DEVOPS with MULTI-CLOUD
Practice Tasks

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Course **:** DevOps with Multi-Cloud
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TASK-18 :- Auto Scaling.

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Objective :-

To automatically increase or decrease resources based on workload demand in order to maintain performance and optimize cost.

Auto Scaling :-

Auto Scaling in Azure is a cloud capability that dynamically adjusts the number of running instances (VMs or services) based on predefined rules like CPU usage or schedule, ensuring high availability and cost efficiency.

→ There are two types of scalings :-

- Vertical Scaling :-
  - It will upgrade the h/w size
  - Eg:- standard b1_s ⇒ d2s_v3
  - 1cpu & 1gb RAM ⇒ 2cpu & 8gb RAM
  - For this type of upgrade we will use vertical scaling.
  - Vertical scaling mainly for the db related server, file server.

- Horizontal Scaling :-
  - Adding machines automatically is called horizontal scaling.
  - In horizontal scaling we use Vmss.
  - The horizontal Scaling is used for web servers(since they don't have data, they have only web pages.)
  - When there is a huge load the machines are automatically created and when load is decreased the vm's are deleted.

→ Why vmss is only for web servers, why not DB?.

- if there is a huge load on servers, the instances will create automatically, then also the data will be stored.
- So if we use this for DB, the data will be lost, because after the decrease of load the instances will be deleted automatically.

→ In the vmss the machines will be added and deleted automatically, this process is done based on the "scaling conditions".

→ we use cpu metric condition in the scaling condition i.e

Eg:-

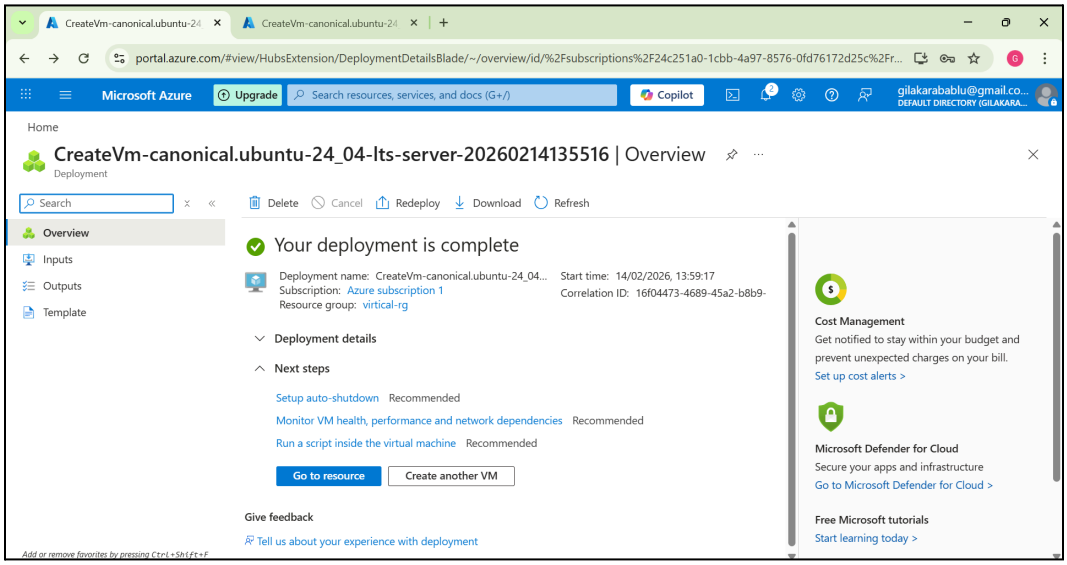
if cpu% is >= 70% then 3 machines should add

if cpu% is <= 20% then 3 machines should delete.

