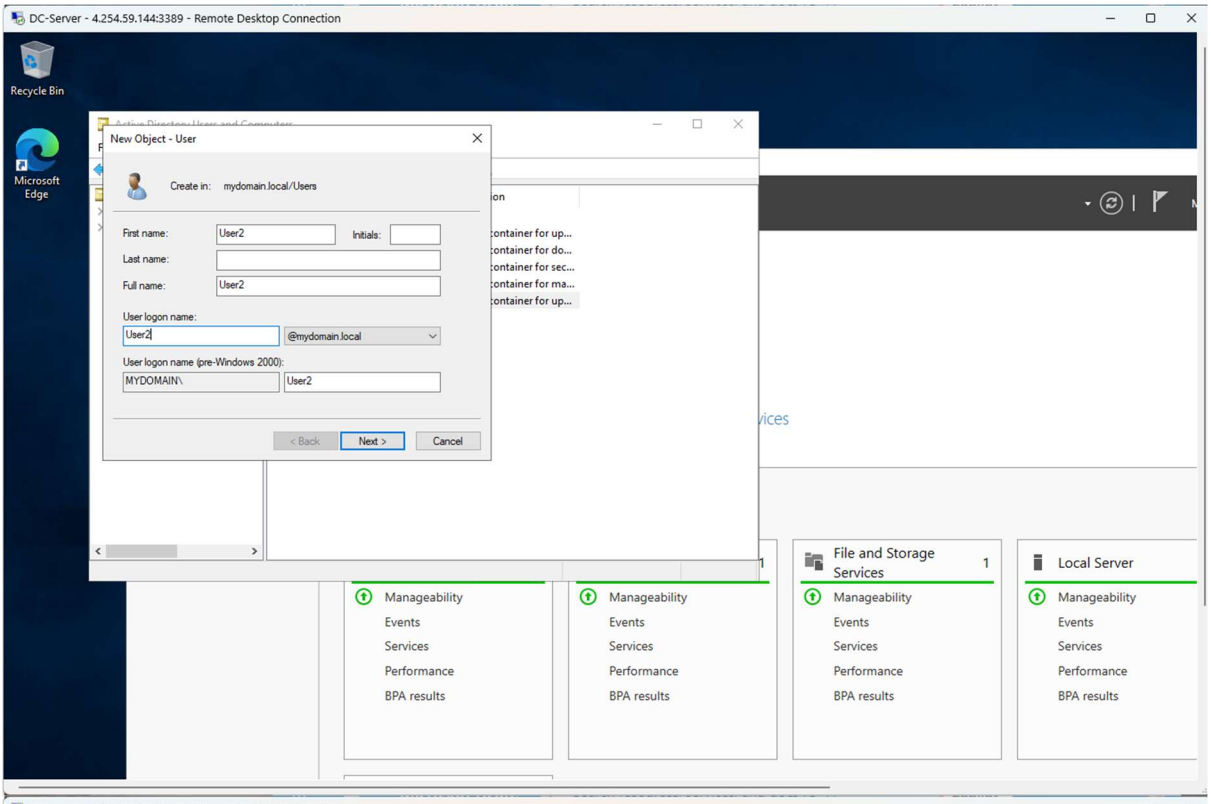
DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
New Object - User
Create in: mydomain.local/Users
First name: User2
Initials:
Last name:
Full name: User2
User logon name:
User2
@mydomain.local
User logon name (pre-Windows 2000):
MYDOMAIN\
User2
< Back
Next >
Cancel
File and Storage Services
1
Local Server
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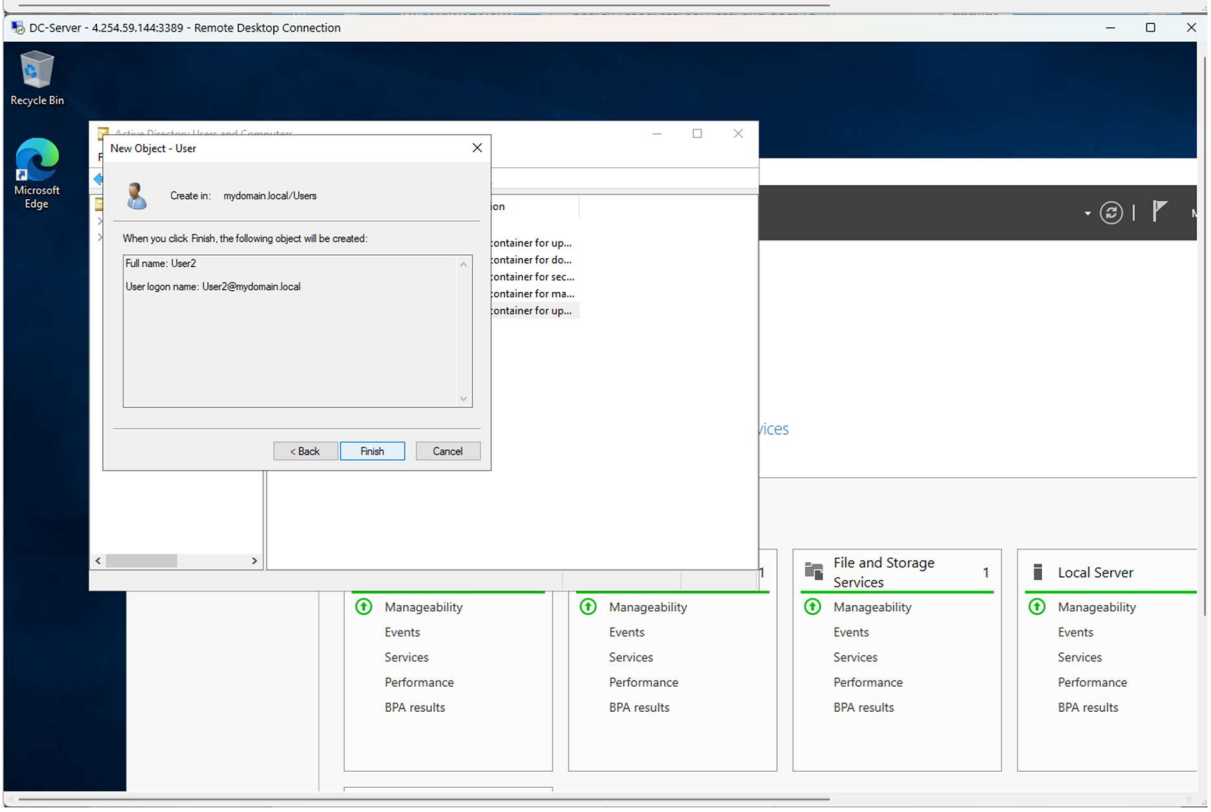
DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
New Object - User
Create in: mydomain.local/Users
When you click Finish, the following object will be created:
Full name: User2
User logon name: User2@mydomain.local
< Back
Finish
Cancel
File and Storage Services
1
Local Server
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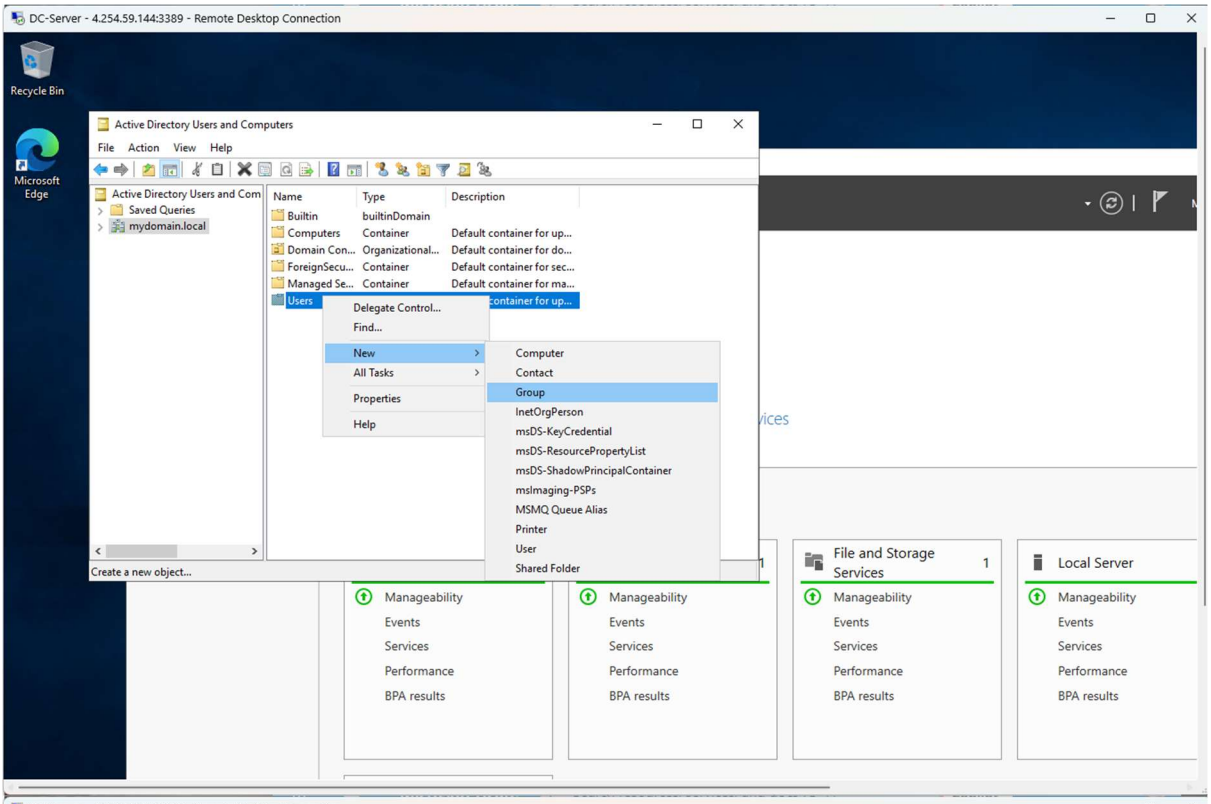
DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
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File Action View Help
Active Directory Users and Com
Saved Queries
mydomain.local
Name
Type
Description
Builtin
builtinDomain
Computers
Container
Default container for up...
Domain Con...
Organizational...
Default container for do...
ForeignSecu...
Container
Default container for sec...
Managed Se...
Container
Default container for ma...
Users
Delegate Control...
Find...
New
All Tasks
Properties
Help
Computer
Contact
Group
InetOrgPerson
msDS-KeyCredential
msDS-ResourcePropertyList
msDS-ShadowPrincipalContainer
msImaging-PSPs
MSMQ Queue Alias
Printer
User
Shared Folder
Create a new object...
File and Storage Services
Local Server
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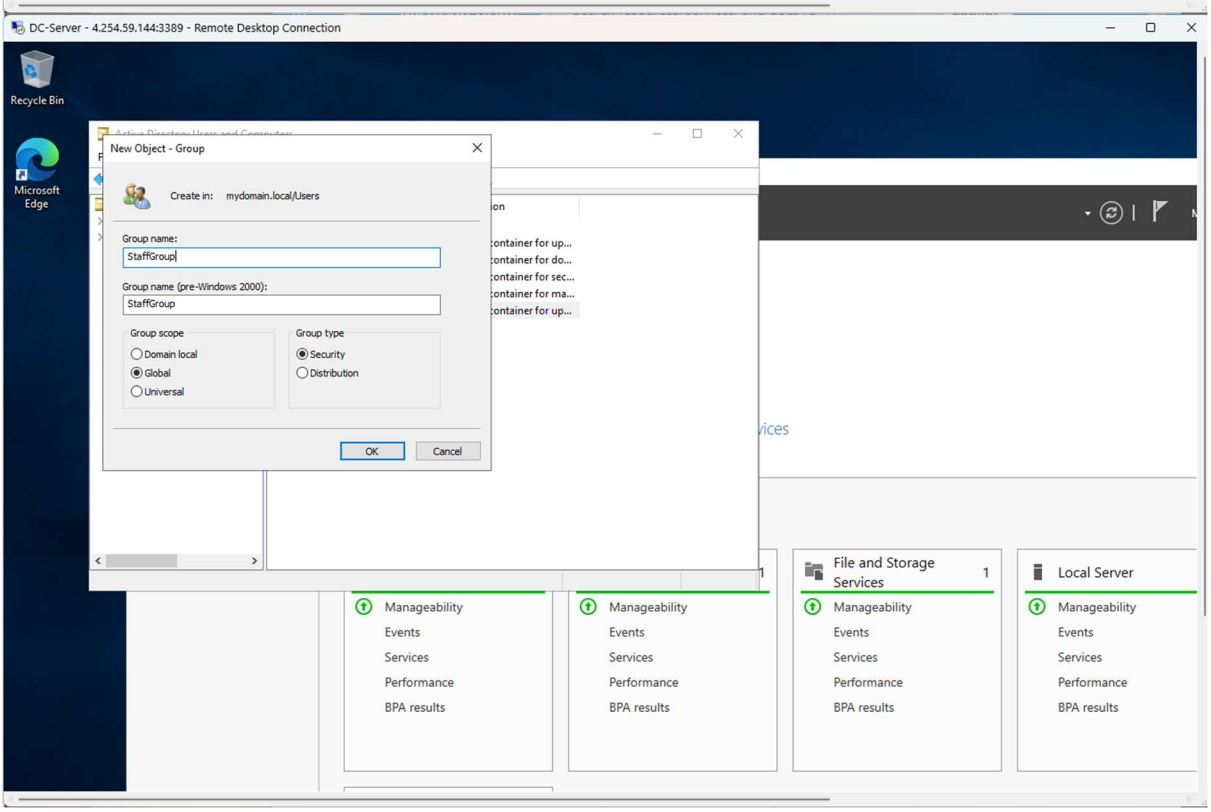
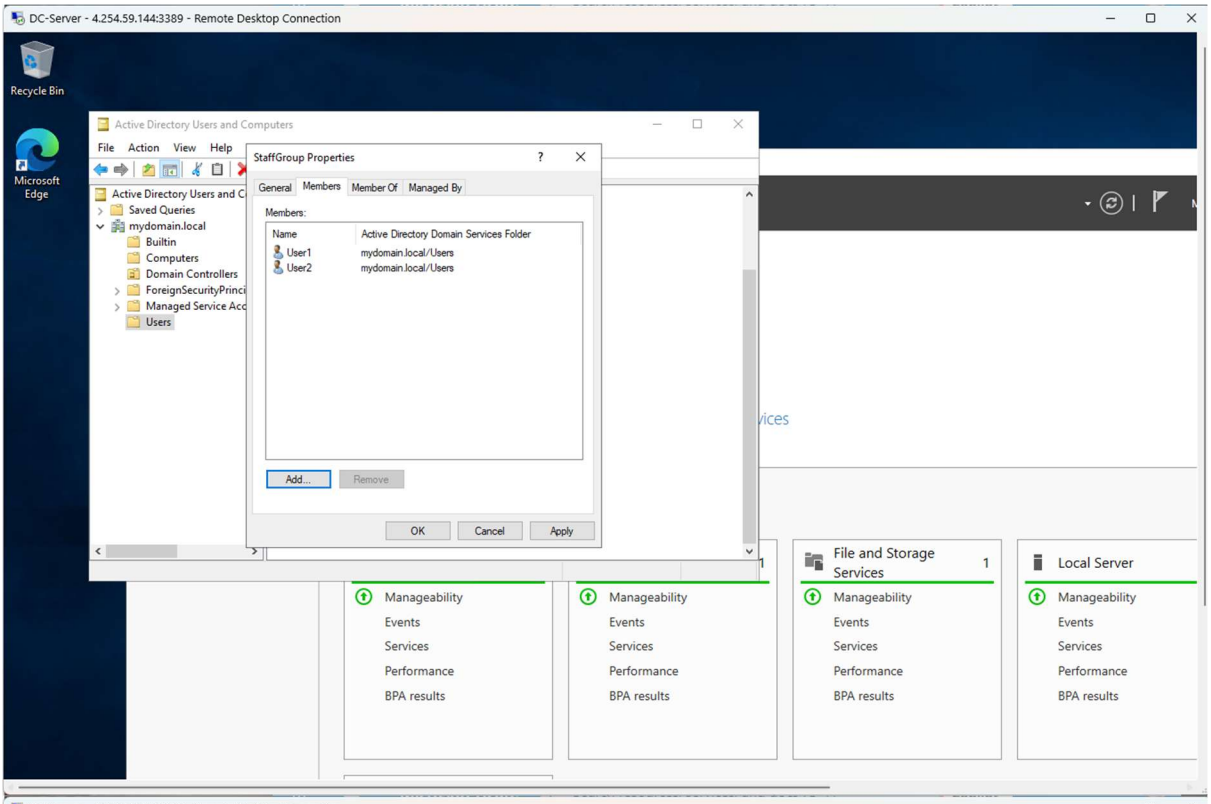
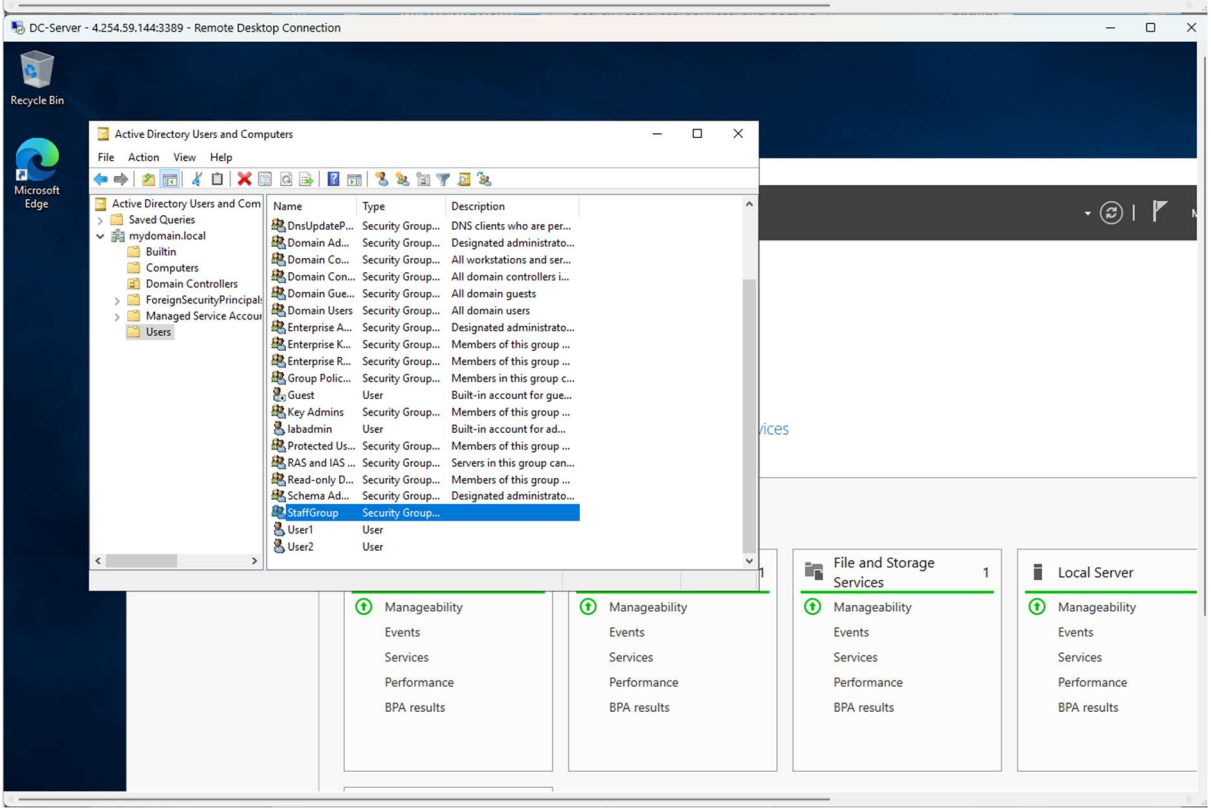
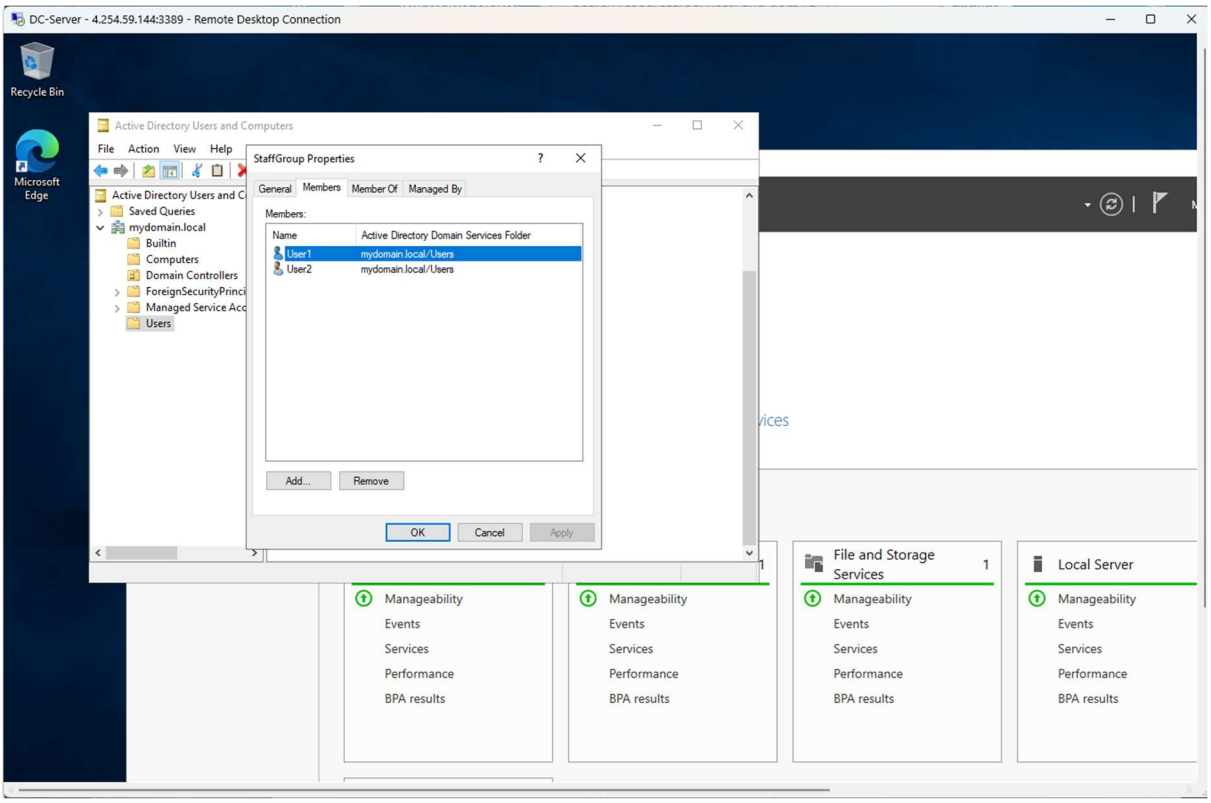
Performance
BPA results


DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
New Object - Group
Create in: mydomain.local/Users
Group name:
StaffGroup
Group name (pre-Windows 2000):
StaffGroup
Group scope
Domain local
Global
Universal
Group type
Security
Distribution
OK
Cancel
File and Storage Services
Local Server
Manageability
Events
Services
Performance
BPA results


DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
Active Directory Users and Computers
File Action View Help
StaffGroup Properties
General Members Member Of Managed By
Members:
Name Active Directory Domain Services Folder
User1 mydomain.local/Users
User2 mydomain.local/Users
Add... Remove
OK Cancel Apply
Active Directory Users and C
Saved Queries
mydomain.local
Builtin
Computers
Domain Controllers
ForeignSecurityPrinci
Managed Service Acc
Users
Manageability
Events
Services
Performance
BPA results
File and Storage Services
Local Server

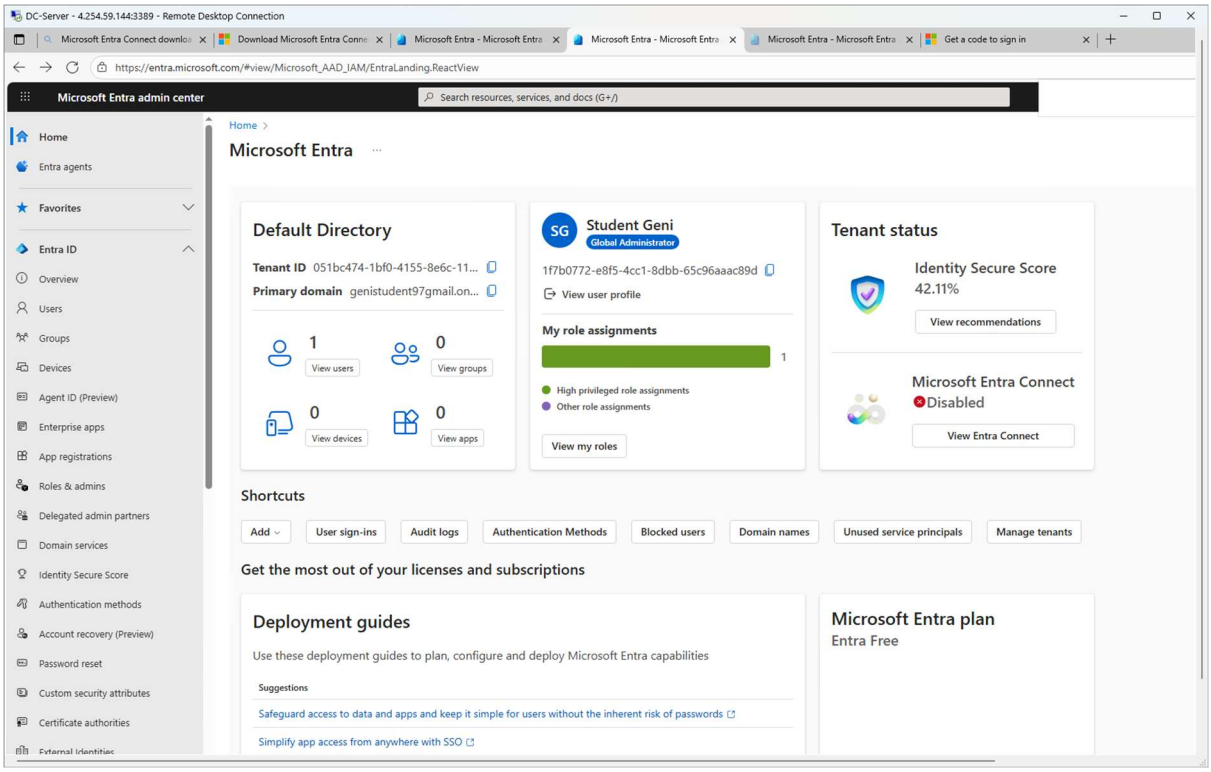

DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
Active Directory Users and Computers
File Action View Help
Active Directory Users and Com
Saved Queries
mydomain.local
Builtin
Computers
Domain Controllers
ForeignSecurityPrincipals
Managed Service Accou
Users
Name Type Description
DnsUpdateP... Security Group... DNS clients who are per...
Domain Ad... Security Group... Designated administrato...
Domain Co... Security Group... All workstations and ser...
Domain Con... Security Group... All domain controllers i...
Domain Gue... Security Group... All domain guests
Domain Users Security Group... All domain users
Enterprise A... Security Group... Designated administrato...
Enterprise K... Security Group... Members of this group ...
Enterprise R... Security Group... Members of this group ...
Group Polic... Security Group... Members in this group c...
Guest User Built-in account for gue...
Key Admins Security Group... Members of this group ...
labadmin User Built-in account for ad...
Protected Us... Security Group... Members of this group ...
RAS and IAS ... Security Group... Servers in this group can...
Read-only D... Security Group... Members of this group ...
Schema Ad... Security Group... Designated administrato...
StaffGroup Security Group...
User1 User
User2 User
Manageability
Events
Services
Performance
BPA results
File and Storage Services
Local Server

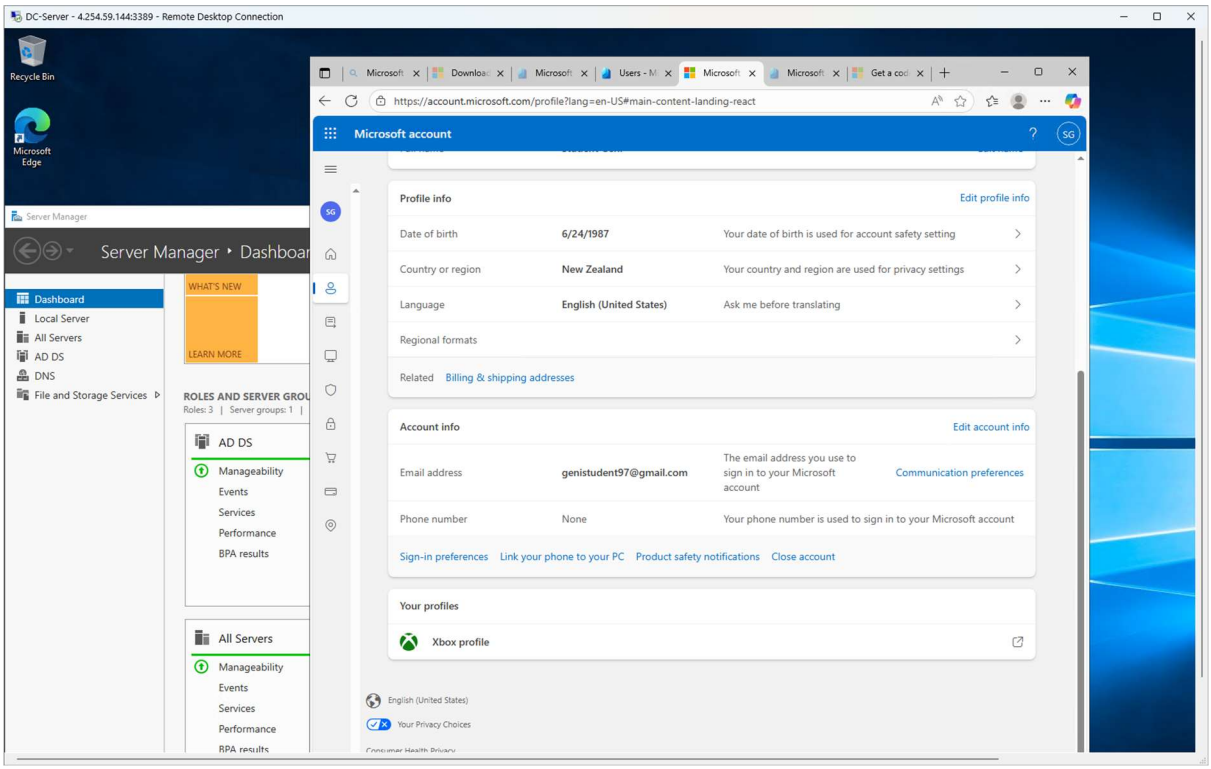


Entra Connect

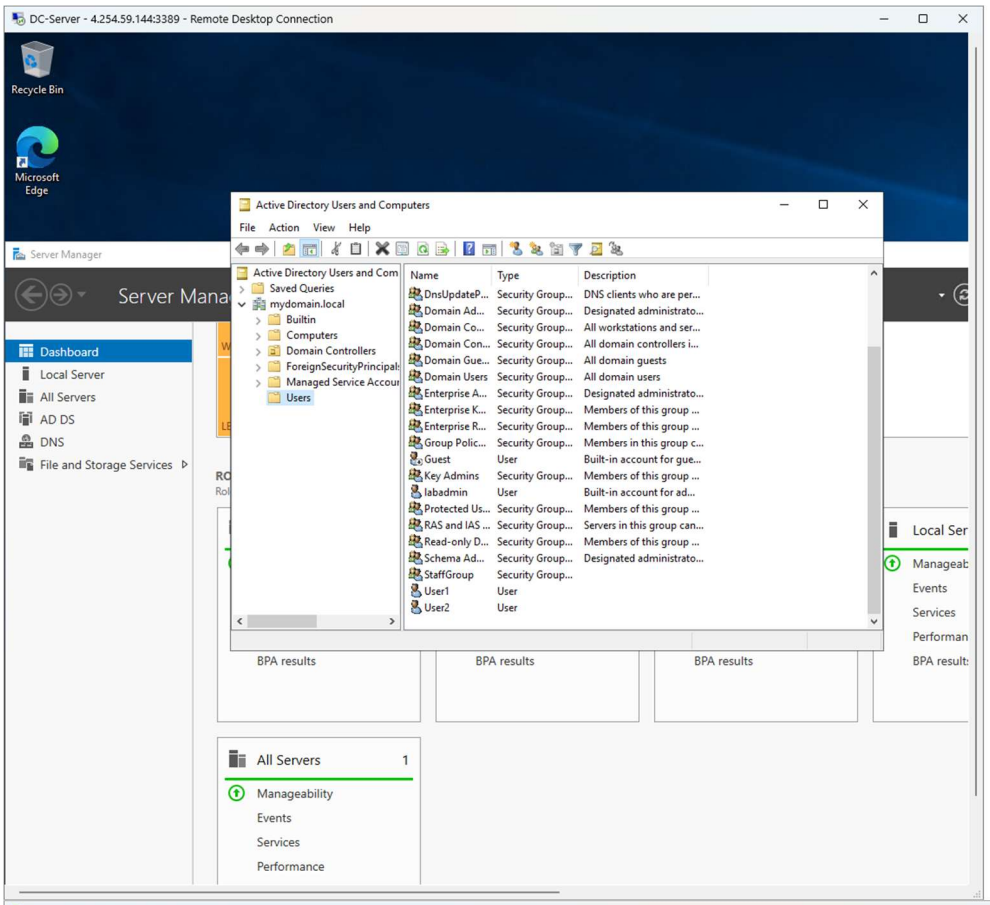
Because I have a free Azure tenant created with a Gmail account, Microsoft Entra Connect is not available and directory sync cannot be enabled. The portal shows the Entra Connect section as disabled, so only limited screenshots are provided. Cloud-only users were created instead to complete the required authentication steps.

