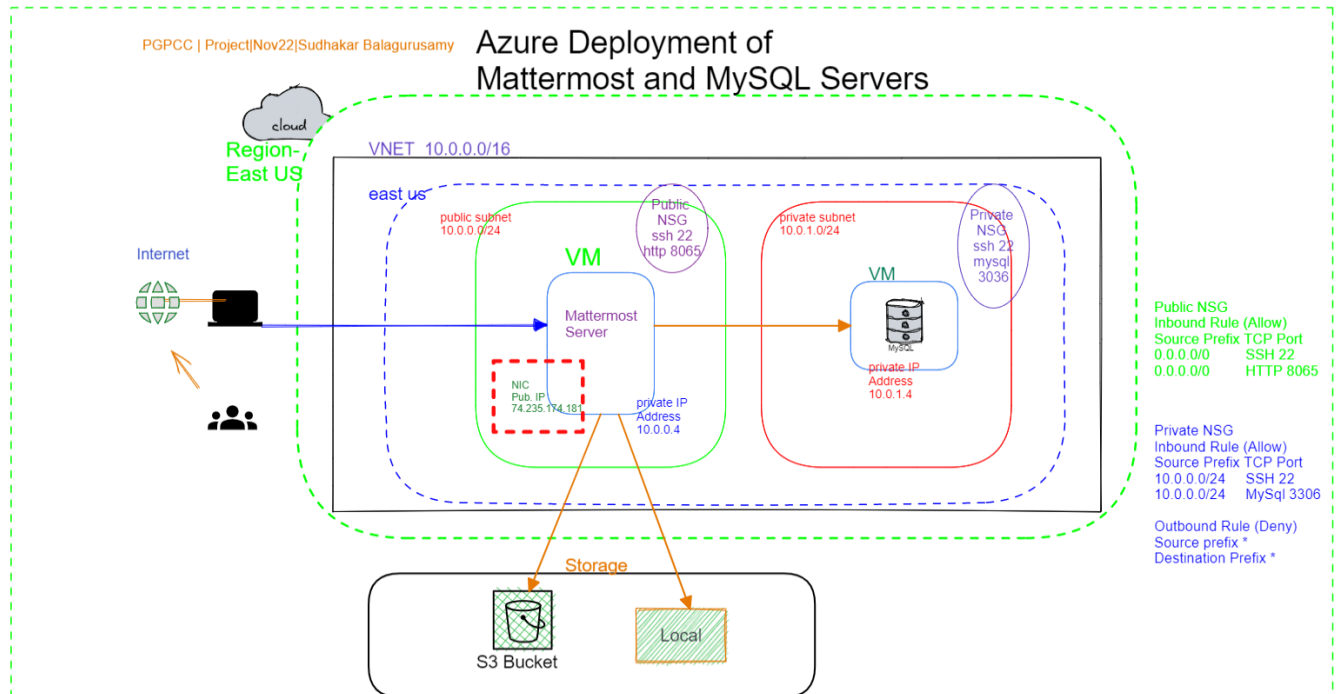


Architecture Diagram



Deployment of Mattermost and MySQL servers

A virtual network of address prefix 10.0.0.0/16 is created with 2 subnets with the address prefixes of 10.0.0.0/24 and 10.0.1.0/24. The public facing Mattermost server is placed in the first subnet and the MySQL server is placed in the second subnet. A public NSG is assigned to the first subnet to allow the inbound connection to ports 22 and 8065 from the internet. A private NSG is assigned to the second subnet to allow the traffic only from the first subnet on ports 22 and 3306. This private NSG has an outbound rule to deny the outbound traffic to internet from this subnet. **This outbound rule is in disabled state till the installation of MySQL server** as the Installation of MySQL server requires internet connection. This is enabled after the installation. The Mattermost and MySQL server are installed based on the instructions from : <https://docs.mattermost.com/install/installing-ubuntu-2004-LTS.html>. The Mattermost server can be configured to store the data either in AWS S3 buckets or in local file system.

Workflow Steps

Azure CLI is used for creating all the resources needed for Mattermost server installation.

Step: 1 Login to Azure

Open a bash terminal (WSL Ubuntu terminal is used)

Run the following command to login to Azure

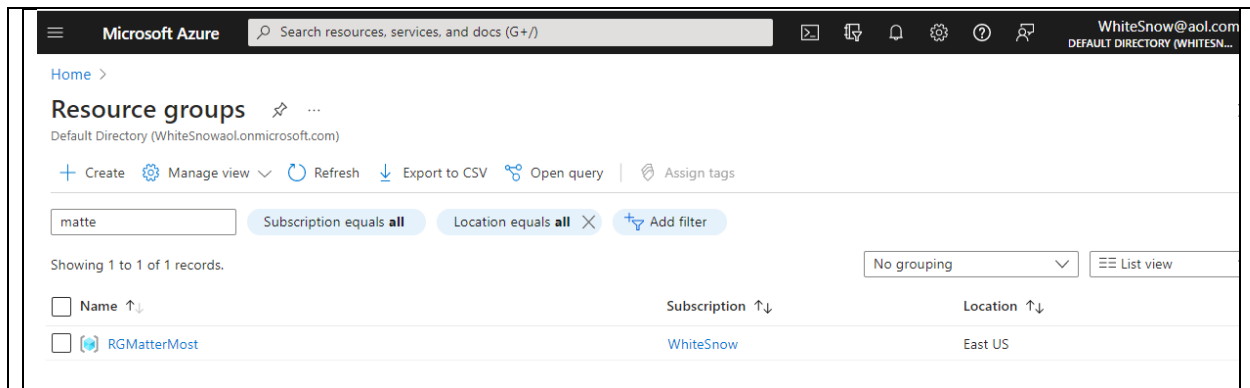
az login

```
sudhakar@UrsaMajor: ~/azure X + v
sudhakar@UrsaMajor:~/azure-projects$ az login
A web browser has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize. Please continue the login in the web browser.
If no web browser is available or if the web browser fails to open, use device code flow with 'az login --use-device-code'.
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "07e813c6-eb7f-4734-9fdd-35e3038e9752",
    "id": "37427082-8987-4090-a942-f4eed9e71741",
    "isDefault": true,
    "managedByTenants": [],
    "name": "WhiteSnow",
    "state": "Enabled",
    "tenantId": "07e813c6-eb7f-4734-9fdd-35e3038e9752",
    "user": {
      "name": "WhiteSnow@aol.com",
      "type": "user"
    }
  }
]
sudhakar@UrsaMajor:~/azure-projects$ |
```

Step: 2 Create a Resource Group 'RGMatterMost'.

```
LOCATION="eastus"
RES_GROUP="RGMatterMost"
az group create --location ${LOCATION} --name ${RES_GROUP}
```

```
sudhakar@UrsaMajor: ~/azure X + v
sudhakar@UrsaMajor:~/azure-projects$ LOCATION="eastus"
sudhakar@UrsaMajor:~/azure-projects$ RES_GROUP="RGMatterMost"
sudhakar@UrsaMajor:~/azure-projects$ az group create --location ${LOCATION} --name ${RES_GROUP}
{
  "id": "/subscriptions/37427082-8987-4090-a942-f4eed9e71741/resourceGroups/RGMatterMost",
  "location": "eastus",
  "managedBy": null,
  "name": "RGMatterMost",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
sudhakar@UrsaMajor:~/azure-projects$
```

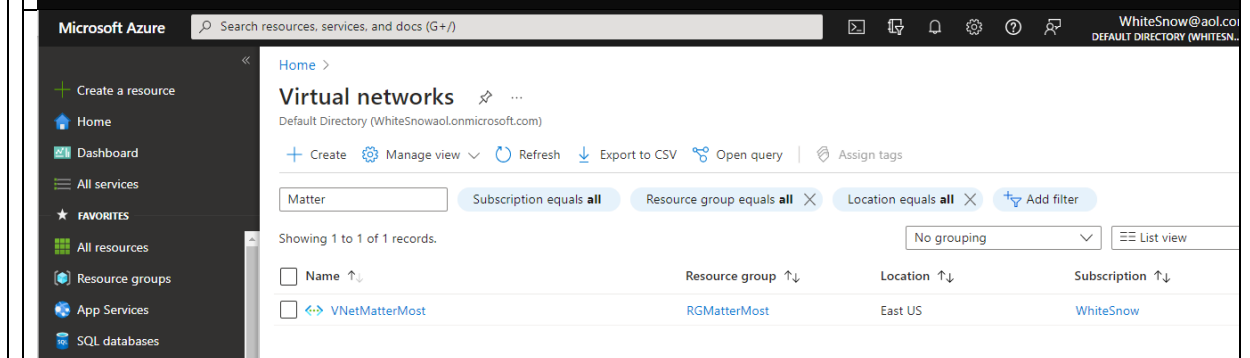


STEP 3: Create a VNET with the address prefix of 10.0.0.0/16

Set the VNET and CIDR_VNET shell variables

```
VNET="VNetMatterMost"
CIDR_VNET="10.0.0.0/16"
az network vnet create --resource-group ${RES_GROUP} --name ${VNET} \
  --address-prefixes ${CIDR_VNET} --location ${LOCATION} --no-wait false
```

```
sudhakar@UrsaMajor:~/azure-projects$ CIDR_VNET="10.0.0.0/16"
sudhakar@UrsaMajor:~/azure-projects$ VNET="VNetMatterMost"
sudhakar@UrsaMajor:~/azure-projects$ az network vnet create --resource-group ${RES_GROUP} --name ${VNET} \
  --address-prefixes ${CIDR_VNET} --location ${LOCATION} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$
```



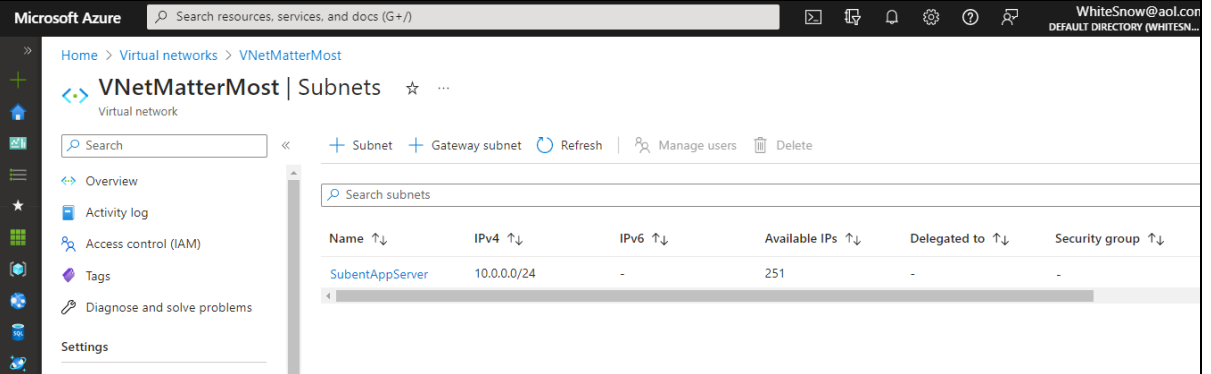
STEP 4: Create a subnet with the address prefix of 10.0.0.0/24 for App Server