□ Vertical scaling :-

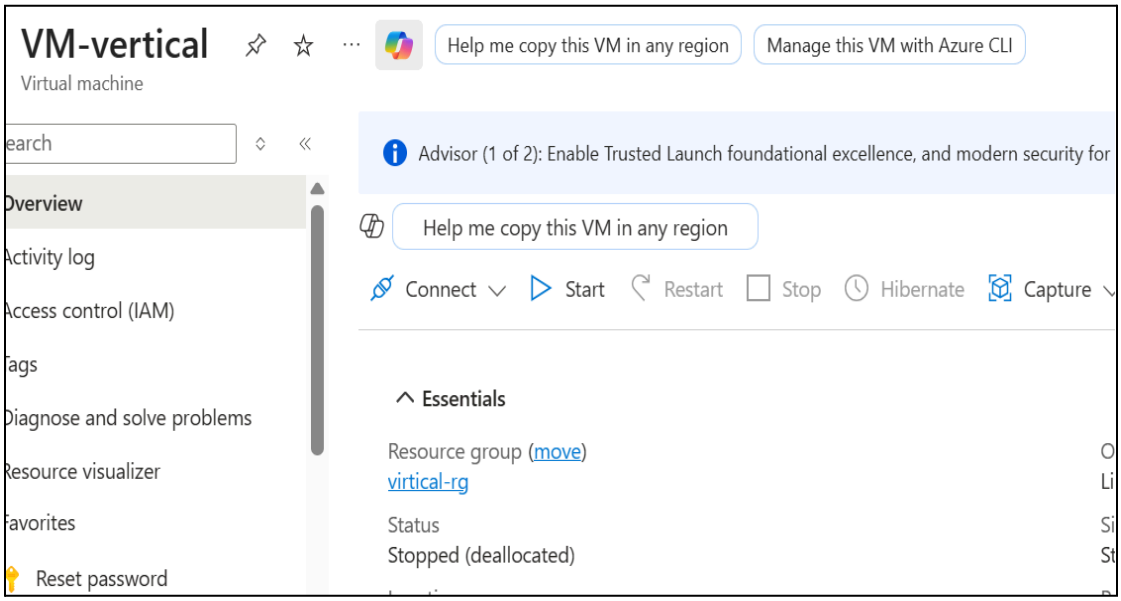
→ Create a virtual machine,

Vertical-rg > vm-vertical > os-linux/windows.



fig(1) virtual machine is created.

→ To upgrade the size, we need to stop the machine and upgrade(to ignore any issues.)



fig(2) the machine is stopped.

Operating system
Linux

Size
Standard DC2s v3 (2 vcpus, 16 GiB memory)

Primary NIC public IP
20.120.76.137

1 associated public IPs

Virtual network/subnet
vnet-eastus/snet-eastus-1

DNS name
Not configured

fig(3) before upgrade.

Operating system
Linux

Size
Standard DC4ds v3 (4 vcpus, 32 GiB memory)

Primary NIC public IP
20.120.76.137

1 associated public IPs

Virtual network/subnet
vnet-eastus/snet-eastus-1

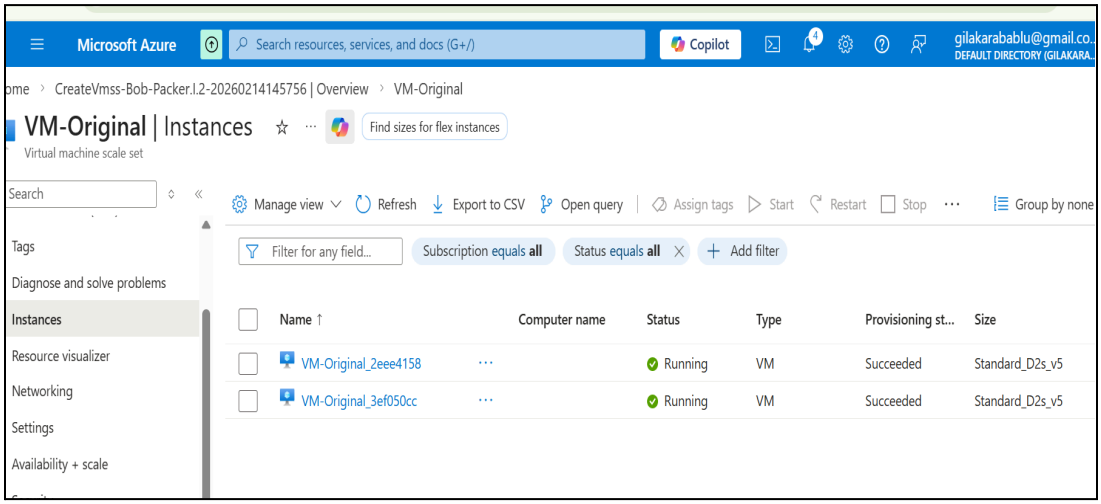
DNS name
Not configured

fig(4) after upgrade.

