

REPORT ON MICROSOFT AZURE FUNDAMENTALS

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1)Sandbox:

Create a Linux virtual machine and install Nginx

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LEVEL 51700 / 7699 XP

Task 1: Create a Linux virtual machine and install Nginx

Use the following Azure CLI commands to create a Linux VM and install Nginx. After your VM is created, you'll use the Custom Script Extension to install Nginx. The Custom Script Extension is an easy way to download and run scripts on your Azure VMs. It's just one of the many ways you can configure the system after your VM is up and running.

1. From Cloud Shell, run the following `az vm create` command to create a Linux VM:

```
az vm create \
  --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" \
  --name my-vm \
  --public-ip-sku Standard \
  --image Ubuntu2204 \
  --admin-username azureuser \
  --generate-ssh-keys
```

Your VM takes a few moments to come up. You named the VM my-vm.

Azure Cloud Shell

Switch to PowerShellRestartManage filesNew session

```
"forceUpdateTag": null,
"id": "/subscriptions/293caa52-ebff-42e6-9e6f-48771148aeed/resourceGroups/learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908/providers/Microsoft.Compute/virtualMachines/my-vm/extensions/customScript",
"instanceView": null,
"location": "westus",
"name": "customScript",
"protectedSettings": null,
"protectedSettingsFromKeyVault": null,
"provisionAfterExtensions": null,
"provisioningState": "Succeeded",
"publisher": "Microsoft.Azure.Extensions",
"resourceGroup": "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908",
"settings": {
  "fileUri": [
    "https://raw.githubusercontent.com/MicrosoftDocs/mslearn-welcome-to-azure/master/configure-nginx.sh"
  ]
},
"suppressFailures": null,
"tags": null,
"type": "Microsoft.Compute/virtualMachines/extensions",
"typeHandlerVersion": "2.1",
"typePropertiesType": "customScript"
}
```

Access your web server

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< PreviousUnit 9 of 14Next >

100 XP

Exercise - Configure network access

10 minutes

Sandbox activated! Time remaining: 28 min

You have used 1 of 10 sandboxes for today. More sandboxes will be available tomorrow.

In this exercise, you configure the access to the virtual machine (VM) you created earlier in this module.

Important

The Microsoft Learn sandbox should still be running. If the sandbox timed

Azure Cloud Shell


Switch to PowerShellRestartManage filesNew session

```
"storageAccountType": "Premium_LRS"
},
"name": "my-vm_disk1_4dec3c43f9b4b1bae4a56f55604356",
"osType": "Linux",
"vhd": null,
"writeAcceleratorEnabled": null
},
"tags": {},
"timeCreated": "2024-08-10T05:18:18.188331+00:00",
"type": "Microsoft.Compute/virtualMachines",
"userData": null,
"virtualMachineScaleSet": null,
"vmId": "4884b7d5-0f8e-4fa5-b3c8-51231f73492e",
"zones": null
}
]
surya_c2005 [ ~ ]$ IPADDRESS=$(az vm list-ip-addresses --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" --name my-vm --query "[].virtualMachine.network.k.publicIpAddresses[*].ipAddress" --output tsv)
surya_c2005 [ ~ ]$ curl --connect-timeout 5 http://$IPADDRESS
curl: (28) Failed to connect to 40.112.137.8 port 80 after 5003 ms: Timeout was reached
surya_c2005 [ ~ ]$ echo $IPADDRESS
40.112.137.8
surya_c2005 [ ~ ]$
```

Microsoft Learn | Learn | Discover | Product documentation | Development languages | Topics | Training | Products | Career Paths | Browse all training | Educator Center | Student Hub | FAQ & Help | LEVEL 5 | 1700 / 7699 XP

Your web server wasn't accessible. To find out why, let's examine your current NSG rules.

- ```
Azure CLI Copy
```
- ```
az network nsg list \
--resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" \
--query '[] .name' \
--output tsv
```