Set the SUBNET_APP_SERVER and CIDR_APP_SERVER

run **az network vnet subnet create** command to create a subnet for App Server

```
SUBNET_APP_SERVER="SubnetAppServer"
CIDR_APP_SERVER="10.0.0.0/24"
az network vnet subnet create --resource-group ${RES_GROUP} --name \
  ${SUBNET_APP_SERVER} --vnet-name ${VNET} \
  --address-prefixes ${CIDR_APP_SERVER} --no-wait false
```

```
sudhakar@UrsaMajor:~/azure-projects$ SUBNET_APP_SERVER="SubentAppServer"
sudhakar@UrsaMajor:~/azure-projects$ CIDR_APP_SERVER="10.0.0.0/24"
sudhakar@UrsaMajor:~/azure-projects$ az network vnet subnet create --resource-group ${RES_GROUP} --name ${SUBNET_APP_SERVER} --vnet-name ${VNET_NAME} --address-prefixes ${CIDR_APP_SERVER} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$
```



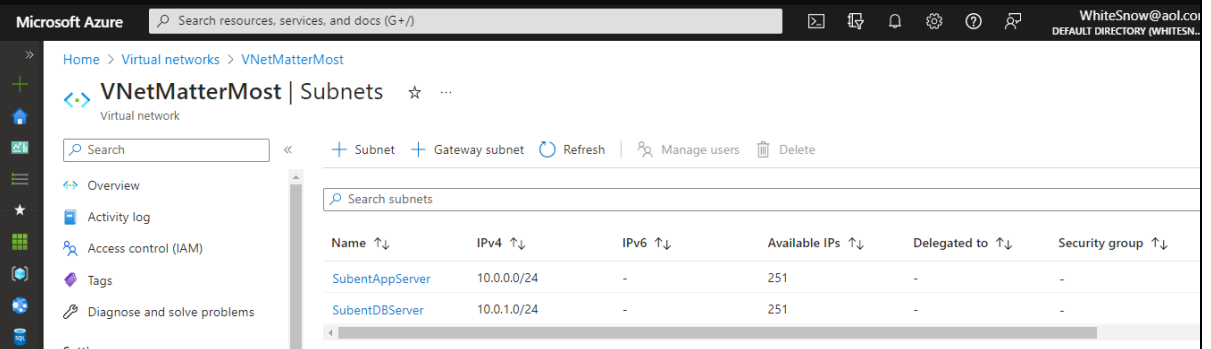
Name	IPv4	IPv6	Available IPs	Delegated to	Security group
SubentAppServer	10.0.0.0/24	-	251	-	-

STEP 4: Create a subnet with the address prefix of 10.0.1.0/24 for DB Server

Set the shell variables SUBNET_DB_SERVER=SubentDBServer and CIDR_DB_SERVER=10.0.1.0/24 and run **az network vnet create** command to create a subnet for DB Server

```
SUBNET_DB_SERVER="SubentDBServer"
CIDR_DB_SERVER="10.0.1.0/24"
az network vnet subnet create --resource-group ${RES_GROUP} --name
${SUBNET_DB_SERVER} --vnet-name ${VNET_NAME} \
--address-prefixes ${CIDR_DB_SERVER} --no-wait false
```

```
sudhakar@UrsaMajor:~/azure-projects$ SUBNET_DB_SERVER="SubentDBServer"
sudhakar@UrsaMajor:~/azure-projects$ CIDR_DB_SERVER="10.0.1.0/24"
sudhakar@UrsaMajor:~/azure-projects$ az network vnet subnet create --resource-group ${RES_GROUP} --name ${SUBNET_DB_SERVER} --vnet-name ${VNET_NAME} --address-prefixes ${CIDR_DB_SERVER} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$
```



Name	IPv4	IPv6	Available IPs	Delegated to	Security group
SubentAppServer	10.0.0.0/24	-	251	-	-
SubentDBServer	10.0.1.0/24	-	251	-	-

STEP 5: Create an NSG for App Server Subnet

Set the NSG_APP_SERVER="NsgAppServer" and run **az network nsg create** to create a network security group

```
NSG_APP_SERVER="NsgAppServer"
az network nsg create --location ${LOCATION} --name ${NSG_APP_SERVER} \
--resource-group ${RES_GROUP} --no-wait false
```

```

sudhakar@UrsaMajor:~/azure-projects$ NSG_APP_SERVER="NsgAppServer"
sudhakar@UrsaMajor:~/azure-projects$ az network nsg create --location ${LOCATION} --name ${NSG_APP_SERVER}
--resource-group ${RES_GROUP} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$

```

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

Home > Resource groups > RGMatterMost >

NsgAppServer

Network security group

Search

Move Delete Refresh Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Inbound security rules

Outbound security rules

Network interfaces

Subnets

Properties

Locks

Monitoring

Alerts

D diagnostic settings

Logs

NSG flow logs

RG MatterMost

0 inbound, 0 outbound

Location: East US

Associated with: 0 subnets, 0 network interfaces

Subscription (move): WhiteSnow

Subscription ID: 37427082-8987-4090-a942-f4eed9e71741

Tags (edit): Click here to add tags

Filter by name

Port == all Protocol == all Source == all Destination == all Action == all

Priority	Name	Port	Protocol	Source	Destination
Inbound Security Rules					
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowAzureLoadBalanc...	Any	Any	AzureLoadBalancer	Any
65500	DenyAllInBound	Any	Any	Any	Any
Outbound Security Rules					
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowInternetOutBound	Any	Any	Any	Internet
65500	DenyAllOutBound	Any	Any	Any	Any

STEP 6: Create inbound NSG rules for NsgAppServer

Create NSG rules to allow internet traffic from SSH (22) and Mattermost ports (8065) using **az network nsg create** command

```

az network nsg rule create --name AllowSSH --nsg-name ${NSG_APP_SERVER} \
  --resource-group ${RES_GROUP} \
  --access Allow --priority 150 --source-address-prefix Internet --source-port-range "*" \
  --destination-address-prefix "*" --destination-port-ranges 22 --direction Inbound \
  --protocol Tcp --no-wait false --description "Allow ssh ports"
az network nsg rule create --name AllowMatterMost --nsg-name ${NSG_APP_SERVER} \
  --resource-group ${RES_GROUP} \
  --access Allow --priority 200 --source-address-prefix Internet --source-port-range "*" \
  --destination-address-prefix "*" --destination-port-ranges 8065 --direction Inbound \
  --protocol Tcp --no-wait false --description "Allow MatterMost ports"

```

```

sudhakar@UrsaMajor:~/azure-projects$ az network nsg rule create --name AllowSSH --nsg-name ${NSG_APP_SERVER} --resource-group ${RES_GROUP} \
--access Allow --priority 150 --source-address-prefix Internet --source-port-range "*" \
--destination-address-prefix "*" --destination-port-ranges 22 --direction Inbound \
--protocol Tcp --no-wait false --description "Allow ssh ports"
sudhakar@UrsaMajor:~/azure-projects$ az network nsg rule create --name AllowMatterMost --nsg-name ${NSG_APP_SERVER} --resource-group ${RES
P} \
--access Allow --priority 200 --source-address-prefix Internet --source-port-range "*" \
--destination-address-prefix "*" --destination-port-ranges 8065 --direction Inbound \
--protocol Tcp --no-wait false --description "Allow MatterMost ports"
sudhakar@UrsaMajor:~/azure-projects$

```

Microsoft Azure Search resources, services, and docs (G+)

Home > Resource groups > RGMatterMost >

NsgAppServer Network security group

Subscription (move) WhiteSnow
Subscription ID 37427082-8987-4090-a942-f4eed9e71741
Tags (edit) Click here to add tags

Filter by name

Port == all Protocol == all Source == all Destination == all Action == all

Priority ↑↓	Name ↑↓	Port ↑↓	Protocol ↑↓	Source ↑↓	Destination ↑↓
Inbound Security Rules					
150	AllowSSH	22	Tcp	Internet	Any
200	AllowMatterMost	8065	Tcp	Internet	Any
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowAzureLoadBalan...	Any	Any	AzureLoadBalancer	Any
65500	DenyAllInBound	Any	Any	Any	Any
Outbound Security Rules					
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowInternetOutBound	Any	Any	Any	Internet
65500	DenyAllOutBound	Any	Any	Any	Any

STEP 7: Associate the NsgAppServer to App Server Subnet

Associate the network security group NsgAppServer to App Server subnet using the following command **az network vnet subnet update**

```

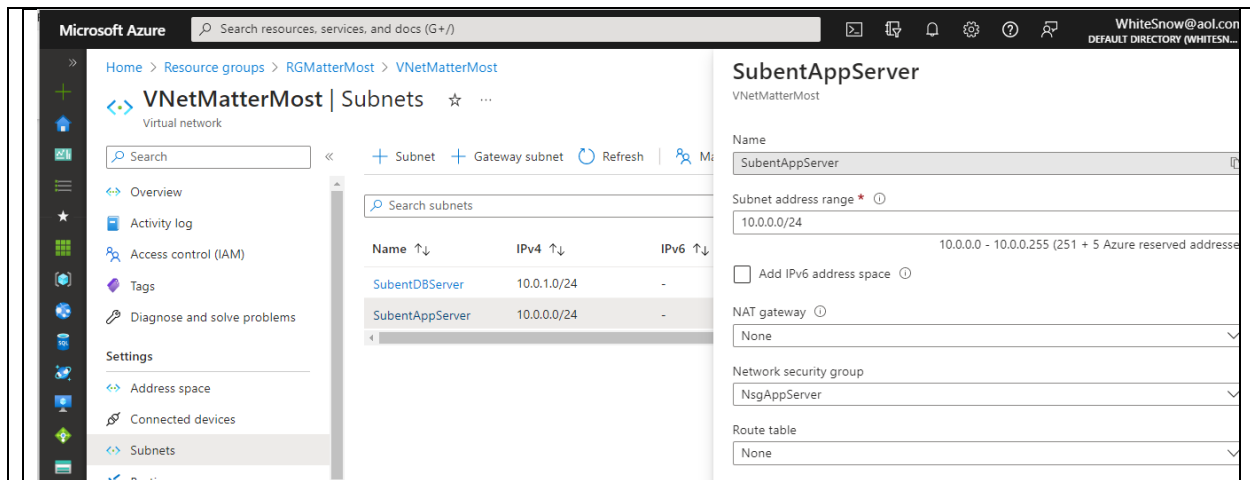
az network vnet subnet update --vnet-name ${VNET} \
--name ${SUBNET_APP_SERVER} \
--resource-group ${RES_GROUP} \
--network-security-group ${NSG_APP_SERVER} --no-wait false