Horizontal Scaling :-

→ To implement the horizontal scaling we use the vmss - Virtual Machine Scale Set.

Search vmss > +create



fig(5) vmss is created.

→ we can see defaultly 2 instances are created, coz it is default rule we can change it in scaling condition.

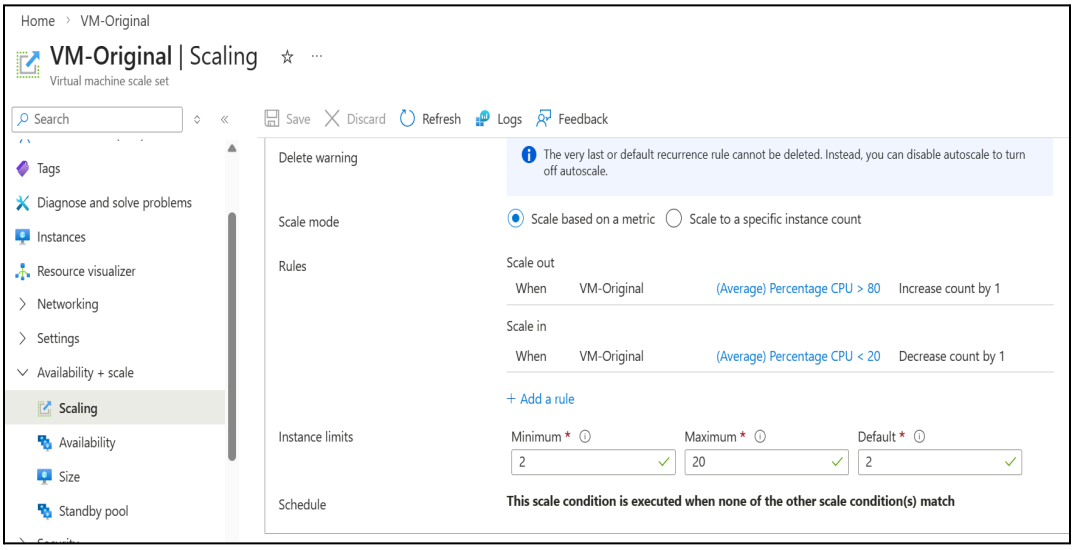
→ To change :-

Original vm > scaling > configure.

Change (instance limits)

Min - 1, max - 20, default - 1

→ now there will be only one instance.



fig(6) scaling in vmss.

→ writing scaling condition :-

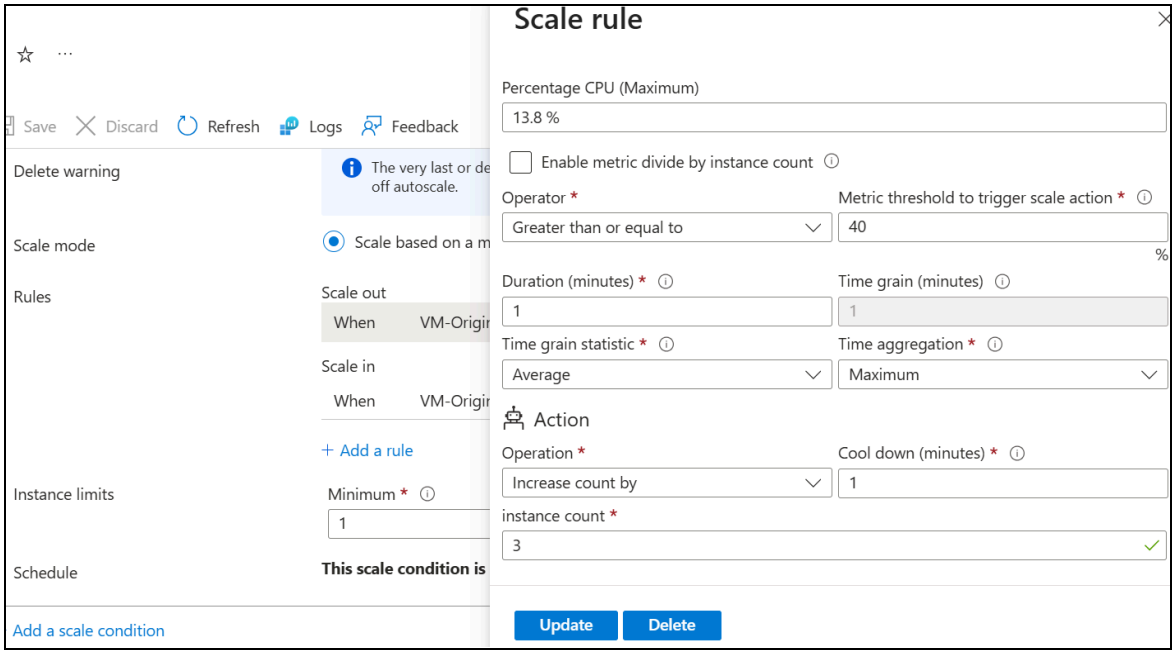
Original vm > scaling > configure > default condition