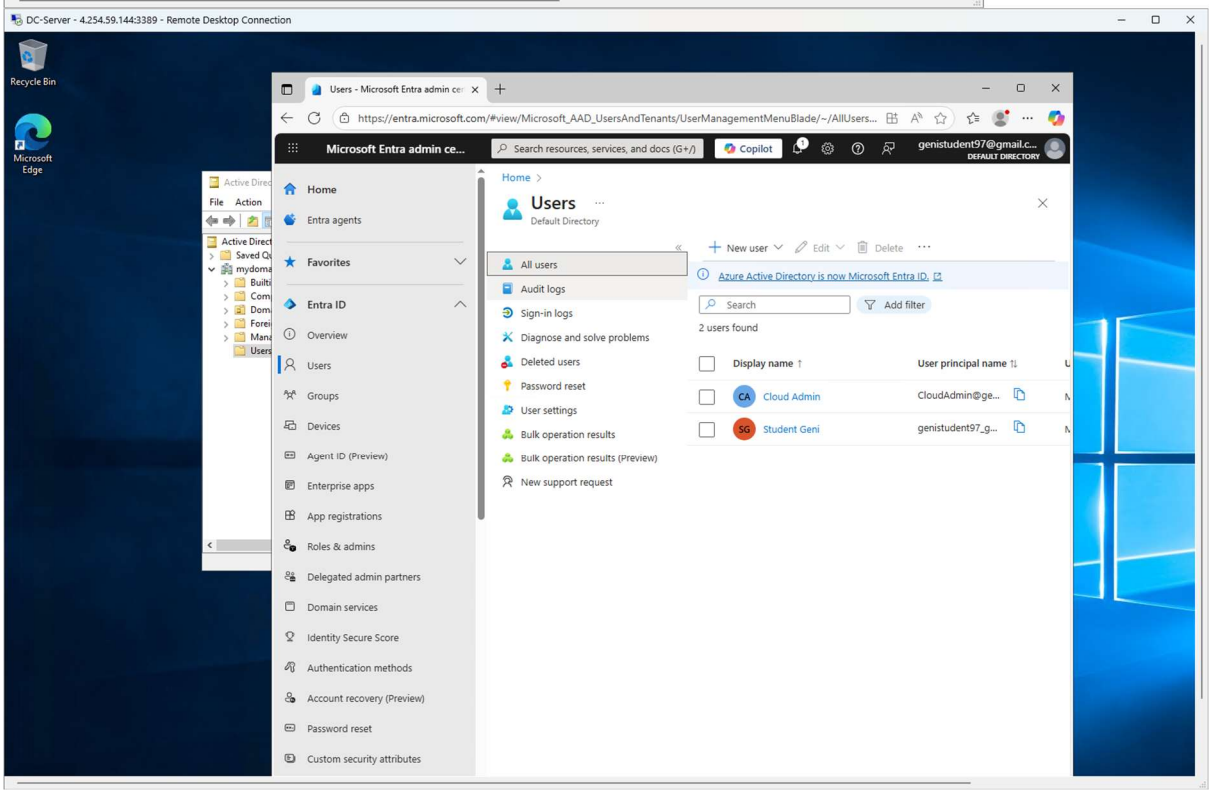
- *Entra Admin Center – Entra Connect Status (Disabled)*
- *Identity Page Not Available under Free Entra ID*

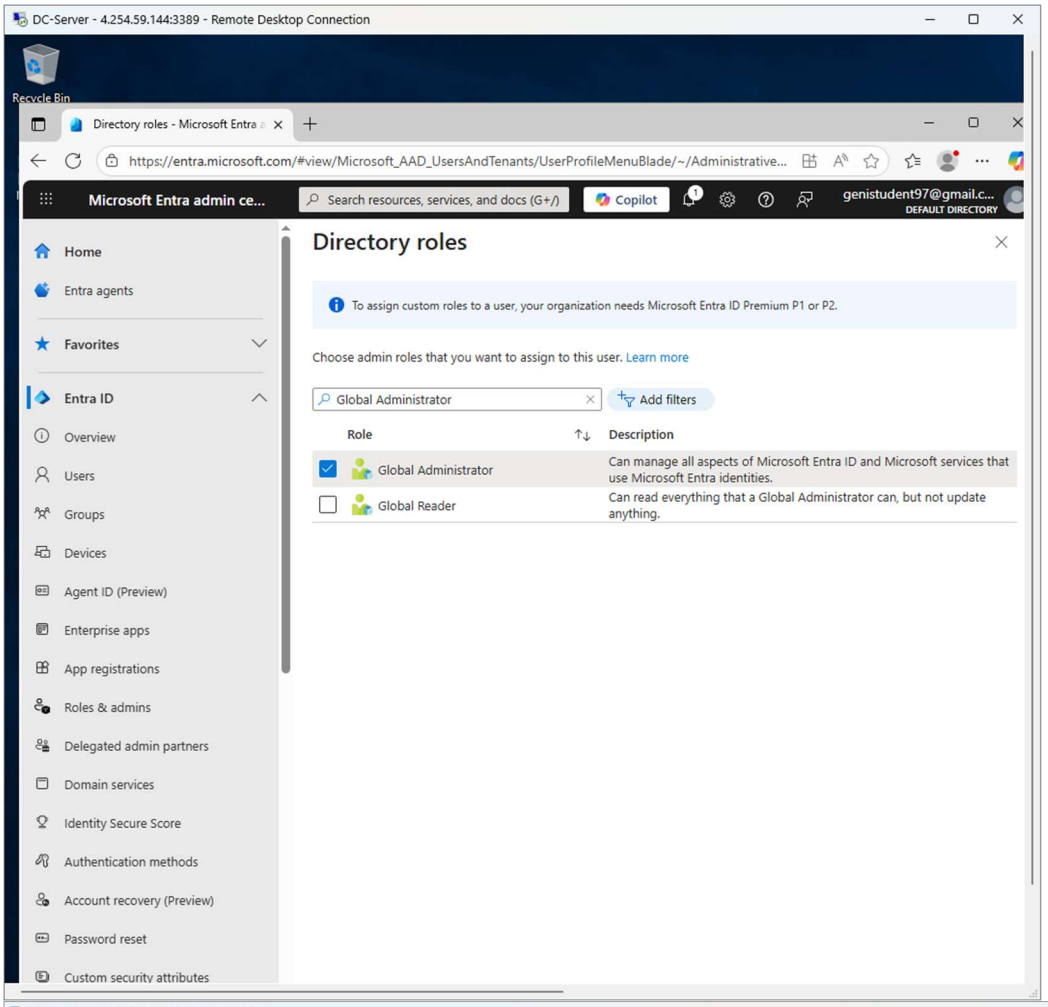

DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
https://entra.microsoft.com/#view/Microsoft_AAD_IAM/EntraLanding.ReactView
Microsoft Entra admin center
Search resources, services, and docs (G+/)
Home
Entra agents
Favorites
Entra ID
Overview
Users
Groups
Devices
Agent ID (Preview)
Enterprise apps
App registrations
Roles & admins
Delegated admin partners
Domain services
Identity Secure Score
Authentication methods
Account recovery (Preview)
Password reset
Custom security attributes
Certificate authorities
Home
Microsoft Entra
Default Directory
Tenant ID 051bc474-1bf0-4155-8e6c-11...
Primary domain genistudent97gmail.on...
1 View users
0 View groups
0 View devices
0 View apps
SG Student Geni
Global Administrator
1f7b0772-e8f5-4cc1-8dbb-65c96aaac89d
View user profile
My role assignments
1
High privileged role assignments
Other role assignments
View my roles
Tenant status
Identity Secure Score
42.11%
View recommendations
Microsoft Entra Connect
Disabled
View Entra Connect
Shortcuts
Add
User sign-ins
Audit logs
Authentication Methods
Blocked users
Domain names
Unused service principals
Manage tenants
Get the most out of your licenses and subscriptions
Deployment guides
Use these deployment guides to plan, configure and deploy Microsoft Entra capabilities
Suggestions
Safeguard access to data and apps and keep it simple for users without the inherent risk of passwords
Simplify app access from anywhere with SSO
Microsoft Entra plan
Entra Free


DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
Server Manager
Server Manager • Dashboard
Dashboard
Local Server
All Servers
AD DS
DNS
File and Storage Services
WHAT'S NEW
LEARN MORE
AD DS
Manageability
Events
Services
Performance
BPA results
All Servers
Manageability
Events
Services
Performance
BPA results
https://account.microsoft.com/profile?lang=en-US#main-content-landing-react
Microsoft account
Profile info
Edit profile info
Date of birth 6/24/1987 Your date of birth is used for account safety setting
Country or region New Zealand Your country and region are used for privacy settings
Language English (United States) Ask me before translating
Regional formats
Related Billing & shipping addresses
Account info
Edit account info
Email address genistudent97@gmail.com The email address you use to sign in to your Microsoft account
Communication preferences
Phone number None Your phone number is used to sign in to your Microsoft account
Sign-in preferences
Link your phone to your PC
Product safety notifications
Close account
Your profiles
Xbox profile
English (United States)
Your Privacy Choices

Cloud Identity Creation






DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Recycle Bin
Directory roles - Microsoft Entra
https://entra.microsoft.com/#view/Microsoft_AAD_UsersAndTenants/UserProfileMenuBlade/~/Administrative...
Microsoft Entra admin ce...
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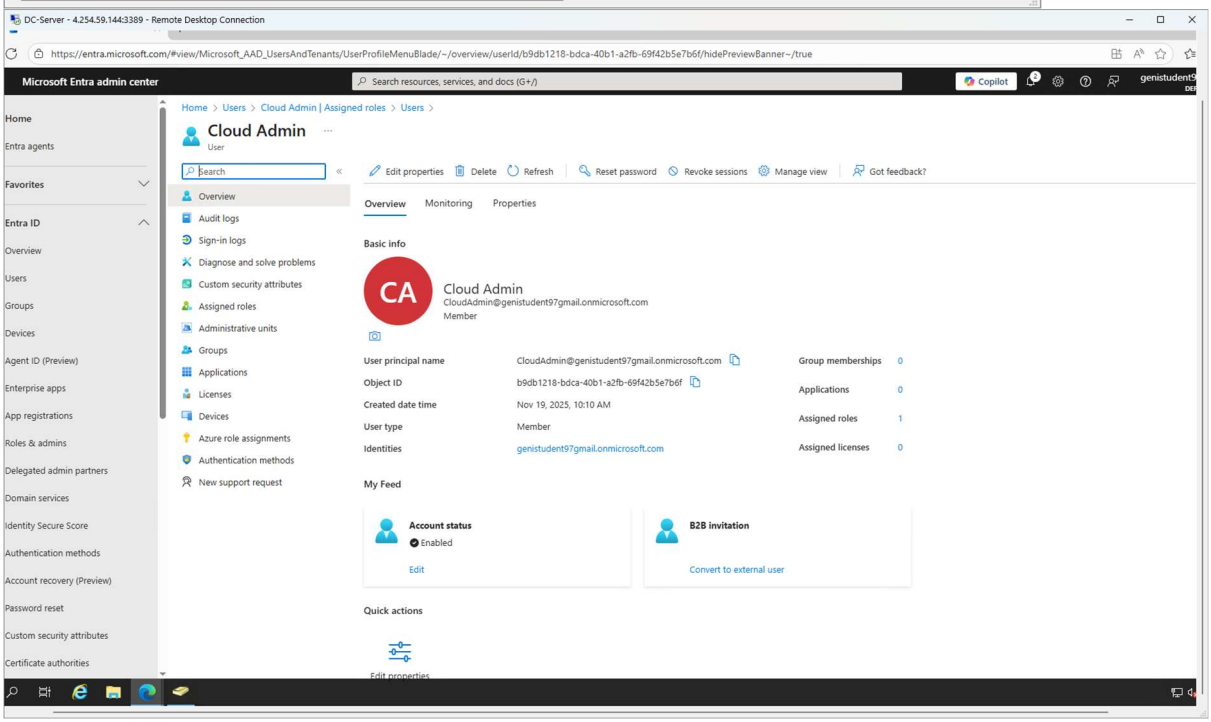
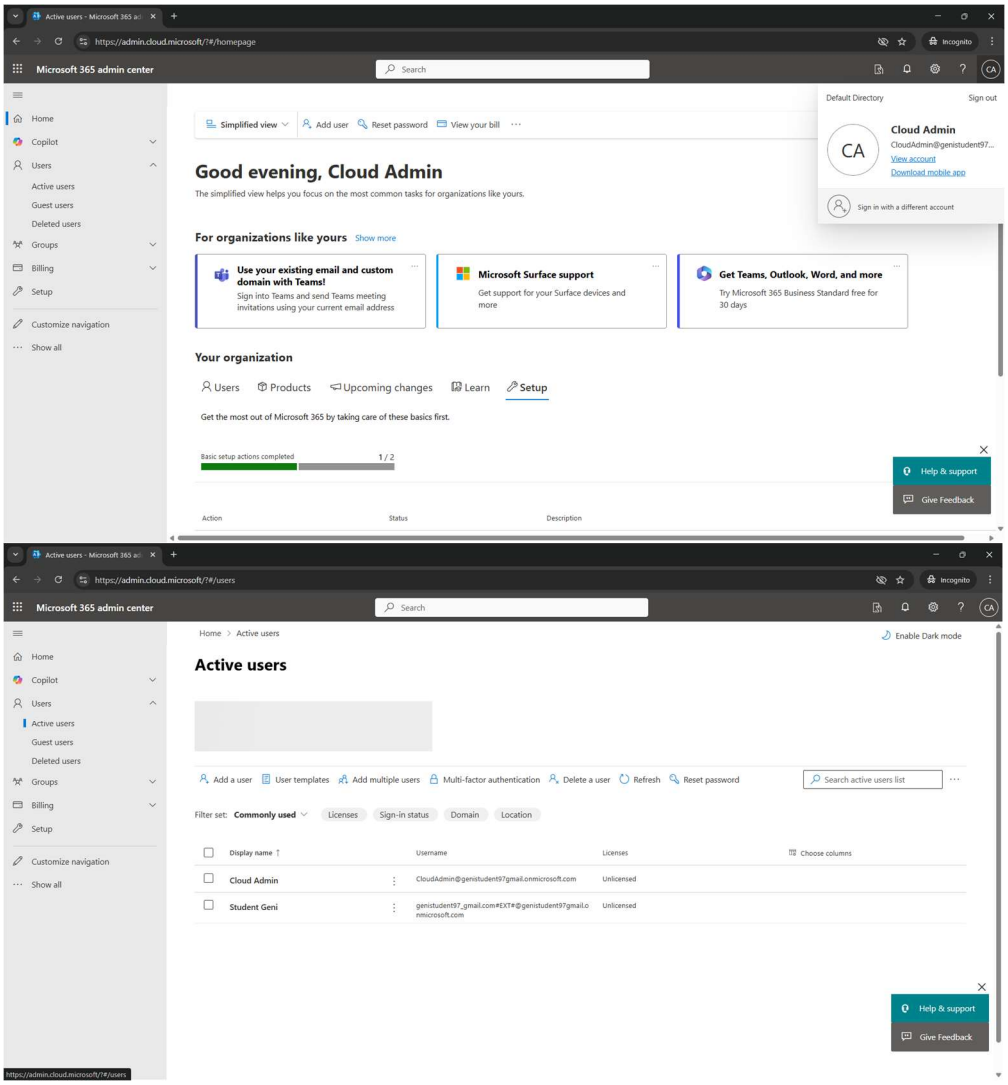
Entra ID
Overview
Users
Groups
Devices
Agent ID (Preview)
Enterprise apps
App registrations
Roles & admins
Delegated admin partners
Domain services
Identity Secure Score
Authentication methods
Account recovery (Preview)
Password reset
Custom security attributes
Directory roles
To assign custom roles to a user, your organization needs Microsoft Entra ID Premium P1 or P2.
Choose admin roles that you want to assign to this user. Learn more
Global Administrator
Add filters
Role
Description
Global Administrator
Can manage all aspects of Microsoft Entra ID and Microsoft services that use Microsoft Entra identities.
Global Reader
Can read everything that a Global Administrator can, but not update anything.


DC-Server - 4.254.59.144:3389 - Remote Desktop Connection
Microsoft Entra admin center
Search resources, services, and docs (G+/)
Copilot
Home > Users > Cloud Admin | Assigned roles > Users >
Cloud Admin
User
Edit properties
Delete
Refresh
Reset password
Revoke sessions
Manage view
Got feedback?
Overview
Monitoring
Properties
Basic info
CA
Cloud Admin
CloudAdmin@genistudent97gmail.onmicrosoft.com
Member
User principal name
CloudAdmin@genistudent97gmail.onmicrosoft.com
Object ID
b9db1218-bdca-40b1-a2fb-69f42b5e7b6f
Created date time
Nov 19, 2025, 10:10 AM
User type
Member
Identities
genistudent97gmail.onmicrosoft.com
Group memberships 0
Applications 0
Assigned roles 1
Assigned licenses 0
My Feed
Account status
Enabled
Edit
B2B invitation
Convert to external user
Quick actions
Edit properties

Cloud Authentication Test



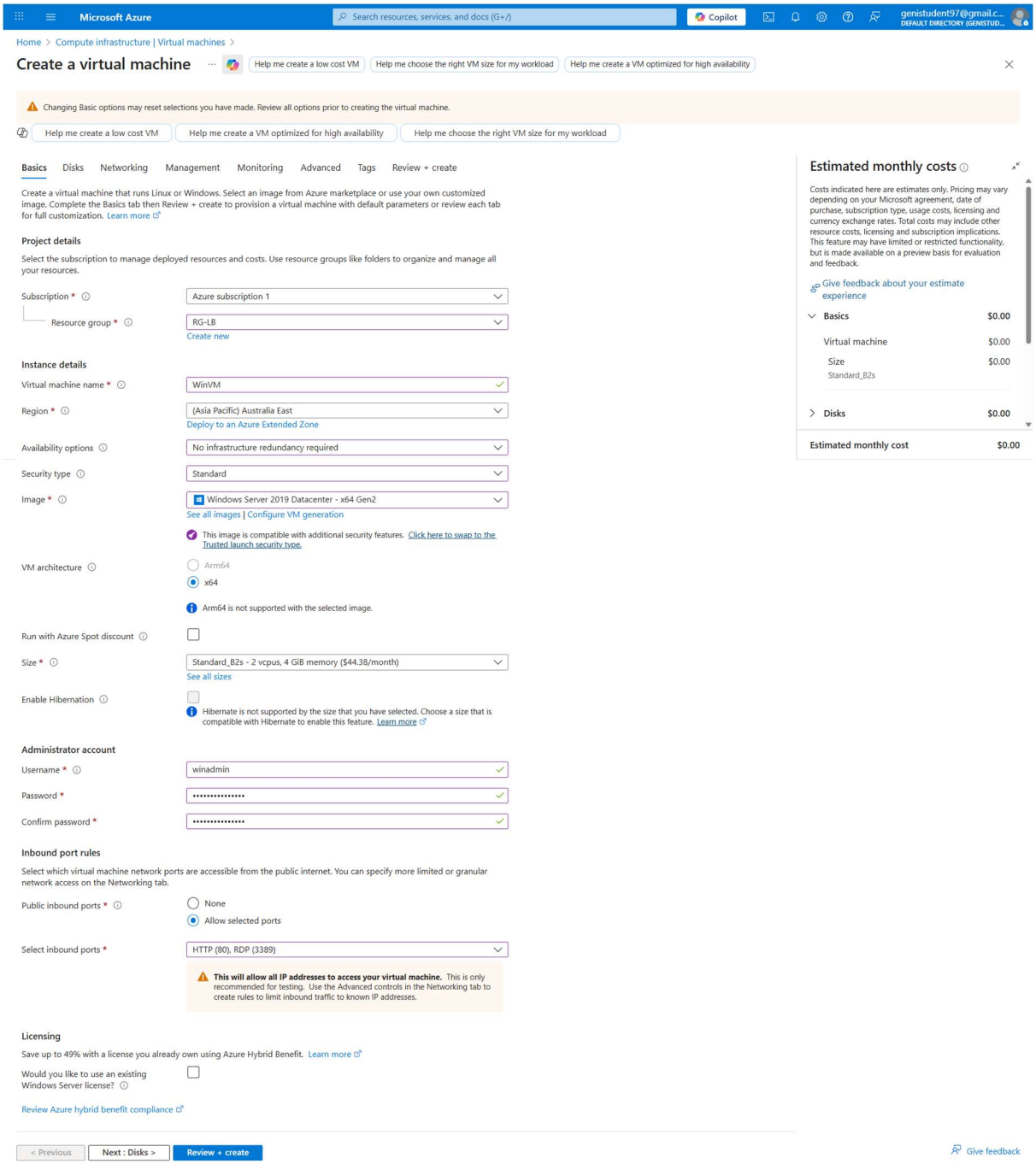
Migration Process and Benefits

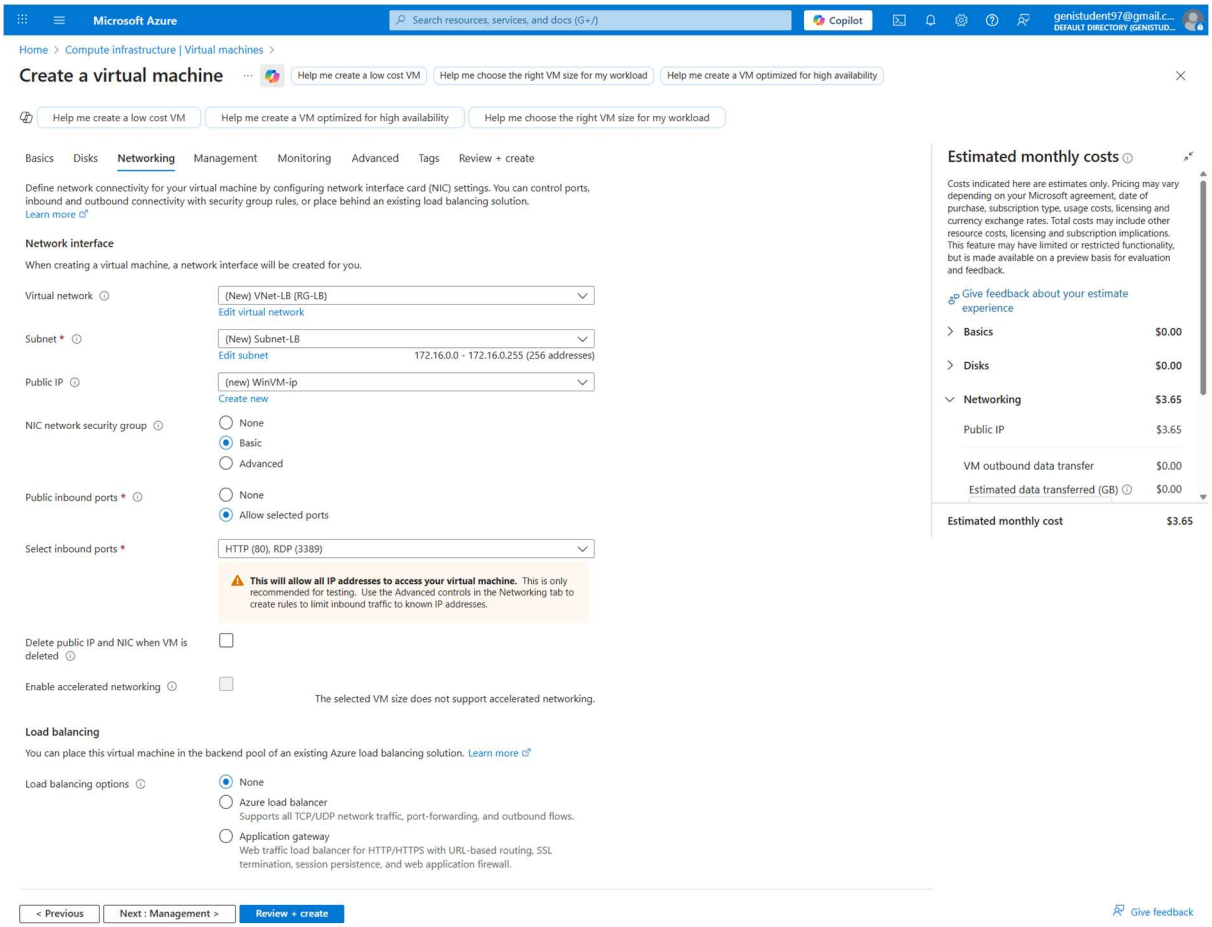
For this task, I worked through the process of moving an on-premises Active Directory into Azure AD. My setup was a bit different because my Azure tenant was created with a Gmail address, so Microsoft Entra Connect wasn't available at all. The sync option was disabled in the portal, so I couldn't do a full hybrid connection. Instead, I documented what I could see on the Entra Connect page and then used cloud-only users in Azure AD to complete the authentication part of the task. On the practical side, I created a Windows Server VM and installed Active Directory Domain Services. I added two users and a group on the VM just to simulate a simple on-premises AD environment. Since sync wasn't possible, I made a few users directly in Azure AD to show how identities work in the cloud. These accounts were able to sign in normally, which at least confirmed that the cloud authentication part was working.

Even though I couldn't do the full sync, the migration idea still makes sense. Azure AD reduces a lot of the maintenance work and comes with security features like MFA and conditional access. For a place like Yoobee College, this helps with reliability, easier management, and avoiding extra hardware costs.

Task 3: Theoretical and Practical Implementation: High Availability with Load Balancer