```

```

sudhakar@UrsaMajor:~/azure-projects$ az network vnet subnet update --vnet-name ${VNET} --name ${SUBNET_APP_SERVER} \
--resource-group ${RES_GROUP} --network-security-group ${NSG_APP_SERVER} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$

```

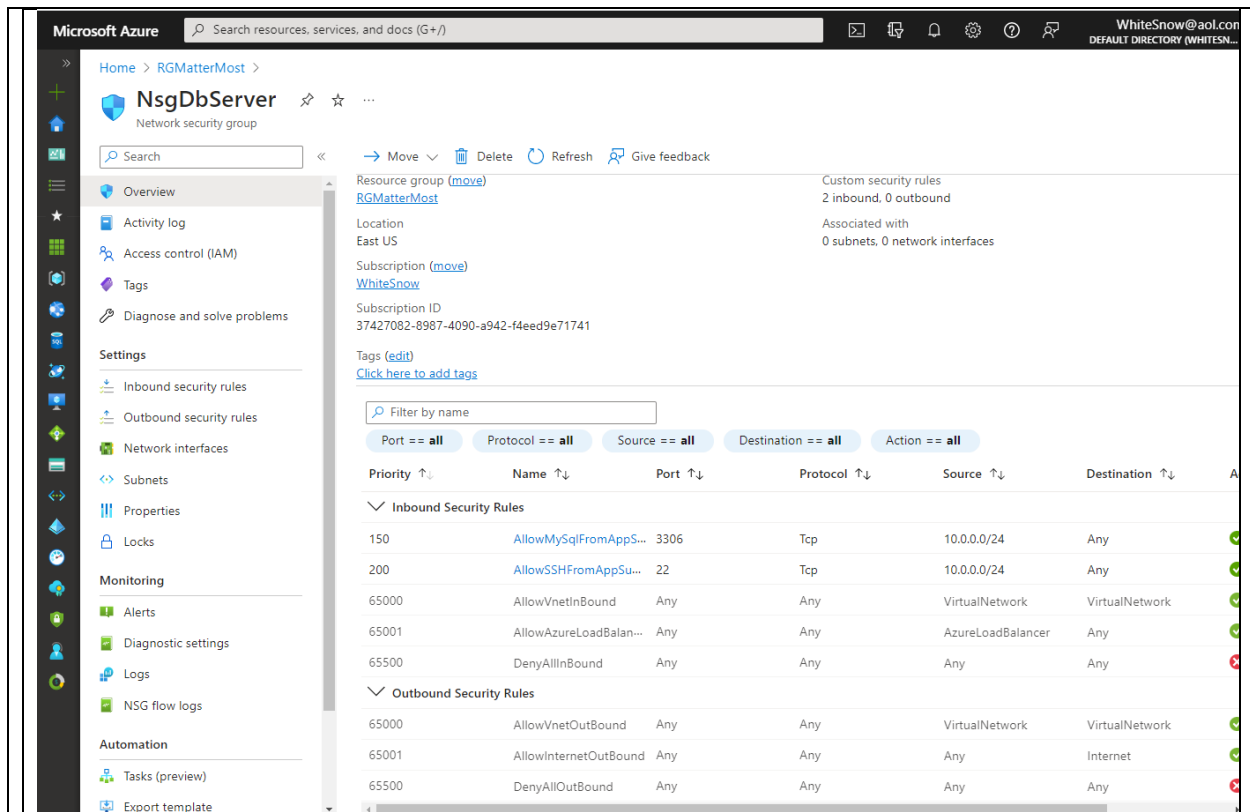


STEP 8: Create an NSG for the DB Server subnet

Set the shell variable `NSG_DB_SERVER=NsgDBServer` and run the following commands to create an NSG and inbound rules to allow traffic from the App Server Subnet to SSH (22) & MySQL ports (3306)

```
NSG_DB_SERVER="NsgDbServer"
az network nsg create --location ${LOCATION} --name ${NSG_DB_SERVER} \
--resource-group ${RES_GROUP} --no-wait false
az network nsg rule create --resource-group ${RES_GROUP} --nsg-name ${NSG_DB_SERVER} \
--name AllowMySQLFromAppSubnet --no-wait false \
--access Allow --protocol Tcp --direction Inbound --priority 150 \
--source-address-prefix ${CIDR_APP_SERVER} --source-port-range "*" \
--destination-address-prefix "*" --destination-port-range 3306
az network nsg rule create --resource-group ${RES_GROUP} --nsg-name ${NSG_DB_SERVER} \
--name AllowSSHFromAppSubnet --no-wait false \
--access Allow --protocol Tcp --direction Inbound --priority 200 \
--source-address-prefix ${CIDR_APP_SERVER} --source-port-range "*" \
--destination-address-prefix "*" --destination-port-range 22

sudhakar@UrsaMajor:~/azure-projects$ NSG_DB_SERVER="NsgDbServer"
sudhakar@UrsaMajor:~/azure-projects$ az network nsg create --location ${LOCATION} --name ${NSG_DB_SERVER} \
--resource-group ${RES_GROUP} --no-wait false
echo "Created a NSG : ${NSG_DB_SERVER}"
Created a NSG : NsgDbServer
sudhakar@UrsaMajor:~/azure-projects$ az network nsg rule create --resource-group ${RES_GROUP} --nsg-name ${NSG_DB_SERVER} \
--name AllowMySQLFromAppSubnet --no-wait false \
--access Allow --protocol Tcp --direction Inbound --priority 150 \
--source-address-prefix ${CIDR_APP_SERVER} --source-port-range "*" \
--destination-address-prefix "*" --destination-port-range 3306
sudhakar@UrsaMajor:~/azure-projects$ az network nsg rule create --resource-group ${RES_GROUP} --nsg-name ${NSG_DB_SERVER} \
--name AllowSSHFromAppSubnet --no-wait false \
--access Allow --protocol Tcp --direction Inbound --priority 200 \
--source-address-prefix ${CIDR_APP_SERVER} --source-port-range "*" \
--destination-address-prefix "*" --destination-port-range 22
sudhakar@UrsaMajor:~/azure-projects$
```



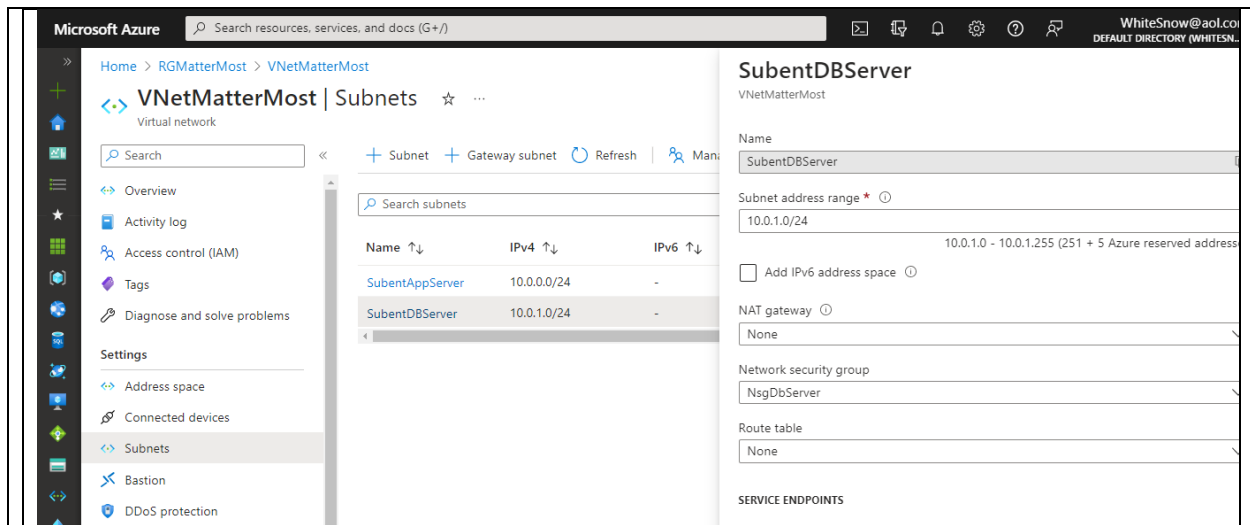
Note: Currently the NsgDbServer allows all the outbound traffic to the Internet. An NSG rule will be added to **deny** all the outbound internet traffic after installing the MySQL server.

STEP 9: Associate the NsgDbServer to the DB Server Subnet

Associate the NsgDbServer with the DB Server subnet using the following command : **az network vnet subnet update**

```
az network vnet subnet update --vnet-name ${VNET} \
--name ${SUBNET_DB_SERVER} --resource-group ${RES_GROUP} \
--network-security-group ${NSG_DB_SERVER} --no-wait false
```

```
sudhakar@UrsaMajor:~/azure-projects$ az network vnet subnet update --vnet-name ${VNET} \
--name ${SUBNET_DB_SERVER} --resource-group ${RES_GROUP} \
--network-security-group ${NSG_DB_SERVER} --no-wait false
sudhakar@UrsaMajor:~/azure-projects$
```

STEP 10: Create a static public IP address for the Mattermost Server

Set the shell variable `IP_APP_SERVER="IPAppServer"` and run the following command to create the IP address. **az network public-ip create**

```
IP_APP_SERVER="IPAppServer"
az network public-ip create --resource-group ${RES_GROUP} \
  --name ${IP_APP_SERVER} \
  --allocation-method Static --version IPv4
```

```
sudhakar@UrsaMajor:~/azure-projects$ IP_APP_SERVER="IPAppServer"
sudhakar@UrsaMajor:~/azure-projects$ az network public-ip create --resource-group ${RES_GROUP} --name ${IP_APP_SERVER} --allocation-method Static --version IPv4
Please note that the default public IP used for creation will be changed from Basic to Standard in the future.
{
  "publicIp": {
    "etag": "W/\"e5e510c4-e5cd-4621-af25-d1b836ad8a8d\"",
    "id": "/subscriptions/37427882-8987-4090-a942-f4eed9e71741/resourceGroups/RGMatterMost/providers/Microsoft.Network/publicIPAddresses/IPAppServer",
    "idleTimeoutInMinutes": 4,
    "ipAddress": "74.235.174.181",
    "ipTags": [],
    "location": "eastus",
    "name": "IPAppServer",
    "provisioningState": "Succeeded",
    "publicIpAddressVersion": "IPv4",
    "publicIPAllocationMethod": "Static",
    "resourceGroup": "RGMatterMost",
    "resourceGuid": "fb0cc3ce-e43a-46f6-8834-932e10f9c3df",
    "sku": {
      "name": "Basic",
      "tier": "Regional"
    },
    "type": "Microsoft.Network/publicIPAddresses"
  }
}
```