Scale out :-

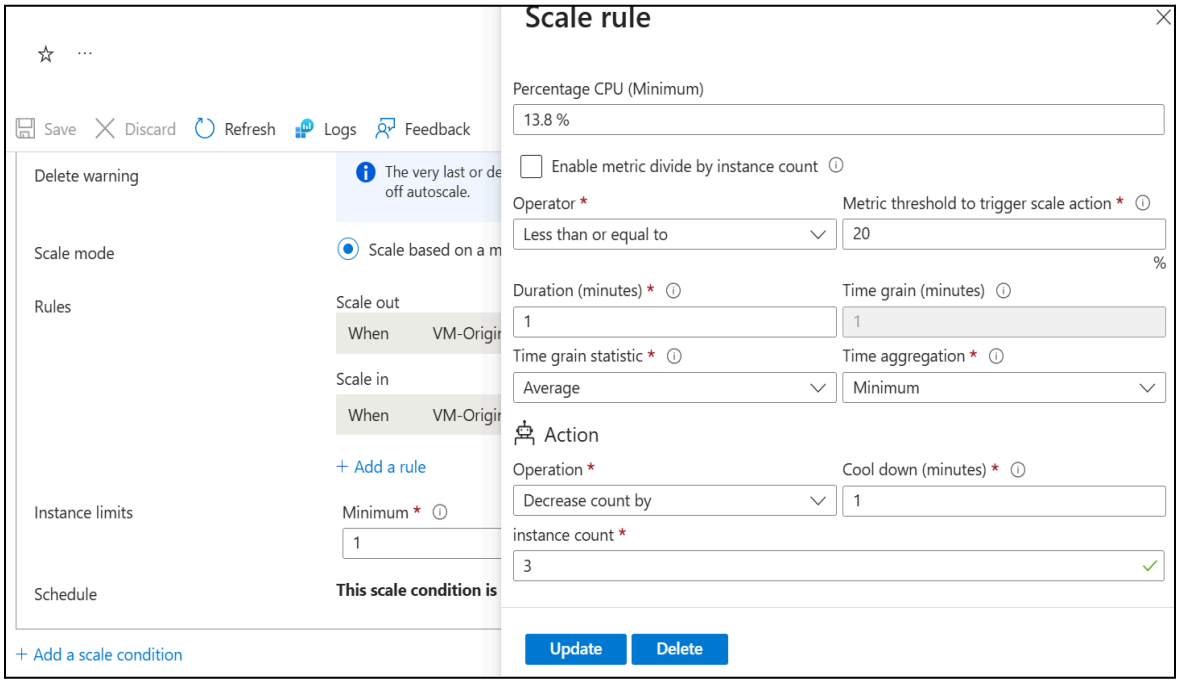
- How many vm want to increase based on condition.
- Increasing the number of instances (VMs or services) to handle more traffic or load.