Windows Virtual Machine Deployment




Microsoft Azure
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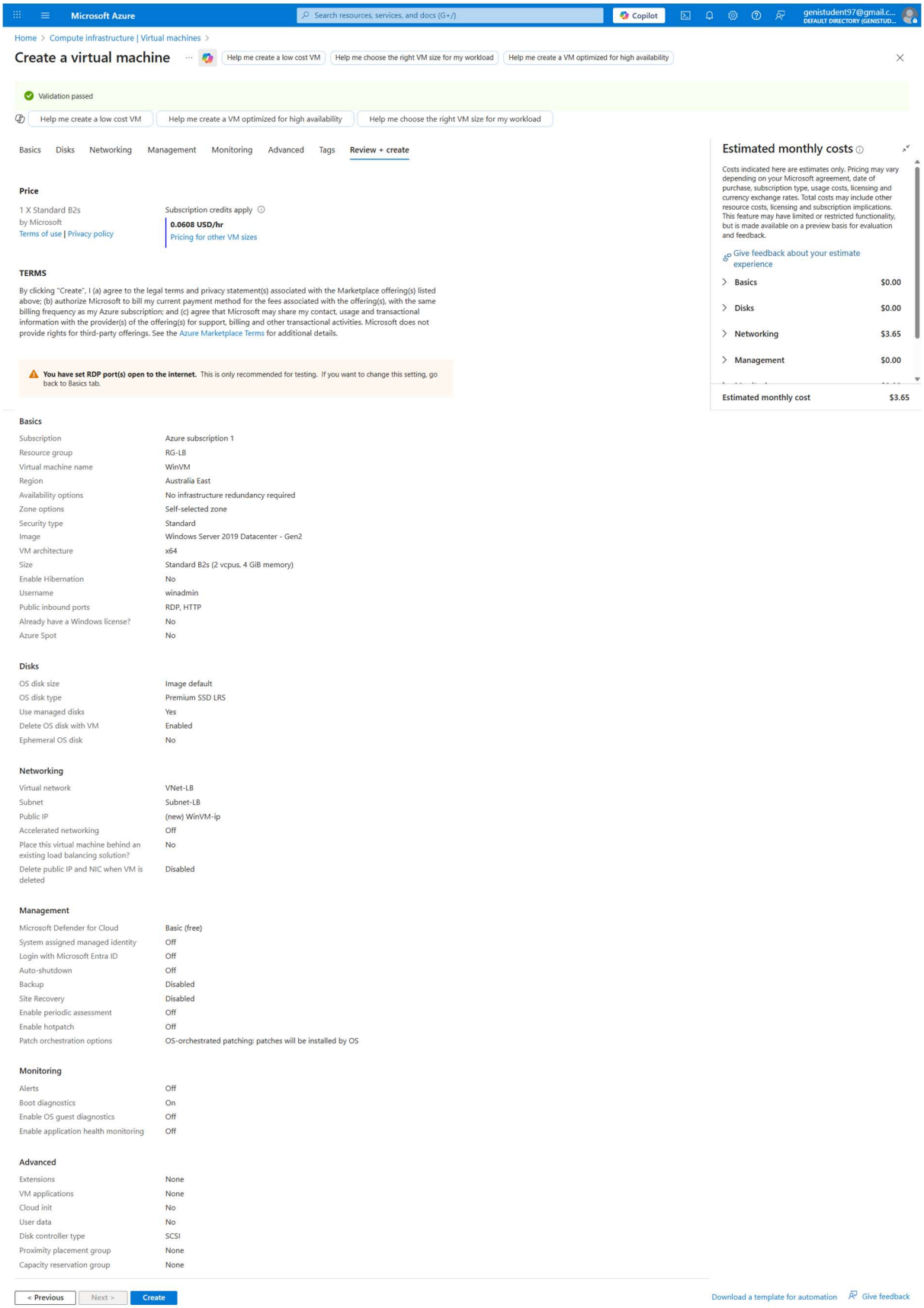
DEFAULT DIRECTORY (GENISTUD...
Home > Compute infrastructure | Virtual machines >
Create a virtual machine
Help me create a low cost VM
Help me choose the right VM size for my workload
Help me create a VM optimized for high availability
Basics Disks Networking Management Monitoring Advanced Tags Review + create
Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.
Learn more
Network interface
When creating a virtual machine, a network interface will be created for you.
Virtual network
(New) VNet-LB (RG-LB)
Edit virtual network
Subnet *
(New) Subnet-LB
Edit subnet
172.16.0.0 - 172.16.0.255 (256 addresses)
Public IP
(new) WinVM-ip
Create new
NIC network security group
None
Basic
Advanced
Public inbound ports *
None
Allow selected ports
Select inbound ports *
HTTP (80), RDP (3389)
This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.
Delete public IP and NIC when VM is deleted
Enable accelerated networking
The selected VM size does not support accelerated networking.
Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. Learn more
Load balancing options
None
Azure load balancer
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
Application gateway
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.
< Previous
Next : Management >
Review + create
Estimated monthly costs
Costs indicated here are estimates only. Pricing may vary depending on your Microsoft agreement, date of purchase, subscription type, usage costs, licensing and currency exchange rates. Total costs may include other resource costs, licensing and subscription implications. This feature may have limited or restricted functionality, but is made available on a preview basis for evaluation and feedback.
Give feedback about your estimate experience
Basics $0.00
Disks $0.00
Networking $3.65
Public IP $3.65
VM outbound data transfer $0.00
Estimated data transferred (GB) $0.00
Estimated monthly cost $3.65
Give feedback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Help me create a low cost VM
Help me choose the right VM size for my workload
Help me create a VM optimized for high availability
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
0.0608 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.
You have set RDP port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.
Estimated monthly costs
Costs indicated here are estimates only. Pricing may vary depending on your Microsoft agreement, date of purchase, subscription type, usage costs, licensing and currency exchange rates. Total costs may include other resource costs, licensing and subscription implications. This feature may have limited or restricted functionality, but is made available on a preview basis for evaluation and feedback.
Give feedback about your estimate experience
Basics $0.00
Disks $0.00
Networking $3.65
Management $0.00
Estimated monthly cost $3.65
Basics
Subscription Azure subscription 1
Resource group RG-LB
Virtual machine name WinVM
Region Australia East
Availability options No infrastructure redundancy required
Zone options Self-selected zone
Security type Standard
Image Windows Server 2019 Datacenter - Gen2
VM architecture x64
Size Standard B2s (2 vcpus, 4 GiB memory)
Enable Hibernation No
Username winadmin
Public inbound ports RDP, HTTP
Already have a Windows license? No
Azure Spot No
Disks
OS disk size Image default
OS disk type Premium SSD LRS
Use managed disks Yes
Delete OS disk with VM Enabled
Ephemeral OS disk No
Networking
Virtual network VNet-LB
Subnet Subnet-LB
Public IP (new) WinVM-ip
Accelerated networking Off
Place this virtual machine behind an existing load balancing solution? No
Delete public IP and NIC when VM is deleted Disabled
Management
Microsoft Defender for Cloud Basic (free)
System assigned managed identity Off
Login with Microsoft Entra ID Off
Auto-shutdown Off
Backup Disabled
Site Recovery Disabled
Enable periodic assessment Off
Enable hotpatch Off
Patch orchestration options OS-orchestrated patching: patches will be installed by OS
Monitoring
Alerts Off
Boot diagnostics On
Enable OS guest diagnostics Off
Enable application health monitoring Off
Advanced
Extensions None
VM applications None
Cloud init No
User data No
Disk controller type SCSI
Proximity placement group None
Capacity reservation group None
< Previous
Next >
Create
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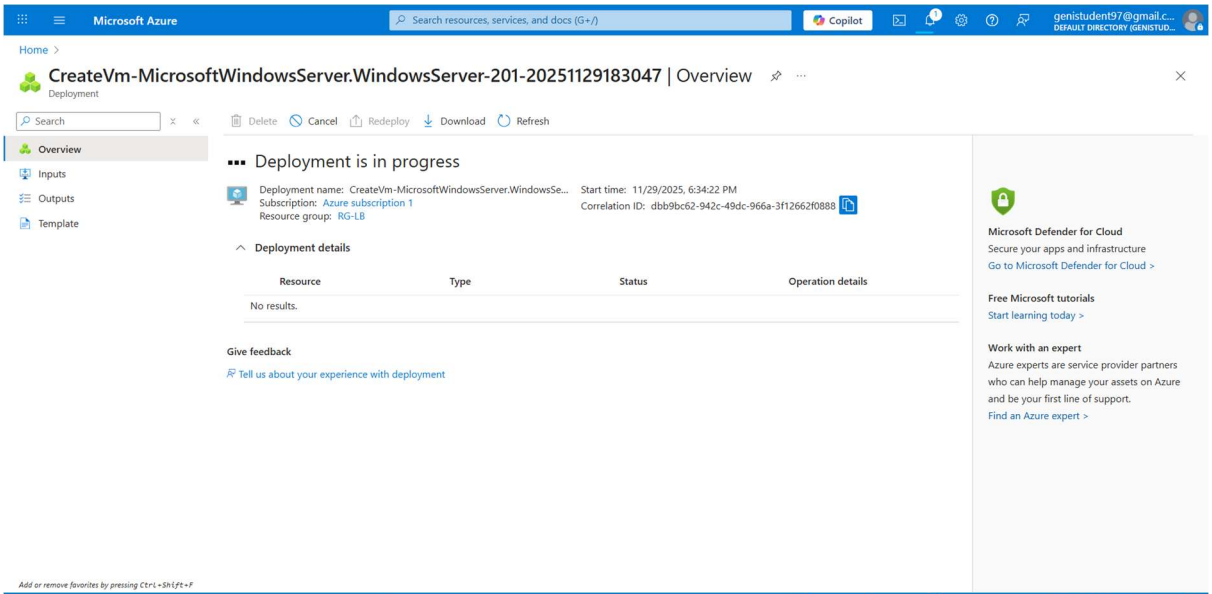
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Home
CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251129183047 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Deployment is in progress
Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...
Subscription: Azure subscription 1
Resource group: RG-LB
Start time: 11/29/2025, 6:34:22 PM
Correlation ID: dbb9bc62-942c-49dc-966a-3f12662f0888
Deployment details
Resource
Type
Status
Operation details
No results.
Give feedback
Tell us about your experience with deployment
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Secure your apps and infrastructure
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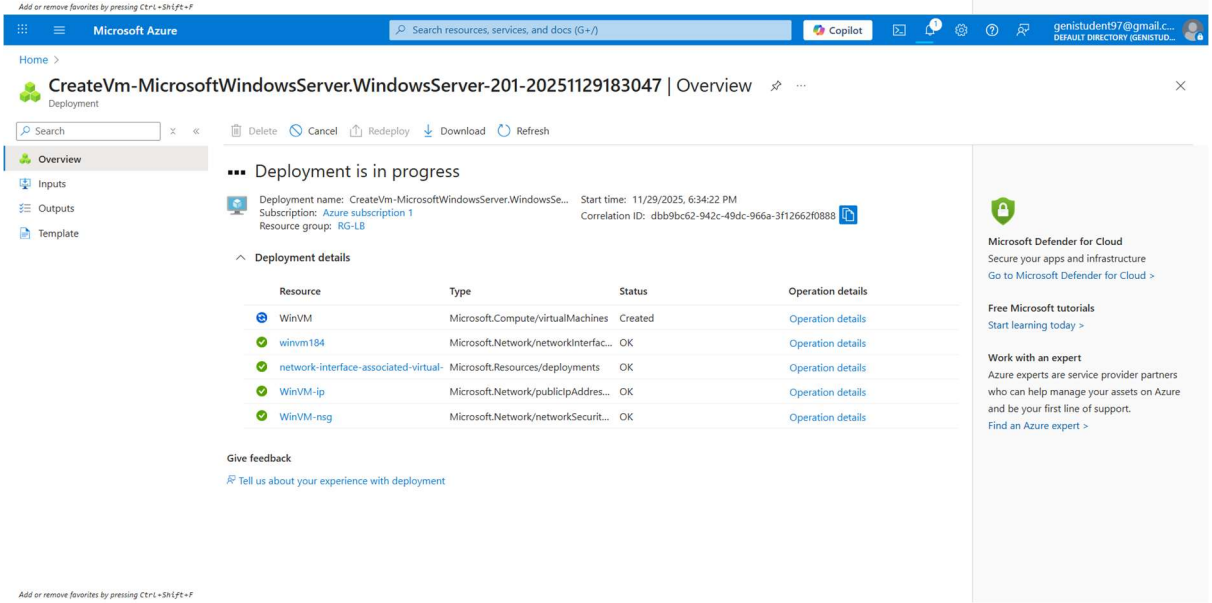
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Home
CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251129183047 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Deployment is in progress
Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...
Subscription: Azure subscription 1
Resource group: RG-LB
Start time: 11/29/2025, 6:34:22 PM
Correlation ID: dbb9bc62-942c-49dc-966a-3f12662f0888
Deployment details
Resource
Type
Status
Operation details
WinVM
Microsoft.Compute/virtualMachines
Created
Operation details
winvm184
Microsoft.Network/networkInterfac...
OK
Operation details
network-interface-associated-virtual-
Microsoft.Resources/deployments
OK
Operation details
WinVM-ip
Microsoft.Network/publicIpAddres...
OK
Operation details
WinVM-nsg
Microsoft.Network/networkSecurit...
OK
Operation details
Give feedback
Tell us about your experience with deployment
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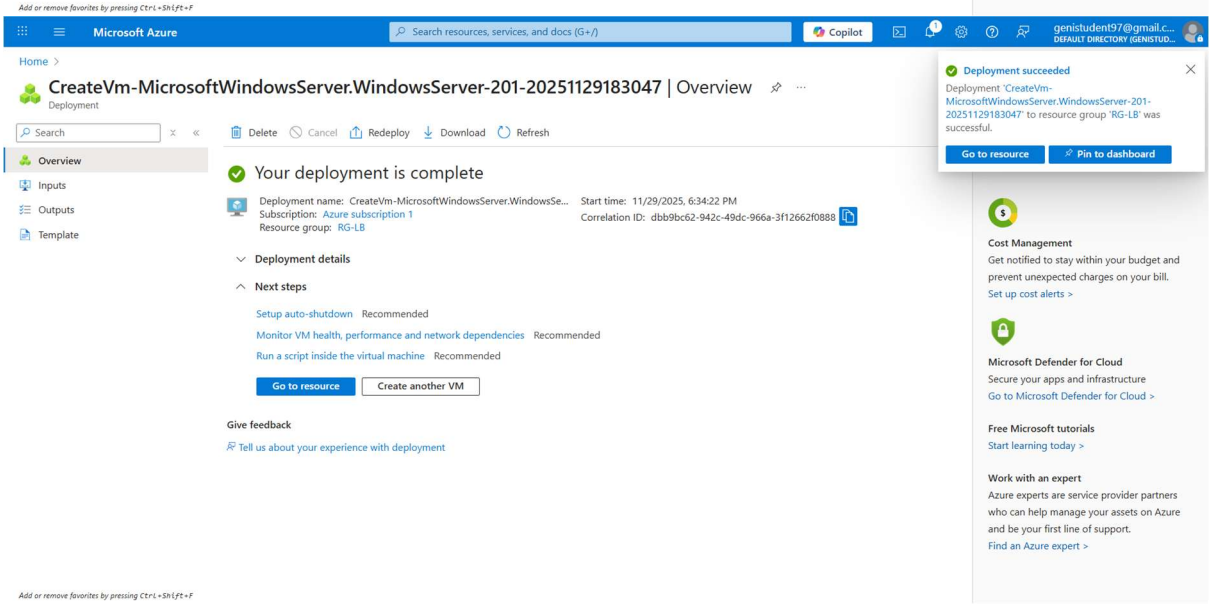
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DEFAULT DIRECTORY (GENISTUD...
Home
CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251129183047 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe...
Subscription: Azure subscription 1
Resource group: RG-LB
Start time: 11/29/2025, 6:34:22 PM
Correlation ID: dbb9bc62-942c-49dc-966a-3f12662f0888
Deployment details
Next steps
Setup auto-shutdown Recommended
Monitor VM health, performance and network dependencies Recommended
Run a script inside the virtual machine Recommended
Go to resource
Create another VM
Give feedback
Tell us about your experience with deployment
Deployment succeeded
Deployment 'CreateVm-MicrosoftWindowsServer.WindowsServer-201-20251129183047' to resource group 'RG-LB' was successful.
Go to resource
Pin to dashboard
Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
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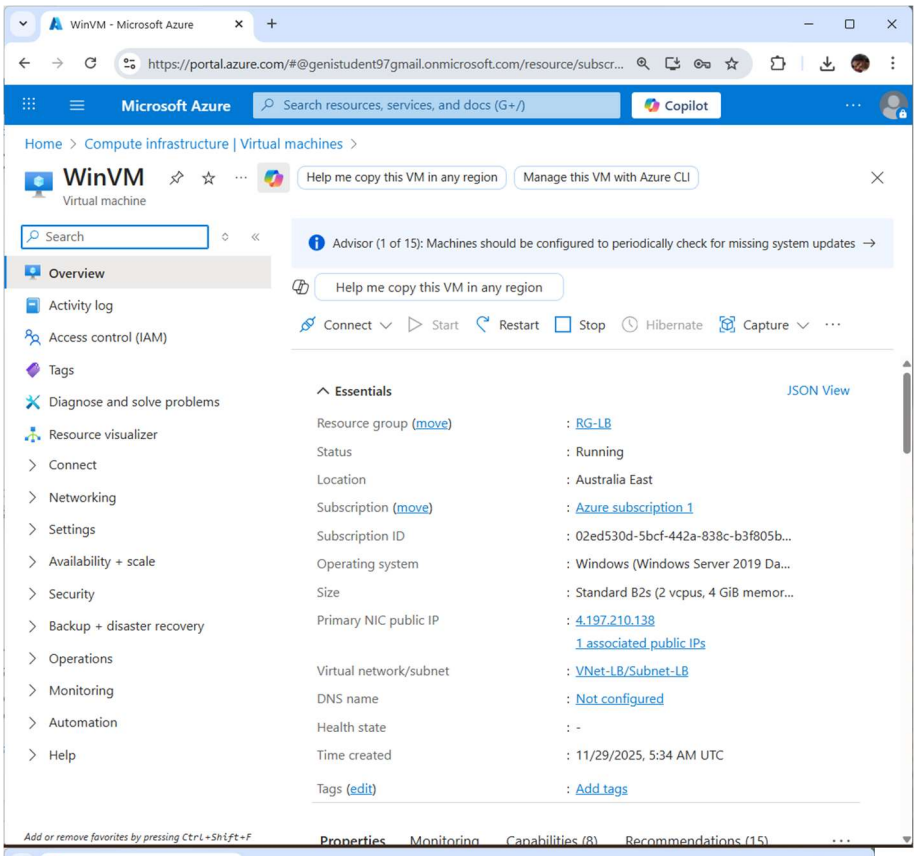
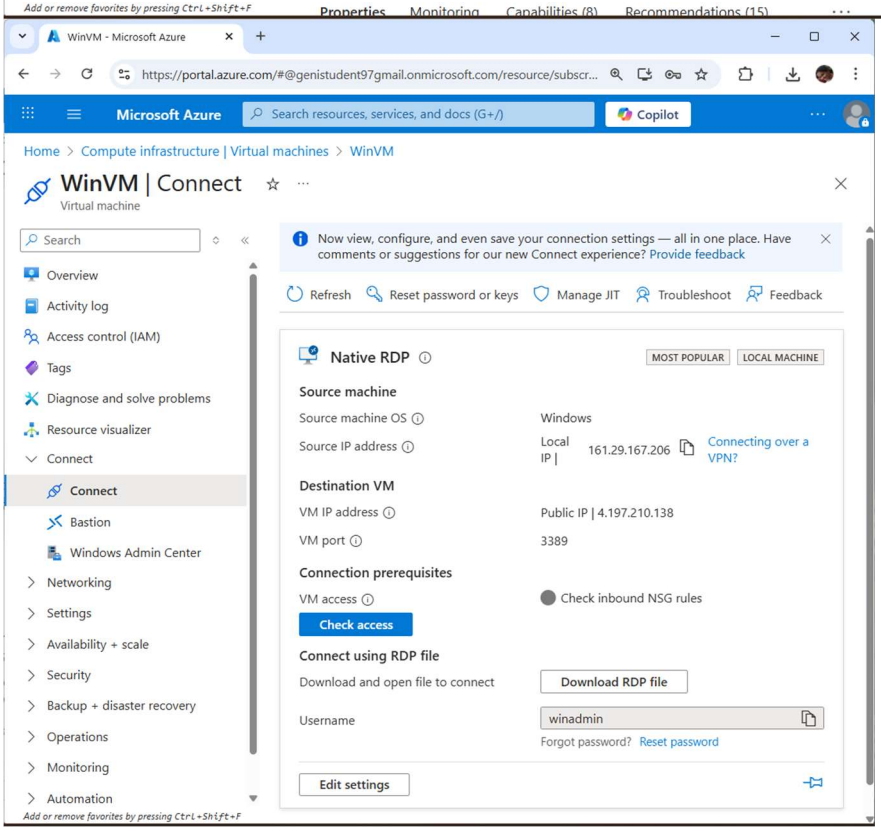
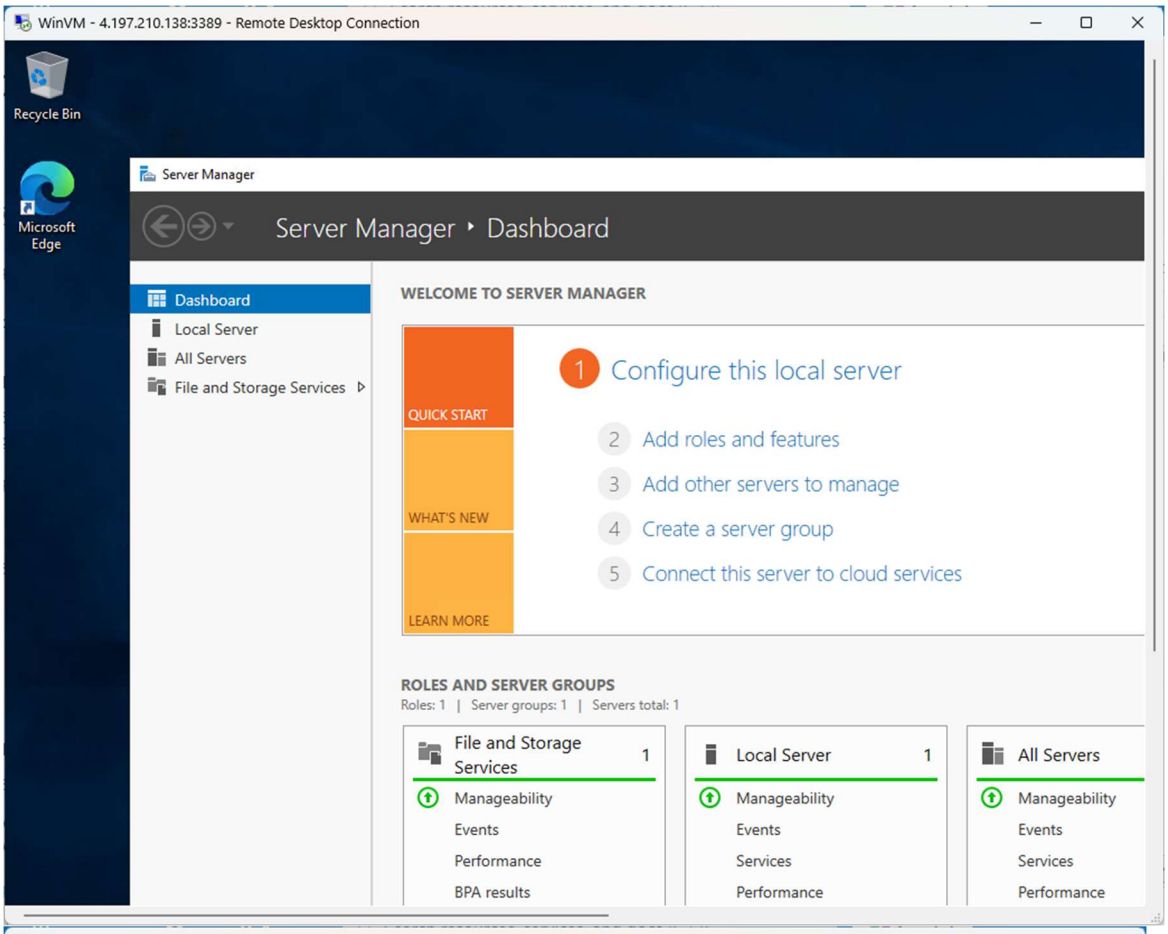
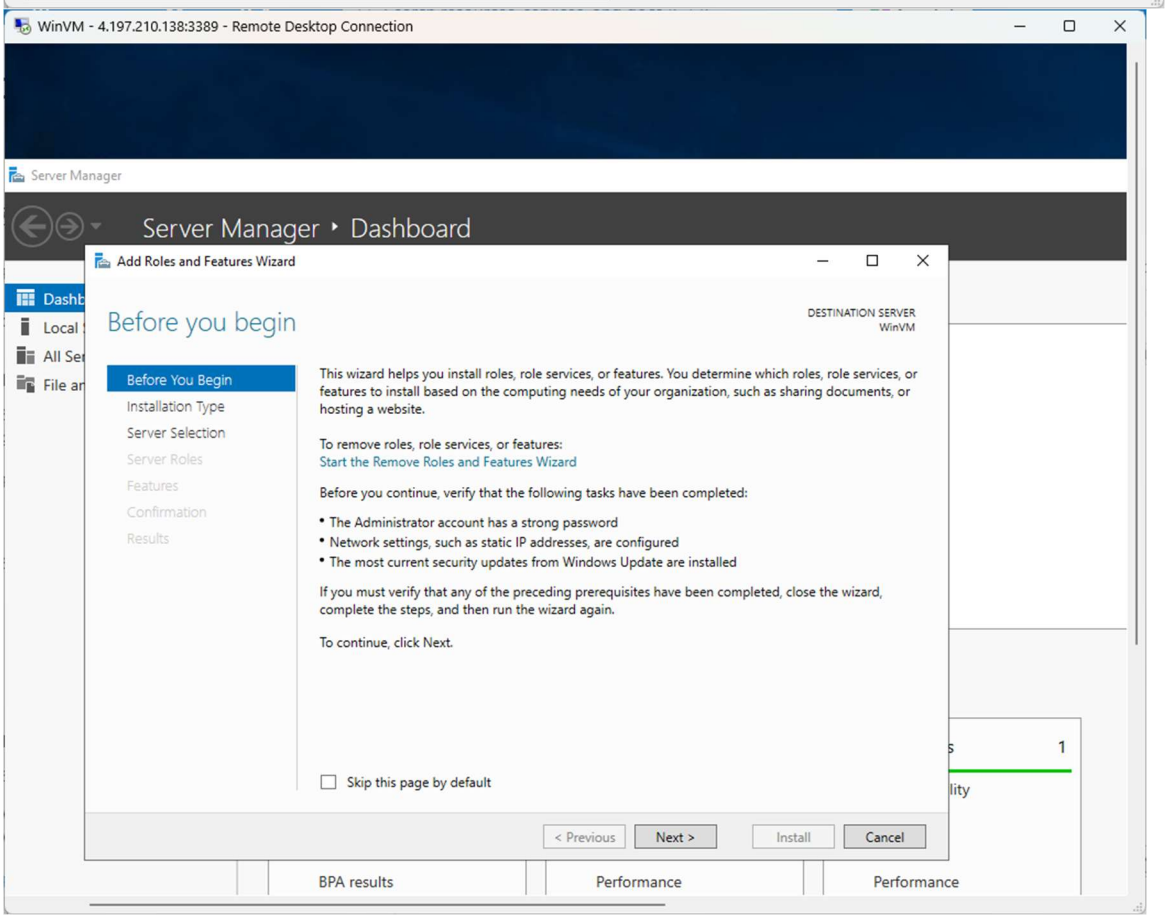
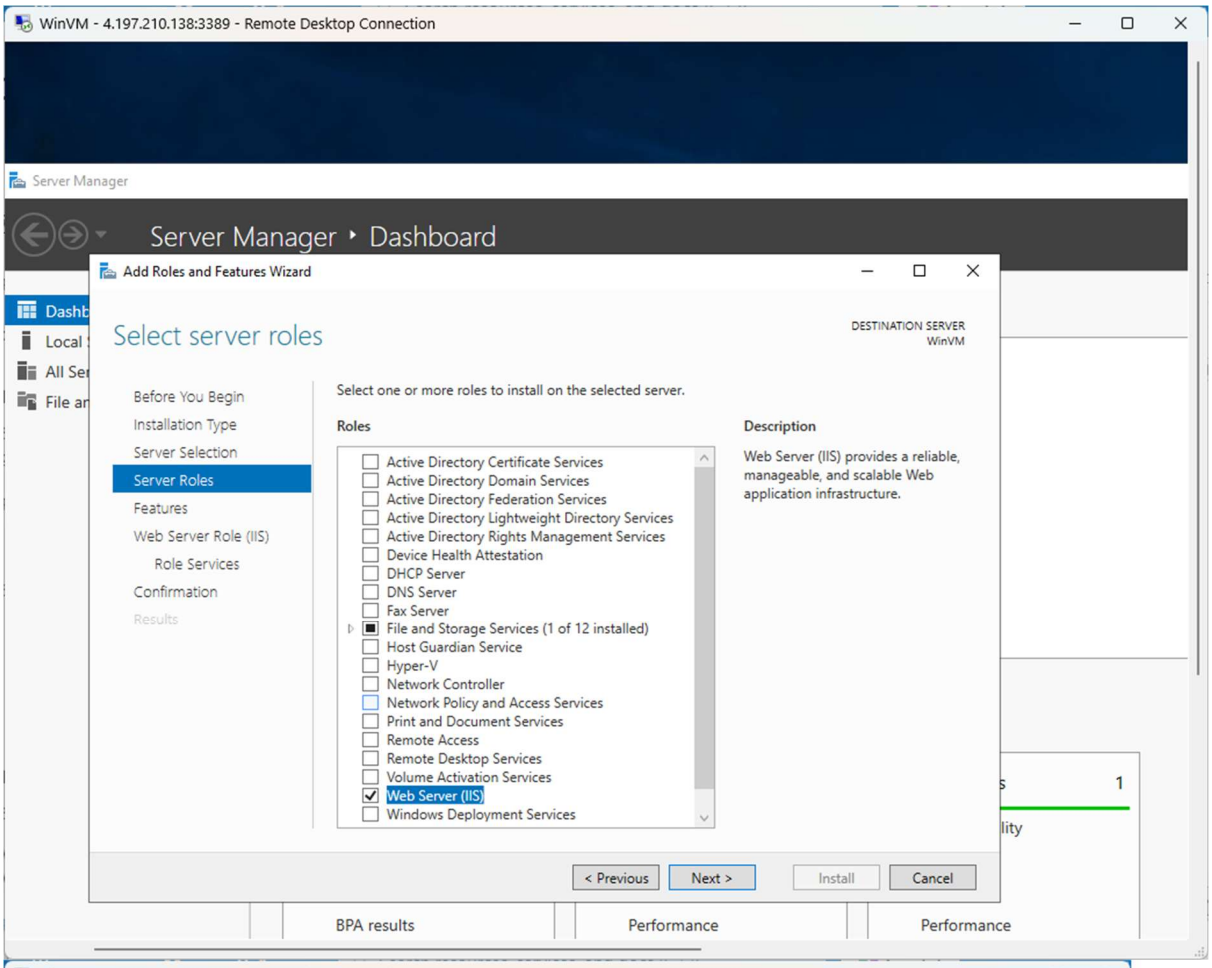
IIS Web Server Installation on Windows VM

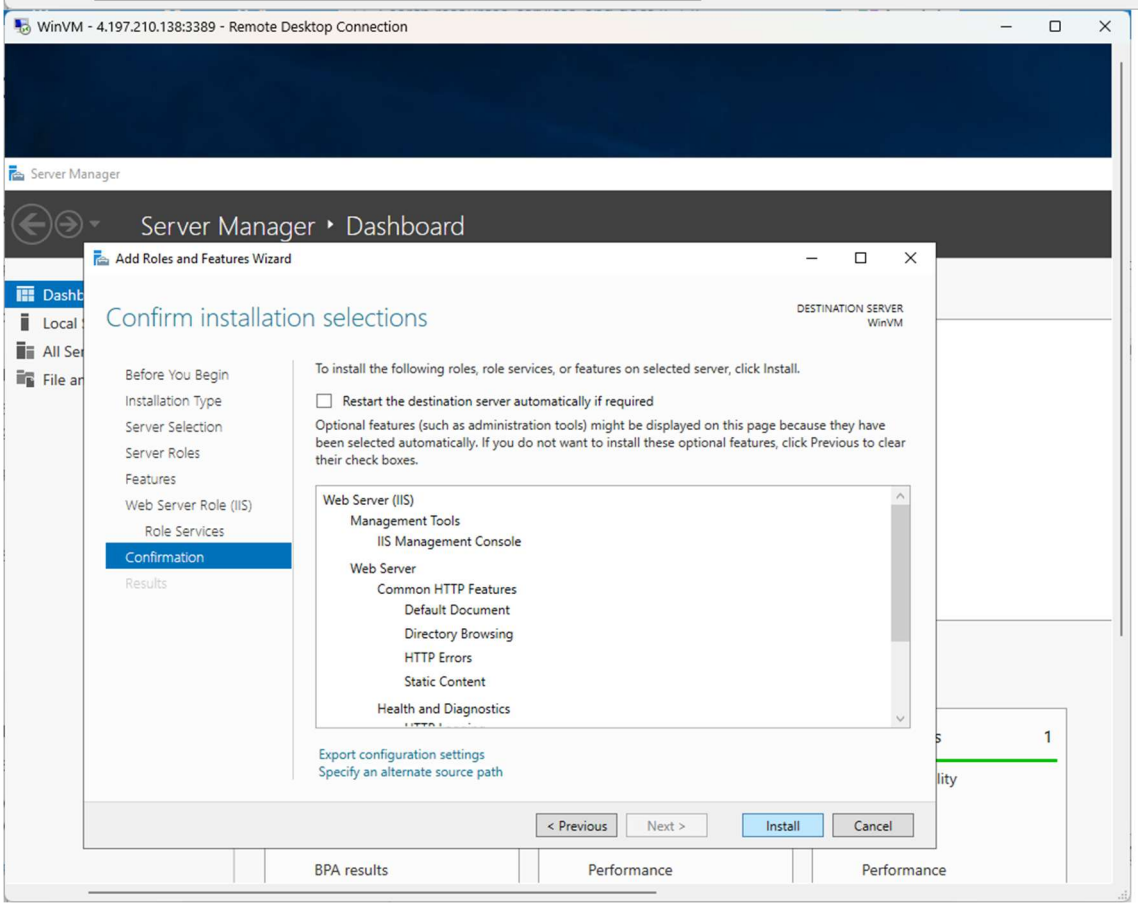


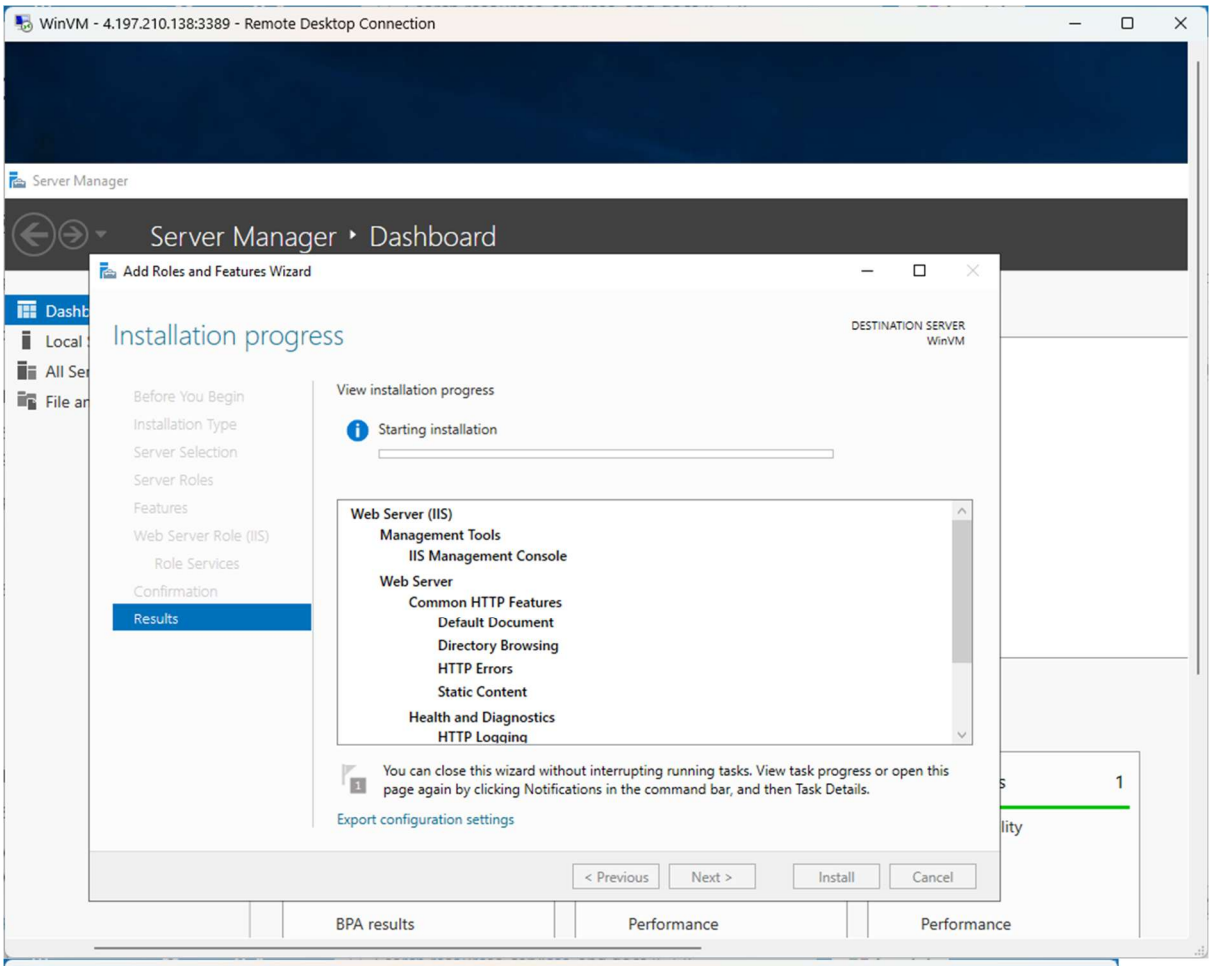


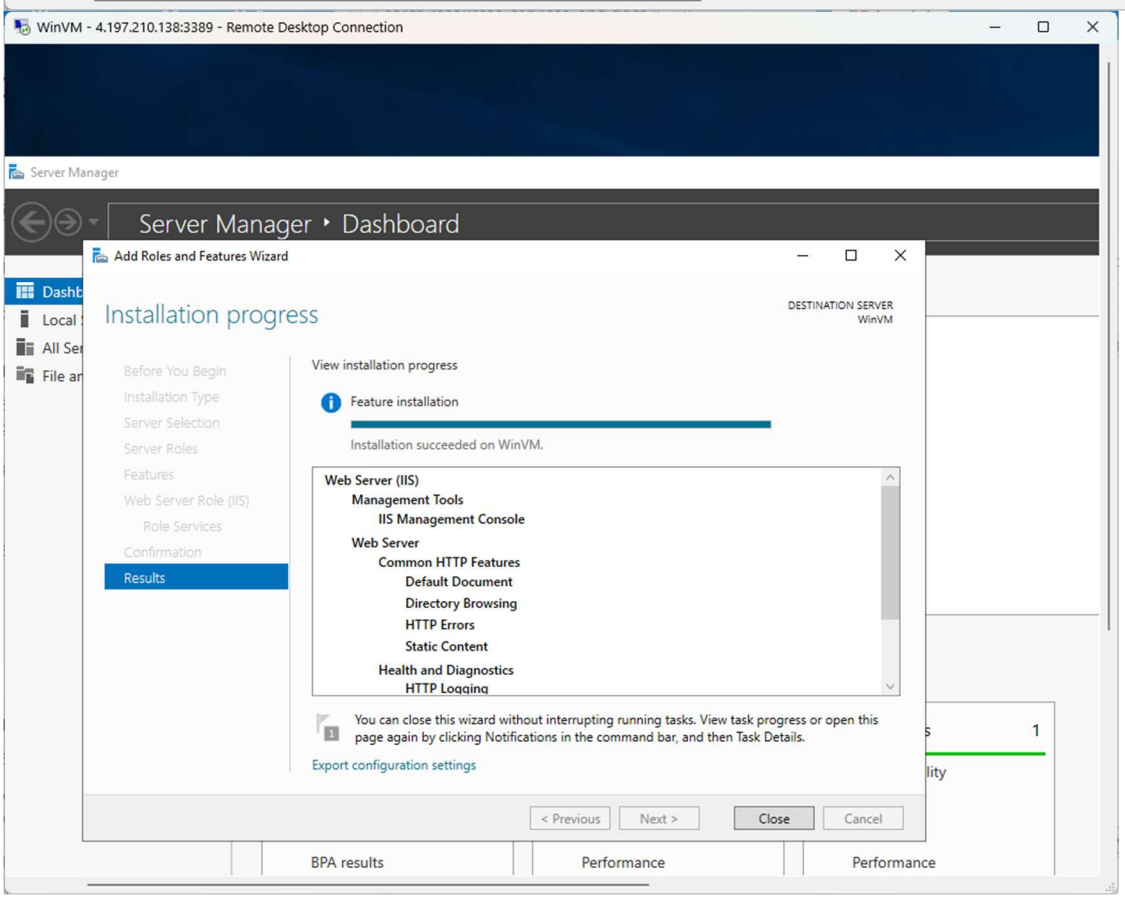

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Recycle Bin
Microsoft Edge
Server Manager
Server Manager • Dashboard
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
Events
Performance
BPA results
Local Server 1
Manageability
Events
Services
Performance
All Servers
Manageability
Events
Services
Performance

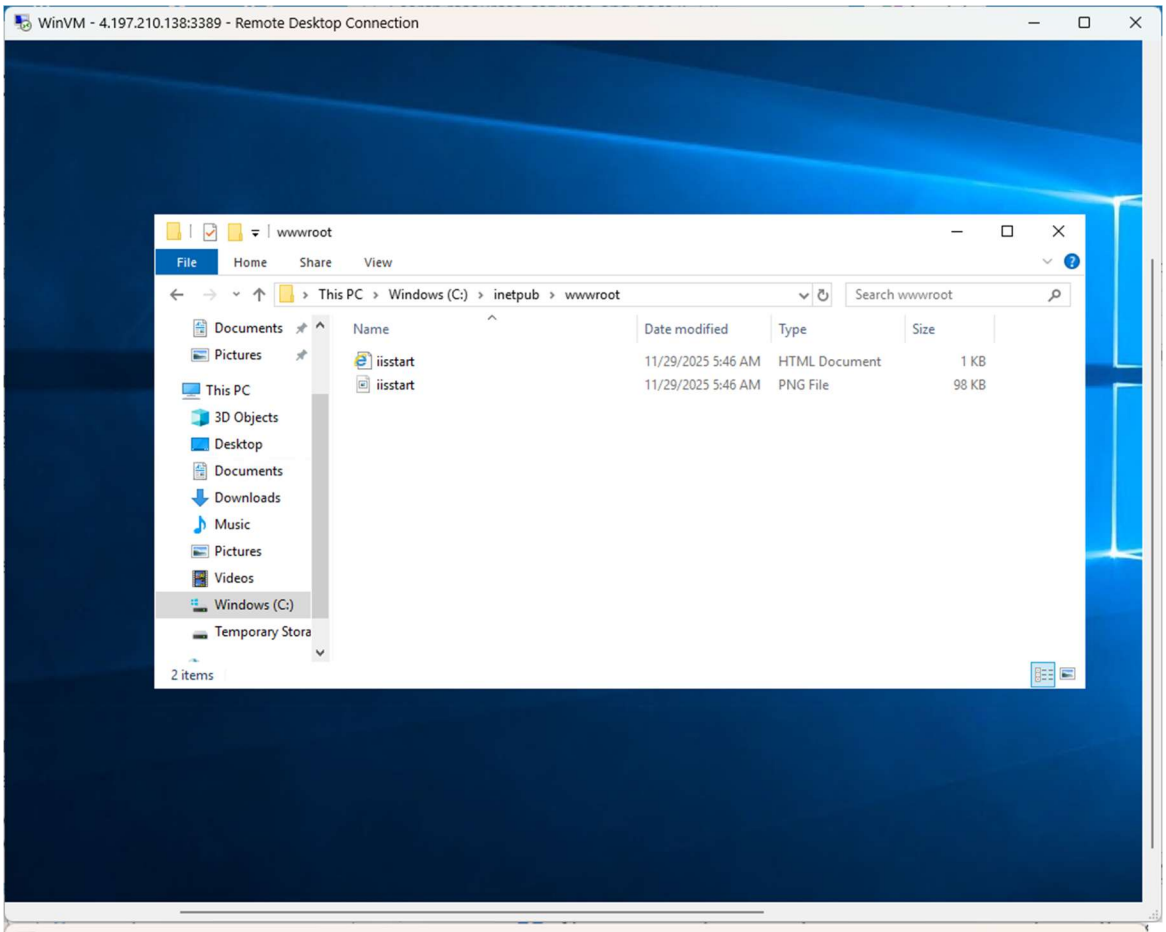

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Server Manager
Server Manager • Dashboard
Add Roles and Features Wizard
Before you begin
DESTINATION SERVER
WinVM
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.
To remove roles, role services, or features:
Start the Remove Roles and Features Wizard
Before you continue, verify that the following tasks have been completed:
• The Administrator account has a strong password
• Network settings, such as static IP addresses, are configured
• The most current security updates from Windows Update are installed
If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.
To continue, click Next.
Skip this page by default
< Previous
Next >
Install
Cancel
BPA results
Performance
Performance