Microsoft Azure Search resources, services, and docs (G+)

Home > Public IP addresses >

IPAppServer Public IP address

Search

Overview

Activity log

Access control (IAM)

Tags

Settings

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Properties

Locks

Monitoring

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Metrics

Diagnostic settings

Logs

Automation

Tasks (preview)

Export template

Upgrade to Standard SKU - Microsoft recommends Standard SKU public IP address for production workloads

Associate Dissociate Delete Move Refresh Open in mobile

Essentials

Resource group (move) : RGMatterMost SKU : Basic

Location (move) : East US Tier : Regional

Subscription (move) : WhiteSnow IP address : 74.235.174.181

Subscription ID : 37427082-8987-4090-a942-f4eed9e71741 DNS name : -

Associated to : -

Virtual machine : -

Routing preference : Microsoft network

Tags (edit) : Click here to add tags

Get Started Properties Tutorials

Public IP address

Resource GUID : fb0cc3ce-e43a-46f6-8834-932e10f9c3df

IP address : 74.235.174.181

IP address version : IPv4

Provisioning state : Succeeded

Allocation method : Static

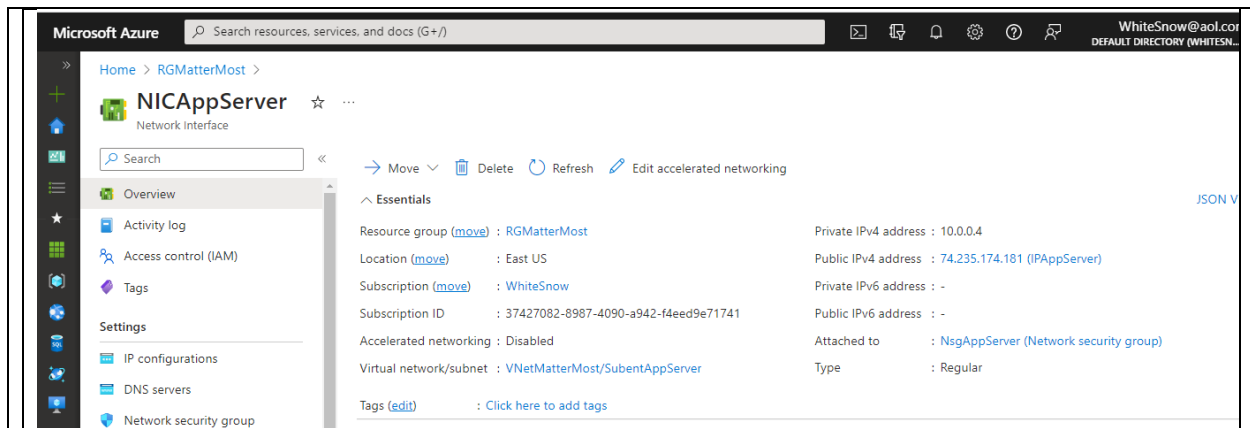
Idle timeout (change) : 4

STEP 11: Create an NIC for the Mattermost Server

Set the shell variable `NIC_APP_SERVER="NICAppServer"` and run the following command to create an NIC. **Az network nic create**

```
NSG_APP_SERVER="NsgAppServer"
az network nic create --resource-group ${RES_GROUP} \
--name ${NIC_APP_SERVER} \
--vnet-name ${VNET} --subnet ${SUBNET_APP_SERVER} \
--network-security-group ${NSG_APP_SERVER} \
--public-ip-address ${IP_APP_SERVER} \
--no-wait false

sudhakar@UrsaMajor:~/azure-projects$ NIC_APP_SERVER="NICAppServer"
sudhakar@UrsaMajor:~/azure-projects$ az network nic create --resource-group ${RES_GROUP} --name ${NIC_APP_SERVER}
--vnet-name ${VNET} --subnet ${SUBNET_APP_SERVER} \
--network-security-group ${NSG_APP_SERVER} --public-ip-address ${IP_APP_SERVER} \
--no-wait false
sudhakar@UrsaMajor:~/azure-projects$
```



STEP 12: Create an SSH key for the Mattermost and MySQL servers

Use ssh-keygen to generate an ssh key

```
SSH_KEY="SshKeyMatterMost"
```

```
ssh-keygen -t rsa -b 4096 -f ${SSH_KEY_FILE}
```

```
sudhakar@UrsaMajor:~/azure-projects$ ssh-keygen -t rsa -b 4096 -f mattermost-vm-key
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in mattermost-vm-key
Your public key has been saved in mattermost-vm-key.pub
The key fingerprint is:
SHA256:0HfCggJzLoKptoOIVnnoXBRq/oieFREqdwEvvqK/ILQ sudhakar@UrsaMajor
The key's randomart image is:
+---[RSA 4096]-----+
|  +oo.                |
| .  .*.o..o .         |
|+.++=.o o + .         |
|..*oE=. . o o         |
|..+* o S              |
|=.*.                  |
|*=.= .                |
|*+.                   |
|o=o.                  |
+---[SHA256]-----+
sudhakar@UrsaMajor:~/azure-projects$
```

STEP 13: Copy the SSH public key to Azure Resource group

Set the variable SSH_KEY and Run **"az sshkey create"** command

```
SSH_KEY="SshKeyMatterMost"
```

```
az sshkey create --name ${SSH_KEY} --public-key "@./mattermost-vm-key.pub" \
--resource-group ${RES_GROUP}
```

```
sudhakar@UrsaMajor:~/azure-projects$ SSH_KEY="SshKeyMatterMost"
sudhakar@UrsaMajor:~/azure-projects$ az sshkey create --name ${SSH_KEY} --public-key "@./mattermost-vm-key.pub" \
--resource-group ${RES_GROUP}
{
  "id": "/subscriptions/37427082-8987-4090-a942-f4eed9e71741/resourceGroups/RGMATTERMOST/providers/Microsoft.Compute/sshPublicKeys/SshKeyMatterMost",
  "location": "eastus",
  "name": "SshKeyMatterMost",
  "publicKey": "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQAC1qGQtr1uLP0LzDGakBRVddWLSPOyGdsXtqTsxuTpYdAniTo7Ua9/JI+4sTPFj4K3GV59UNS5nh6zeTsI6+5IgeHQEnupjkgfZmVWOBWtYwVKWhgEAmek9BidiVmKd33VbuOs3aN4+APYgXHfHfQz0W53YjFVZTd/5FW8gzJaQRY+Wk37yeFT+UVP0Zjaze5RkuBM/TQW4MxpkiaQFaDKrQcQjWdxjMvyeiNRej4hVAekgU3nHoAtB8abrPJMFIQn2qJz07d06Gui5Xcr4YwFkUiYDt+seZPY8btrsMf9RA6uB4LwssM3uaRGFKdnzZNOPPF1Hucz5snke3bTZq00UBZS6M1Yxzn0lIsY55v1+W5Ke5dMYaEhT86EFztbDSDJNcAwLAEWw0zyvDFFeHgy50+U3RYLnq5iuT3xGcBH4NKlJQmFOqt95Yhk7LLWrymE+PFD4pZByher8Kw0NN4g+14QXAJfmxeV2WU4jOLkAACX3+GWqFYgklYx+y0k/fWUf1bWz1WaktBboVQywrTJwTmWmWeZm33MteWchh4Wx6p6IKxa8I6MMIt9XvJWZDFMIMmE4FEMozYj0HuFWNC8RsRmCkMOMkOon/T4gUyXJkHdDnuog3q9topFV+eLSHUdzsa1PGISGysIF3bwEB7cyGw== sudhakar@UrsaMajor",
  "resourceGroup": "RGMATTERMOST",
  "tags": null,
  "type": null
}
```

Microsoft Azure Search resources, services, and docs (G+)

Home > RGMatterMost >

SshKeyMatterMost SSH key

Search Delete Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

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Export template

Support + troubleshooting

New Support Request

Essentials

Resource group (move)
[RGMatterMost](#)

Location
East US

Subscription (move)
[WhiteSnow](#)

Subscription ID
37427082-8987-4090-a942-f4eed9e71741

Tags (edit)
[Click here to add tags](#)

Public key

ssh-rsa
AAAAAB3NzaC1yc2EAAAADAQABAAQAC1qGQtr1uLP0LzDGakBRVddWLSPOyGdsXtqTsxuTpYdAniTo7Ua9/JI+4sTPFj4K3GV59UNS5nh6zeTsI6+5IgeHQEnupjkgfZmVWOBWtYwVKWhgEAmek9BidiVmKd33VbuOs3aN4+APYgXHfHfQz0W53YjFVZTd/5FW8gzJaQRY+Wk37yeFT+UVP0Zjaze5RkuBM/TQW4MxpkiaQFaDKrQcQjWdxjMvyeiNRej4hVAekgU3nHoAtB8abrPJMFIQn2qJz07d06Gui5Xcr4YwFkUiYDt+seZPY8btrsMf9RA6uB4LwssM3uaRGFKdnzZNOPPF1Hucz5snke3bTZq00UBZS6M1Yxzn0lIsY55v1+W5Ke5dMYaEhT86EFztbDSDJNcAwLAEWw0zyvDFFeHgy50+U3RYLnq5iuT3xGcBH4NKlJQmFOqt95Yhk7LLWrymE+PFD4pZByher8Kw0NN4g+14QXAJfmxeV2WU4jOLkAACX3+GWqFYgklYx+y0k/fWUf1bWz1WaktBboVQywrTJwTmWmWeZm33MteWchh4Wx6p6IKxa8I6MMIt9XvJWZDFMIMmE4FEMozYj0HuFWNC8RsRmCkMOMkOon/T4gUyXJkHdDnuog3q9topFV+eLSHUdzsa1PGISGysIF3bwEB7cyGw== sudhakar@UrsaMajor

STEP 14: Set the shell variables : VM_SIZE, IMAGE, USER

Set the following shell variables (used by VM create command)

```
sudhakar@UrsaMajor:~/azure-projects$
sudhakar@UrsaMajor:~/azure-projects$ IMAGE_VM="Ubuntu2204"
sudhakar@UrsaMajor:~/azure-projects$ VM_SIZE="Standard_B2s"
sudhakar@UrsaMajor:~/azure-projects$ USER_VM="azureuser"
sudhakar@UrsaMajor:~/azure-projects$ VM_APP_SERVER="VMAppServer"
sudhakar@UrsaMajor:~/azure-projects$ VM_DB_SERVER="VMDbServer"
```