Output  Copy

```
my -vmNSG
```

```

"destinationPortRange": "22",
"destinationPortRanges": [],
"direction": "Inbound",
"etag": "\"W/\"3db9c58-88cf-412f-903d-f8e5e071d656\\\"\"",
"id": "/subscriptions/293caa52-ebff-42e6-9e6f-48771148aeed/resourceGroups/learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/default-allow-ssh",
"name": "default-allow-ssh",
"priority": 1000,
"protocol": "Tcp",
"provisioningState": "Succeeded",
"resourceGroup": "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908",
"sourceAddressPrefix": "*",
"sourceAddressPrefixes": [],
"sourcePortRange": "*",
"sourcePortRanges": [],
"type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
]
surya_c2005 [ ~ ]$ az network nsg rule list --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" --nsg-name my-vmNSG --query '{[Name,name, Priority,priority, Port:destinationPortRange, Access:access]}' --output table

```

Name	Priority	Port	Access
default-allow-ssh	1000	22	Allow

```

surya_c2005 [ ~ ]$

```

A screenshot of a web browser window. The address bar shows the URL: learn.microsoft.com/en-us/training/modules/describe-azure-compute-networking-services/9-exercise-configure-network-access. The page header includes the Microsoft Learn logo and navigation links: Discover, Product documentation, Development languages, and Topics. Below the header, there is a 'Training' section with links to Products, Career Paths, Browse all training, Educator Center, Student Hub, and FAQ & Help. On the right side of the header, there is a progress indicator showing 'LEVEL 5' with a green bar and '1700 / 7699 XP'.

1. Run the following `az network nsg rule create` command to create a rule called `allow-http` that allows inbound access on port 80:

```
Azure CLI 📄 Copy
```

```
az network nsg rule create \  
  --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" \  
  --nsg-name my-vmNSG \  
  --name allow-http \  
  --protocol tcp \  
  --priority 100 \  
  --destination-port-range 80 \  
  --access Allow
```

```

"\"id\": \"/subscriptions/293caa52-ebff-42e6-9e6f-48771148aed/resourceGroups/learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/default-allow-ssh\",
  \"name\": \"default-allow-ssh\",
  \"priority\": 1000,
  \"protocol\": \"Tcp\",
  \"provisioningState\": \"Succeeded\",
  \"resourceGroup\": \"learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908\",
  \"sourceAddressPrefix\": \"*\",
  \"sourceAddressPrefixes\": [],
  \"sourcePortRange\": \"*\",
  \"sourcePortRanges\": [],
  \"type\": \"Microsoft.Network/networkSecurityGroups/securityRules\"
}
]

surya_c2005 [ ~ ]$ az network nsg rule list --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" --nsg-name my-vmNSG --query '[].(Name,name, Priority,priority, Port:destinationPortRange, Access:access)' --output table
Name                                Priority    Port    Access
-----
default-allow-ssh                   1000      22     Allow

surya_c2005 [ ~ ]$ az network nsg rule create --resource-group "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908" --nsg-name my-vmNSG --name allow-http --protocol tcp --priority 100 --destination-port-range 80 --access Allow
{
  \"access\": \"Allow\",

```

Access your web server again

The screenshot shows the Microsoft Learn training page for 'Task 4: Access your web server again'. The page includes a 'Note' box stating that after updating the NSG, it may take a few moments before the updated rules propagate. Below the note, step 1 instructs the user to run the same `curl` command as earlier. A terminal window shows the command `curl --connect-timeout 5 http://$IPADDRESS` being executed. The output shows a timeout error. To the right, the Azure Cloud Shell terminal displays the JSON configuration for a network security rule named 'allow-http', which allows inbound traffic on port 80. The terminal also shows the user running the `curl` command again, which results in a timeout error.

Task 4: Access your web server again

Now that you configured network access to port 80, let's try to access the web server a second time.

Note

After you update the NSG, it may take a few moments before the updated rules propagate. Retry the next step, with pauses between attempts, until you get the desired results.