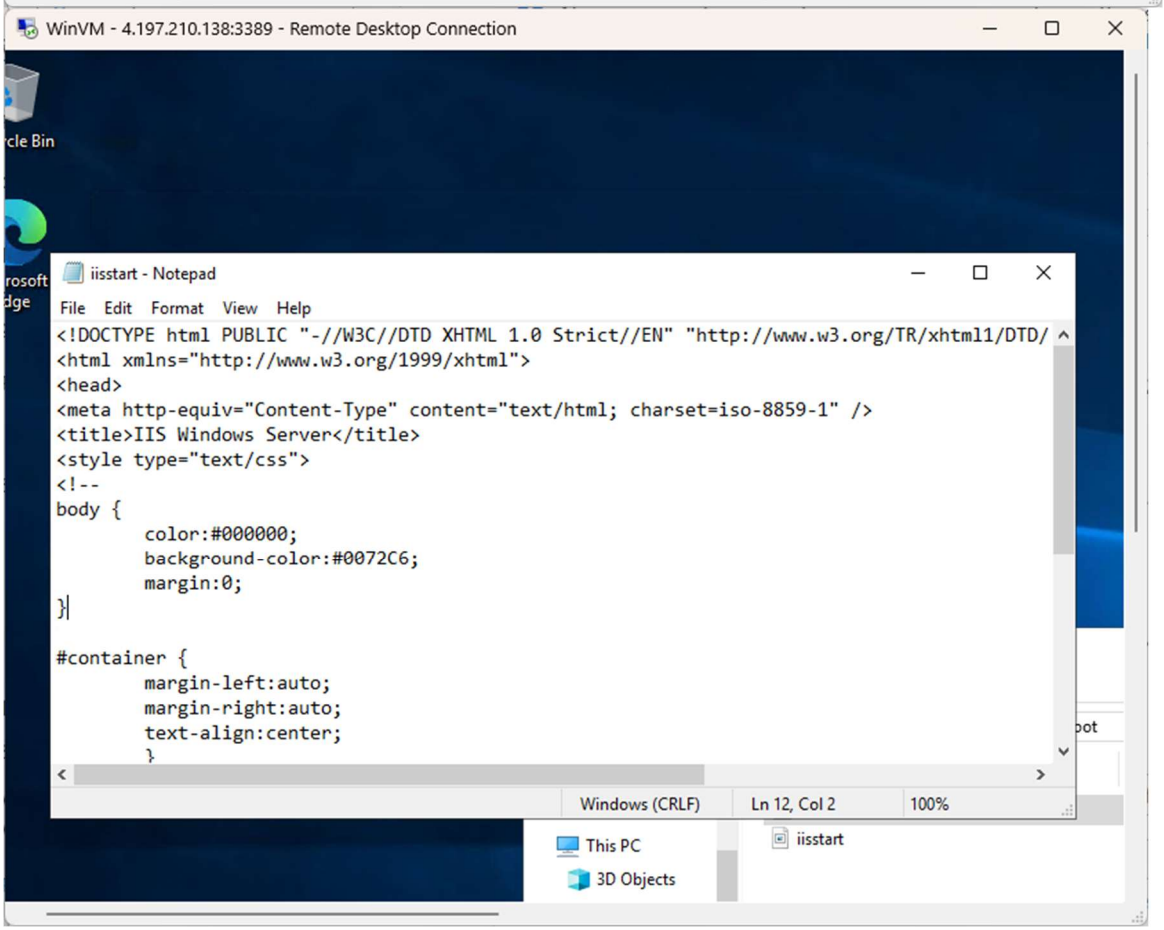

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Server Manager
Server Manager ‣ Dashboard
Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
WinVM
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
Select one or more roles to install on the selected server.
Roles
Active Directory Certificate Services
Active Directory Domain Services
Active Directory Federation Services
Active Directory Lightweight Directory Services
Active Directory Rights Management Services
Device Health Attestation
DHCP Server
DNS Server
Fax Server
File and Storage Services (1 of 12 installed)
Host Guardian Service
Hyper-V
Network Controller
Network Policy and Access Services
Print and Document Services
Remote Access
Remote Desktop Services
Volume Activation Services
Web Server (IIS)
Windows Deployment Services
Description
Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.
< Previous
Next >
Install
Cancel
BPA results
Performance
Performance

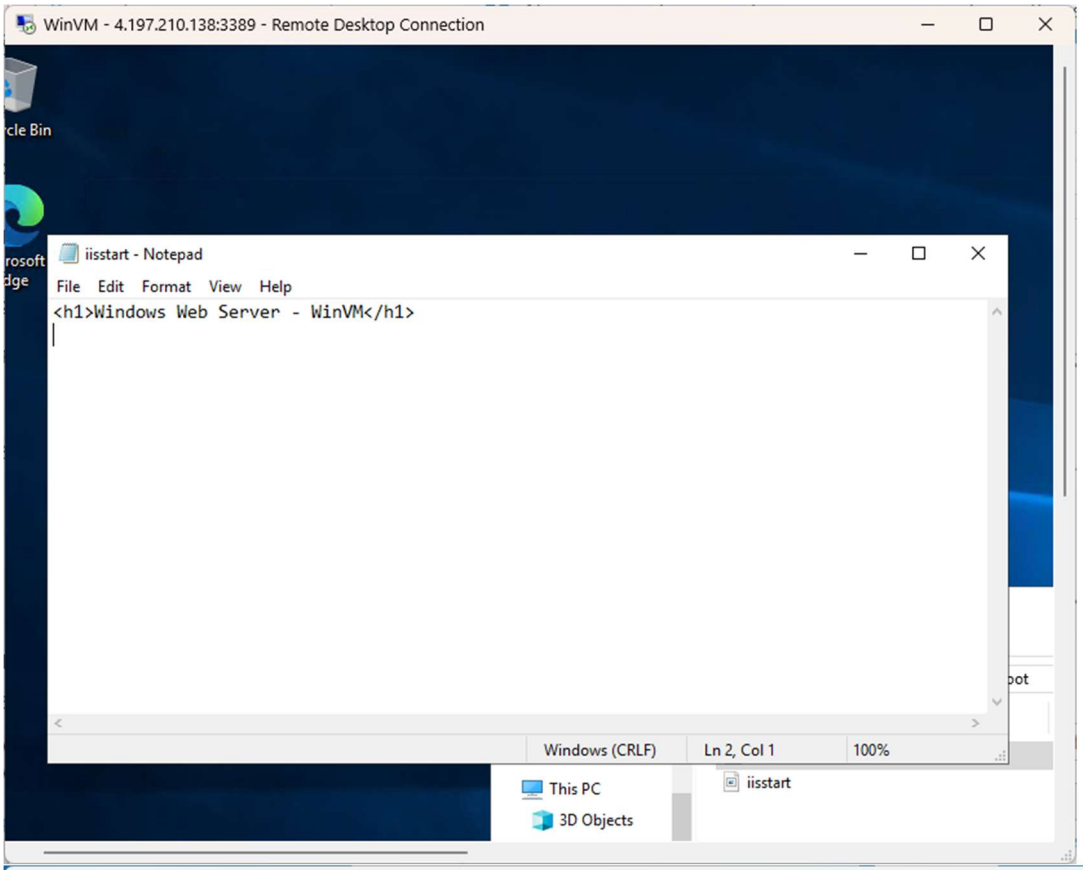

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Server Manager
Server Manager ‣ Dashboard
Add Roles and Features Wizard
Confirm installation selections
DESTINATION SERVER
WinVM
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
To install the following roles, role services, or features on selected server, click Install.
Restart the destination server automatically if required
Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.
Web Server (IIS)
Management Tools
IIS Management Console
Web Server
Common HTTP Features
Default Document
Directory Browsing
HTTP Errors
Static Content
Health and Diagnostics
Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel
BPA results
Performance
Performance

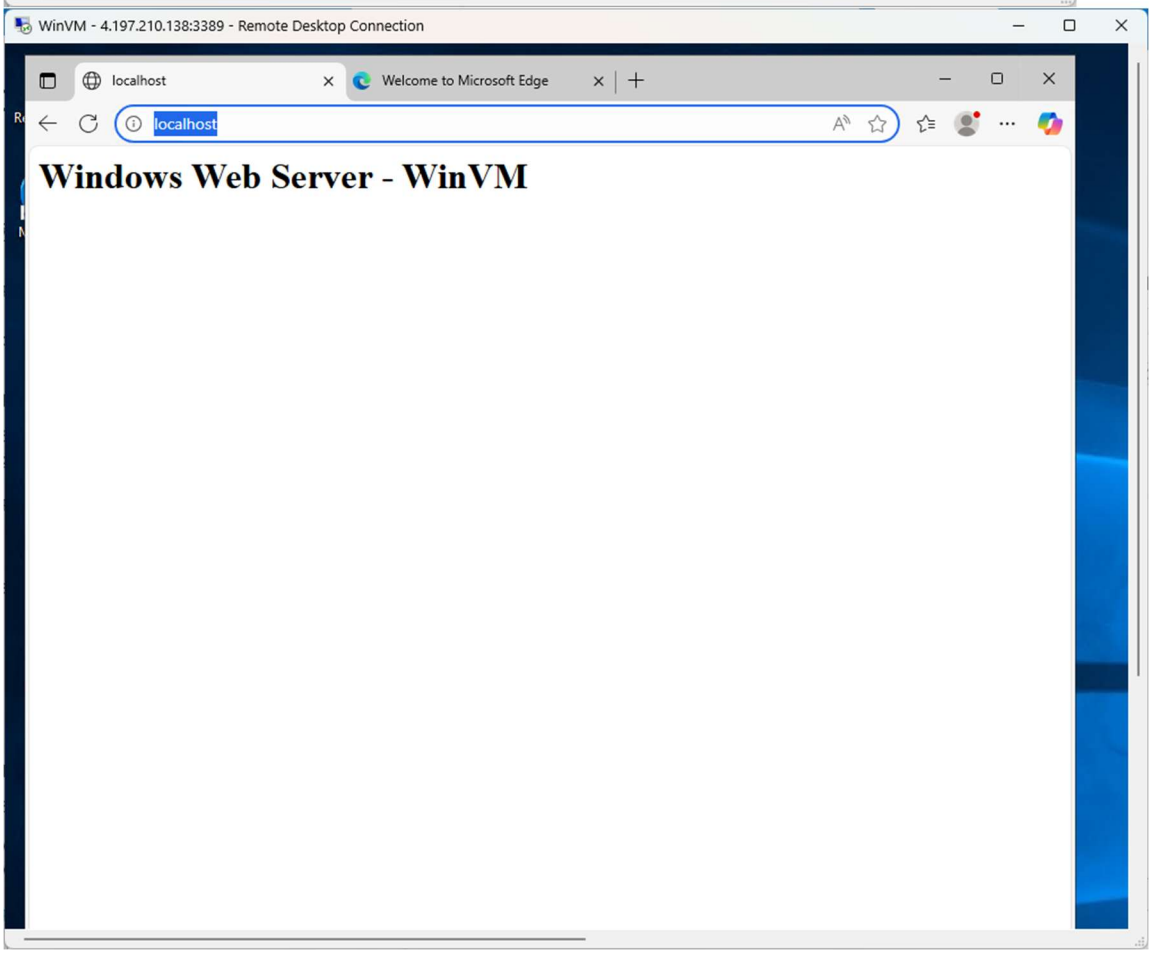

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Server Manager
Server Manager ‣ Dashboard
Add Roles and Features Wizard
Installation progress
DESTINATION SERVER
WinVM
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
View installation progress
Starting installation
Web Server (IIS)
Management Tools
IIS Management Console
Web Server
Common HTTP Features
Default Document
Directory Browsing
HTTP Errors
Static Content
Health and Diagnostics
HTTP Logging
You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.
Export configuration settings
< Previous
Next >
Install
Cancel
BPA results
Performance
Performance


WinVM - 4.197.210.138:3389 - Remote Desktop Connection
Server Manager
Server Manager ‣ Dashboard
Add Roles and Features Wizard
Installation progress
DESTINATION SERVER
WinVM
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results
View installation progress
Feature installation
Installation succeeded on WinVM.
Web Server (IIS)
Management Tools
IIS Management Console
Web Server
Common HTTP Features
Default Document
Directory Browsing
HTTP Errors
Static Content
Health and Diagnostics
HTTP Logging
You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.
Export configuration settings
< Previous
Next >
Close
Cancel
BPA results
Performance
Performance

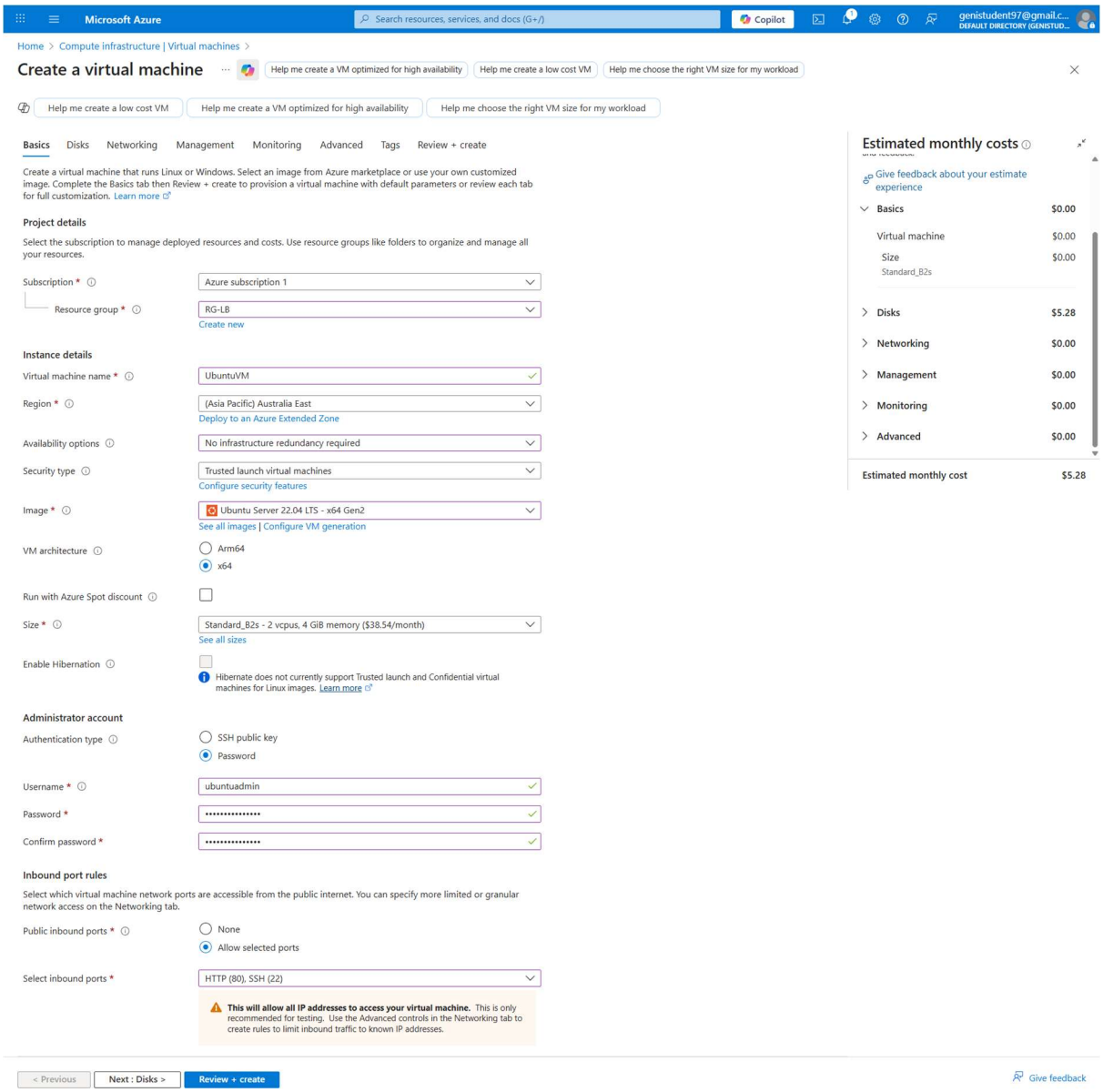

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
wwwroot
File Home Share View
This PC › Windows (C:) › inetpub › wwwroot
Search wwwroot
Documents
Pictures
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows (C:)
Temporary Stora
Name
Date modified
Type
Size
iisstart
11/29/2025 5:46 AM
HTML Document
1 KB
iisstart
11/29/2025 5:46 AM
PNG File
98 KB
2 items

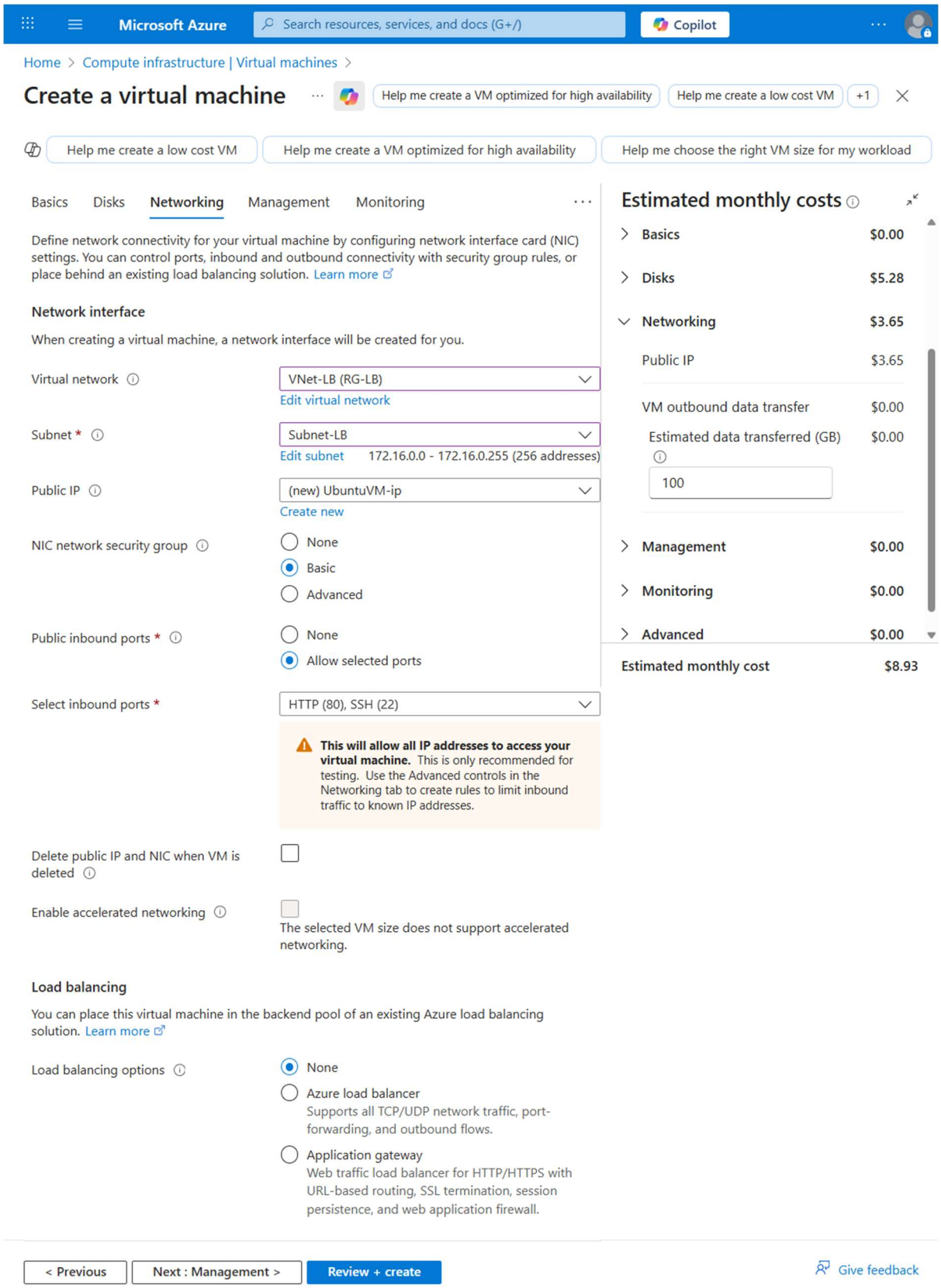

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
iisstart - Notepad
File Edit Format View Help
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>IIS Windows Server</title>
<style type="text/css">
<!--
body {
color:#000000;
background-color:#0072C6;
margin:0;
}
#container {
margin-left:auto;
margin-right:auto;
text-align:center;
}
Windows (CRLF)
Ln 12, Col 2
100%
This PC
3D Objects
iisstart

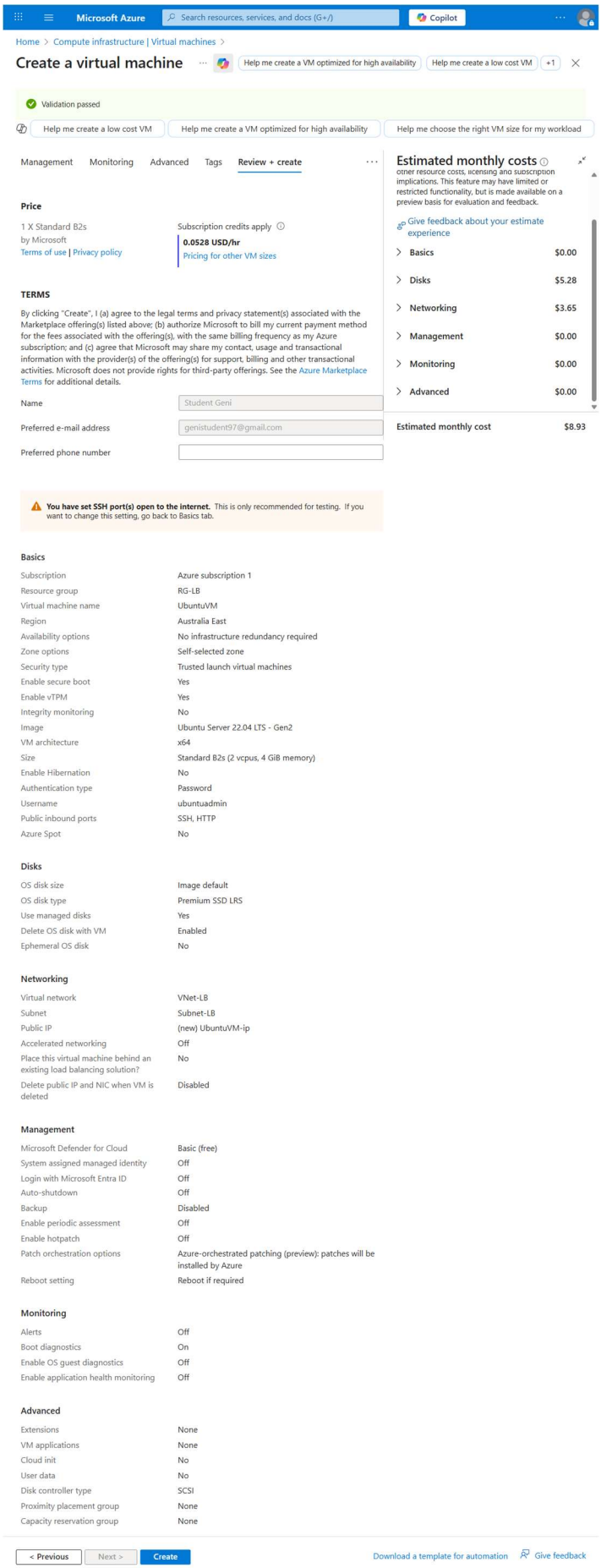

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
iisstart - Notepad
File Edit Format View Help
<h1>Windows Web Server - WinVM</h1>
Windows (CRLF)
Ln 2, Col 1
100%
This PC
3D Objects
iisstart

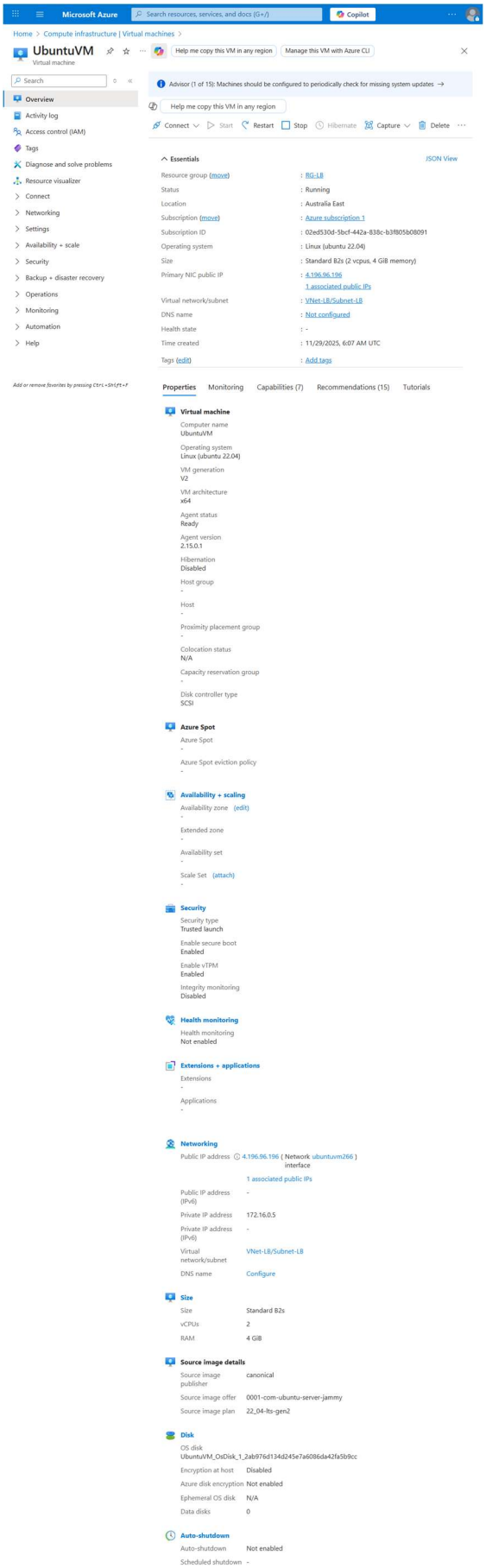

WinVM - 4.197.210.138:3389 - Remote Desktop Connection
localhost
Welcome to Microsoft Edge
localhost
Windows Web Server - WinVM

Ubuntu Virtual Machine Deployment

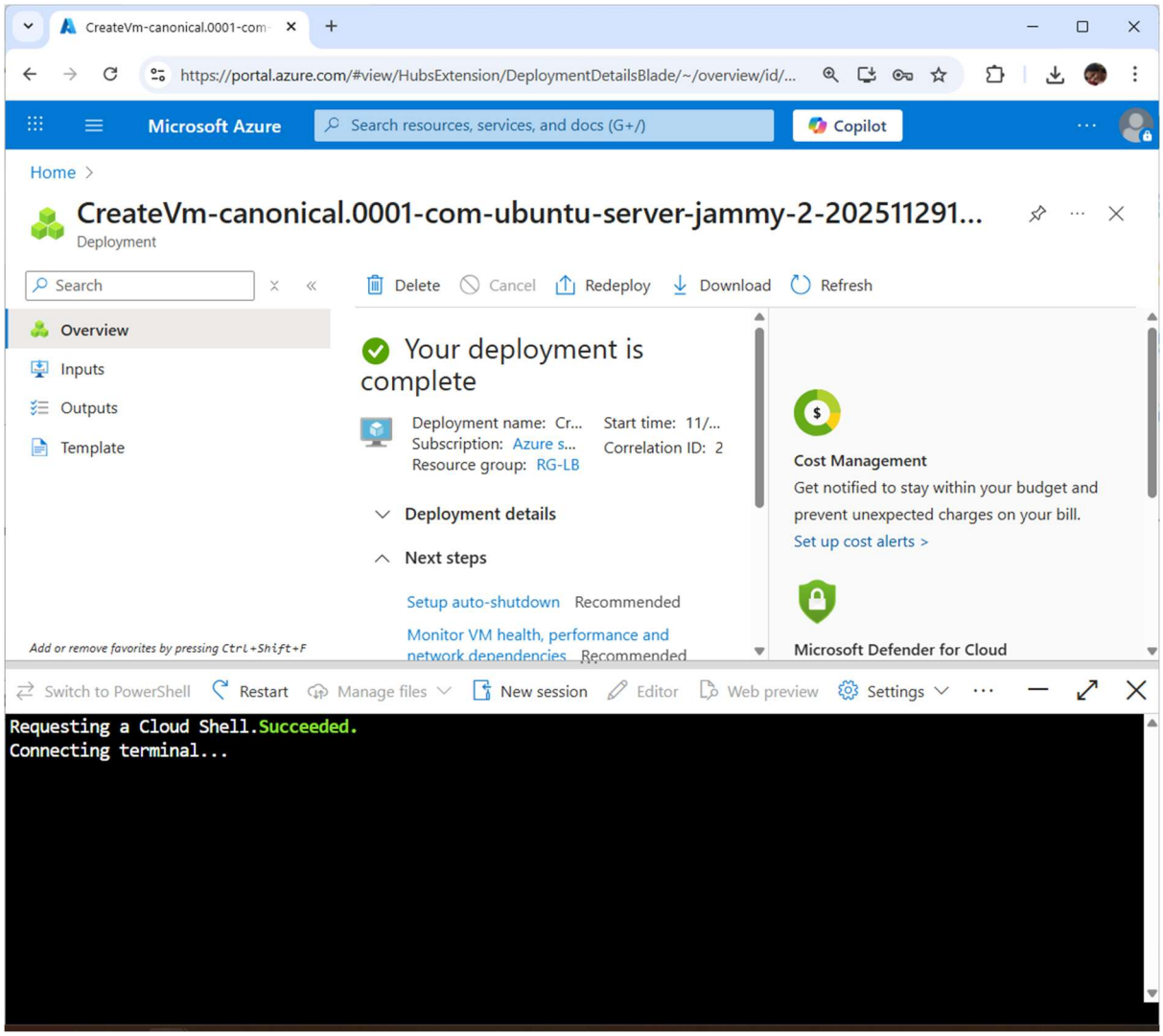


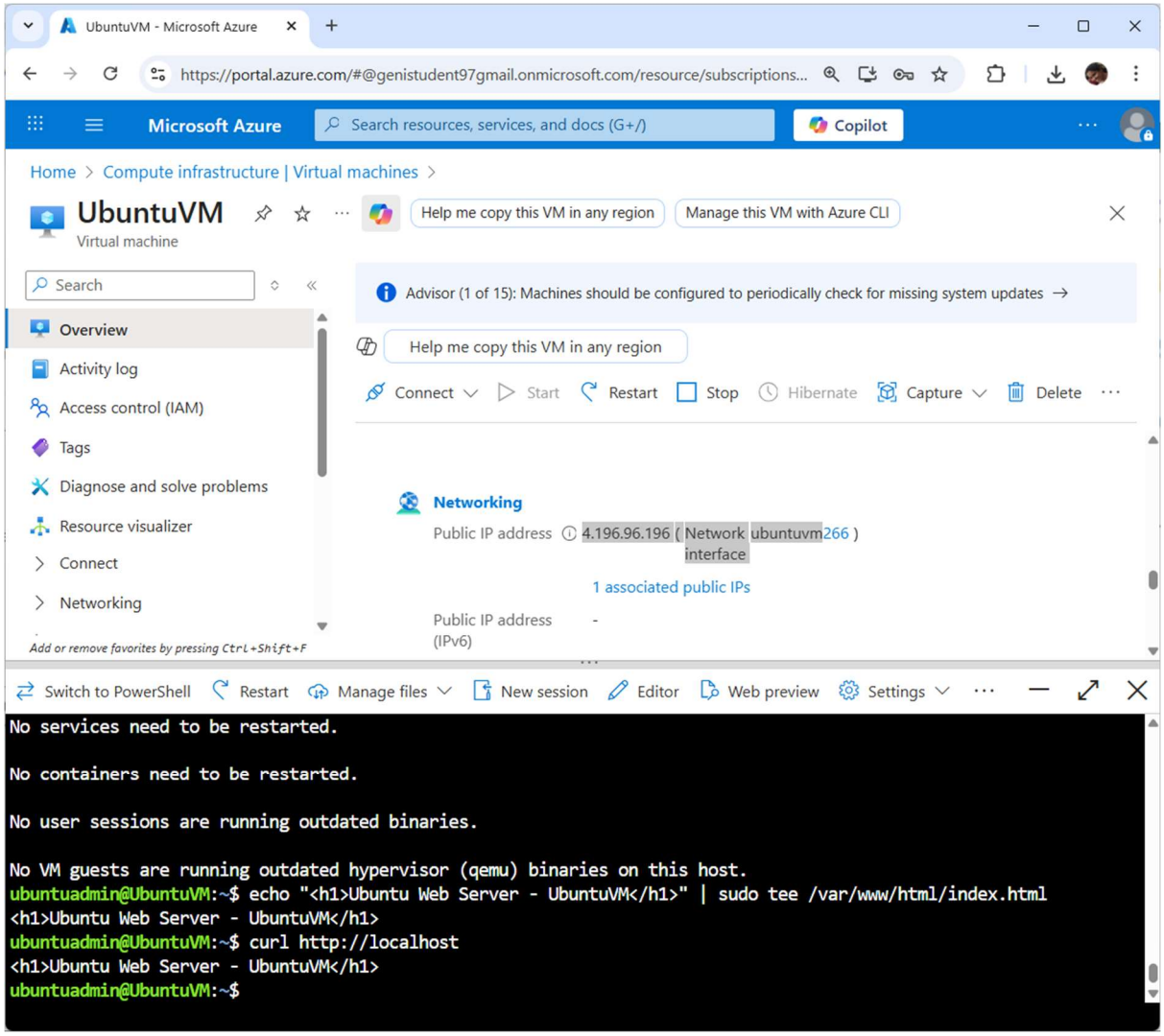

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
Home > Compute infrastructure | Virtual machines >
Create a virtual machine
Help me create a VM optimized for high availability
Help me create a low cost VM
+1
Help me create a low cost VM
Help me create a VM optimized for high availability
Help me choose the right VM size for my workload
Basics
Disks
Networking
Management
Monitoring
Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution. Learn more
Network interface
When creating a virtual machine, a network interface will be created for you.
Virtual network
VNet-LB (RG-LB)
Edit virtual network
Subnet *
Subnet-LB
Edit subnet
172.16.0.0 - 172.16.0.255 (256 addresses)
Public IP
(new) UbuntuVM-ip
Create new
NIC network security group
None
Basic
Advanced
Public inbound ports *
None
Allow selected ports
Select inbound ports *
HTTP (80), SSH (22)
This will allow all IP addresses to access your virtual machine. This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.
Delete public IP and NIC when VM is deleted
Enable accelerated networking
The selected VM size does not support accelerated networking.
Load balancing
You can place this virtual machine in the backend pool of an existing Azure load balancing solution. Learn more
Load balancing options
None
Azure load balancer
Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
Application gateway
Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.
Estimated monthly costs
Basics $0.00
Disks $5.28
Networking $3.65
Public IP $3.65
VM outbound data transfer $0.00
Estimated data transferred (GB) $0.00
100
Management $0.00
Monitoring $0.00
Advanced $0.00
Estimated monthly cost $8.93
< Previous
Next : Management >
Review + create
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
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
+1
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
Management
Monitoring
Advanced
Tags
Review + create
Price
1 X Standard B2s
by Microsoft
Terms of use | Privacy policy
Subscription credits apply
0.0528 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.
Name
Student Geni
Preferred e-mail address
genistudent97@gmail.com
Preferred phone number
You have set SSH port(s) open to the internet. This is only recommended for testing. If you want to change this setting, go back to Basics tab.
Estimated monthly costs
other resource costs, licensing and subscription implications. This feature may have limited or restricted functionality, but is made available on a preview basis for evaluation and feedback.
Give feedback about your estimate experience
Basics $0.00
Disks $5.28
Networking $3.65
Management $0.00
Monitoring $0.00
Advanced $0.00
Estimated monthly cost $8.93
Basics
Subscription Azure subscription 1
Resource group RG-LB
Virtual machine name UbuntuVM
Region Australia East
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 Ubuntu Server 22.04 LTS - Gen2
VM architecture x64
Size Standard B2s (2 vcpus, 4 GiB memory)
Enable Hibernation No
Authentication type Password
Username ubuntuadmin
Public inbound ports SSH, HTTP
Azure Spot No
Disks
OS disk size Image default
OS disk type Premium SSD LRS
Use managed disks Yes
Delete OS disk with VM Enabled
Ephemeral OS disk No
Networking
Virtual network VNet-LB
Subnet Subnet-LB
Public IP (new) UbuntuVM-ip
Accelerated networking Off
Place this virtual machine behind an existing load balancing solution? No
Delete public IP and NIC when VM is deleted Disabled
Management
Microsoft Defender for Cloud Basic (free)
System assigned managed identity Off
Login with Microsoft Entra ID Off
Auto-shutdown Off
Backup Disabled
Enable periodic assessment Off
Enable hotpatch Off
Patch orchestration options Azure-orchestrated patching (preview): patches will be installed by Azure
Reboot setting Reboot if required
Monitoring
Alerts Off
Boot diagnostics On
Enable OS guest diagnostics Off
Enable application health monitoring Off
Advanced
Extensions None
VM applications None
Cloud init No
User data No
Disk controller type SCSI
Proximity placement group None
Capacity reservation group None
< Previous
Next >
Create
Download a template for automation
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
Home > Compute infrastructure | Virtual machines >
UbuntuVM
Virtual machine
Help me copy this VM in any region
Manage this VM with Azure CLI
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Networking
Settings
Availability + scale
Security
Backup + disaster recovery
Operations
Monitoring
Automation
Help
Add or remove favorites by pressing Ctrl+Shift+F
Advisor (1 of 15): Machines should be configured to periodically check for missing system updates →
Help me copy this VM in any region
Connect
Start
Restart
Stop
Hibernate
Capture
Delete
Essentials
JSON View
Resource group (move) : RG-LB
Status : Running
Location : Australia East
Subscription (move) : Azure subscription 1
Subscription ID : 02ed530d-5bcf-442a-838c-b3f805b08091
Operating system : Linux (ubuntu 22.04)
Size : Standard B2s (2 vcpus, 4 GiB memory)
Primary NIC public IP : 4.196.96.196
1 associated public IPs
Virtual network/subnet : VNet-LB/Subnet-LB
DNS name : Not configured
Health state : -
Time created : 11/29/2025, 6:07 AM UTC
Tags (edit) : Add tags
Properties
Monitoring
Capabilities (7)
Recommendations (15)
Tutorials
Virtual machine
Computer name
UbuntuVM
Operating system
Linux (ubuntu 22.04)
VM generation
V2
VM architecture
x64
Agent status
Ready
Agent version
2.15.0.1
Hibernation
Disabled
Host group
-
Host
-
Proximity placement group
-
Colocation status
N/A
Capacity reservation group
-
Disk controller type
SCSI
Azure Spot
Azure Spot
-
Azure Spot eviction policy
-
Availability + scaling
Availability zone (edit)
-
Extended zone
-
Availability set
-
Scale Set (attach)
-
Security
Security type
Trusted launch
Enable secure boot
Enabled
Enable vTPM
Enabled
Integrity monitoring
Disabled
Health monitoring
Health monitoring
Not enabled
Extensions + applications
Extensions
-
Applications
-
Networking
Public IP address 4.196.96.196 (Network interface ubuntuvm266)
1 associated public IPs
Public IP address (IPv6) -
Private IP address 172.16.0.5
Private IP address (IPv6) -
Virtual network/subnet VNet-LB/Subnet-LB
DNS name Configure
Size
Size Standard B2s
vCPUs 2
RAM 4 GiB
Source image details
Source image publisher canonical
Source image offer 0001-com-ubuntu-server-jammy
Source image plan 22_04-lts-gen2
Disk
OS disk
UbuntuVM_OsDisk_1_2ab976d134d245e7a6086da42fa5b9cc
Encryption at host Disabled
Azure disk encryption Not enabled
Ephemeral OS disk N/A
Data disks 0
Auto-shutdown
Auto-shutdown Not enabled
Scheduled shutdown -