STEP 15: Create a VM for App Server

```
az vm create --resource-group ${RES_GROUP} --name ${VM_APP_SERVER} \
--image ${IMAGE_VM} --size ${VM_SIZE} --nics ${NIC_APP_SERVER} \
--vnet-name ${VNET} --subnet ${SUBNET_DB_SERVER} \
```

```
--admin-username ${USER_VM} --ssh-key-name ${SSH_KEY} \
--public-ip-sku "BASIC"
```

```
sudhakar@UrsaMajor:~/azure-projects$ az vm create --resource-group ${RES_GROUP} --name ${VM_APP_SERVER} \
--image ${IMAGE_VM} --size ${VM_SIZE} --nics ${NIC_APP_SERVER} \
--admin-username ${USER_VM} --ssh-key-name ${SSH_KEY} \
--public-ip-sku "BASIC"
Starting Build 2023 event, "az vm/vmss create" command will deploy Trusted Launch VM by default. To know more about Trusted Launch, please visit https://docs.microsoft.com/en-us/azure/virtual-machines/trusted-launch
{
  "fqdns": "",
  "id": "/subscriptions/37427082-8987-4090-a942-f4eed9e71741/resourceGroups/RGMatterMost/providers/Microsoft.Compute/virtualMachines/VMApServer",
  "location": "eastus",
  "macAddress": "00-22-48-32-DB-B1",
  "powerState": "VM running",
  "privateIpAddress": "10.0.0.4",
  "publicIpAddress": "74.235.174.181",
  "resourceGroup": "RGMatterMost",
  "zones": ""
}
sudhakar@UrsaMajor:~/azure-projects$
```

The screenshot displays the Azure portal interface for a virtual machine named 'VMApServer'. The left sidebar shows navigation options like Overview, Activity log, Access control, and Settings. The main content area is divided into 'Essentials' and 'Properties' sections. The 'Essentials' section provides a quick overview of the VM's status (Running), location (East US), and public IP address (74.235.174.181). The 'Properties' section lists detailed information about the VM, including its operating system (Linux (ubuntu 22.04)), publisher (Canonical), offer (0001-com-ubuntu-server-jammy), plan (22_04-lts-gen2), and VM generation (V2). The 'Networking' section shows the public IP address and the virtual network/subnet (VNetMatterMost/SubnetAppServer).

Property	Value
Computer name	VMApServer
Operating system	Linux (ubuntu 22.04)
Publisher	Canonical
Offer	0001-com-ubuntu-server-jammy
Plan	22_04-lts-gen2
VM generation	V2
Public IP address	74.235.174.181 (NICAppServer interface)
Private IP address	10.0.0.4
Virtual network/subnet	VNetMatterMost/SubnetAppServer

STEP 16: Create a VM for the Database Server

```
az vm create --resource-group ${RES_GROUP} --name ${VM_DB_SERVER} \
--public-ip-address "" \
--image ${IMAGE_VM} --size ${VM_SIZE} \
--admin-username ${USER_VM} --ssh-key-name ${SSH_KEY} \
--vnet-name ${VNET} --subnet ${SUBNET_DB_SERVER}
```

```

sudhakar@UrsaMajor:~/azure-projects$ az vm create --resource-group ${RES_GROUP} --name ${VM_DB_SERVER} \
--image ${IMAGE_VM} --size ${VM_SIZE} \
--admin-username ${USER_VM} --ssh-key-name ${SSH_KEY} \
--vnet-name ${VNET} --subnet ${SUBNET_DB_SERVER}
Starting Build 2023 event, "az vm/vmss create" command will deploy Trusted Launch VM by default. To know more about Trusted Launch, please visit https://docs.microsoft.com/en-us/azure/virtual-machines/trusted-launch
It is recommended to use parameter "--public-ip-sku Standard" to create new VM with Standard public IP. Please note that the default public IP used for VM
ion will be changed from Basic to Standard in the future.
{
  "fqdns": "",
  "id": "/subscriptions/37427082-8987-4090-a942-f4eed9e71741/resourceGroups/RGMatterMost/providers/Microsoft.Compute/virtualMachines/VMDbServer",
  "location": "eastus",
  "macAddress": "00-22-48-1C-6E-39",
  "powerState": "VM running",
  "privateIpAddress": "10.0.1.4",
  "publicIpAddress": "20.25.114.144",
  "resourceGroup": "RGMatterMost",
  "zones": ""
}
sudhakar@UrsaMajor:~/azure-projects$

```

Microsoft Azure Search resources, services, and docs (G+)

Home > CreateVm-canonical.0001-com-ubuntu-server-focal-2-20230516210808 | Overview >

VMDbServer Virtual machine

Search

Connect Start Restart Stop Capture Delete Refresh Open in mobile Feedback CLI / PS

Overview

Resource group (move) [RGMatterMost](#)

Operating system: Linux (ubuntu 20.04)

Status: Running

Size: Standard B1s (1 vcpu, 1 GiB memory)

Location: East US (Zone 1)

Public IP address: 20.25.114.144

Subscription (move) [WhiteSnow](#)

Virtual network/subnet: [VNetMatterMost/SubnetDBServer](#)

Subscription ID: 37427082-8987-4090-a942-f4eed9e71741

DNS name: -

Availability zone: 1

Health state: -

Tags (edit) [Click here to add tags](#)

Properties Monitoring Capabilities (7) Recommendations Tutorials

Virtual machine		Networking	
Computer name	VMDbServer	Public IP address	-
Operating system	Linux (ubuntu 20.04)	Public IP address (IPv6)	-
Publisher	canonical	Private IP address	10.0.1.4
Offer	0001-com-ubuntu-server-focal	Private IP address (IPv6)	-
Plan	20_04-lts-gen2	Virtual network/subnet	VNetMatterMost/SubnetDBServer
VM generation	V2	DNS name	-

STEP 17: Get the public IP address of the App server

```
APP_SERVER_IP=$(az network public-ip list --resource-group ${RES_GROUP} --query [].ipAddress --output tsv)
```

```

sudhakar@UrsaMajor:~/azure-projects$ APP_SERVER_IP=$(az network public-ip list --resource-group ${RES_GROUP} --query [].ipAddress --output tsv)
sudhakar@UrsaMajor:~/azure-projects$ echo $APP_SERVER_IP
74.235.174.181
sudhakar@UrsaMajor:~/azure-projects$

```

STEP 18: Copy the SSH key to APP server.

Copy the SSH Key to APP server. This will allow us to establish SSH connections to DB server from App Server (Bastion)

```
SSH_KEY_FILE="mattermost-vm-key"
```

```
scp -i ${SSH_KEY_FILE} ${SSH_KEY_FILE} azureuser@${APP_SERVER_IP}:.ssh
```

```
sudhakar@UrsaMajor:~/azure-projects$ SSH_KEY_FILE="mattermost-vm-key"
sudhakar@UrsaMajor:~/azure-projects$ scp -i ${SSH_KEY_FILE} ${SSH_KEY_FILE} azureuser@${APP_SERVER_IP}:.ssh
mattermost-vm-key
sudhakar@UrsaMajor:~/azure-projects$
```

100% 3381 114.1KB/s 00:00

STEP 19: SSH connect to APP server

```
ssh -i ${SSH_KEY_FILE} azureuser@${APP_SERVER_IP}
```

```
sudhakar@UrsaMajor:~/azure-projects$ ssh -i ${SSH_KEY_FILE} azureuser@${APP_SERVER_IP}
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.0-1038-azure x86_64)
```

```
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/advantage
```

```
System information as of Wed May 17 01:36:35 UTC 2023
```

```
System load:  0.02490234375    Processes:            106
Usage of /:    5.0% of 28.89GB   Users logged in:      0
Memory usage:  7%              IPv4 address for eth0: 10.0.0.4
Swap usage:    0%
```

```
Expanded Security Maintenance for Applications is not enabled.
```

```
0 updates can be applied immediately.
```

```
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
```

```
Last login: Wed May 17 01:15:50 2023 from 73.159.171.229
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

STEP 20: SSH connect to DB Server from App server

Connect to the DB Server using the SSH key uploaded in the previous step. The Private IP address of the DB server is 10.0.1.4 and can be used for SSH connections.

```
ssh -i .ssh/mattermost-vm-key azureuser@10.0.1.4
```

```
azureuser@VMAppServer:~$ ssh -i .ssh/mattermost-vm-key azureuser@10.0.1.4
The authenticity of host '10.0.1.4 (10.0.1.4)' can't be established.
ED25519 key fingerprint is SHA256:8VuLHxEYcl5YC8ZNUC30KQ/vUImZ1QlbnkNM21WKRhw.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.1.4' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1038-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Wed May 17 01:40:11 UTC 2023

System load:  0.0               Processes:            101
Usage of /:   5.2% of 28.89GB   Users logged in:     0
Memory usage: 29%              IPv4 address for eth0: 10.0.1.4
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

azureuser@VMDbServer:~$
```

STEP 21: Run the following command to update

```
Sudo -s
Apt update && apt upgrade -y
```



```
azureuser@VMDbServer:~$ sudo -s
root@VMDbServer:/home/azureuser# apt update && apt upgrade -y
Hit:1 http://azure.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]
Get:6 http://azure.archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [26 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [26 kB]
Get:11 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [254 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [26 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [8628 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [5124 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [26 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [144 kB]
Get:17 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [104 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [26 kB]
Get:19 http://azure.archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [4096 kB]
Get:20 http://azure.archive.ubuntu.com/ubuntu focal-backports/main Translation-en [104 kB]
Get:21 http://azure.archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [26 kB]
Get:22 http://azure.archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [26 kB]
Get:23 http://azure.archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [8628 kB]
Get:24 http://azure.archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [5124 kB]
Get:25 http://azure.archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [26 kB]
Get:26 http://azure.archive.ubuntu.com/ubuntu focal-backports/multiverse amd64 c-n-f Metadata [26 kB]
Get:27 http://azure.archive.ubuntu.com/ubuntu focal-security/main amd64 Packages [214 kB]
Get:28 http://azure.archive.ubuntu.com/ubuntu focal-security/main Translation-en [35 kB]
Get:29 http://azure.archive.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [26 kB]
Get:30 http://azure.archive.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [4096 kB]
Get:31 http://azure.archive.ubuntu.com/ubuntu focal-security/restricted Translation-en [104 kB]
Get:32 http://azure.archive.ubuntu.com/ubuntu focal-security/universe amd64 Packages [8628 kB]
Get:33 http://azure.archive.ubuntu.com/ubuntu focal-security/universe Translation-en [5124 kB]
Get:34 http://azure.archive.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [26 kB]
Get:35 http://azure.archive.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [144 kB]
Get:36 http://azure.archive.ubuntu.com/ubuntu focal-security/multiverse Translation-en [104 kB]
Get:37 http://azure.archive.ubuntu.com/ubuntu focal-security/multiverse amd64 c-n-f Metadata [26 kB]
Fetched 24.2 MB in 4s (5723 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@VMDbServer:/home/azureuser#
```

STEP 22-1: Install the MySQL server