Scale in :-

- How many vm want to decrease based on condition.
- Decreasing the number of instances when the load is low to save cost and resources.

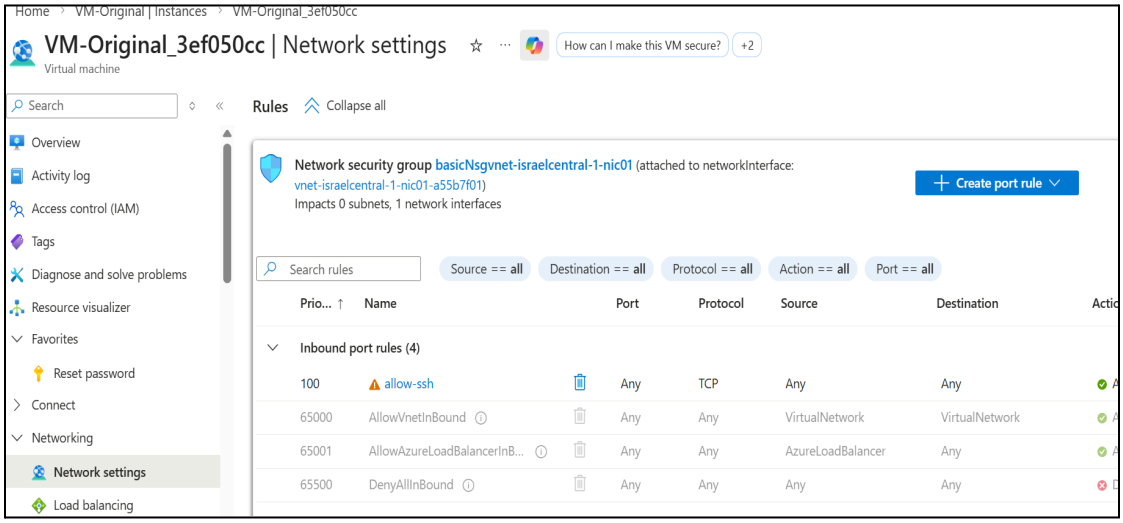


fig(7) scale out condition.



fig(8) scale in condition.

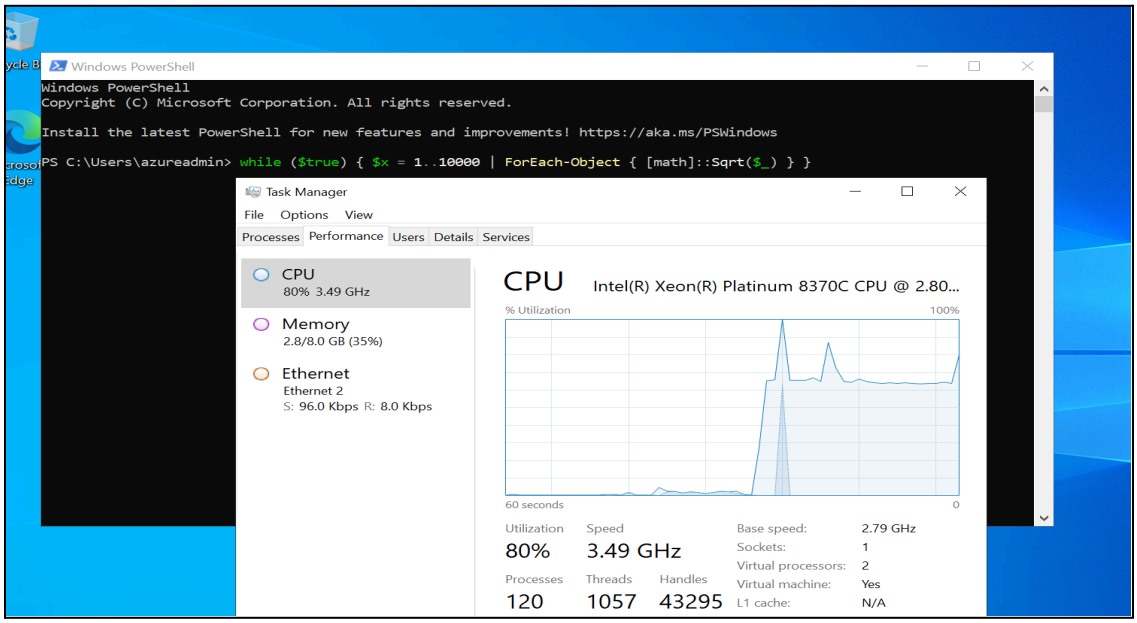
→ Now edit the nsg rules to allow all traffic.



fig(9) nsg rules allowing all traffic.

