

Creating a VM using Azure

Creating the VM manually on Azure

After creating an account on Azure with my personal email (while waiting for my PNC credentials to get processed), I used the free services page on azure portal (<https://go.microsoft.com/fwlink/?linkid=859151>) to create a Linux Virtual Machine.

The details of the machine I created are shown below:

Create a virtual machine

✓ Validation passed

Basics Tags Review + create

⚠ **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.

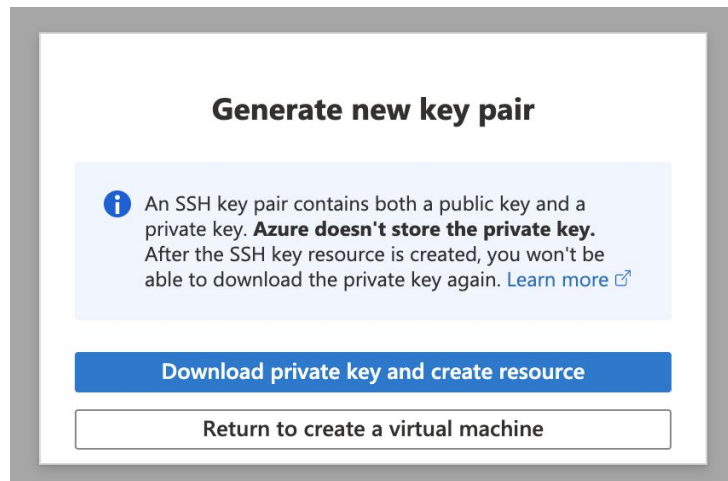
Ubuntu Server 16.04-LTS
Image

Standard B1s
1 vcpu, 1 GiB memory

Basics

Subscription	Free Trial
Resource group	pncvm_group
Virtual machine name	pncvm
Region	West US 2
Image	Ubuntu Server 16.04-LTS - Gen1
Size	Standard B1s (1 vcpu, 1 GiB memory)
Authentication type	SSH public key
Username	azureuser
Key pair name	pncvm_key
Public inbound ports	SSH
Azure Spot	No

After selecting “create”, I was prompted to generate and save the key-value pair to my computer



After this the VM began to deploy.

... Deployment is in progress



Deployment name: CreateVm-canonical.UbuntuServer-16.04-LTS-2...
Subscription: [Free Trial](#)
Resource group: [pncvm](#)

Start time: 1/19/2021, 2:56:37 PM
Correlation ID: 74ad9bb9-2c99-4435-9dc5-31b18dad8584

And as soon as it was complete, I could see it in my dashboard of VMs

✓ Your deployment is complete



Deployment name: CreateVm-canonical.UbuntuServer-16.04-LTS-2...
Subscription: [Free Trial](#)
Resource group: [pncvm](#)

Start time: 1/19/2021, 2:56:37 PM
Correlation ID: 74ad9bb9-2c99-4435-9dc5-31b18dad8584

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i Try the new virtual machine resource browser! This experience is faster and has improved sorting and filtering capabilities. Please note that the new experience will not show classic virtual machines and does not include support for some columns such as maintenance status.

Subscriptions: Free Trial – Don't see a subscription? [Open Directory](#) + [Subscription settings](#)

Filter by name... All resource groups ▾ All types ▾ All locations ▾ All tags ▾ No grouping ▾

1 items

<input type="checkbox"/> Name ↑↓	Type ↑↓	Status	Resource group ↑↓	Location ↑↓	Source	Maintenance status	Subscription ↑↓	
<input type="checkbox"/> pncvm	Virtual machine	Creating	pncvm	West US 2	Marketplace	-	Free Trial	...

Connecting to the Virtual Machine from my computer

Initially I tried to use the instructions found here

<https://docs.microsoft.com/en-us/azure/virtual-machines/ssh-keys-portal> to use my SSH key to connect to my VM using 'ssh -i <path-to-key-file> <username>@<VM's-IP-address>'.