```
apt-get install mysql-server
```

```
root@VMDBServer:/home/azureuser# apt-get install mysql-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-7 libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libmecab2 libmecab-ipadic-utf8 mecab-utils mysql-client-8.0 mysql-client-core-8.0 mysql-common mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libwww-perl mailx tinycat
The following NEW packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-7 libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libmecab2 libmecab-ipadic-utf8 mecab-utils mysql-client-8.0 mysql-client-core-8.0 mysql-common mysql-server mysql-server-8.0
0 upgraded, 25 newly installed, 0 to remove and 0 not upgraded.
Need to get 36.8 MB of archives.
After this operation, 319 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 mysql-common all 5.8+1.0.5ubuntu2 [7496 B]
Get:2 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-core-8.0 amd64 8.0.33-0ubuntu0.2 [89.1 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-8.0 amd64 8.0.33-0ubuntu0.20.04. [89.1 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 libevent-core-2.1-7 amd64 2.1.11-stable-1 [7372 B]
Get:5 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 libevent-pthreads-2.1-7 amd64 2.1.11-stable-1 [7372 B]
Get:6 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 libmecab2 amd64 0.996-10build1 [233 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-server-core-8.0 amd64 8.0.33-0ubuntu0.2 [89.1 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-server-8.0 amd64 8.0.33-0ubuntu0.20.04. [89.1 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 libhtml-tagset-perl all 3.20-4 [12.5 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 liburi-perl all 1.76-2 [77.5 kB]
Get:11 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 libhtml-parser-perl amd64 3.72-5 [86.3 kB]
```

STEP 22-2 : Check the status of MySql Server

```
systemctl status mysql
```

```
root@VMDBServer:/home/azureuser# systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-05-17 01:51:29 UTC; 2min 21s ago
     Main PID: 2933 (mysqld)
    Status: "Server is operational"
       Tasks: 37 (limit: 1076)
      Memory: 357.0M
      CGroup: /system.slice/mysql.service
              └─2933 /usr/sbin/mysqld

May 17 01:51:28 VMDBServer systemd[1]: Starting MySQL Community Server...
May 17 01:51:29 VMDBServer systemd[1]: Started MySQL Community Server.
root@VMDBServer:/home/azureuser#
```

STEP 22-3 : Create the user 'mmuser'

Create the user 'mmuser' to be used by Mattermost as follows

```
sudo mysql
```

```
create user 'mmuser'@'%' identified by 'pi=3.14159';  
create database mattermost;  
grant all privileges on mattermost.* to 'mmuser'@'%';
```

```
root@VMDbServer:/home/azureuser# mysql  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 8  
Server version: 8.0.33-0ubuntu0.20.04.2 (Ubuntu)  
  
Copyright (c) 2000, 2023, Oracle and/or its affiliates.  
  
Oracle is a registered trademark of Oracle Corporation and/or its  
affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
  
mysql> create user 'mmuser'@'%' identified by 'pi=3.14159'  
-> ;  
Query OK, 0 rows affected (0.03 sec)  
  
mysql> create database mattermost;  
Query OK, 1 row affected (0.01 sec)  
  
mysql> grant all privileges on mattermost.* to 'mmuser'@'%';  
Query OK, 0 rows affected (0.02 sec)  
  
mysql> exit  
Bye
```

STEP 22-4 : Modify the MySQL configuration

Run the following commands to change the bind address to 0.0.0.0 from 127.0.0.1 and restart the MySQL service.

```
sed -i "s/bind-address/#bind-address/" /etc/mysql/mysql.conf.d/mysqld.cnf  
sed -i "/\[mysqld\]/abind-address = 0.0.0.0" /etc/mysql/mysql.conf.d/mysqld.cnf  
systemctl stop mysql.service  
systemctl start mysql.service
```

```

root@VMDBServer:/home/azureuser# sed -i "s/bind-address/#bind-address/" /etc/mysql/mysql.conf.d/mysqld.cnf
root@VMDBServer:/home/azureuser# sed -i "/\[mysqld\]/abind-address = 0.0.0.0" /etc/mysql/mysql.conf.d/mysqld.cnf
root@VMDBServer:/home/azureuser# vi /etc/mysql/mysql.conf.d/mysqld.cnf
root@VMDBServer:/home/azureuser# systemctl start mysql.service
root@VMDBServer:/home/azureuser# systemctl stop mysql.service
root@VMDBServer:/home/azureuser# systemctl start mysql.service

```

STEP 23-1: Update the NsgDbServer to disable the Outbound traffic to internet

The DB Server subnet no longer needs to connect to the internet as the MySQL server has been downloaded from the internet and installed. Run “curl https://www.microsoft.com” to verify the internet connection from VMDBServer.

```
curl https://www.microsoft.com
```



```

azureuser@VMDBServer:~$ curl https://www.microsoft.com
<html><head><title>Microsoft Corporation</title><meta http-equiv="X-UA-Compatible" content="IE=EmulateIE7"></meta><meta http-equiv="Content-Type" content="text/html; charset=utf-8"></meta><meta name="SearchTitle" content="Microsoft.com" scheme=""></meta><meta name="Description" content="Get product information, support, and news from Microsoft." scheme=""></meta><meta name="Title" content="Microsoft.com Home Page" scheme=""></meta><meta name="Keywords" content="Microsoft, product, support, help, training, Office, Windows, software, download, trial, preview, demo, business, security, update, free, computer, PC, server, search, download, install, news" scheme=""></meta><meta name="SearchDescription" content="Microsoft.com Homepage" scheme=""></meta></head><body><p>Your current User-Agent string appears to be from an automated process, if this is incorrect, please click this link:<a href="http://www.microsoft.com/en/us/default.aspx?redir=true">Update States English Microsoft Homepage</a></p></body></html>
azureuser@VMDBServer:~$

```

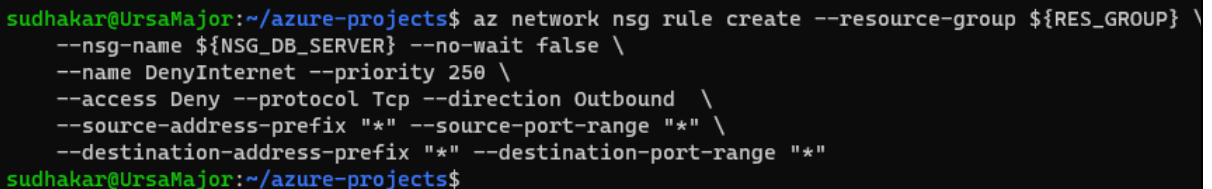
STEP 23-2: Create an outbound rule to deny internet connections for NsgDbServer

Log out from the NsgDbServer and from the Dev Console run the following command.

```

az network nsg rule create --resource-group ${RES_GROUP} \
  --nsg-name ${NSG_DB_SERVER} --no-wait false \
  --name DenyInternet --priority 250 \
  --access Deny --protocol Tcp --direction Outbound \
  --source-address-prefix "*" --source-port-range "*" \
  --destination-address-prefix "*" --destination-port-range "*"

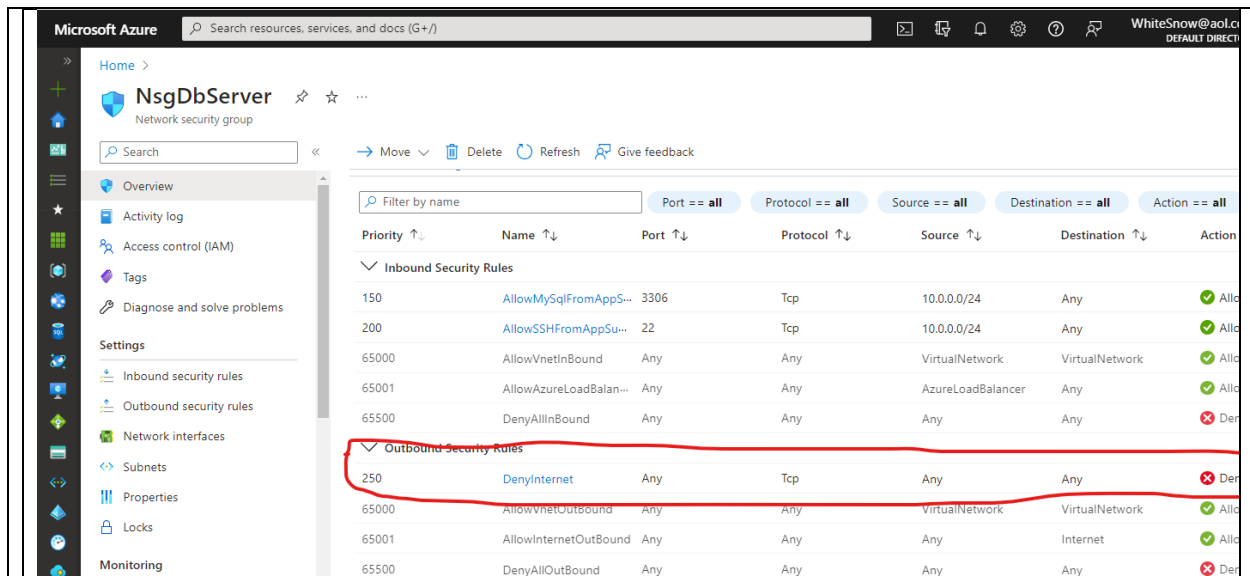
```



```

sudhakar@UrsaMajor:~/azure-projects$ az network nsg rule create --resource-group ${RES_GROUP} \
  --nsg-name ${NSG_DB_SERVER} --no-wait false \
  --name DenyInternet --priority 250 \
  --access Deny --protocol Tcp --direction Outbound \
  --source-address-prefix "*" --source-port-range "*" \
  --destination-address-prefix "*" --destination-port-range "*"
sudhakar@UrsaMajor:~/azure-projects$

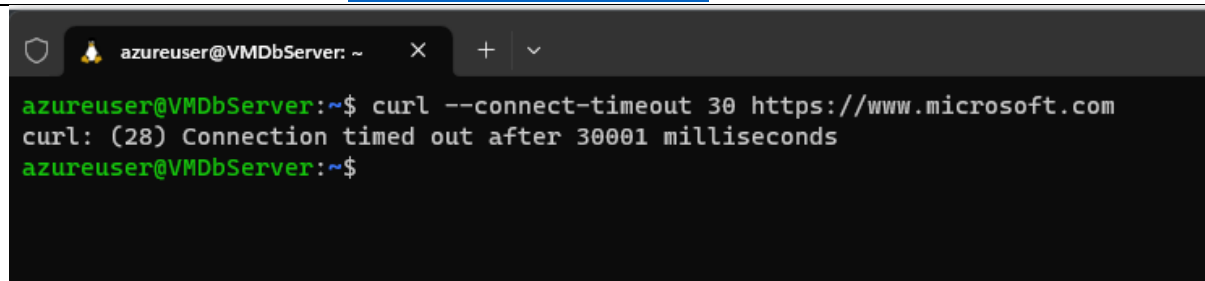
```



STEP 23-3: Login to VMDBServer and verify the internet connection.

The following command times out as the outbound rule prevents the internet connections