1. Run the same `curl` command that you ran earlier:

```
Bash
curl --connect-timeout 5 http://$IPADDRESS
```

You see this response:

```
HTML
Welcome to Azure! My name is my-vm.
```

Azure Cloud Shell

```
Switch to PowerShell Restart Manage files New session
{"destinationAddressPrefix": "*",
"destinationAddressPrefixes": [],
"destinationPortRange": "80",
"destinationPortRanges": [],
"direction": "Inbound",
"etag": "W/\"f6d2857d-5ae5-4383-a1a9-77301696107f\"",
"id": "/subscriptions/293caa52-ebff-42e6-9e6f-48771148aed/resourceGroups/learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908/providers/Microsoft.Network/networkSecurityGroups/my-vmNSG/securityRules/allow-http",
"name": "allow-http",
"priority": 100,
"protocol": "Tcp",
"provisioningState": "Succeeded",
"resourceGroup": "learn-9240c0e0-6fb9-4158-afe7-43fb20cf9908",
"sourceAddressPrefix": "*",
"sourceAddressPrefixes": [],
"sourcePortRange": "*",
"sourcePortRanges": [],
"type": "Microsoft.Network/networkSecurityGroups/securityRules"
}
surya_c2005 [ ~ ]$ curl --connect-timeout 5 http://$IPADDRESS
curl: (28) Failed to connect to 40.112.137.8 port 80 after 5002 ms: Timeout was reached
surya_c2005 [ ~ ]$ curl --connect-timeout 5 http://$IPADDRESS
<html><body><h2>Welcome to Azure! My name is my-vm.</h2></body></html>
surya_c2005 [ ~ ]$
```

Final output:

The screenshot shows the final output of the web server. The browser address bar displays the IP address 40.112.137.8. The page content shows the message 'Welcome to Azure! My name is my-vm.'

Not secure 40.112.137.8

Welcome to Azure! My name is my-vm.

2) Azure Academic Services: Azure for Students

Microsoft Academic Verification Process

Creation of resource groups

The screenshot displays the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and a user profile for 'surya.c2005@outlook.c...'. The main content area is titled 'Resource groups' and shows a list of resource groups. A message at the top indicates that the user is viewing a new version of the 'Browse experience' and provides a link to access the old experience. Below this, there are filter buttons for 'Subscription equals all' and 'Location equals all'. The table lists two resource groups: 'NetworkWatcherRG' and 'rg', both associated with the 'Azure for Students' subscription and located in 'Central India'.

Name ↑	Subscription	Location
NetworkWatcherRG	Azure for Students	Central India
rg	Azure for Students	Central India

Creation of Virtual Machine

The screenshot shows the Microsoft Azure portal interface. At the top, the navigation bar includes the Microsoft Azure logo, a search bar, and the user's profile (surya.c2005@outlook.c...). Below the navigation bar, the 'Virtual machines' section is active, displaying a table of virtual machines. The table has columns for Name, Subscription, Resource group, Location, Status, Operating system, Size, Public IP address, and Disks. Two virtual machines are listed: 'sudar' and 'surya', both running on Linux with Standard_D2s_v3 size. Below the table, there is a 'Cloud Shell' section with a terminal window. The terminal shows the command 'ssh surya@20.198.25.99' being executed, and the output 'Requesting a Cloud Shell.Succeeded. Connecting terminal...'.

Name	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disks
sudar	Azure for Students	rg	Central India	Running	Linux	Standard_D2s_v3	20.197.45.212	1
surya	Azure for Students	rg	Central India	Running	Linux	Standard_D2s_v3	20.198.25.99	1

```
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Your Cloud Shell session will be ephemeral so no files or system changes will persist beyond your current session.
surya [ ~ ]$ ssh surya@20.198.25.99
```

Hosting my portfolio using Azure Cloud Services

The screenshot shows a portfolio website for 'BROWN' (likely Brownie). The website has a navigation bar with links: EDUCATION, SKILLS, EXPERIENCE, PROFILE, PORTFOLIO, CLIENTS, and CONTACT. The main content area features a large background image of a person standing on a beach, looking out at the ocean. Overlaid on this image is the text 'HI, I AM SURYA' in large, bold, white letters. Below this, in smaller white text, is 'UI/UX DESIGNER AND WEB DEVELOPER'. At the bottom center, there is a purple button with the text 'Download Resume'.