Apache Web Server Installation on Ubuntu VM




UbuntuVM - Microsoft Azure
https://portal.azure.com/#@genistudent97gmail.onmicrosoft.com/resource/subscriptions...
Microsoft Azure
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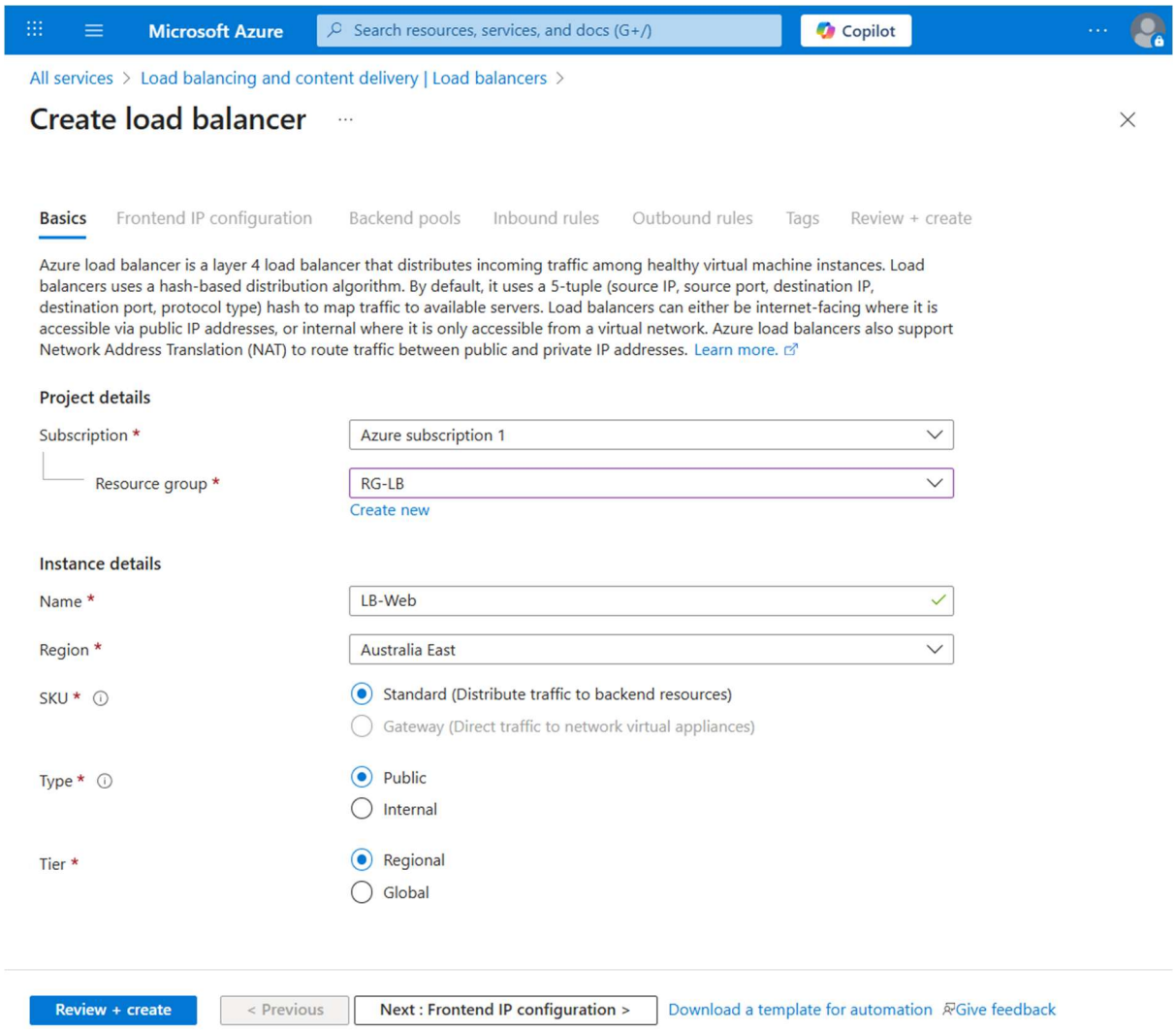
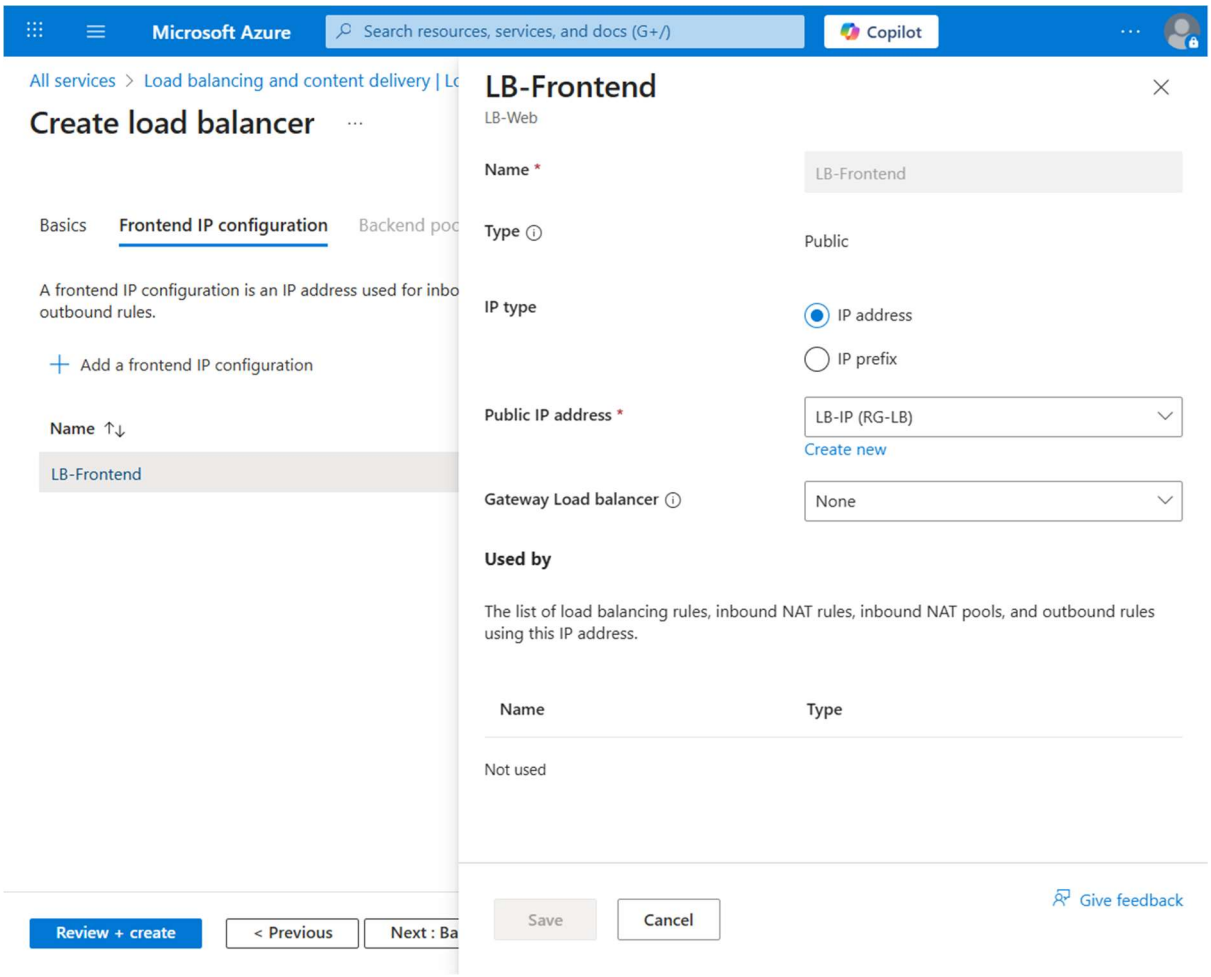
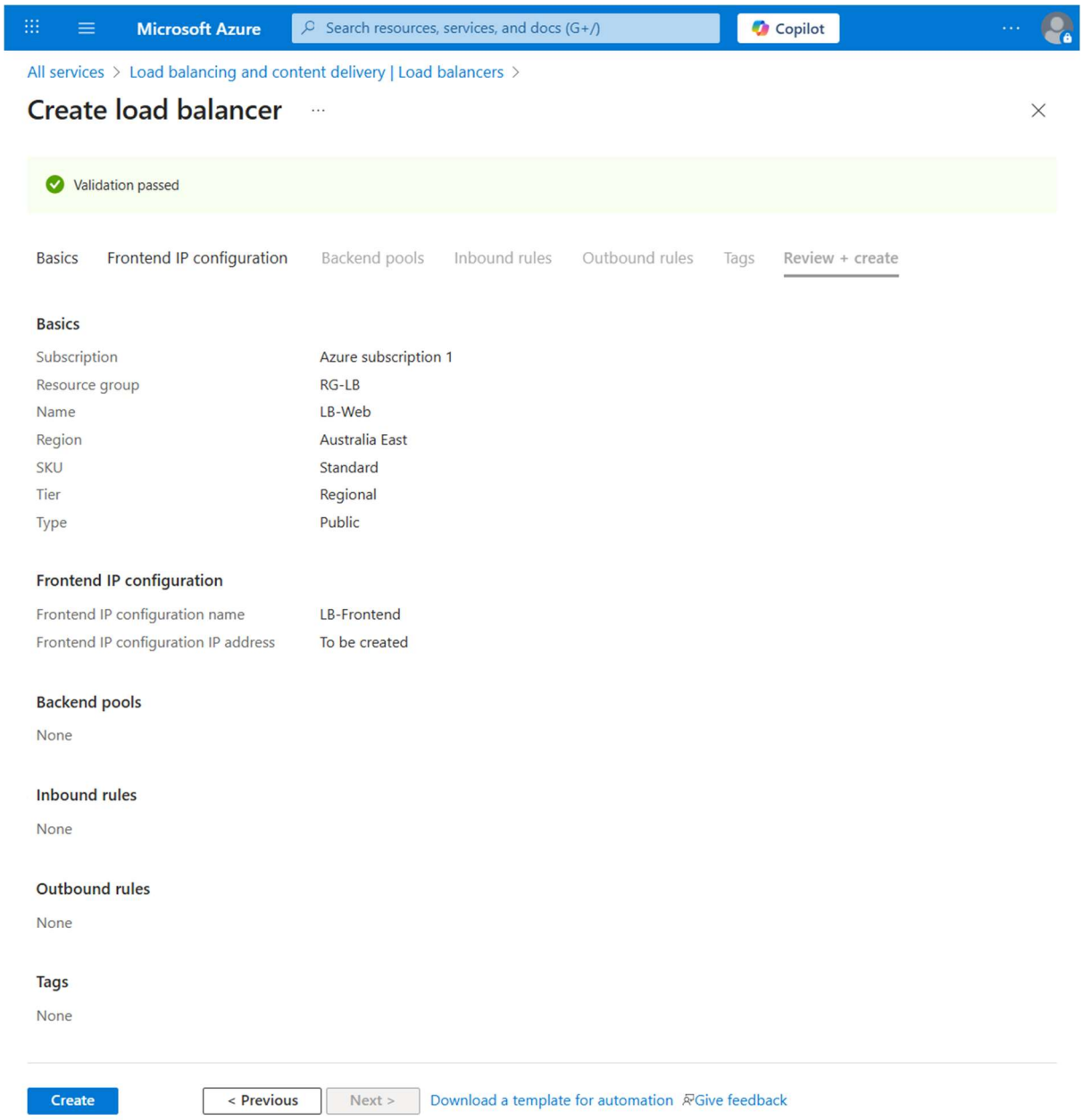
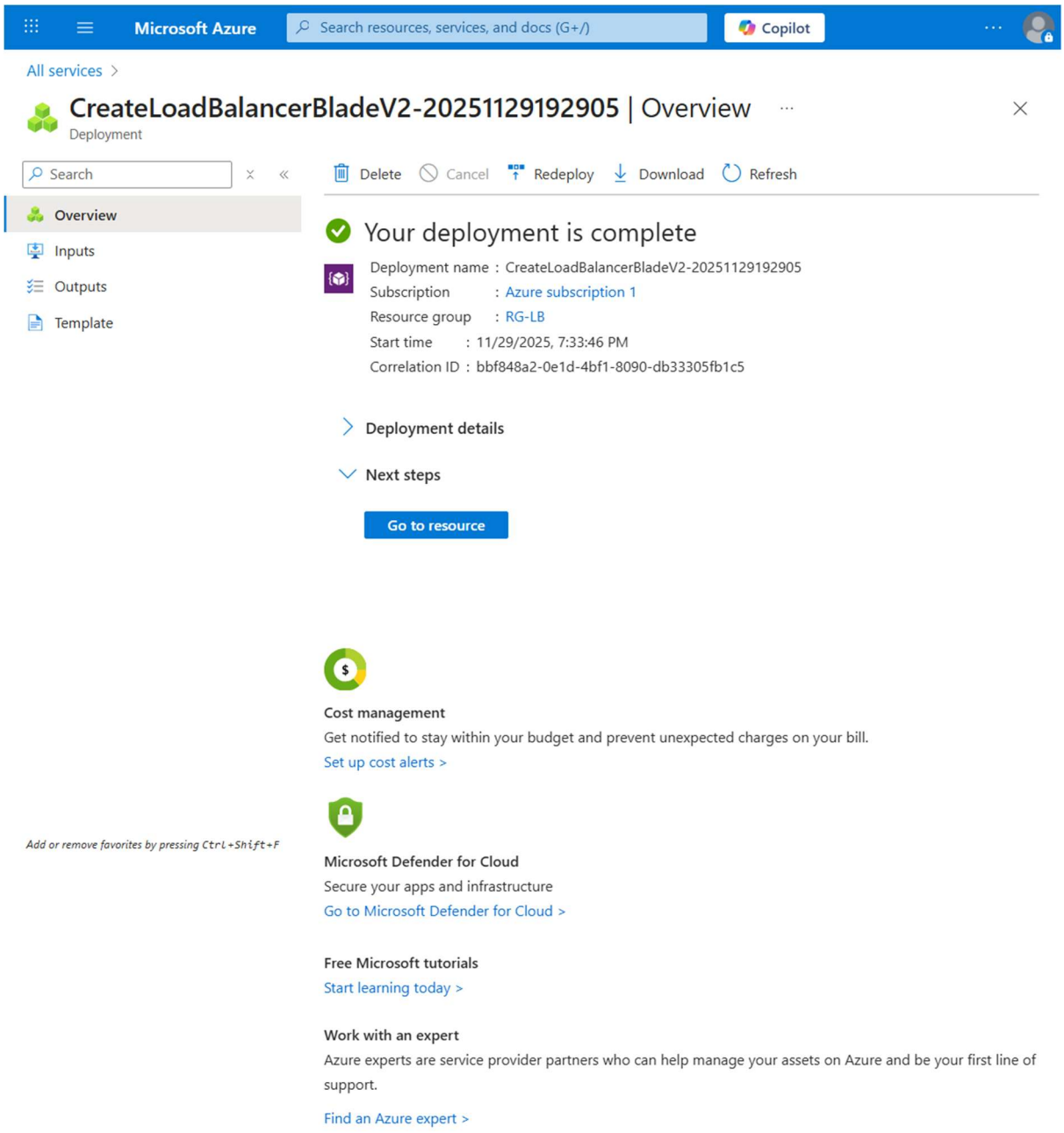
Home > Compute infrastructure | Virtual machines >
UbuntuVM
Virtual machine
Help me copy this VM in any region
Manage this VM with Azure CLI
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Connect
Networking
Add or remove favorites by pressing Ctrl+Shift+F
Advisor (1 of 15): Machines should be configured to periodically check for missing system updates
Help me copy this VM in any region
Connect
Start
Restart
Stop
Hibernate
Capture
Delete
Networking
Public IP address 4.196.96.196 (Network interface ubuntuvm266)
1 associated public IPs
Public IP address (IPv6) -
Switch to PowerShell
Restart
Manage files
New session
Editor
Web preview
Settings
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntuadmin@UbuntuVM:~$ echo "<h1>Ubuntu Web Server - UbuntuVM</h1>" | sudo tee /var/www/html/index.html
<h1>Ubuntu Web Server - UbuntuVM</h1>
ubuntuadmin@UbuntuVM:~$ curl http://localhost
<h1>Ubuntu Web Server - UbuntuVM</h1>
ubuntuadmin@UbuntuVM:~$

Public Load Balancer Creation

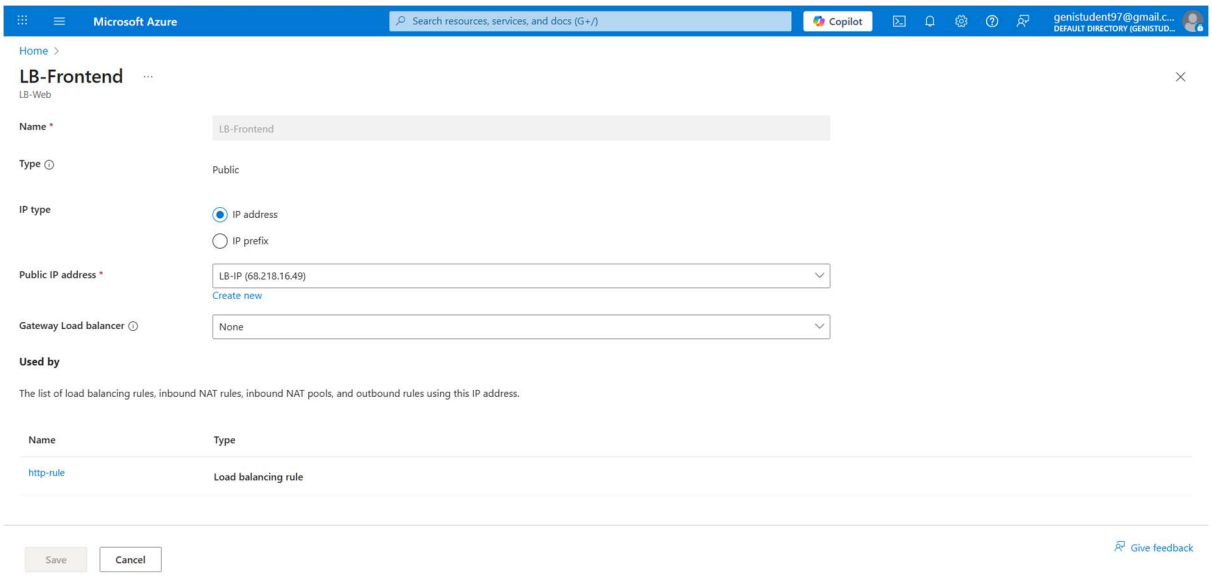


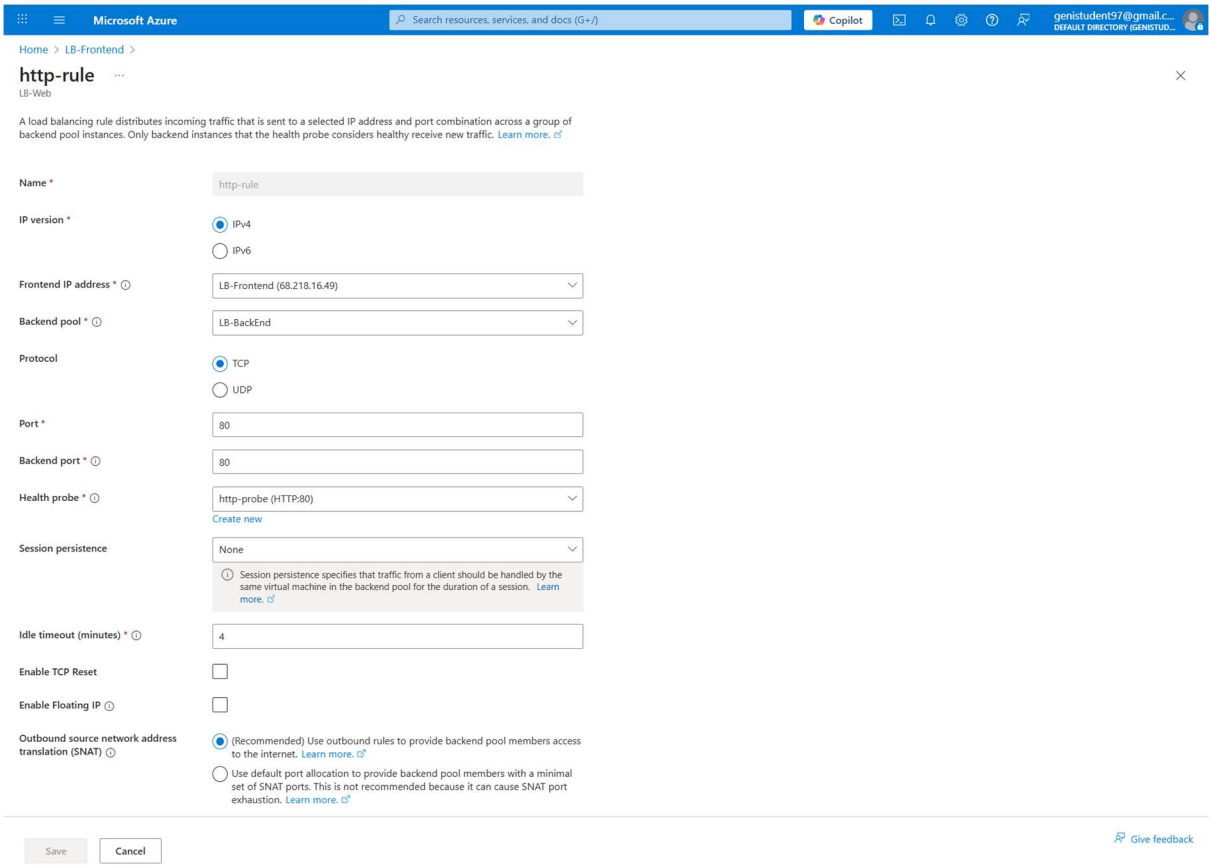

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > Load balancing and content delivery | Lo
Create load balancer
Basics
Frontend IP configuration
Backend poo
A frontend IP configuration is an IP address used for inbo
outbound rules.
Add a frontend IP configuration
Name
LB-Frontend
Review + create
< Previous
Next : Ba
LB-Frontend
LB-Web
Name *
LB-Frontend
Type
Public
IP type
IP address
IP prefix
Public IP address *
LB-IP (RG-LB)
Create new
Gateway Load balancer
None
Used by
The list of load balancing rules, inbound NAT rules, inbound NAT pools, and outbound rules using this IP address.
Name
Type
Not used
Save
Cancel
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > Load balancing and content delivery | Load balancers >
Create load balancer
Validation passed
Basics
Frontend IP configuration
Backend pools
Inbound rules
Outbound rules
Tags
Review + create
Basics
Subscription
Azure subscription 1
Resource group
RG-LB
Name
LB-Web
Region
Australia East
SKU
Standard
Tier
Regional
Type
Public
Frontend IP configuration
Frontend IP configuration name
LB-Frontend
Frontend IP configuration IP address
To be created
Backend pools
None
Inbound rules
None
Outbound rules
None
Tags
None
Create
< Previous
Next >
Download a template for automation
Give feedback

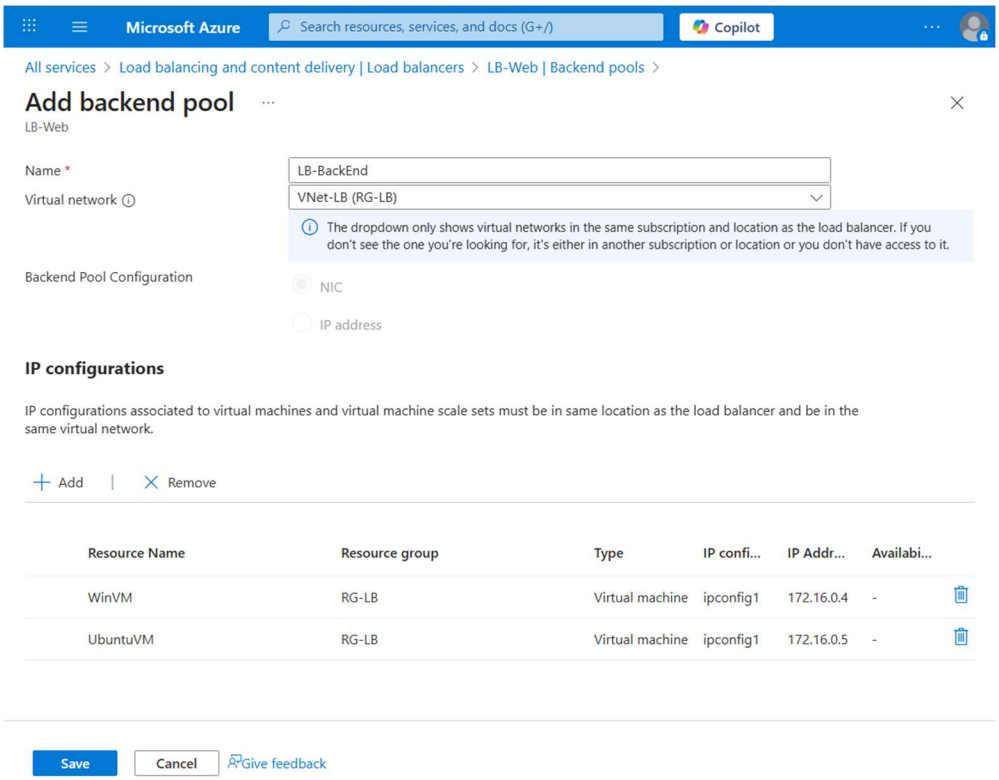

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services
CreateLoadBalancerBladeV2-20251129192905 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name : CreateLoadBalancerBladeV2-20251129192905
Subscription : Azure subscription 1
Resource group : RG-LB
Start time : 11/29/2025, 7:33:46 PM
Correlation ID : bbf848a2-0e1d-4bf1-8090-db33305fb1c5
Deployment details
Next steps
Go to resource
Cost management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Add or remove favorites by pressing Ctrl+Shift+F
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >
Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
Find an Azure expert >