```
curl --connect-timeout 30 https://www.microsoft.com
```



Step 24: Login to App server and run Update and Upgrade

and do APT upgrade the App Server

Update & Upgrade the APP Server

```
apt update && apt upgrade -y
```

```

azureuser@VMAppServer:~$ sudo -s
azureuser@VMAppServer:~$ sudo -s
root@VMAppServer:/home/azureuser# apt update && apt upgrade -y
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://azure.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:6 http://azure.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [604 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [170 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [14.4 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [898 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [184 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [18.4 kB]
Get:17 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [35.3 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [8452 B]
Get:19 http://azure.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [40 B]

```

STEP 25: Add the Mattermost Server PPA repository.

The installation instructions are based on: <https://docs.mattermost.com/install/installing-ubuntu-2004-LTS.html>

```
curl -o- https://deb.packages.mattermost.com/repo-setup.sh | sudo bash -s mattermost
```

```

root@VMAppServer:/home/azureuser# curl -o- https://deb.packages.mattermost.com/repo-setup.sh | sudo bash -s mattermost
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 6078 100 6078    0     0  47728      0 --:--:-- --:--:-- --:--:-- 47858
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease
Get:5 https://deb.packages.mattermost.com jammy InRelease [3956 B]
Get:6 https://deb.packages.mattermost.com jammy/main amd64 Packages [8711 B]
Fetched 12.7 kB in 1s (24.8 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
root@VMAppServer:/home/azureuser#

```


STEP 26: Install the Mattermost server

```
sudo apt install mattermost -y
```

```
root@VMAppServer:/home/azureuser# apt install mattermost -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  mattermost
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 407 MB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 https://deb.packages.mattermost.com jammy/main amd64 mattermost amd64 7.10.0-0 [407 MB]
Fetched 407 MB in 10s (39.2 MB/s)
Selecting previously unselected package mattermost.
(Reading database ... 60404 files and directories currently installed.)
Preparing to unpack .../mattermost_7.10.0-0_amd64.deb ...
Unpacking mattermost (7.10.0-0) ...
Setting up mattermost (7.10.0-0) ...
Created symlink /etc/systemd/system/multi-user.target.wants/mattermost.service → /lib/systemd/system/mattermost.ser
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

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.
root@VMAppServer:/home/azureuser#
```

STEP 27: Install a configuration file from the default configuration and assign correct permissions.

```
install -C -m 600 -o mattermost -g mattermost /opt/mattermost/config/config.defaults.json
/opt/mattermost/config/config.json
```

Location of config file: /opt/mattermost/config/config.json

```
root@VMAppServer:/home/azureuser# ll /opt/mattermost/config/config.json
-rw----- 1 mattermost mattermost 20347 May 17 03:59 /opt/mattermost/config/config.j
root@VMAppServer:/home/azureuser#
```

STEP 28: Modify the config.json using vi or other editor as follows

Set the `SQLSettings.DriverName` to "mysql"

Set the `SQLSettings.DataSource` to

`"mmuser:pi=3.14159@tcp(10.0.1.4:3306)/mattermost?charset=utf8mb4,utf8\u0026writeTimeout=30s"`

This is the connection string to MySQL installed on the private subnet.

10.0.1.4 is the private IP address of the MySQL server

Set the `ServiceSettings.SiteURL` to <http://74.235.174.181> (public IP)

```
}  
"SqlSettings": {  
  "DriverName": "mysql",  
  "DataSource": "mmuser:pi=3.14159@tcp(10.0.1.4:3306)/mattermost?charset=utf8mb4,utf8\u0026writeTimeout=30s",  
  "DataSourceReplicas": [],  
  "DataSourceSearchReplicas": [],  
  "MaxIdleConns": 20,  
  "ConnMaxLifetimeMilliseconds": 3600000,  
  "ConnMaxIdleTimeMilliseconds": 300000,  
  "MaxOpenConns": 100  
}
```

```
{  
  "ServiceSettings": {  
    "SiteURL": "http://74.235.174.181",  
    "WebSocketURL": "",  
    "LicenseFileLocation": ""  
  }  
}
```

STEP 29: Start the Mattermost server and enable the Mattermost server to start on system boot.

```
sudo systemctl start mattermost  
systemctl enable mattermost.service
```



```

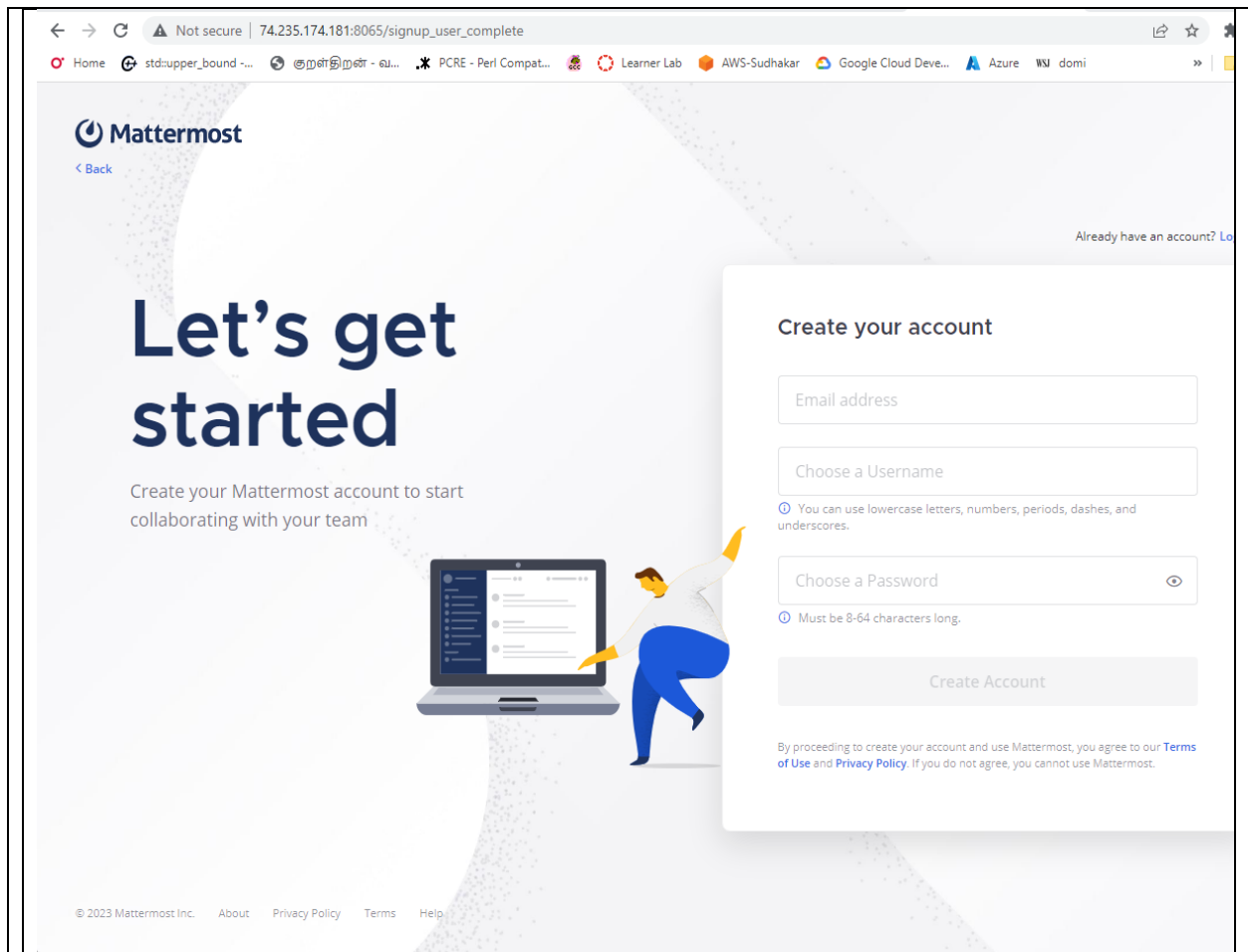
root@VMAppServer:/home/azureuser# systemctl start mattermost
Warning: The unit file, source configuration file or drop-ins of mattermost.service changed on disk. Run 'systemctl daemon-reload' to reload units.