→ note:- we also created azure load balancer in the n/w while creating vmss.

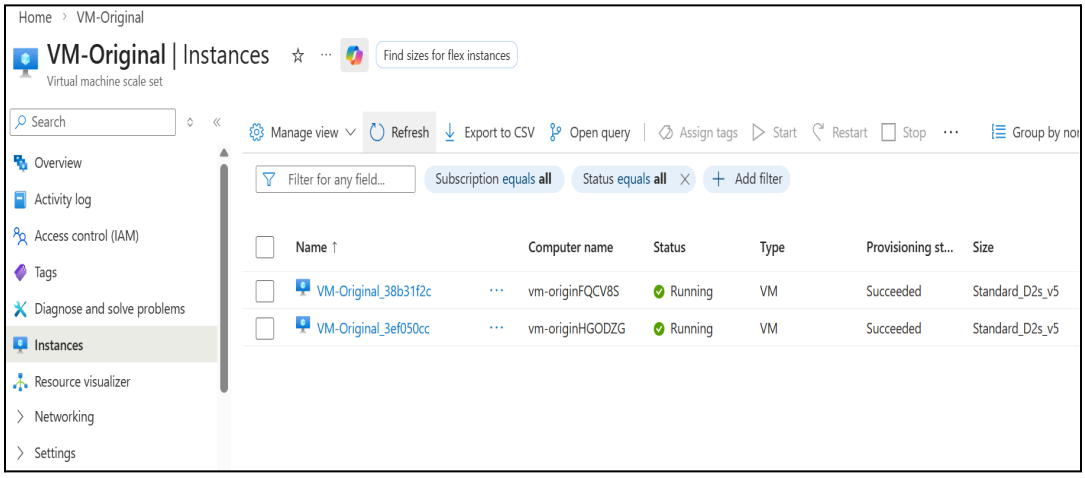
→ now login to the machine and increase the cpu performance i.e apply stress.



fig(10) applied stress.

→ Here we are increasing stress in the windows machine. By running the below command in the windows powershell.

```
while ($true) { $x = 1..100000 | ForEach-Object { [math]::Sqrt($_) } }
```



fig(11) one instance is created automatically due to high performance of cpu.

Note :- To apply stress for linux machines.