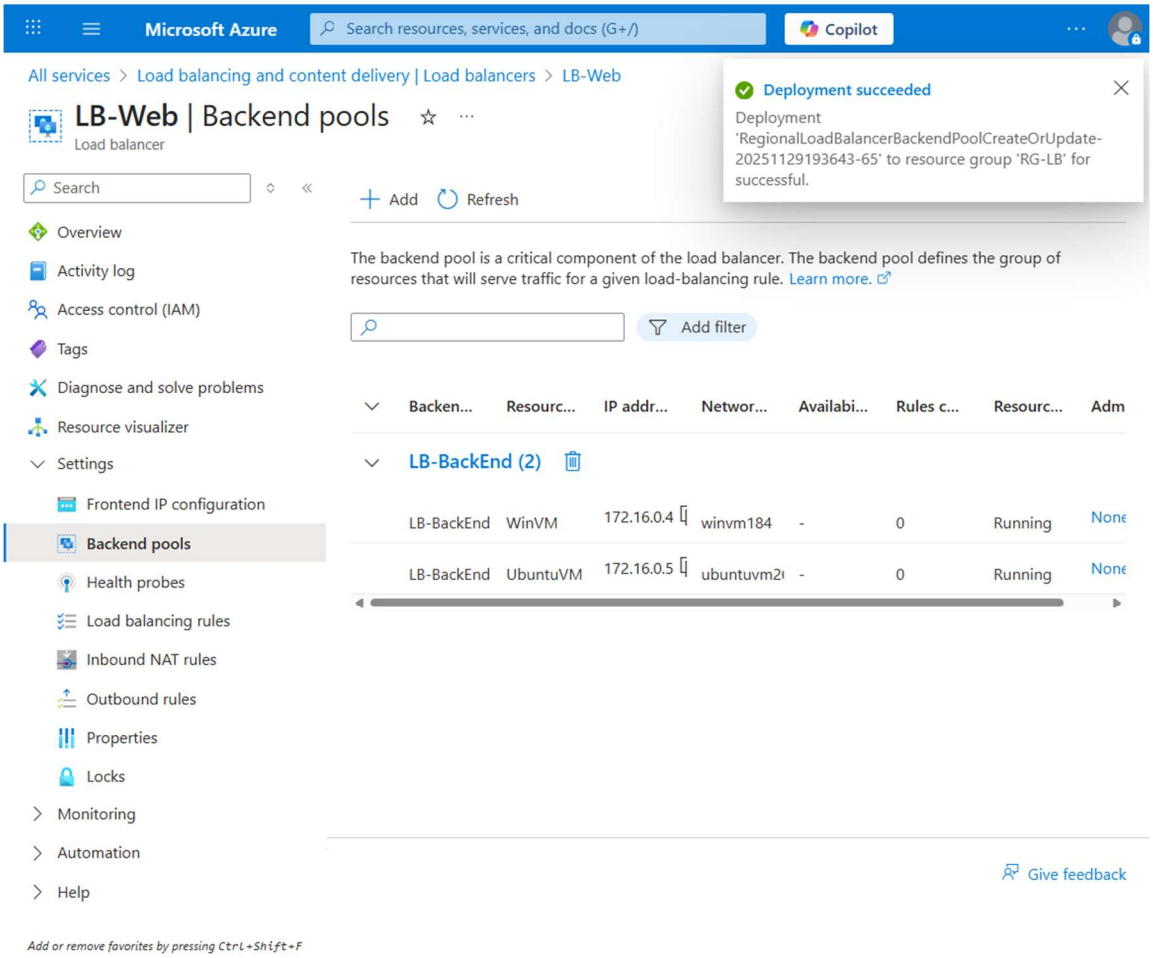
Frontend IP Configuration



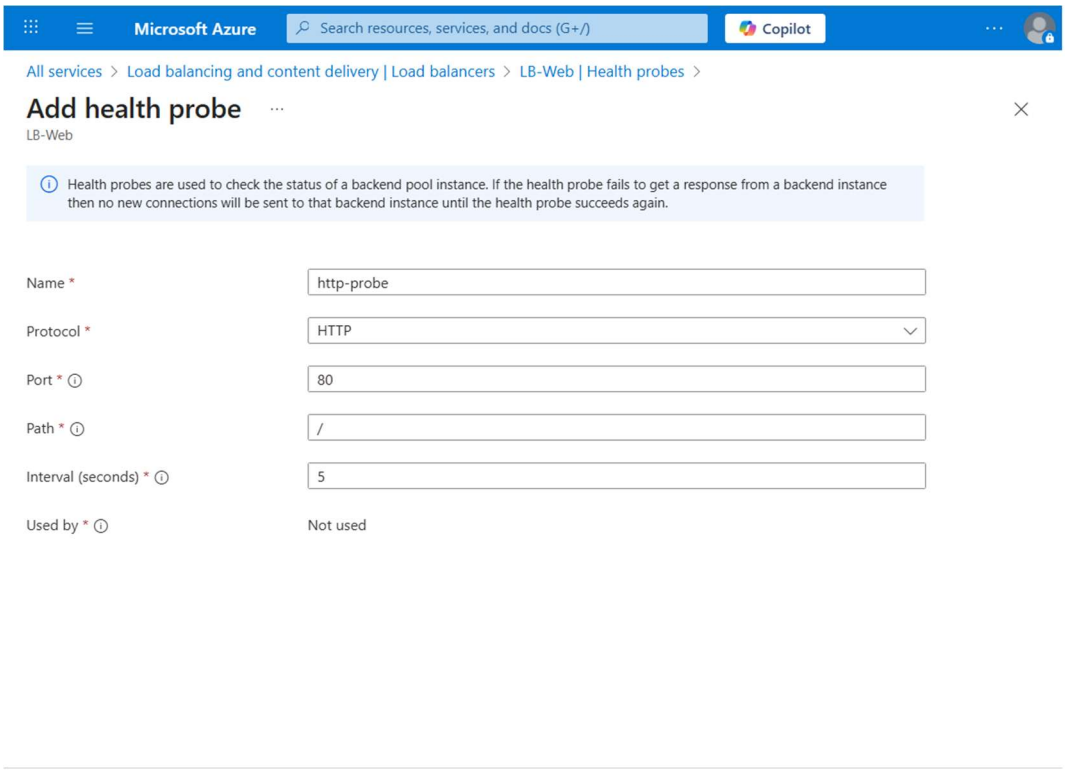


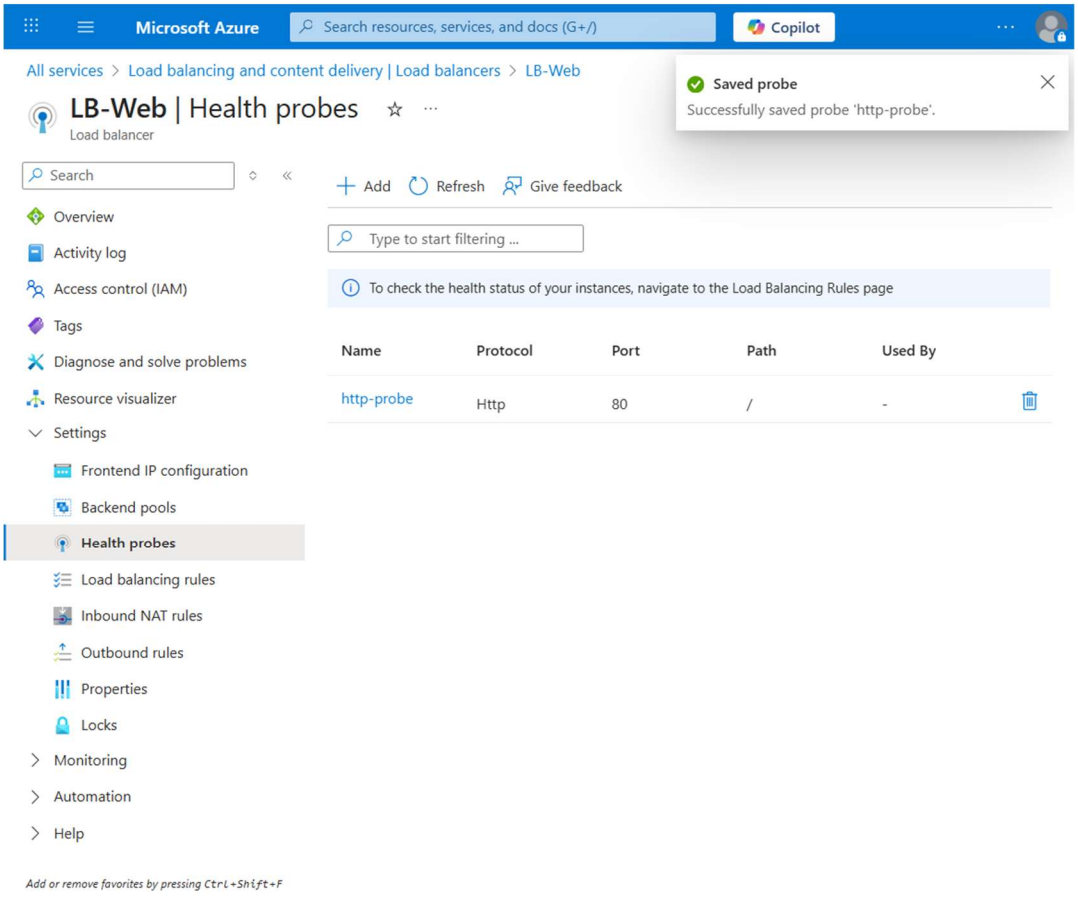
Backend Pool Configuration



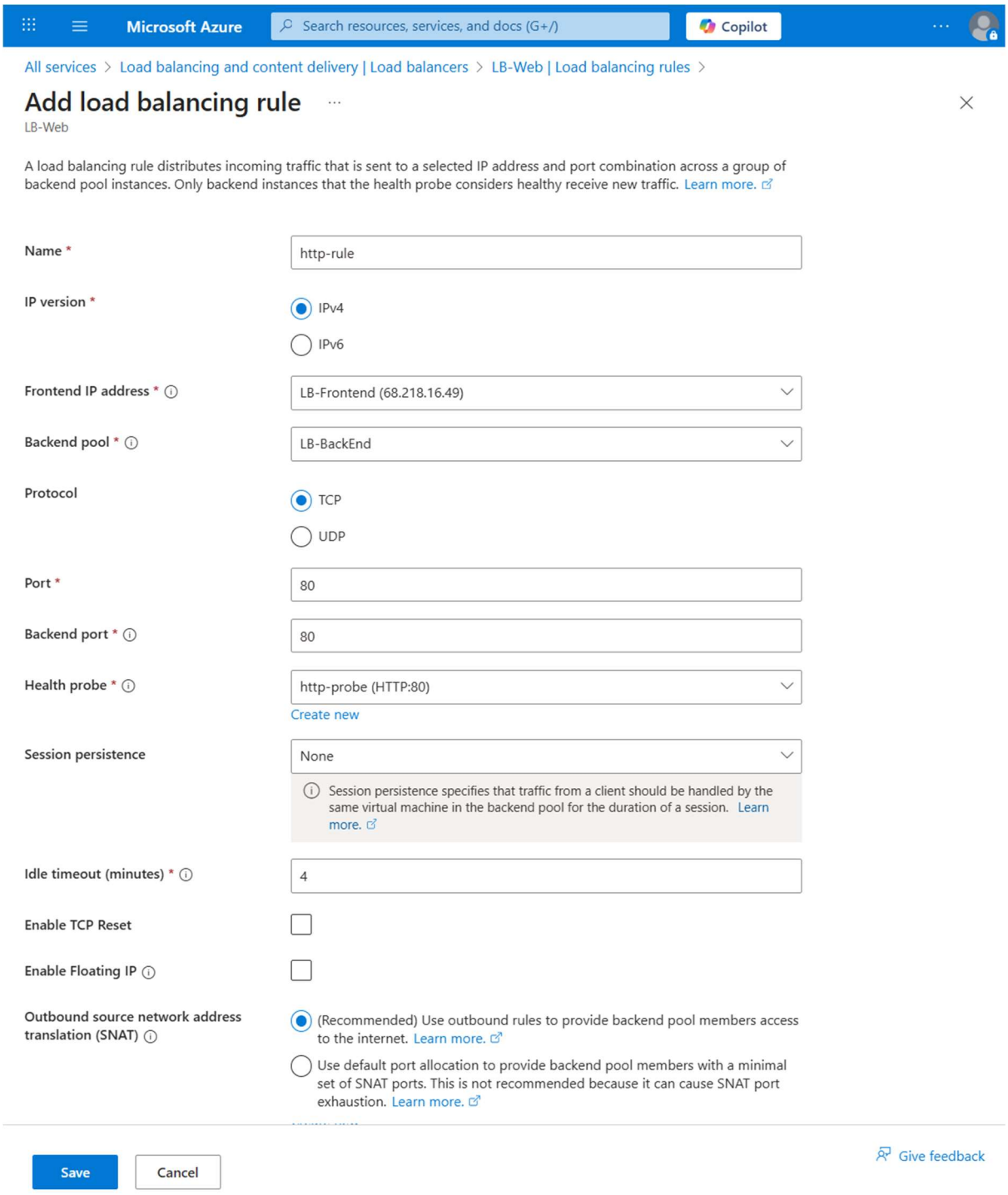


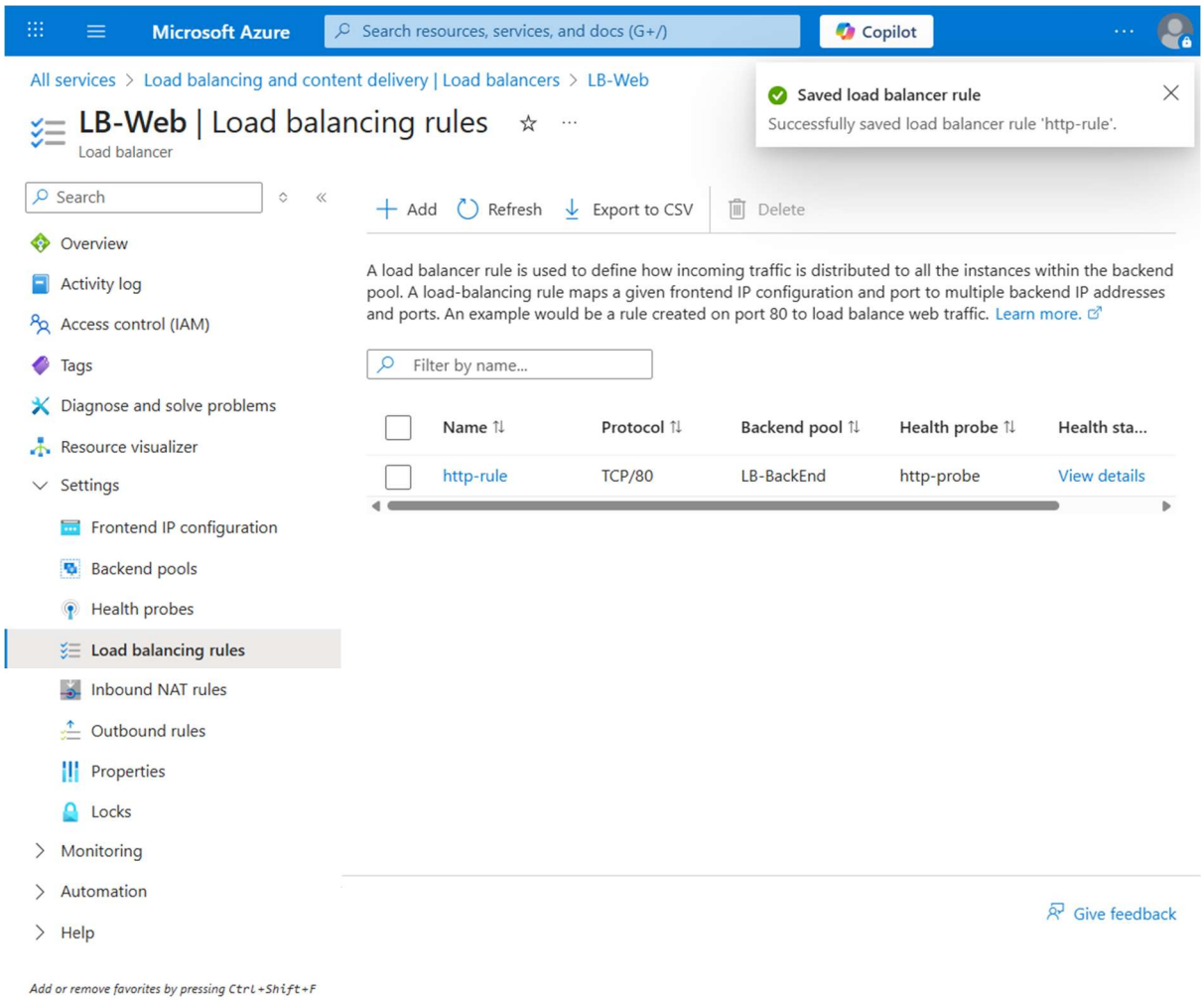
Health Probe Configuration



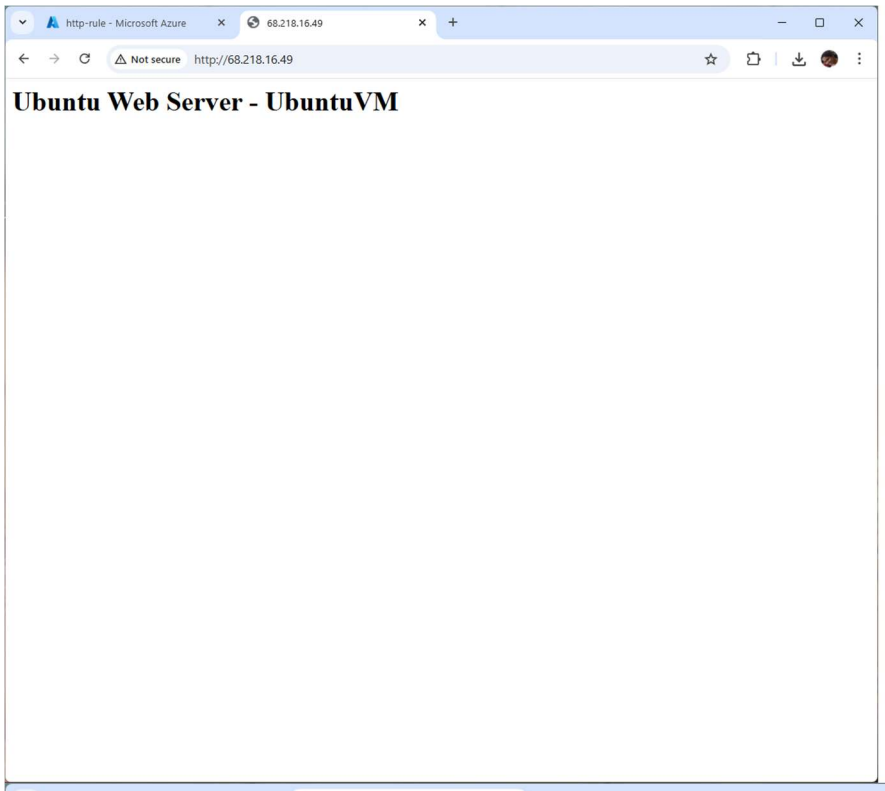


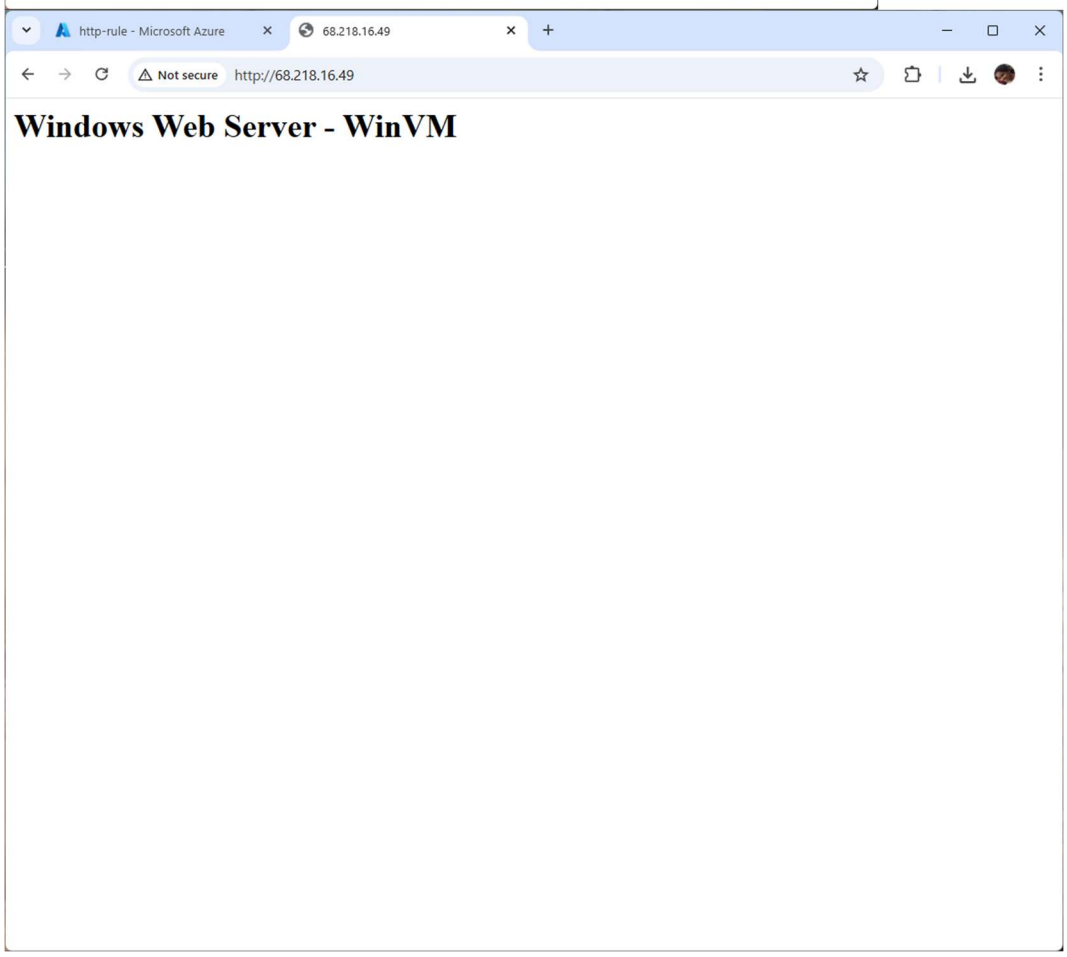
Load Balancing Rule Configuration




Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > Load balancing and content delivery | Load balancers > LB-Web
LB-Web | Load balancing rules
Load balancer
Saved load balancer rule
Successfully saved load balancer rule 'http-rule'.
Search
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Resource visualizer
Settings
Frontend IP configuration
Backend pools
Health probes
Load balancing rules
Inbound NAT rules
Outbound rules
Properties
Locks
Monitoring
Automation
Help
Add or remove favorites by pressing Ctrl+Shift+F
Add
Refresh
Export to CSV
Delete
A load balancer rule is used to define how incoming traffic is distributed to all the instances within the backend pool. A load-balancing rule maps a given frontend IP configuration and port to multiple backend IP addresses and ports. An example would be a rule created on port 80 to load balance web traffic. Learn more.
Filter by name...
Name
Protocol
Backend pool
Health probe
Health sta...
http-rule
TCP/80
LB-BackEnd
http-probe
View details
Give feedback

Load Balancer Testing (Web Page Results)





Advantages of Load Balancing in a Cloud Environment

For this task, I had to set up two VMs and put them behind an Azure Load Balancer, and it really showed me why load balancing matters in the cloud. When I tested the public IP of the Load Balancer, the traffic switched between my Windows Server VM and the Ubuntu VM, which means the workload wasn't stuck on just one machine. If one of the VMs ever stops responding, the other one can still handle the website, so users wouldn't even notice something went wrong or loading slowly.

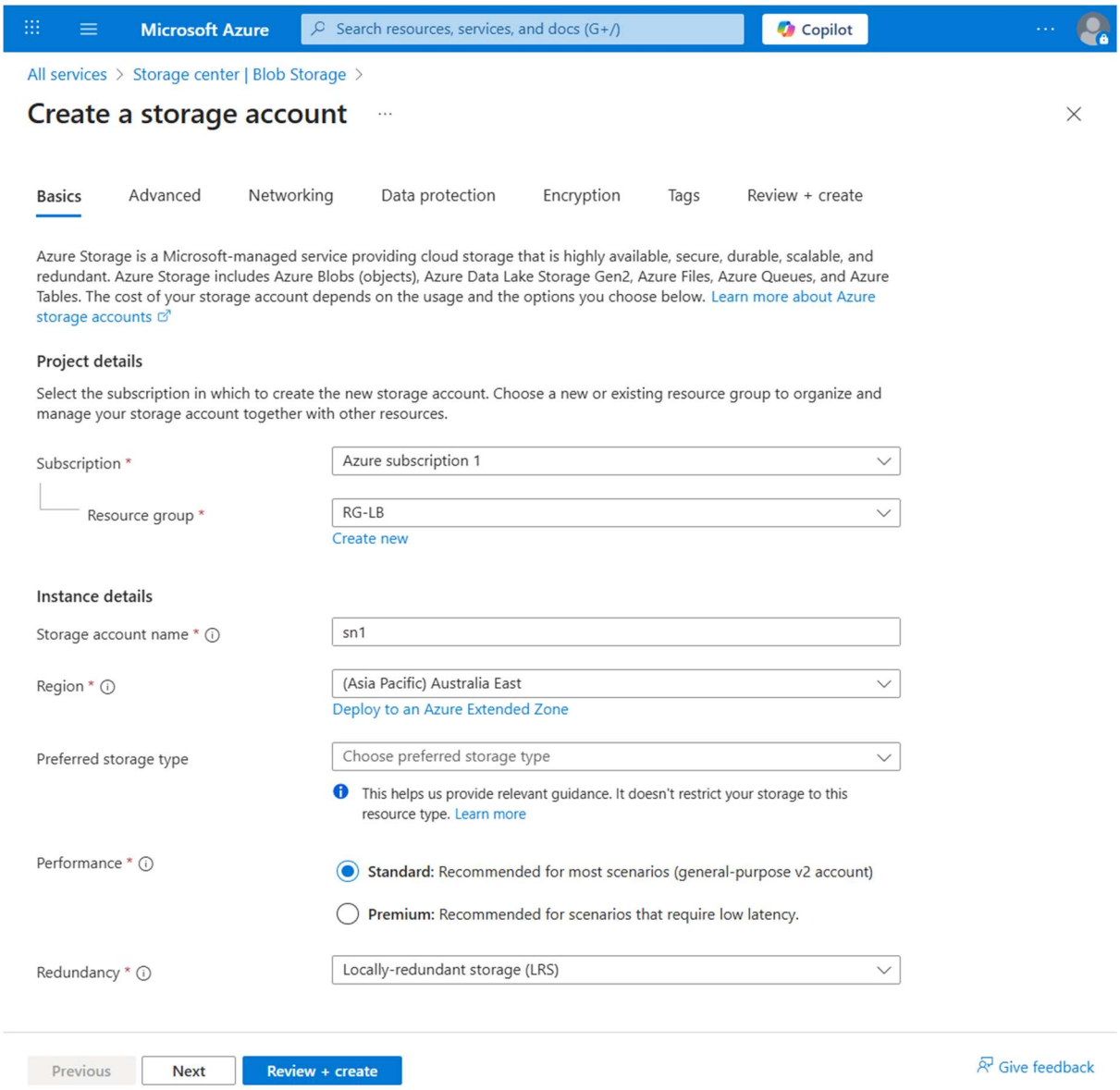
One thing I found useful is the health probe. It constantly checks each VM, and if one becomes unhealthy, Azure automatically takes it out of the backend pool until it's fine again. This avoids downtime without me doing anything manually, which I think is a big help for small IT teams.

Another big advantage is that it's easy to scale later. If Yoobee College suddenly gets more online traffic, more VMs can be added without redesigning the whole setup. That makes it easier to deal with busy periods like enrolment time or big events.

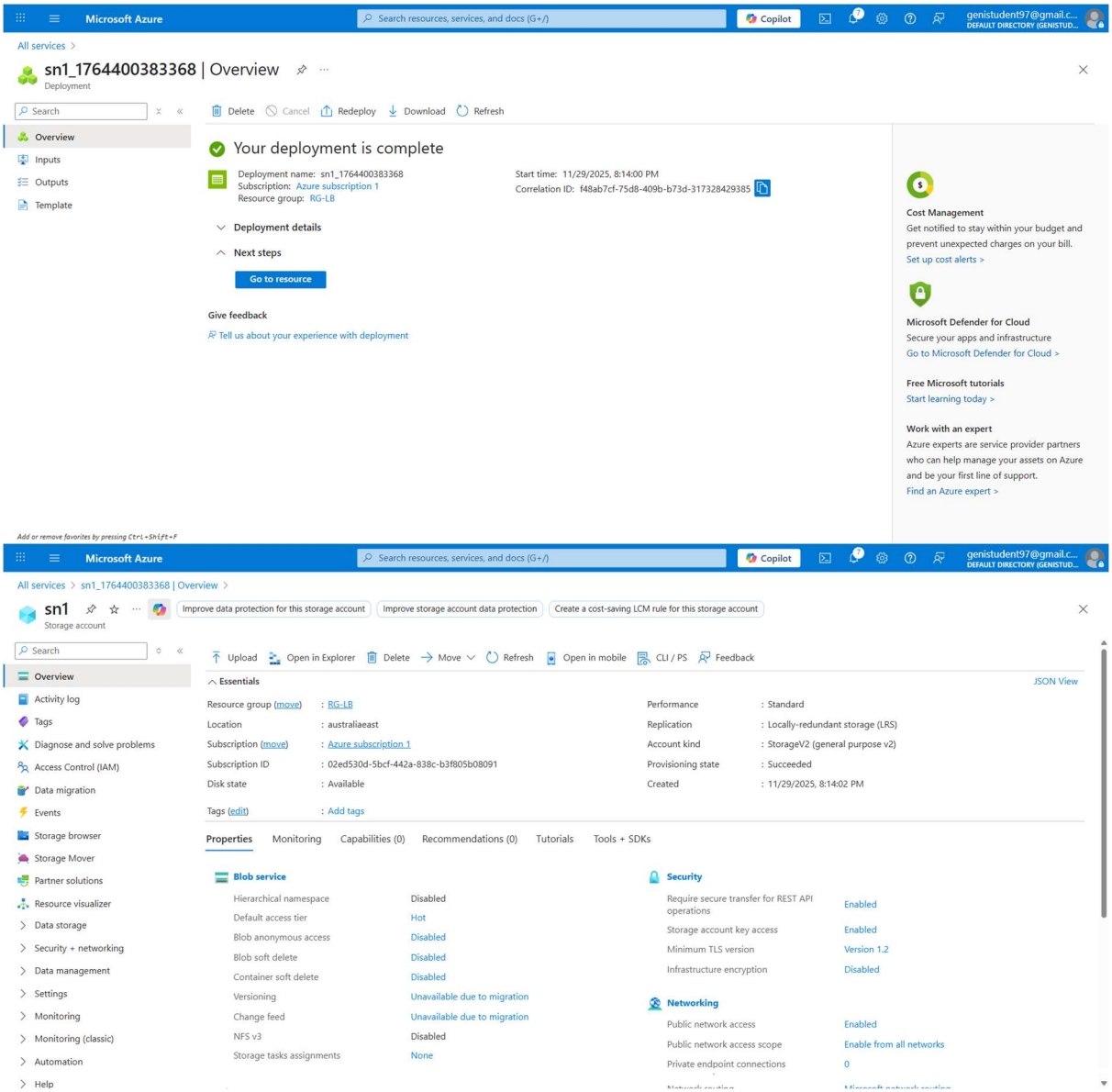
It also helps with cost, because Azure lets the system scale only when needed, instead of running everything at full capacity all the time. Overall, load balancing makes cloud systems steadier, easier to manage, and much better prepared for unexpected traffic or future growth.

Task 4: Theoretical and Practical Evaluation: File Share System for Multi-User Access

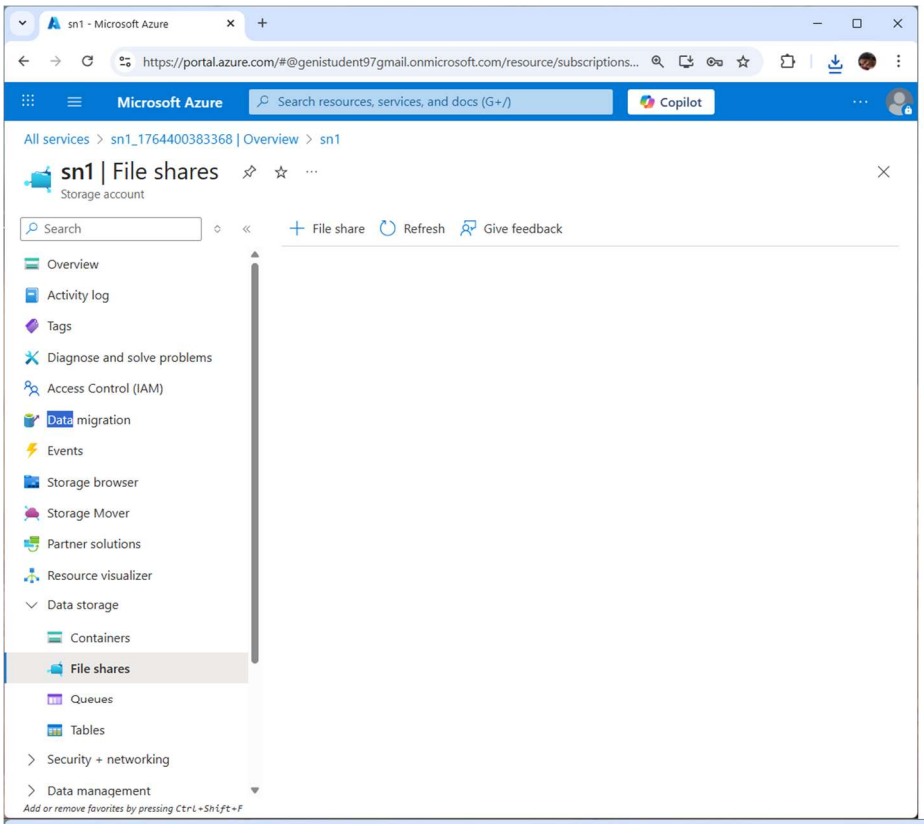
Storage Account Creation

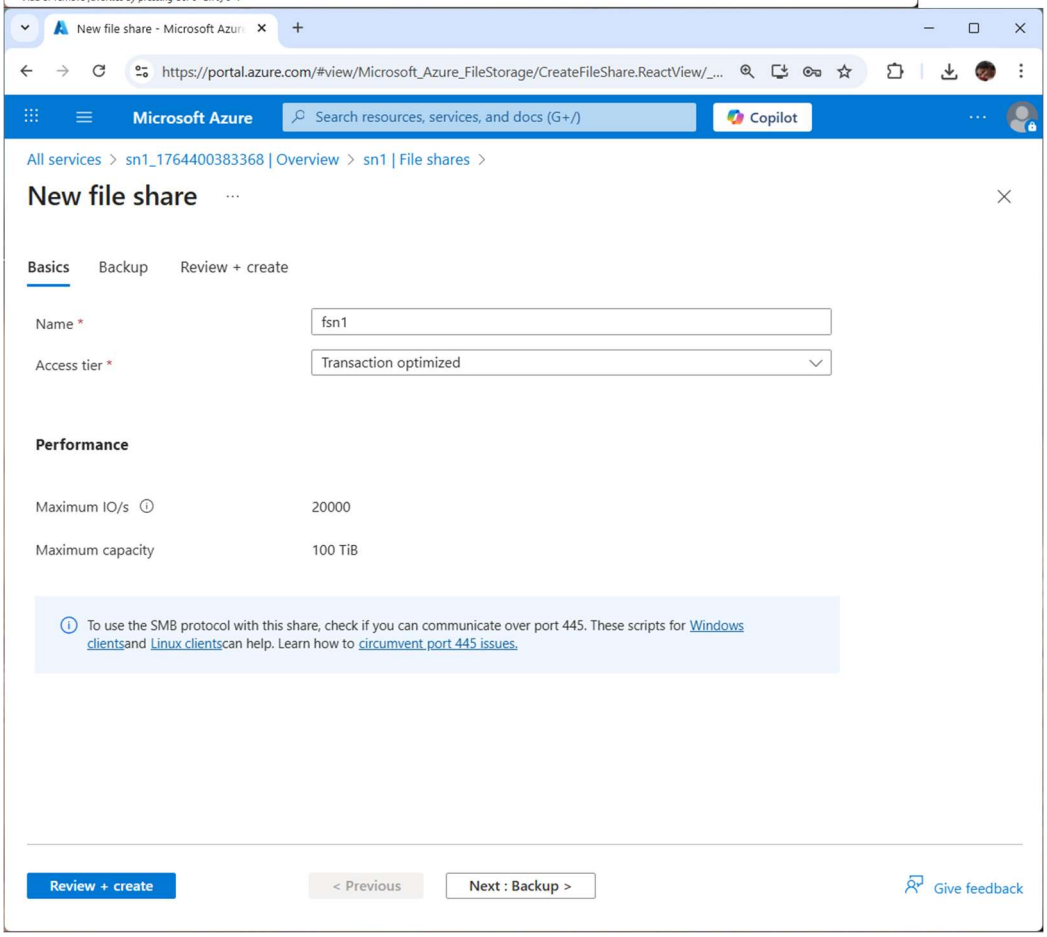


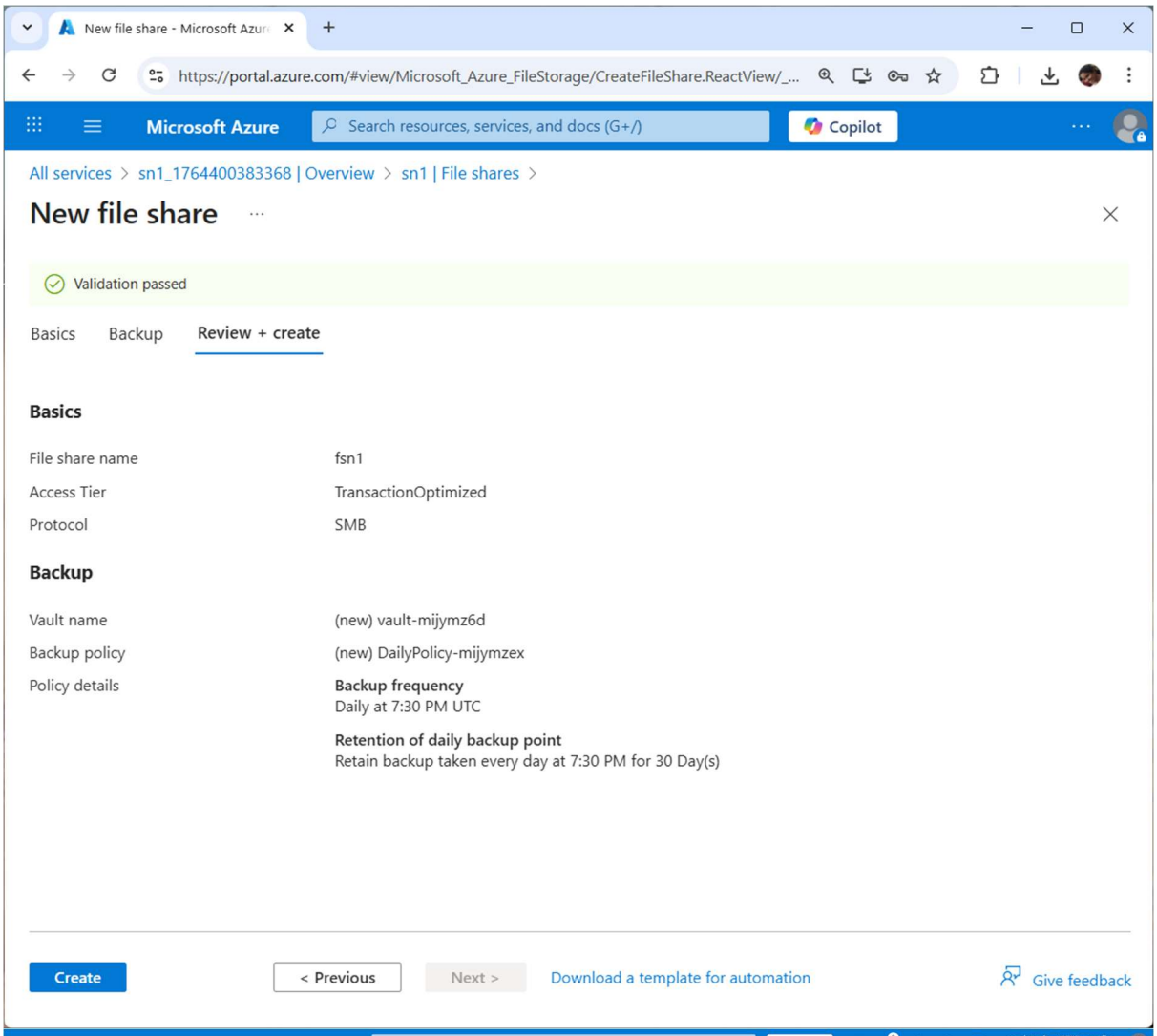

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > Storage center | Blob Storage >
Create a storage account
Basics
Advanced
Networking
Data protection
Encryption
Tags
Review + create
View automation template
Basics
Subscription
Azure subscription 1
Resource group
RG-LB
Location
Australia East
Storage account name
sn1
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
Blob anonymous access
Disabled
Allow storage account key access
Enabled
Default to Microsoft Entra authorization in the Azure portal
Disabled
Minimum TLS version
Version 1.2
Permitted scope for copy operations (preview)
From any storage account
Networking
Public network access
Enabled
Public network access scope
Enabled from all networks
Default routing tier
Microsoft network routing
Data protection
Point-in-time restore
Disabled
Blob soft delete
Enabled
Blob retainment period in days
7
Container soft delete
Enabled
Container retainment period in days
7
File share soft delete
Enabled
File share retainment period in days
7
Versioning
Disabled
Blob change feed
Disabled
Version-level immutability support
Disabled
Encryption
Encryption type
Microsoft-managed keys (MMK)
Enable support for customer-managed keys
Blobs and files only
Enable infrastructure encryption
Disabled
Previous
Next
Create
Give feedback