root@VMAppServer:/home/azureuser#
root@VMAppServer:/home/azureuser# curl http://localhost:8065
<!doctype html><html lang="en"><head><meta charset="utf-8"><meta name="viewport" content="width=device-width,initial-
le=1,maximum-scale=1,user-scalable=0"><meta name="robots" content="noindex, nofollow"><meta name="referrer" content="
referrer"><title>Mattermost</title><meta name="mobile-web-app-capable" content="yes"><meta name="application-name" co
nt="Mattermost"><meta name="format-detection" content="telephone=no"><link rel="icon" type="image/png" href="/static/
ges/favicon/favicon-default-16x16.png" sizes="16x16"><link rel="icon" type="image/png" href="/static/images/favicon/f
con-default-24x24.png" sizes="24x24"><link rel="icon" type="image/png" href="/static/images/favicon/favicon-default-3
2.png" sizes="32x32"><link rel="icon" type="image/png" href="/static/images/favicon/favicon-default-64x64.png" sizes=
x64"><link rel="icon" type="image/png" href="/static/images/favicon/favicon-default-96x96.png" sizes="96x96"><link re
stylesheet" class="code_theme"><style>.error-screen{font-family:'Helvetica Neue',Helvetica,Arial,sans-serif;padding-t
50px;max-width:750px;font-size:14px;color:#333;margin:auto;display:none;line-height:1.5}.error-screen h2{font-size:30
font-weight:400;line-height:1.2}.error-screen ul{padding-left:15px;line-height:1.7;margin-top:0;margin-bottom:10px}.e
r-screen hr{color:ddd;margin-top:20px;margin-bottom:20px;border:0;border-top:1px solid #eee}.error-screen-visible{di
ay:block}</style><meta http-equiv="Content-Security-Policy" content="script-src 'self' cdn.rudderlabs.com/ js.stripe.
/v3"><script defer="defer" src="/static/main.b29dc78a3859ff5e15cf.js"></script><script defer="defer" src="/static/rem
entry.js?bt=1681402592246"></script><meta name="apple-mobile-web-app-title" content="Mattermost" /><meta name="apple
bile-web-app-capable" content="yes" /><meta name="apple-mobile-web-app-status-bar-style" content="default" /><link re
apple-touch-icon" sizes="76x76" href="/static/icon_76x76.png" /><link rel="apple-touch-icon" sizes="72x72" href="/sta
/icon_72x72.png" /><link rel="apple-touch-icon" sizes="60x60" href="/static/icon_60x60.png" /><link rel="apple-touch-
n" sizes="57x57" href="/static/icon_57x57.png" /><link rel="apple-touch-icon" sizes="152x152" href="/static/icon_152x
.png" /><link rel="apple-touch-icon" sizes="144x144" href="/static/icon_144x144.png" /><link rel="apple-touch-icon" s
s="120x120" href="/static/icon_120x120.png" /><link rel="manifest" href="/static/manifest.json" /></head><body class=
nt--open_sans enable-animations"><div id="root"><div class="error-screen"><h2>Cannot connect to Mattermost</h2><hr><
e're having trouble connecting to Mattermost. If refreshing this page (Ctrl+R or Command+R) does not work, please ver
that your computer is connected to the internet.</p><br></div><div class="loading-screen" style="position:relative"
div class="loading__content"><div class="round round-1"></div><div class="round round-2"></div><div class="round round
"></div></div></div><div id="root-portal"></div><noscript>To use Mattermost, please enable JavaScript.</noscript
body></html>root@VMAppServer:/home/azureuser# systemctl enable mattermost.service
root@VMAppServer:/home/azureuser#

```

STEP 30: Open the Mattermost URL

<http://74.235.174.181:8065/>



STEP 31: Create the first user and the first user has the admin privileges.

74.235.174.181:8065/admin_console/user_management/users

Homestd:upper_bound - ...சுற்றுகிறேன் - வ...PCRE - Perl Compat...Learner LabAWS-SudhakarGoogle Cloud Deve...AzureWSU domiOther boo

Preview Mode: Email notifications have not been configured.

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User Status: All Users

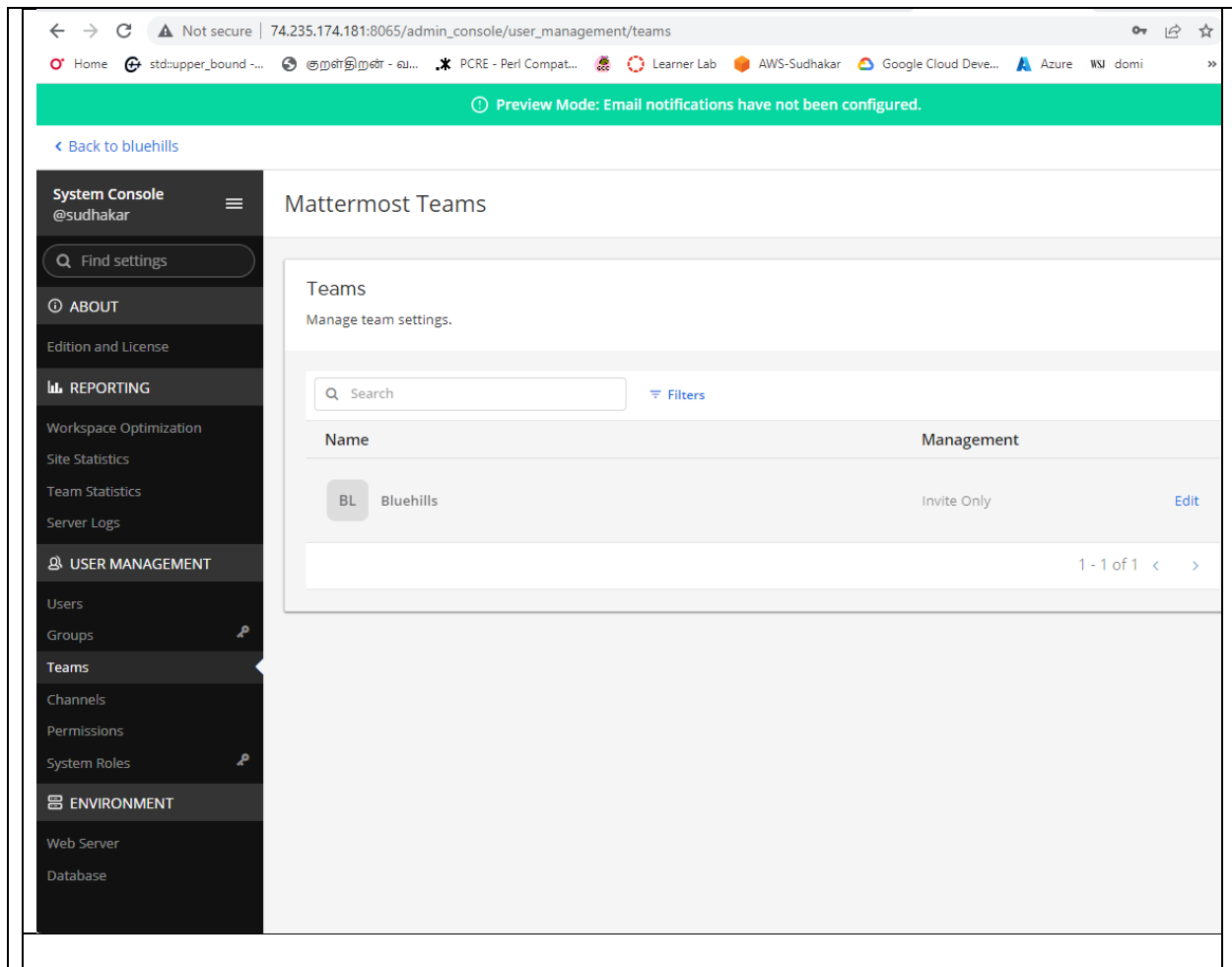
1 user

@sudhakar

System Admin

Email: sudhakar.balagurusamy@gmail.com

Sign-in Method: Email, User ID: gci555nhhbtuxtgif3x59frfyw



STEP 32: Configure Mattermost server to store the data in an AWS S3 bucket.

The following screen print shows the configuration of storage to use the S3 bucket:

arn:aws:s3:::sudhakar-content-store

←

→

↺

Not secure | 74.235.174.181:8065/admin_console/environment/file_storage

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Emoji

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Email

Password

MFA

AD/LDAP

SAML 2.0

GitLab

OpenID Connect

Guest Access

PLUGINS

Plugin Management

File Storage

File Storage System:

Amazon S3

Storage system where files and image attachments are saved.

Selecting "Amazon S3" enables fields to enter your Amazon credentials and bucket details.

Selecting "Local File System" enables the field to specify a local file directory.

Local Storage Directory:

./data/

Directory to which files and images are written. If blank, defaults to ./data/.

Maximum File Size:

100

Maximum file size for message attachments in megabytes. Caution: Verify server memory can support your setting choice. Large file sizes increase the risk of server crashes and failed uploads due to network interruptions.

Enable document search by content:

☒ true ☐ false

When enabled, supported document types are searchable by their content. Search results for existing documents may be incomplete until a data migration is executed.

Enable searching content of documents within ZIP files:

☐ true ☒ false

When enabled, content of documents within ZIP files will be returned in search results. This may have an impact on server performance for large files.

Amazon S3 Bucket:

sudhakar-content-store

Name you selected for your S3 bucket in AWS.

Amazon S3 Path Prefix:

E.g.: "subdir1" or you can leave it empty.

Prefix you selected for your S3 bucket in AWS.

Amazon S3 Region:

us-east-1

AWS region you selected when creating your S3 bucket. If no region is set, Mattermost attempts to get the appropriate region from AWS, or sets it to "us-east-1" if none found.

Amazon S3 Access Key ID:

AKIAJLWML4GQSLKGOXNV

(Optional) Only required if you do not want to authenticate to S3 using an IAM role. Enter the Access Key ID provided by your Amazon EC2 administrator.

Amazon S3 Endpoint:

s3.amazonaws.com

Hostname of your S3 Compatible Storage provider. Defaults to "s3.amazonaws.com".

Amazon S3 Secret Access Key:

GRdPX46yEZl6TED3SeddKs25ENX9Ys0mk3P0Mcq5

(Optional) The secret access key associated with your Amazon S3 Access Key ID.

Enable Secure Amazon S3 Connections:

☐ true ☒ false

When false, allow insecure connections to Amazon S3. Defaults to secure connections only.

Enable Amazon S3 Debugging:

☐ true ☒ false

(Development Mode) When true, log additional debugging information to the system logs.

Test Connection

✓ Connection was successful

STEP 33: Delete the Resource Group RGMatterMost

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation links for Home, Resource groups, Overview, Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Deployments, Security, Policies, Properties, Locks, Cost Management, Cost analysis, Cost alerts (preview), Budgets, Advisor recommendations, Monitoring, and Insights (preview). The main content area displays the 'RGMatterMost' resource group details, including Subscription (WhiteSnow), Subscription ID (37427082-8987-4090-a942-f4eed9e71741), and Tags. The 'Resources' tab is selected, showing a list of 13 resources. The 'Delete a resource group' dialog is open on the right, listing the resource group to be deleted and the 13 dependent resources to be deleted. The resources are listed in a table with columns for Name and Resource type. The dialog also includes a checkbox for 'Apply force delete for selected Virtual machines and Virtual machine scale sets' and a confirmation step where the user enters the resource group name 'RGMatterMost'.

Delete a resource group

The following resource group and all its dependent resources will be permanently deleted.

Resource group to be deleted

RGMatterMost

Dependent resources to be deleted (13)

All dependent resources, including hidden types, are shown

Name	Resource type
IPAppServer	Public IP address
NICAppServer	Network interface
NsgAppServer	Network security group
NsgDbServer	Network security group
SshKeyMatterMost	SSH key
VMAppServer	Virtual machine
VMAppServer_OsDisk_1_e05ac0838f46476793	Disk
VMDbServer	Virtual machine

☒ Apply force delete for selected Virtual machines and Virtual machine scale sets

Enter resource group name to confirm deletion *














RGMatterMost

Delete **Cancel**

Delete a resource group



All dependent resources, including hidden types, are shown


Name	Resource type
 IPAppServer	Public IP address
 NICAppServer	Network interface
 NsgAppServer	Network security group
 NsgDbServer	Network security group
 SshKeyMatterMost	SSH key
 VMAppServer	Virtual machine
 VMAppServer	Virtual machine
 VMDbServer	Virtual machine
 vmdbserver2	Virtual machine
 VMDbServer	Virtual machine
 VMDbServer	Network security group
 VMDbServerPublicIP	Public IP address
 VNetMatterMost	Virtual network

Delete confirmation

Deleting this resource group and its dependent resources is a permanent action and cannot be undone.

Delete

Go back

☒ Apply force delete for selected Virtual machines and Virtual machine scale sets 

Enter resource group name to confirm deletion *

RGMatterMost

Delete

Cancel