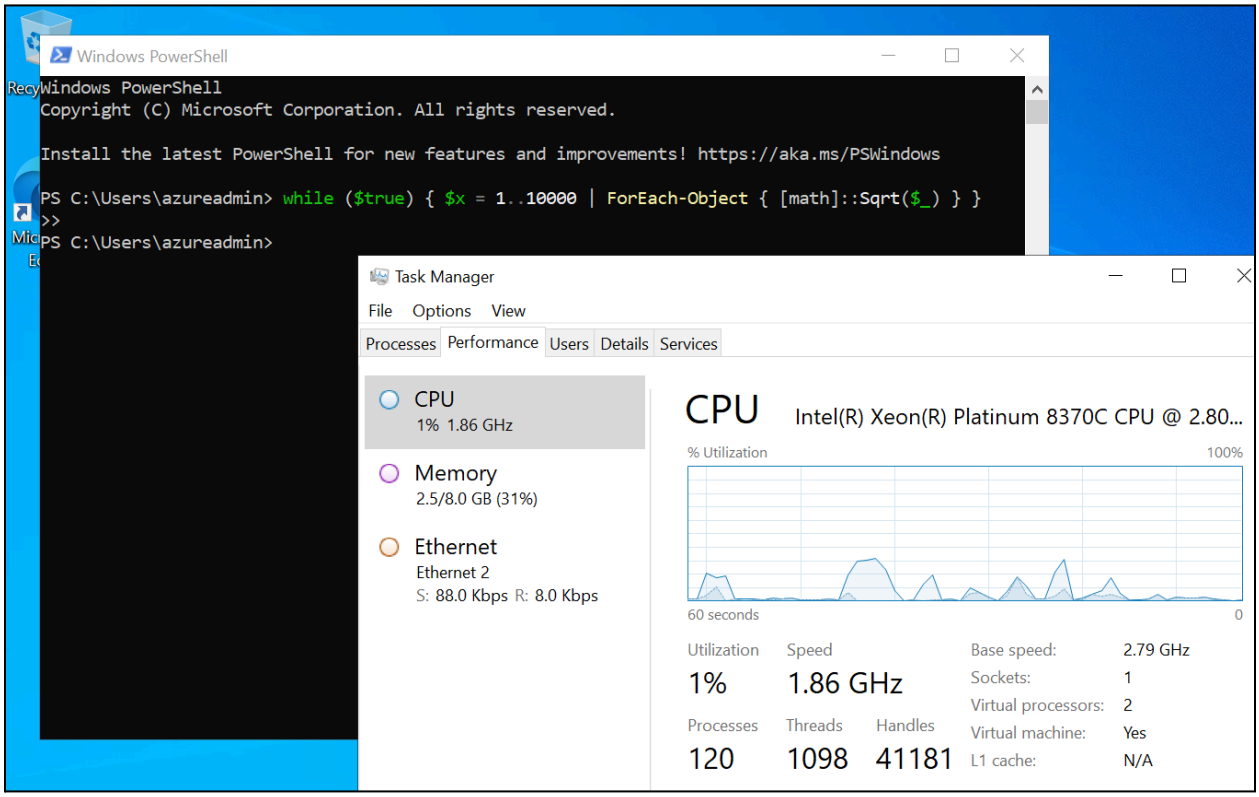
```
$ Sudo su
#apt update
#Apt install stress
#stress
```

We will get an example (change time 10 or 20min) copy and paste.

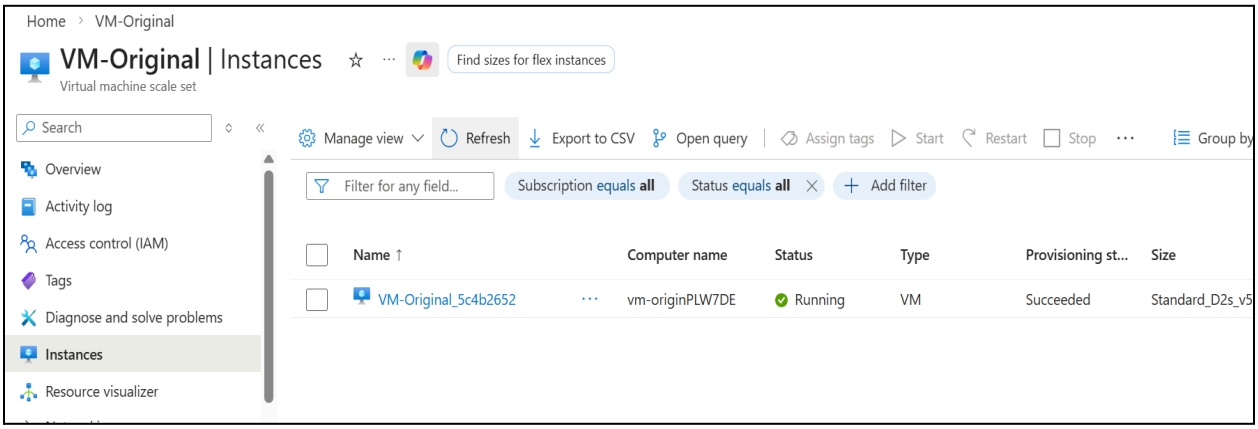
Now we can check the cpu %

```
#htop    (shows the cpu%)
```

→ Now after the decrease of the load the instances will be deleted automatically, type ctrl+c in windows powershell for removing stress.



fig(12) removed stress hence cpu % is decreased.



fig(13) since no increase in cpu %, the instances are deleted.

—————X—————