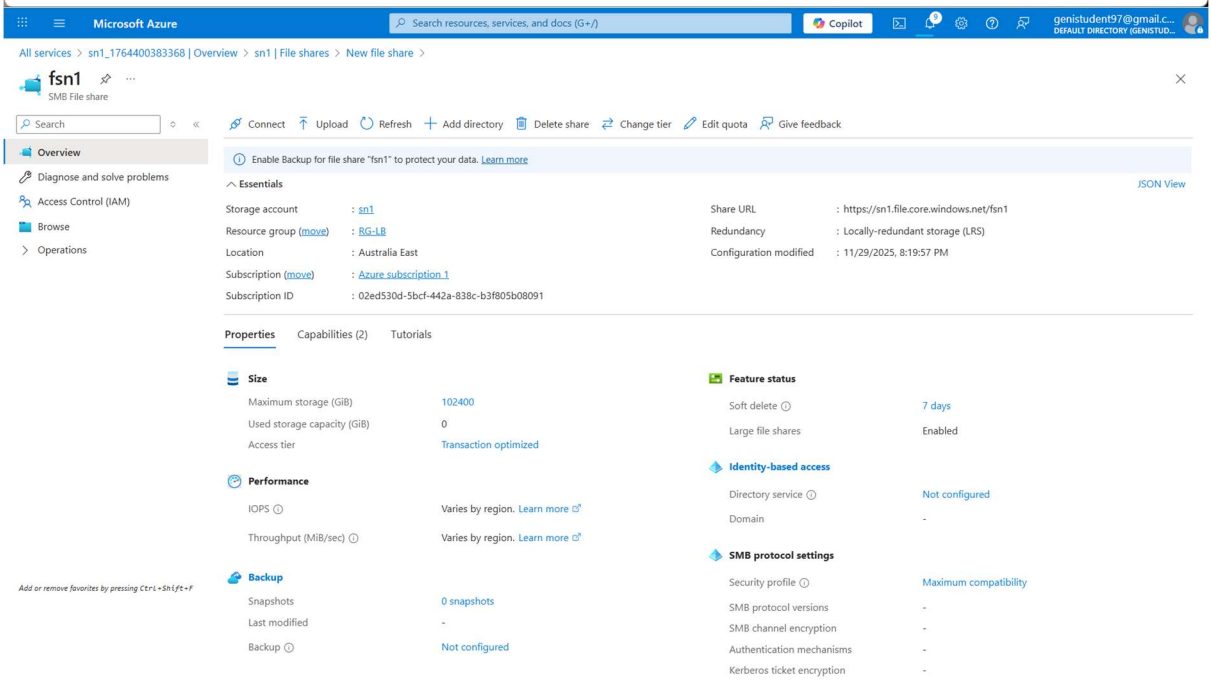

Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
genistudent97@gmail.c...
DEFAULT DIRECTORY (GENISTUD...
All services
sn1_1764400383368 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: sn1_1764400383368
Subscription: Azure subscription 1
Resource group: RG-LB
Start time: 11/29/2025, 8:14:00 PM
Correlation ID: f48ab7cf-75d8-409b-b73d-317328429385
Deployment details
Next steps
Go to resource
Give feedback
Tell us about your experience with deployment
Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >
Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
Find an Azure expert >
Add or remove favorites by pressing Ctrl+Shift+F
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
genistudent97@gmail.c...
DEFAULT DIRECTORY (GENISTUD...
All services > sn1_1764400383368 | Overview >
sn1
Storage account
Improve data protection for this storage account
Improve storage account data protection
Create a cost-saving LCM rule for 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-LB
Location : australiaeast
Subscription (move) : Azure subscription 1
Subscription ID : 02ed530d-5bcf-442a-838c-b3f805b08091
Disk state : Available
Tags (edit) : Add tags
Performance : Standard
Replication : Locally-redundant storage (LRS)
Account kind : StorageV2 (general purpose v2)
Provisioning state : Succeeded
Created : 11/29/2025, 8:14:02 PM
Properties
Monitoring
Capabilities (0)
Recommendations (0)
Tutorials
Tools + SDKs
Blob service
Hierarchical namespace Disabled
Default access tier Hot
Blob anonymous access Disabled
Blob soft delete Disabled
Container soft delete Disabled
Versioning Unavailable due to migration
Change feed Unavailable due to migration
NFS v3 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

File Share Creation

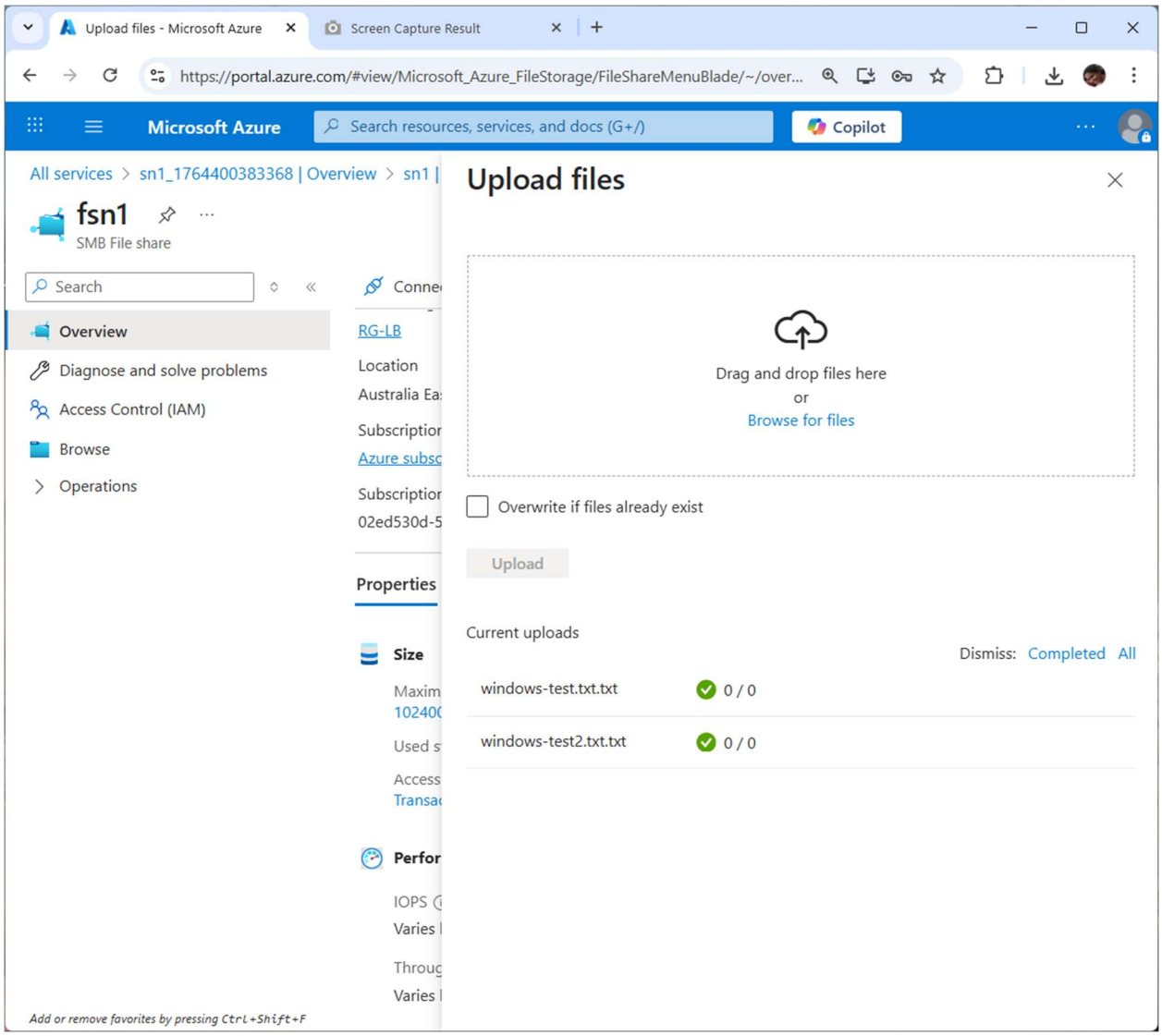




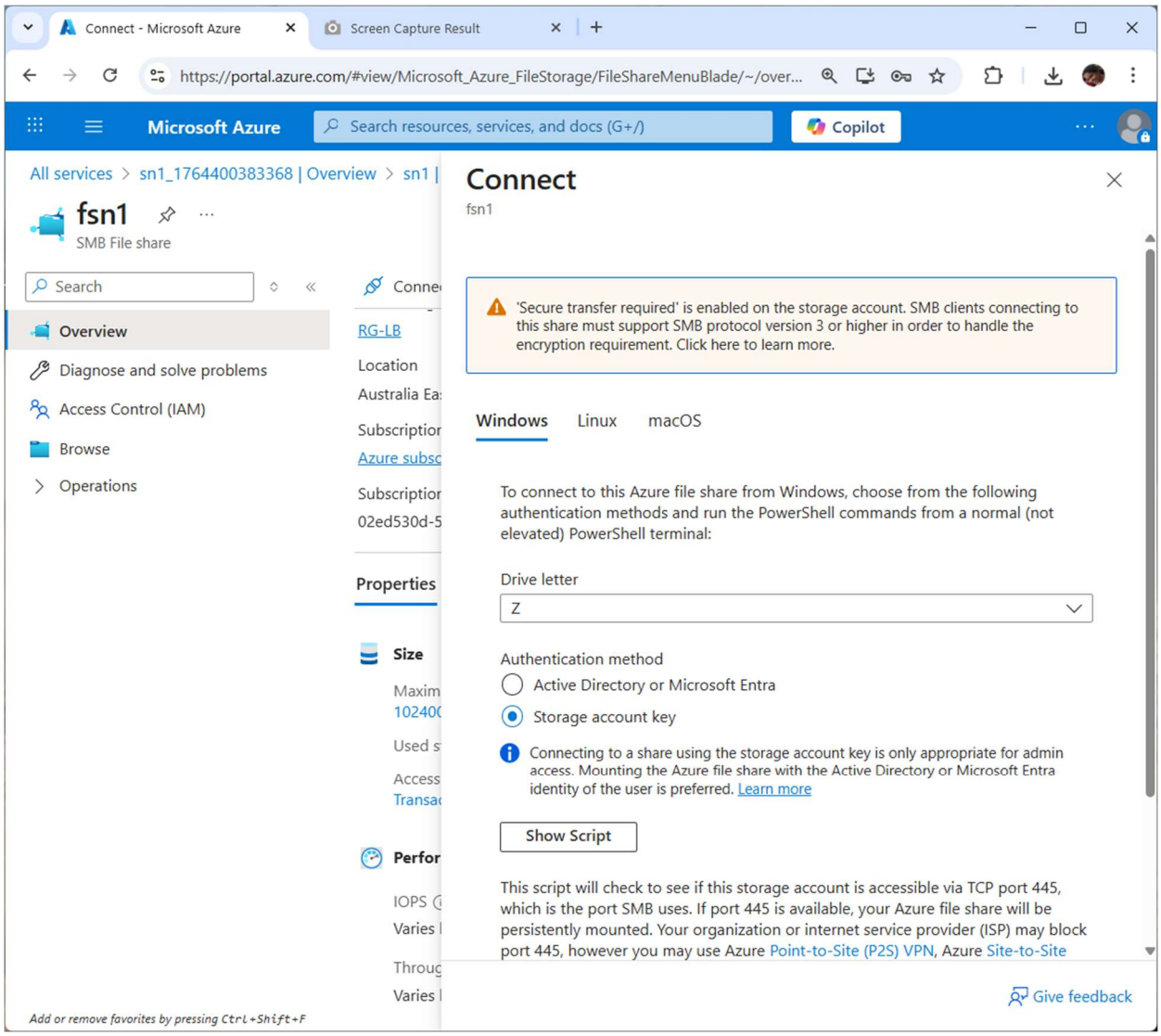

New file share - Microsoft Azure
https://portal.azure.com/#view/Microsoft_Azure_FileStorage/CreateFileShare.ReactView/...
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > sn1_1764400383368 | Overview > sn1 | File shares >
New file share
Validation passed
Basics
Backup
Review + create
Basics
File share name
fsn1
Access Tier
TransactionOptimized
Protocol
SMB
Backup
Vault name
(new) vault-mijymz6d
Backup policy
(new) DailyPolicy-mijymzex
Policy details
Backup frequency
Daily at 7:30 PM UTC
Retention of daily backup point
Retain backup taken every day at 7:30 PM for 30 Day(s)
Create
< Previous
Next >
Download a template for automation
Give feedback


Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
genistudent97@gmail.c...
DEFAULT DIRECTORY (GENISTUD...
All services > sn1_1764400383368 | Overview > sn1 | File shares > New file share >
fsn1
SMB File share
Search
Overview
Diagnose and solve problems
Access Control (IAM)
Browse
Operations
Connect
Upload
Refresh
Add directory
Delete share
Change tier
Edit quota
Give feedback
Enable Backup for file share "fsn1" to protect your data. Learn more
Essentials
JSON View
Storage account : sn1
Resource group (move) : RG-LB
Location : Australia East
Subscription (move) : Azure subscription 1
Subscription ID : 02ed530d-5bcf-442a-838c-b3f805b08091
Share URL : https://sn1.file.core.windows.net/fsn1
Redundancy : Locally-redundant storage (LRS)
Configuration modified : 11/29/2025, 8:19:57 PM
Properties
Capabilities (2)
Tutorials
Size
Maximum storage (GiB) 102400
Used storage capacity (GiB) 0
Access tier Transaction optimized
Performance
IOPS Varies by region. Learn more
Throughput (MiB/sec) Varies by region. Learn more
Backup
Snapshots 0 snapshots
Last modified -
Backup Not configured
Feature status
Soft delete 7 days
Large file shares Enabled
Identity-based access
Directory service Not configured
Domain -
SMB protocol settings
Security profile Maximum compatibility
SMB protocol versions -
SMB channel encryption -
Authentication mechanisms -
Kerberos ticket encryption -
Add or remove favorites by pressing Ctrl+Shift+F

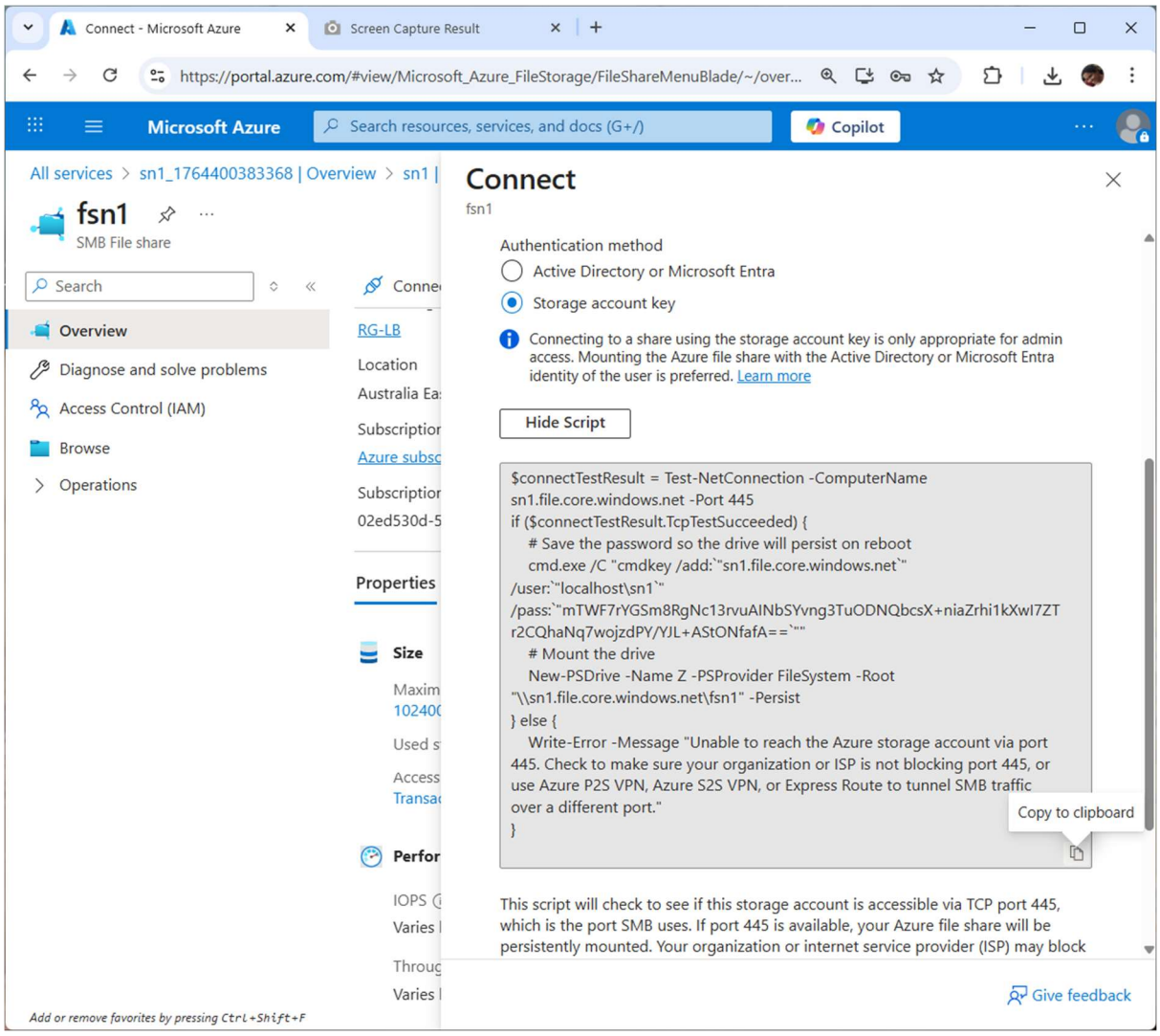
File Upload

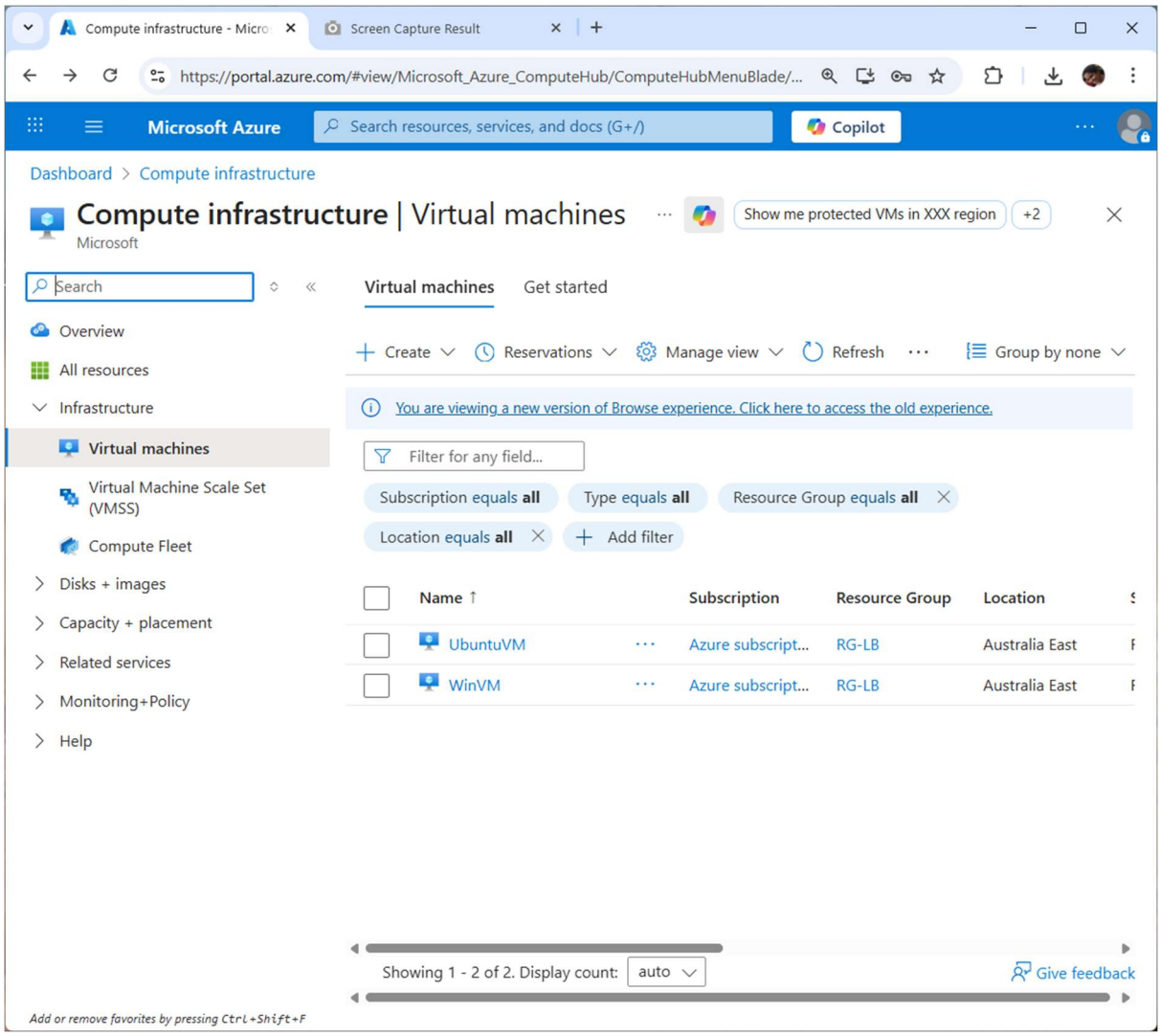

Upload files - Microsoft Azure
Screen Capture Result
https://portal.azure.com/#view/Microsoft_Azure_FileStorage/FileShareMenuBlade/~/over...
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
All services > sn1_1764400383368 | Overview > sn1 |
fsn1
SMB File share
Search
Overview
Diagnose and solve problems
Access Control (IAM)
Browse
Operations
RG-LB
Location
Australia Ea
Subscriptior
Azure subsc
Subscriptior
02ed530d-5
Properties
Size
Maxim
10240
Used s
Access
Transac
Perfor
IOPS
Varies
Throug
Varies
Add or remove favorites by pressing Ctrl+Shift+F
Upload files
Drag and drop files here
or
Browse for files
Overwrite if files already exist
Upload
Current uploads
Dismiss: Completed All
windows-test.txt.txt
0 / 0
windows-test2.txt.txt
0 / 0

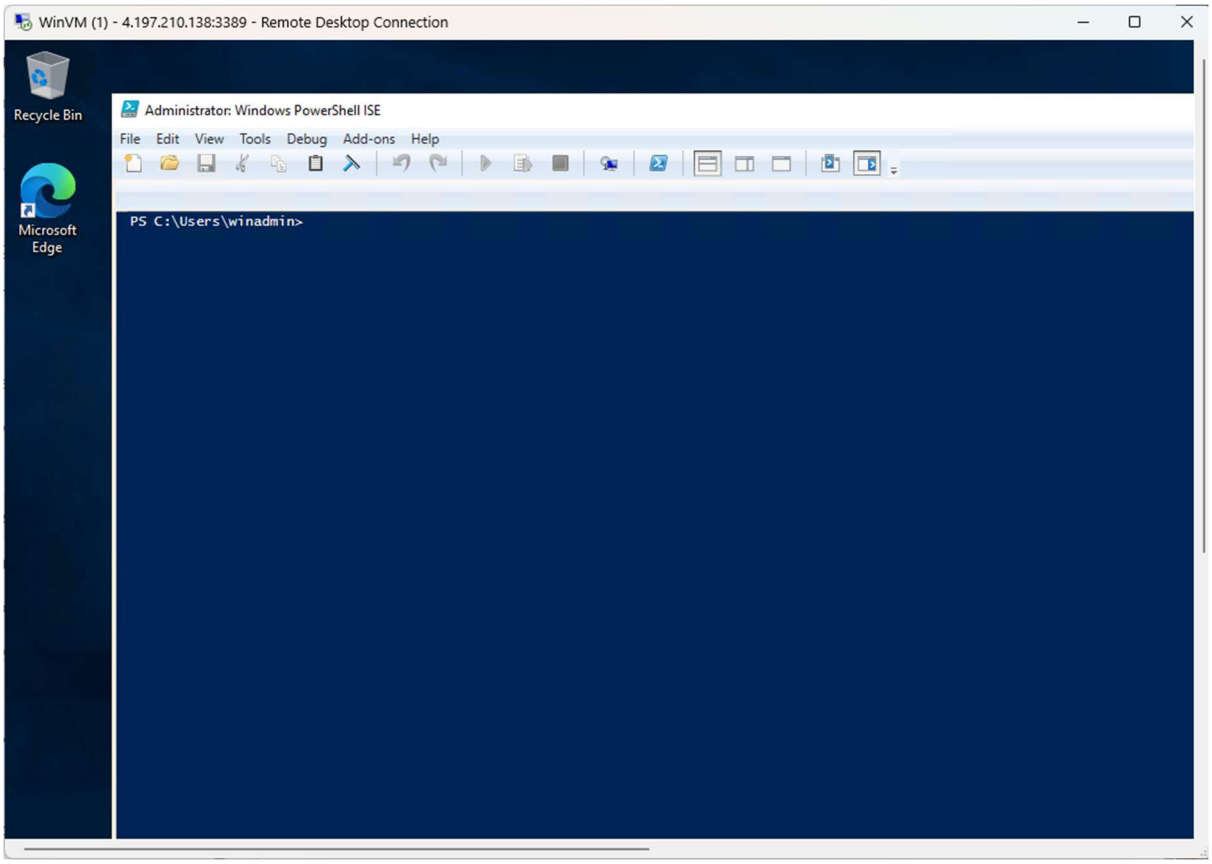
File Share Connect



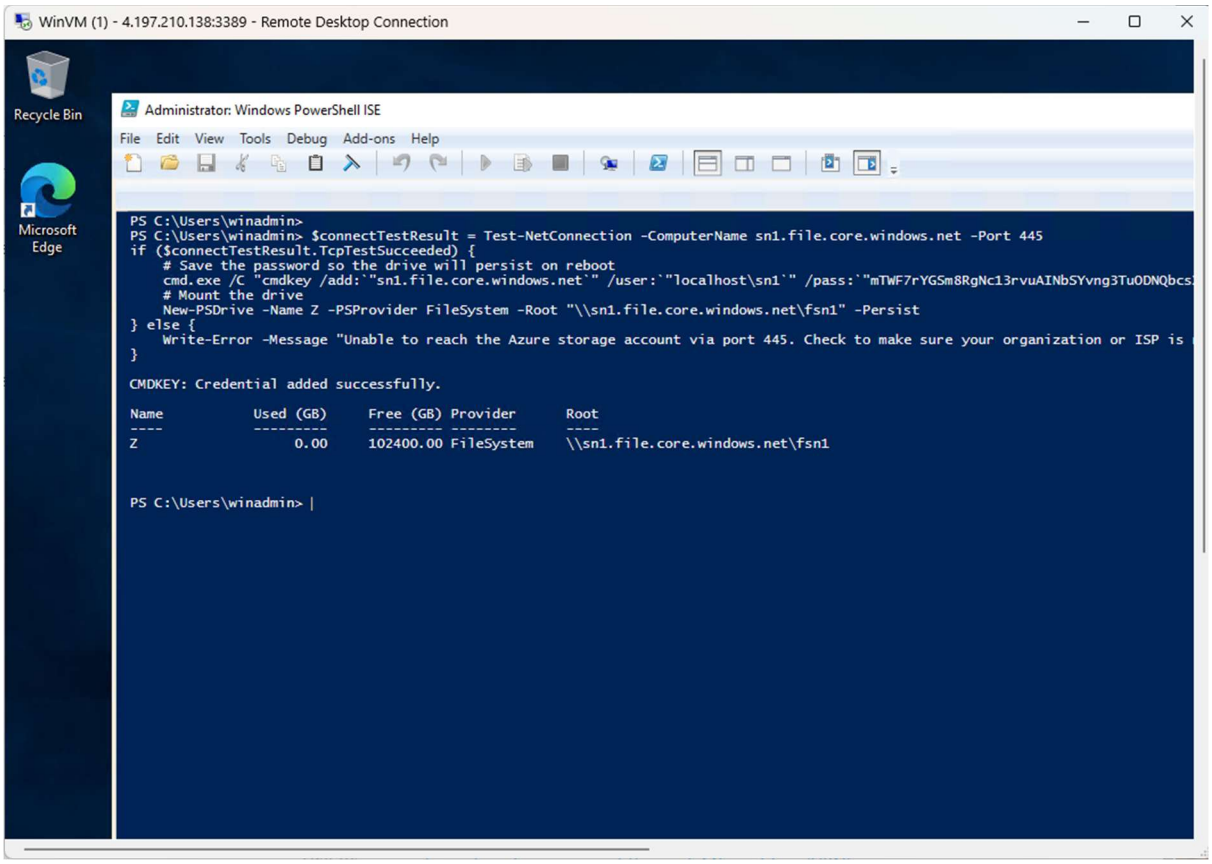
Windows VM Connect



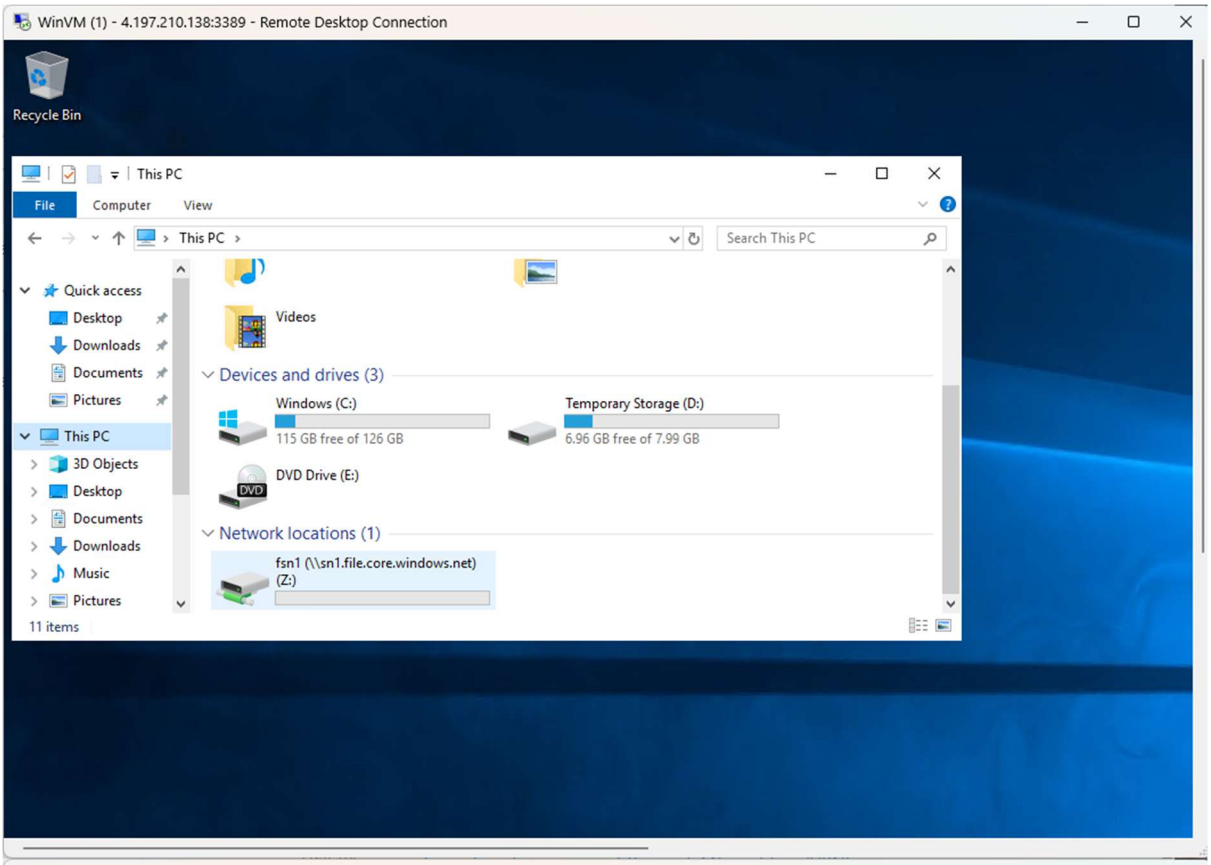

Compute infrastructure - Micro
Screen Capture Result
https://portal.azure.com/#view/Microsoft_Azure_ComputeHub/ComputeHubMenuBlade/...
Microsoft Azure
Search resources, services, and docs (G+/)
Copilot
Dashboard > Compute infrastructure
Compute infrastructure | Virtual machines
Microsoft
Show me protected VMs in XXX region
+2
Search
Overview
All resources
Infrastructure
Virtual machines
Virtual Machine Scale Set (VMSS)
Compute Fleet
Disks + images
Capacity + placement
Related services
Monitoring+Policy
Help
Virtual machines
Get started
Create
Reservations
Manage view
Refresh
Group by none
You are viewing a new version of Browse experience. Click here to access the old experience.
Filter for any field...
Subscription equals all
Type equals all
Resource Group equals all
Location equals all
Add filter
Name
Subscription
Resource Group
Location
UbuntuVM
Azure subscript...
RG-LB
Australia East
WinVM
Azure subscript...
RG-LB
Australia East
Showing 1 - 2 of 2. Display count: auto
Give feedback
Add or remove favorites by pressing Ctrl+Shift+F