I got this error:

```
priyakanipakam@Priyas-MBP-2 virtualmachine % ssh -i pncvm_key_0119.pem azureuser@52.183.85.79
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@                WARNING: UNPROTECTED PRIVATE KEY FILE!                @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
Permissions 0644 for 'pncvm_key_0119.pem' are too open.
It is required that your private key files are NOT accessible by others.
This private key will be ignored.
Load key "pncvm_key_0119.pem": bad permissions
azureuser@52.183.85.79: Permission denied (publickey).
```

This was because you need to switch the file with the key to a read only file for security reasons. I did this using the command "chmod 400 <file-name>.pem". After this, I was able to connect to my VM.

```
priyakanipakam@Priyas-MBP-2 virtualmachine % ssh -i pncvm_key_0119.pem azureuser@52.183.85.79
Welcome to Ubuntu 16.04.7 LTS (GNU/Linux 4.15.0-1103-azure x86_64)

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

0 packages can be updated.
0 of these updates are security updates.

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@pncvm:~$
```

Creating a VM using terraform

In order to explore how we could use automation to create VMs in azure, I will create a VM using terraform.

About terraform

- It is used for provisioning and managing cloud infrastructure. It codifies infrastructure in configuration files that describe the topology of cloud resources.

- Terraform CLI provides a simple mechanism to deploy and version the configuration files to Azure.

Instructions:

<https://docs.microsoft.com/en-us/azure/developer/terraform/create-linux-virtual-machine-with-infrastructure>

First I installed terraform into my system (MacOS)

1. `brew tap hashicorp/tap`
2. `brew install hashicorp/tap/terraform`

To verify installation, run "terraform -help"

```
[priyakanipakam@Priyas-MBP-2 azure-docs % terraform -help
Usage: terraform [global options] <subcommand> [args]

The available commands for execution are listed below.
The primary workflow commands are given first, followed by
less common or more advanced commands.

Main commands:
  init          Prepare your working directory for other commands
  validate      Check whether the configuration is valid
  plan          Show changes required by the current configuration
  apply         Create or update infrastructure
  destroy       Destroy previously-created infrastructure

All other commands:
  console       Try Terraform expressions at an interactive command prompt
  fmt           Reformat your configuration in the standard style
  force-unlock  Release a stuck lock on the current workspace
  get           Install or upgrade remote Terraform modules
  graph         Generate a Graphviz graph of the steps in an operation
  import        Associate existing infrastructure with a Terraform resource
  login         Obtain and save credentials for a remote host
  logout        Remove locally-stored credentials for a remote host
  output        Show output values from your root module
  providers     Show the providers required for this configuration
  refresh       Update the state to match remote systems
  show          Show the current state or a saved plan
  state         Advanced state management
  taint         Mark a resource instance as not fully functional
  untaint       Remove the 'tainted' state from a resource instance
  version       Show the current Terraform version
  workspace     Workspace management

Global options (use these before the subcommand, if any):
  -chdir=DIR    Switch to a different working directory before executing the
                given subcommand.
  -help         Show this help output, or the help for a specified subcommand.
  -version      An alias for the "version" subcommand.
```

Next, I installed azure cli into my system

1. `brew update && brew install azure-cli`
2. To set up account - `az login`

```
[priyakanipakam@Priyas-MBP-2 azure-docs % az login]
The default web browser has been opened at https://login.microsoftonline.com/mon/oauth2/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`.
You have logged in. Now let us find all the subscriptions to which you have access...
The following tenants don't contain accessible subscriptions. Use 'az login --allow-no-subscriptions' to have tenant level access.
c10cd415-1635-4d79-9e32-262b326d1f28 'my team'
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "273e4da0-c196-4c65-b234-56a0dc18c5a5",
    "id": "3fa40d5c-dbaa-49f0-8620-d88fea24f13b",
    "isDefault": true,
    "managedByTenants": [],
    "name": "Free Trial",
    "state": "Enabled",
    "tenantId": "273e4da0-c196-4c65-b234-56a0dc18c5a5",
    "user": {
      "name": "priyarkan@gmail.com",
      "type": "user"
    }
  }
]
```

Then, I created the file shown in these [instructions](#). I then moved into the directory with the file `terraform_azure.tf`.

Then I ran the following

1. `terraform init`
2. `terraform plan`
3. `terraform apply` - this step builds the infrastructure in azure

Below you can see the vm “myVM” shown in the Azure portal.

2 items							
<input type="checkbox"/> Name ↑	Type ↑	Status	Resource group ↑	Location ↑	Source	Maintenance status	Subscription ↑
<input type="checkbox"/> myVM	Virtual machine	Running	myResourceGroup	East US	Marketplace	-	Free Trial ...
<input type="checkbox"/> pncvm	Virtual machine	Running	PNCVM	West US 2	Marketplace	-	Free Trial ...