Pricing calculator

AutoSave

ExportedEstimate

Search (Cmd + Ctrl + U)

HomeInsertDrawPage LayoutFormulasDataReviewViewAutomate

Paste

Segoe UI14A⁺A⁻

General

Conditional FormattingFormat as TableCell Styles

InsertDeleteFormat

Sort & FilterFind & Select

CommentsShare

Add-InsAnalyse Data

A1	Microsoft Azure Estimate					
1	Microsoft Azure Estimate					
2	Your Estimate					
3	Service category	Service type	Custom name	Region	Description	Estimated monthly cost
4	Compute	Virtual Machines		East US	1 D2 v3 (2 vCPUs, 8 GB RAM) x 730 Hours (Pay as you go), Windows (License included), OS Only; 0 managed disks – S4; Inter Region transfer type, 5 GB outbound data transfer from East US to East Asia	\$137.24
5	Support			Support		\$0.00
6				Licensing Program	Microsoft Customer Agreement (MCA)	\$0.00
7				Billing Account		
8				Billing Profile		
9				Total		\$137.24
10						\$0.00
11	Disclaimer					
12	All prices shown are in United States – Dollar (\$) USD. This is a summary estimate, not a quote. For up to date pricing information please visit https://azure.microsoft.com/pricing/calculator/					
13	This estimate was created at 8/9/2024 4:04:33 AM UTC.					
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Your Estimate

ReadyAccessibility: Investigate

100%

Total Cost of Ownership (TCO) Calculator

tco azure.pdf

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Search

1

2

1

2

My saved reports

Sign In

Total Cost of Ownership (TCO) Calculator

Estimate the cost savings you can realize by migrating your workloads to Azure

Over 5 year(s) with Microsoft Azure, your estimated cost savings could be as much as **\$158,081**

Total on-premises vs. Azure cost over time

Savings from running workloads in Azure accrue over time. The following shows how those savings add up over years.

7

Creation of container

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and the user profile 'surya.c2005@outlook.c...'. The main content area displays the 'Containers' overview for the storage account 'surya22'. A notification banner at the top right states 'Successfully created storage container' and 'Successfully created storage container 'surya12''. The left sidebar lists various services, with 'Containers' selected. The main table lists the containers:

Name	Last modified	Anonymous access level	Lease state
\$logs	8/10/2024, 11:45:18 AM	Private	Available
surya12	8/10/2024, 11:50:22 AM	Blob	Available

The screenshot shows the Microsoft Azure portal interface for the 'surya12' container. The top navigation bar includes the Microsoft Azure logo, a search bar, and the user profile 'surya.c2005@outlook.c...'. The main content area displays the 'Overview' of the 'surya12' container. The left sidebar lists various services, with 'Overview' selected. The main content area shows the container details, including the authentication method (Access key) and location (surya12). A search bar for blobs is present, and a table lists the blobs:

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
udp-2.JPG	8/10/2024, 11:51:48 ...	Hot (Inferred)		Block blob	25.36 KiB	Available

Home > demostoragepinesphere | Containers > container1 >

container1

Container

Search

Upload Change access level

Overview

Diagnose and solve problems

Access Control (IAM)

Settings

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

Location: container1

Search blobs by prefix (case-...)

Show deleted blobs

Add filter

Name

Screenshot 2024-08-07 at 4.28... ***

Screenshot 2024-08-07 at 4.28.40 PM.png

Blob

Save Discard Download Refresh Delete Change tier

Overview Versions Snapshots Edit Generate SAS

Properties

URL <https://demostorage...>

LAST MODIFIED 8/8/2024, 2:25:38 PM

CREATION TIME 8/8/2024, 2:25:38 PM

VERSION ID -

TYPE Block blob

SIZE 182.95 KiB

ACCESS TIER Hot (Inferred)

ACCESS TIER LAST MODIFIED N/A

ARCHIVE STATUS -

REHYDRATE PRIORITY -

SERVER ENCRYPTED true

ETAG 0x8DCB787E0325253

VERSION-LEVEL IMMUTABILITY POLICY Disabled

CACHE-CONTROL

CONTENT-TYPE image/png

CONTENT MD5 D1c7b0/Nvub777/...

Cre Bro Perf Bro Git Rele Intr Char Dow Sury Virti Exer Whi 089 udp x +

surya22.blob.core.windows.net/surya12/udp-2.JPG

```
Microsoft Windows [Version 10.0.19045.3086]
(c) Microsoft Corporation. All rights reserved.

D:\Java\s尔va>javac UDPclient.java

D:\Java\s尔va>java UDPclient
Server: Waiting
Client:
hello
Server: hmm
Client:
enna pandra
Server: summa tha
Client:
ok da bye
Server: hm bye
Client:
```