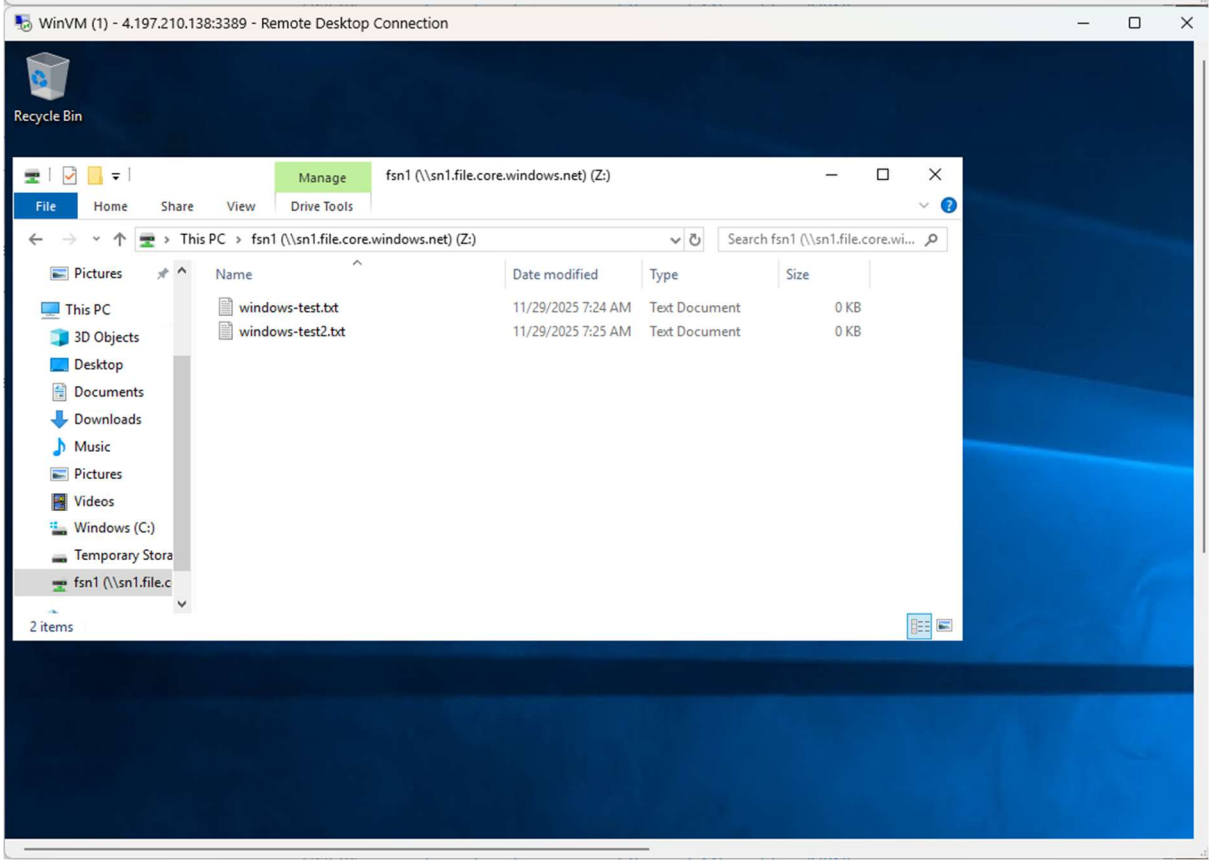


Windows VM Mount

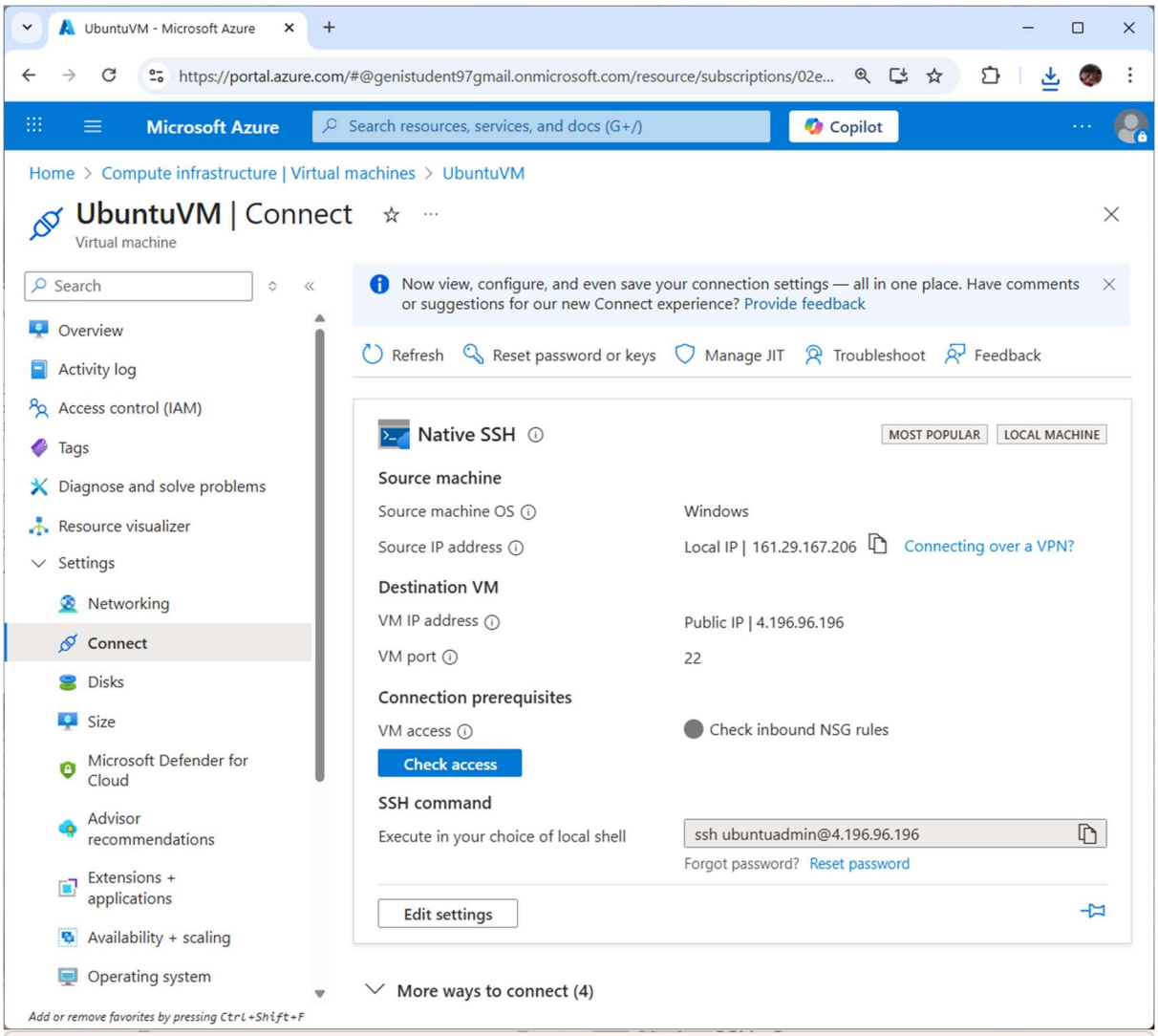


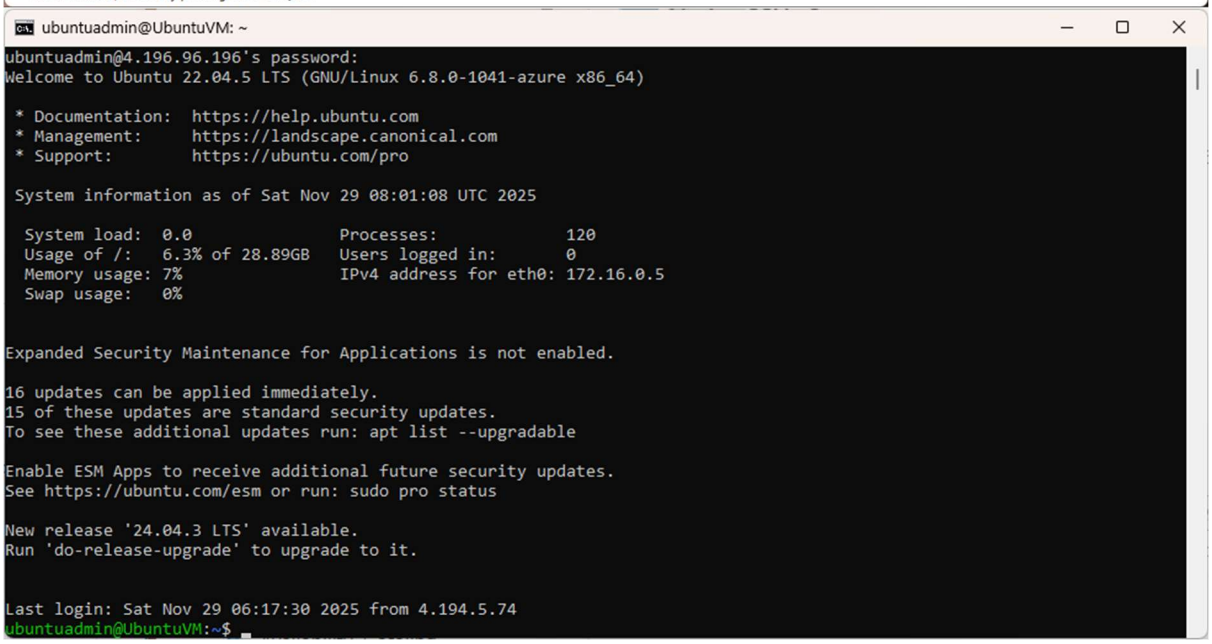
Windows VM Verification



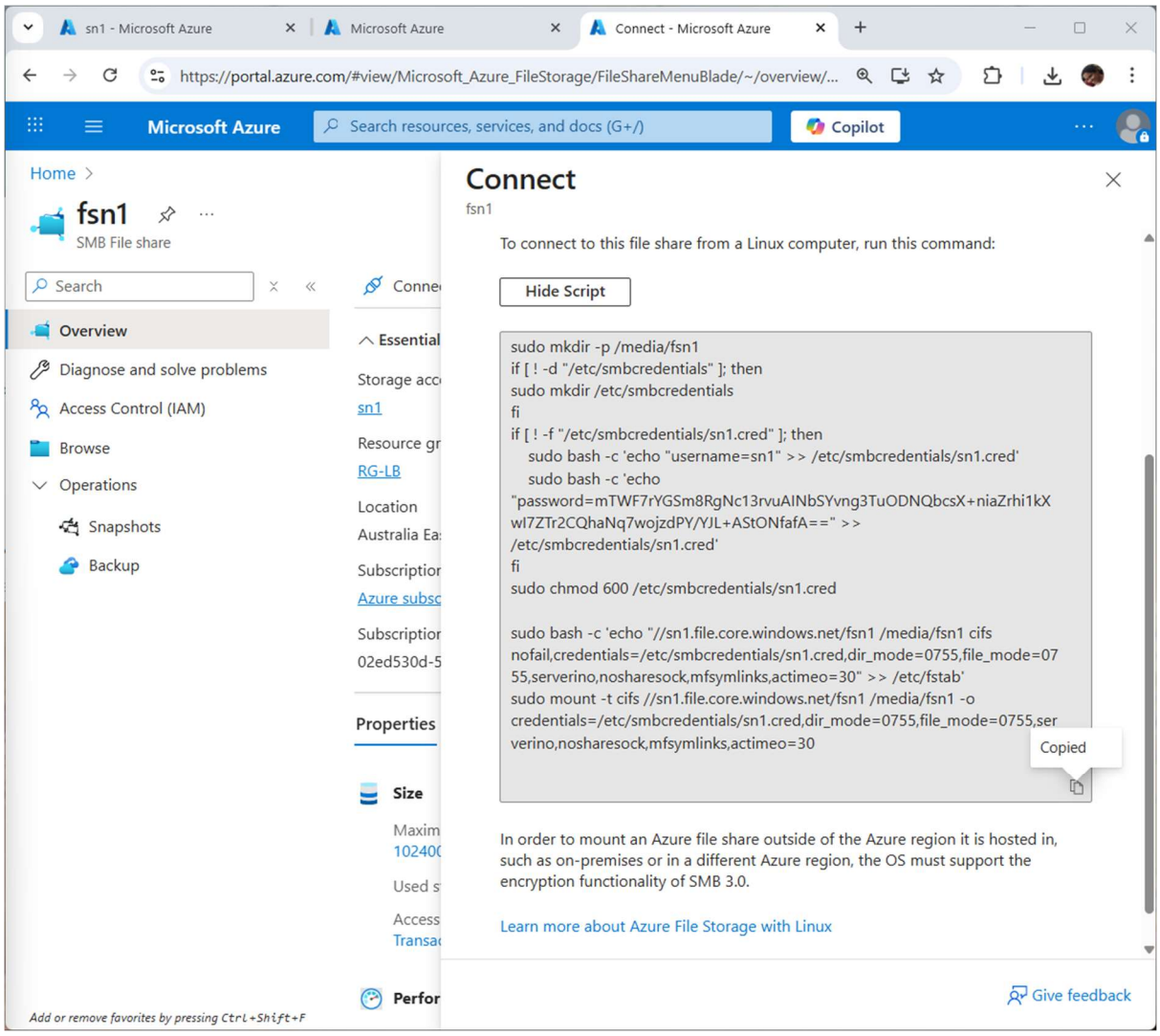


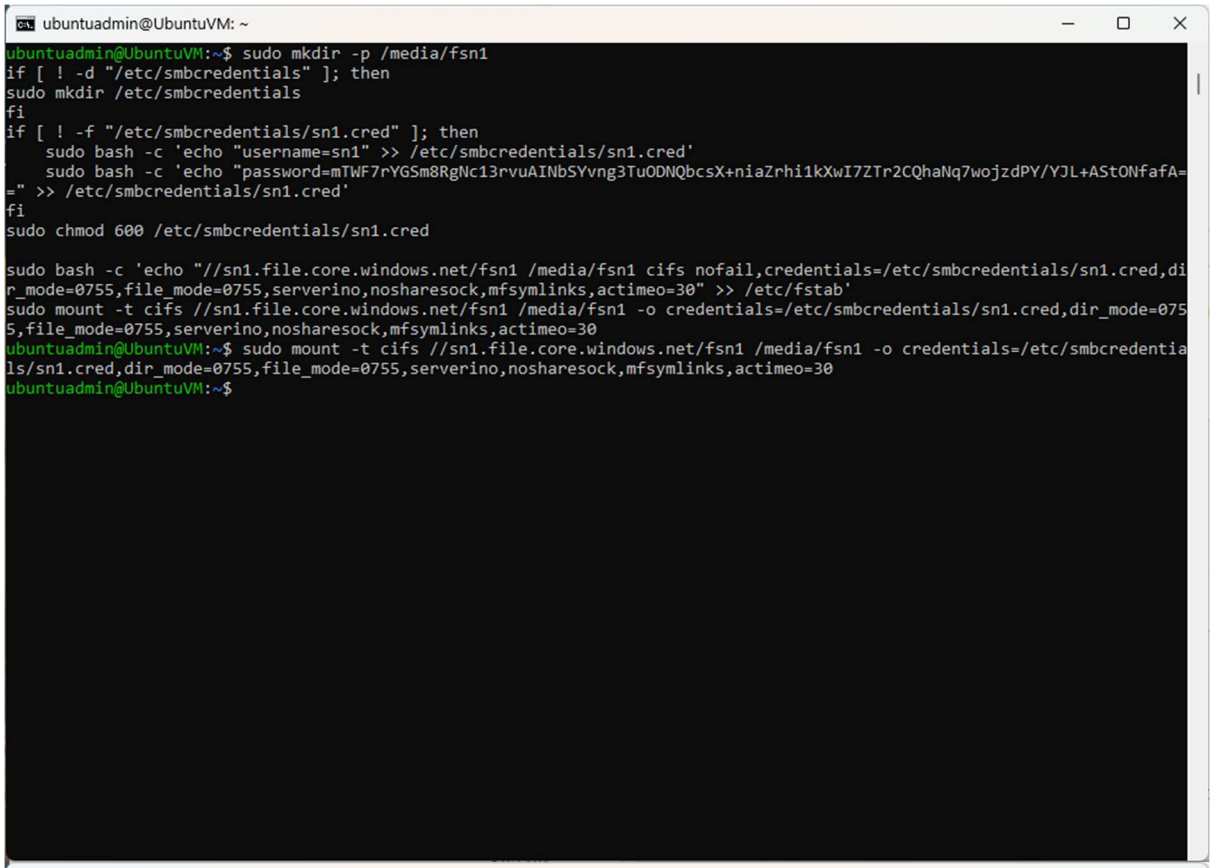
Ubuntu VM Connect

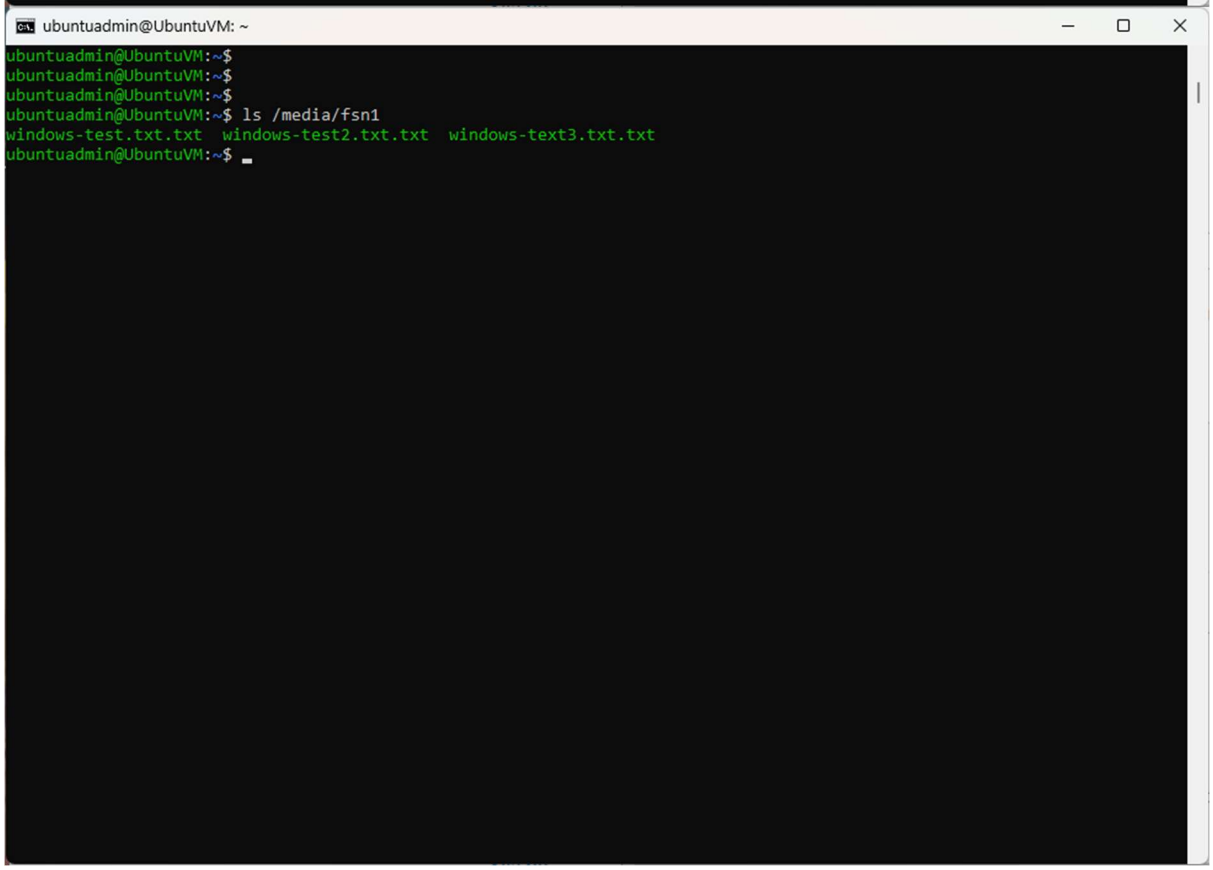




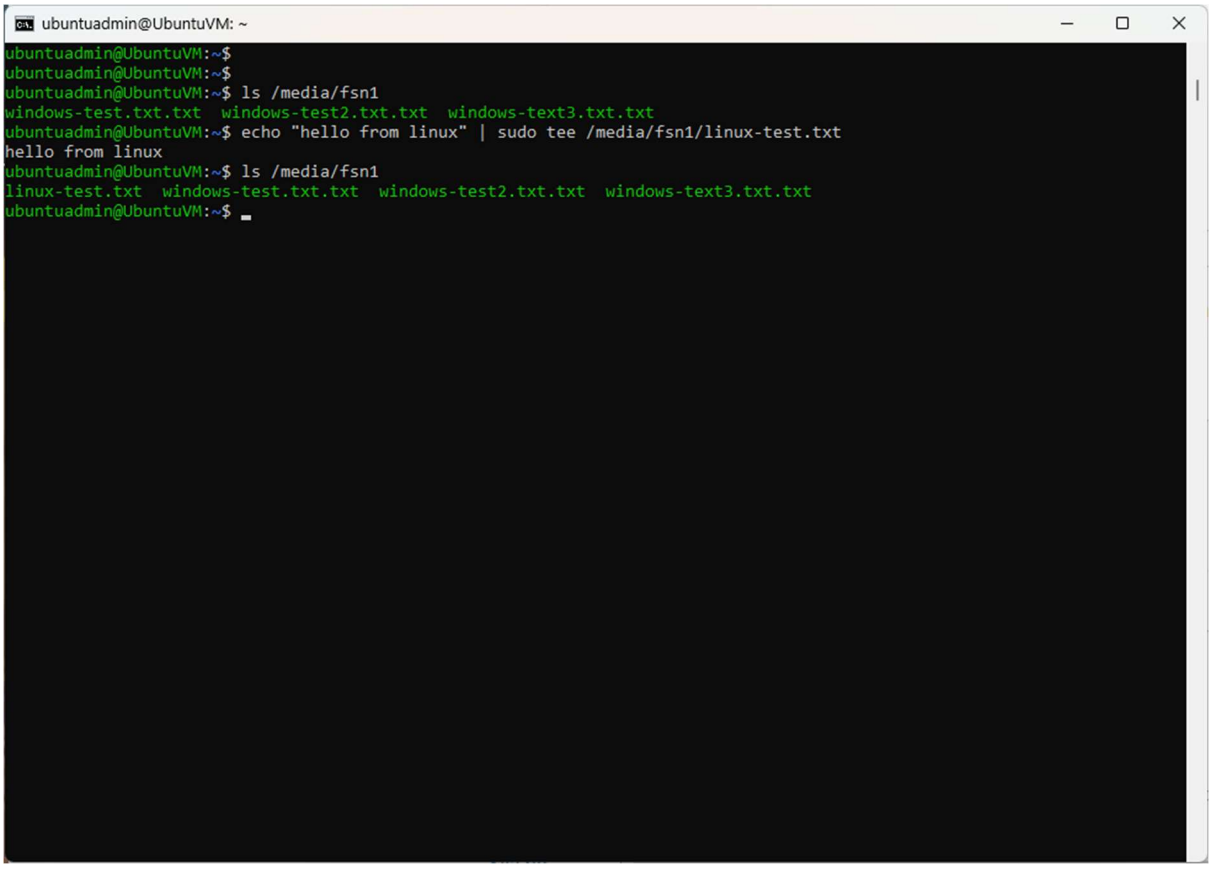
Ubuntu VM Mount



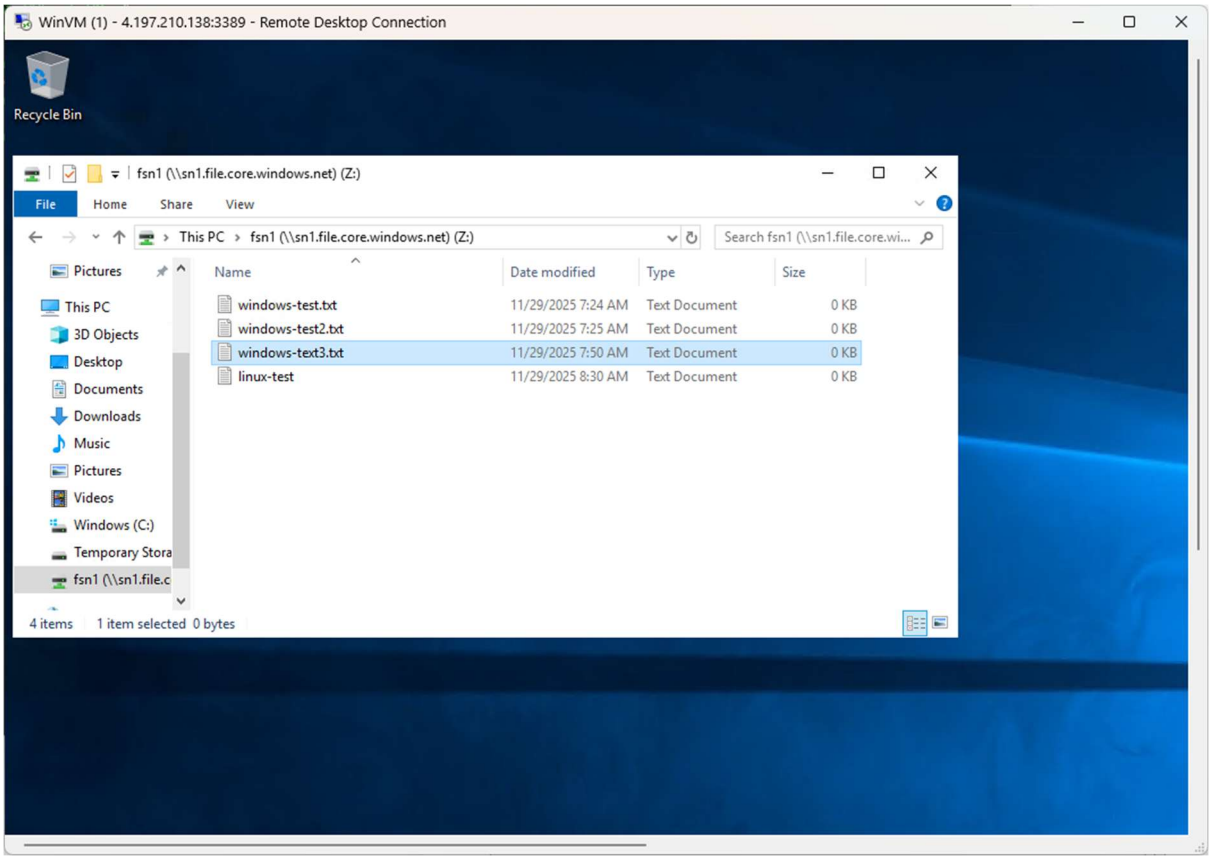

ubuntuadmin@UbuntuVM: ~
ubuntuadmin@UbuntuVM:~$ sudo mkdir -p /media/fsn1
if [! -d "/etc/smbcredentials"]; then
sudo mkdir /etc/smbcredentials
fi
if [! -f "/etc/smbcredentials/sn1.cred"]; then
sudo bash -c 'echo "username=sn1" >> /etc/smbcredentials/sn1.cred'
sudo bash -c 'echo "password=mTWF7rYGSm8RgNc13rvuAINbSYvng3TuODNQbcsX+niaZrhi1kXwI7ZTr2CQhaNq7wojzdPY/YJL+AStONfafA==" >> /etc/smbcredentials/sn1.cred'
fi
sudo chmod 600 /etc/smbcredentials/sn1.cred
sudo bash -c 'echo "//sn1.file.core.windows.net/fsn1 /media/fsn1 cifs nofail,credentials=/etc/smbcredentials/sn1.cred,dir_mode=0755,file_mode=0755,serverino,nosharesock,mfsymlinks,actimeo=30" >> /etc/fstab'
sudo mount -t cifs //sn1.file.core.windows.net/fsn1 /media/fsn1 -o credentials=/etc/smbcredentials/sn1.cred,dir_mode=0755,file_mode=0755,serverino,nosharesock,mfsymlinks,actimeo=30
ubuntuadmin@UbuntuVM:~$ sudo mount -t cifs //sn1.file.core.windows.net/fsn1 /media/fsn1 -o credentials=/etc/smbcredentials/sn1.cred,dir_mode=0755,file_mode=0755,serverino,nosharesock,mfsymlinks,actimeo=30
ubuntuadmin@UbuntuVM:~$


ubuntuadmin@UbuntuVM: ~
ubuntuadmin@UbuntuVM:~$
ubuntuadmin@UbuntuVM:~$
ubuntuadmin@UbuntuVM:~$
ubuntuadmin@UbuntuVM:~$ ls /media/fsn1
windows-test.txt.txt windows-test2.txt.txt windows-text3.txt.txt
ubuntuadmin@UbuntuVM:~$

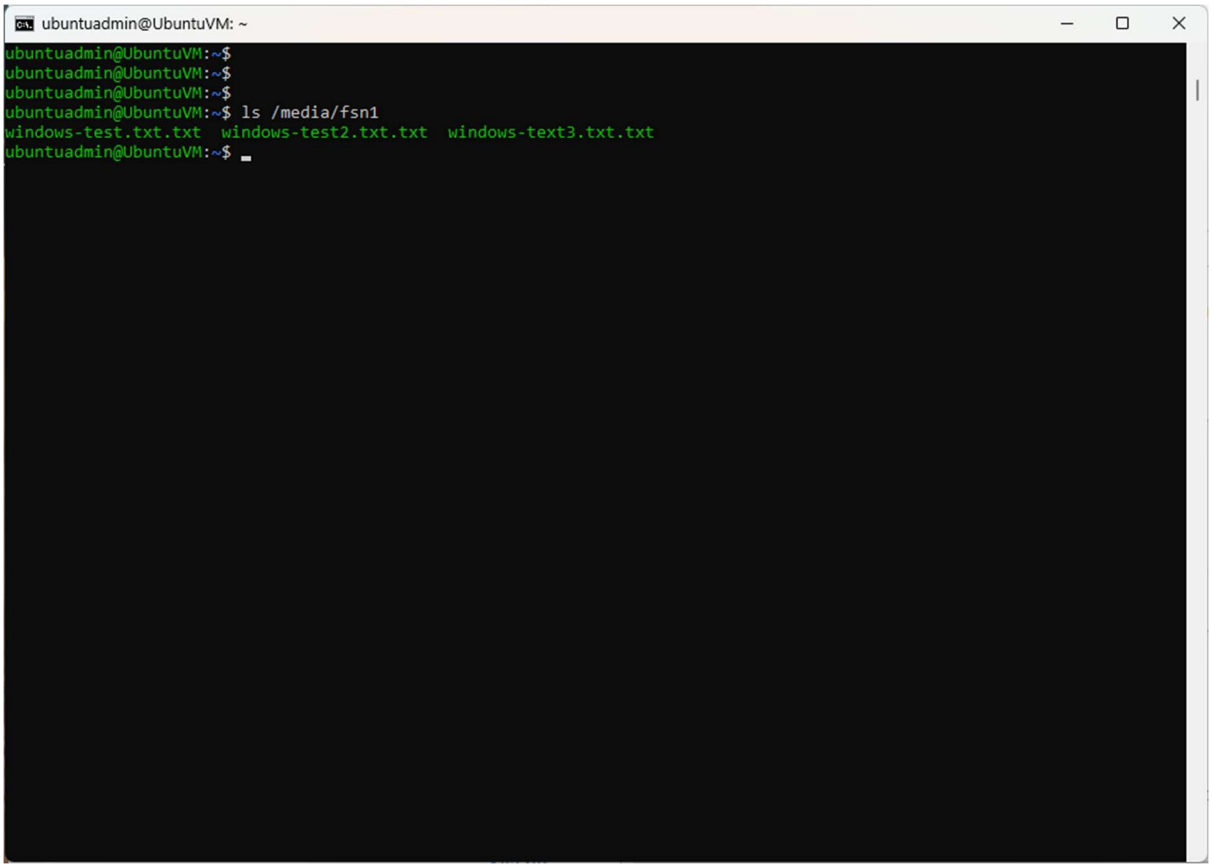
Ubuntu VM Verification



Windows VM Verification Files Created in Linux



Linux VM Verification Files Created in Windows



How Azure File Share Improves Multi-User Collaboration

For this task, I had to set up an Azure File Share and connect it to both a Windows VM and a Linux VM, and it really showed me how useful this service can be for shared work. I created a storage account, made the file share, uploaded a couple of test files, and then mounted it on both machines. On Windows I used PowerShell to map it as a network drive, and on Ubuntu I used the SMB mount command. Once both systems were connected, I could read and write files from each VM without any issues, which proved how well Azure File Share supports multi-user access.
One of the most helpful things about it is that it doesn't matter what operating system someone uses. At a place like Yoobee College, different teams and students use different platforms, so having one shared location makes things easier. Another big advantage is that Azure handles the storage backend for you. There's no need to maintain physical file servers or worry about hardware problems.
It's also reliable because Azure keeps the data protected and available in the background. Permissions can be set so only the right people can change files. Overall, Azure File Share gives a simple and secure way for multiple users to collaborate without relying on on-premises storage.

Reference

• **Microsoft Learn. (2025). Azure Virtual Machines - Overview.**
https://learn.microsoft.com/en-us/azure/virtual-machines/

• **Microsoft Learn. (2025). Introduction to Azure Storage.**
https://learn.microsoft.com/en-us/azure/storage/common/storage-introduction/

• **Microsoft Learn. (2025). Azure Virtual Network - Concepts and Best Practices.**
https://learn.microsoft.com/en-us/azure/virtual-network/

• **Microsoft Learn. (2025). Azure Pricing Models Explained.**
https://learn.microsoft.com/en-us/azure/cost-management-billing/

• **Microsoft Learn. (2025). Azure Load Balancer Documentation.**
https://learn.microsoft.com/en-us/azure/load-balancer/

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