I found the public IP address through the interface on the portal (in myVM/overview). However, I was getting the error “Permission denied (publickey)”


```

priyakanipakam@Priyas-MBP-2 azure-docs % ssh azureuser@52.170.62.155
The authenticity of host '52.170.62.155 (52.170.62.155)' can't be established.
ECDSA key fingerprint is SHA256:P//cWZ2WmKXTys2hZUETiQyatm5gEscM5JhwTFqXkE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '52.170.62.155' (ECDSA) to the list of known hosts.
azureuser@52.170.62.155: Permission denied (publickey).
priyakanipakam@Priyas-MBP-2 azure-docs % ssh azureuser@52.170.62.155
azureuser@52.170.62.155: Permission denied (publickey).

```

When creating the VM using terraform, I couldn't find the private key file stored anywhere. However, when I ran "terraform apply" the output had the following private key:

```

tls_private_key = <<E0T
-----BEGIN RSA PRIVATE KEY-----
MIIEKQIBAAKCAgEAmo9HFsg9Z29zLxXPNRr6V0/B04vZ8Z22CgAc2ceG3eAqeDxH
CcoX36qdAq00ZrIsey4H79jeVBASG5k8Z0ycCLyKACnrazu7icTcqEoKRCwG1Nw7
3yFDfkyhcEv83n67yKFCBWQWqnrPL7/udMEZG2LJM/hoRoZuWNITFaY4KbfIddPK
kEfdcfUhcqE2N80WsLZmwmIu/HpHrzJ5jUmN1VDtfDkkUrc6Mijh1EoIZ9vqjcbA
HQEXy52dVvS+vo6NypU5utZddLKiB8iLSqJp3LjL6k7x+NC9gVMH/j273anhDY4D
f3U2Lgu1WbINZYbE2RvnMLxdYzVUNn5juIo155Q8Ux9oXcoeJPKF7nngcX0digMH
ofSQneyhn/CxZmn/87090kNfxbbsXovpyglQvL/cN/quyiAyEAnaEen1Gda2zVT1
Z+2J1o8UUVLZTwh2WJM57DbIhxsabQsHsb2xJIOCadmXBDKNN+444f1YUZmBsw0Z
VYtuyiyvXiN7Zze8HSZQF1V0mt4csoPZ1Nd//c5sp+kZJg4fm6UnyttSLc8FhVF1
VHD677HDC0J4eIfkepVosFXkx82KJYX/Qq3RaoeiDTOMepQH+jGhm3jgzRodu93
rBSc25GXA61JeBngHId4MmpEJf7jufiv44y1qt06js8VFJnxkhjQUvmkskCAwEA
AQKCAgARhv4Az2RnCdX+GPM0iqipDhpfeZSVmdTy/WBIMiBR0QKX7/3+VjSu4KI9
k3bFzp7MuU0dJ3LPBa0IDanum0Z21yrVkdHQr01tKi37x6myYWu9pdwESb1lsTr9
iSB7+tNaxUi/Y8J0Qu8L8zAPfXZjbKh0hE808F/DIs+XP0pRkM3izsnB4uRx7+KD
3VUTrd2A3K66i1fYUwaaY15opM5YiwlKtv60a3Dx907WBT30ckwEYB0dNmgE71Nh

```

I copied it into a file in the directory I was in and called it key.pem and changed it to read only (using chmod 400 key.pem).

Then to ssh to connect to the VM using the following command:

```
ssh -i key.pem azureuser@52.170.62.155
```

```

priyakanipakam@Priyas-MBP-2 azure-docs % ssh -i key.pem azureuser@52.170.62.155
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 5.4.0-1036-azure x86_64)

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

System information as of Wed Jan 20 23:49:05 UTC 2021

System load:  0.0          Processes:    109
Usage of /:   4.5% of 28.90GB Users logged in:  0
Memory usage: 5%          IP address for eth0: 10.0.1.4
Swap usage:  0%

0 packages can be updated.
0 of these updates are security updates.

New release '20.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Wed Jan 20 23:41:31 2021 from 23.114.170.181
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

azureuser@myvm:~$

```