Mid Term Submission

SUBJECT: CLOUD PERFORMANCE TUNING

SUBJECT CODE: CSEG3015

SUBMITTED TO:

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BATCH :B 6

Difference Between AWS and Microsoft Azure

Both Amazon Web Services (AWS) and Microsoft Azure are leading cloud service providers, and they offer various services and tools for cloud performance tuning. While the specific differences between them can change over time as they introduce new features and updates, here are some key points to consider when comparing AWS and Azure in terms of cloud performance tuning:

1. **Cost**: The choice between AWS and Microsoft Azure in terms of cost depends on your specific needs. Both cloud providers have competitive pricing, but the most cost-effective option for you will depend on the services you use, where you use them, and how you use them. It's like comparing prices at different stores – it depends on what you're buying and where you're buying it. To find the best fit, you'll need to analyze your usage, consider any long-term commitments, and keep an eye on data transfer costs according to me Azure is costly as here if use AMI's the using cost is high here and give less memory for using in free tier as compare to AWS.
2. **Storage:** AWS and Microsoft Azure both offer robust storage solutions. AWS provides Amazon S3, EBS, and Glacier, while Azure offers Blob Storage and Azure Files. The choice depends on your specific storage needs and preferences. Consider factors like performance, scalability, and pricing to determine the best fit for your use case. Largest instance AWS offer 256 GB Ram + 16v CPU while Azure offers 224 GB + 16 vCPU's.
3. **Availability Zone:** Availabilty Zone: Aws was the first on of its kind which means Aws is hosting in hosting in multiple locations worldwide and of course it's true for Azure as well but differences occur's in the numbers of regions and availability zones talking of numbers Aws has 55 availability zones worldwide with eight more on its weight whereas Azure is having 44 availability zones with a whopping numbers.
4. **Services:** Aws and Azure both covers 100 plus services like compute, Database, Storage, Security, Networking and many more Some of the services that Aws covers(Ec2, AWS RDS S3, IAM,VPC, cloudwatch and cloud9 Similarly in Azure covers Vm, SQL, blob Storage, virtual network and Azure monitor and visual studio and many more.
5. **Open Source Integeration:** Aws has quite better relations with open source communities leading to more open integration with Aws which includes open source tools like Jenkins Docker, ansible, Github and its very friendly when it comes to linux servers while in Azure it offers native Integrations for windows development tools such as VBS,SQL and more as you all know Microsoft hasn't always embraced this model but recently they have been catching with it and organization can run on RedHat and Hadoop clusters in azure

Difference between x64 and AMD.

x64: This term generally refers to a type of computer architecture based on the x86 instruction set. It's an extension of the x86 architecture that adds support for 64-bit computing. It's used by both Intel and AMD processors and supports 64-bit software, allowing the processor to handle larger amounts of memory and perform more complex tasks compared to older 32-bit architectures.

AMD: This refers to Advanced Micro Devices, Inc., a company that designs and produces computer processors (CPUs), GPUs, and related technology. AMD manufactures processors that use the x86 and x64 architecture, similar to Intel. AMD processors have been known for providing competitive performance, particularly in terms of multi-core processing and value for the price compared to Intel processors.

When choosing between x64 architectures (usually found in both AMD and Intel processors), there are a few factors to consider for tuning performance:

Usage: Consider the specific tasks or software you'll be using. Some applications or tasks might perform better on AMD processors due to their architecture, while others might be optimized for Intel. For example, some software might be optimized for Intel's specific instruction sets like AVX (Advanced Vector Extensions) or AMD's equivalent.

Budget: AMD processors have been known to offer competitive performance at a lower price point compared to their Intel counterparts. Depending on your budget, you might find an AMD processor that provides better performance for the price you're willing to pay.

Multitasking and Multithreading: AMD processors typically offer more cores and threads at various price points compared to Intel, which can be beneficial for tasks that can leverage parallel processing. If you're dealing with heavily multi-threaded applications or multitasking, an AMD processor might offer better performance.

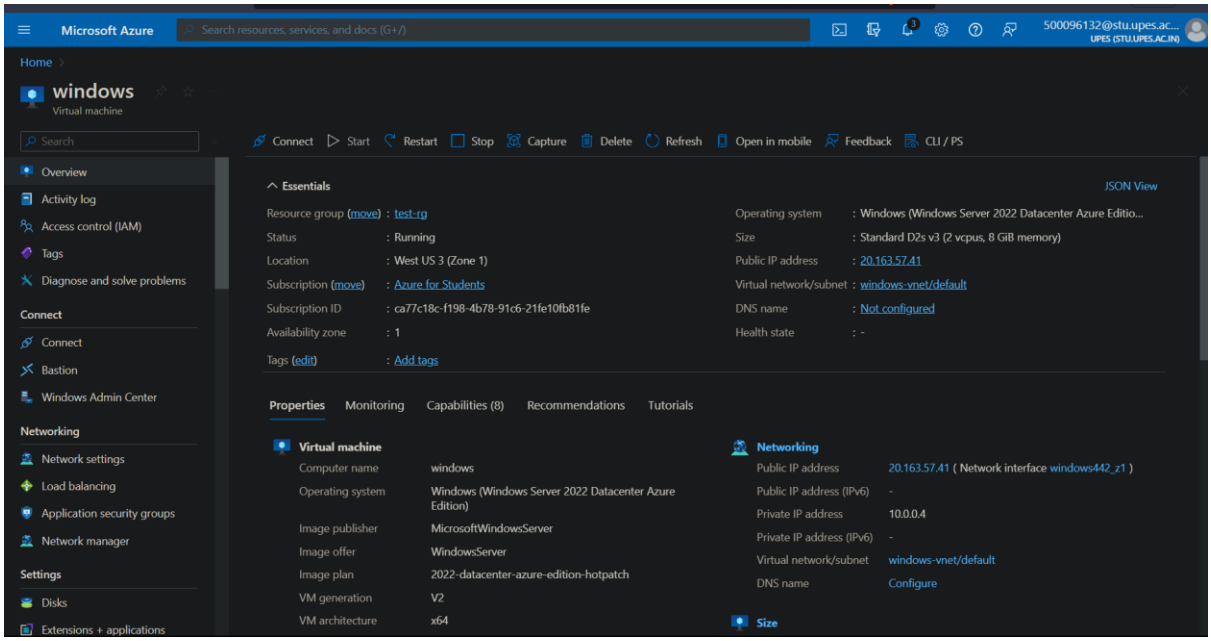
Project Name:- Language Translator

Language translation, or simply translation, is the process of converting text or spoken language from one language (the source language) into another language (the target language). This practice plays a significant role in our increasingly globalized world, where communication between people who speak different languages is a common occurrence..

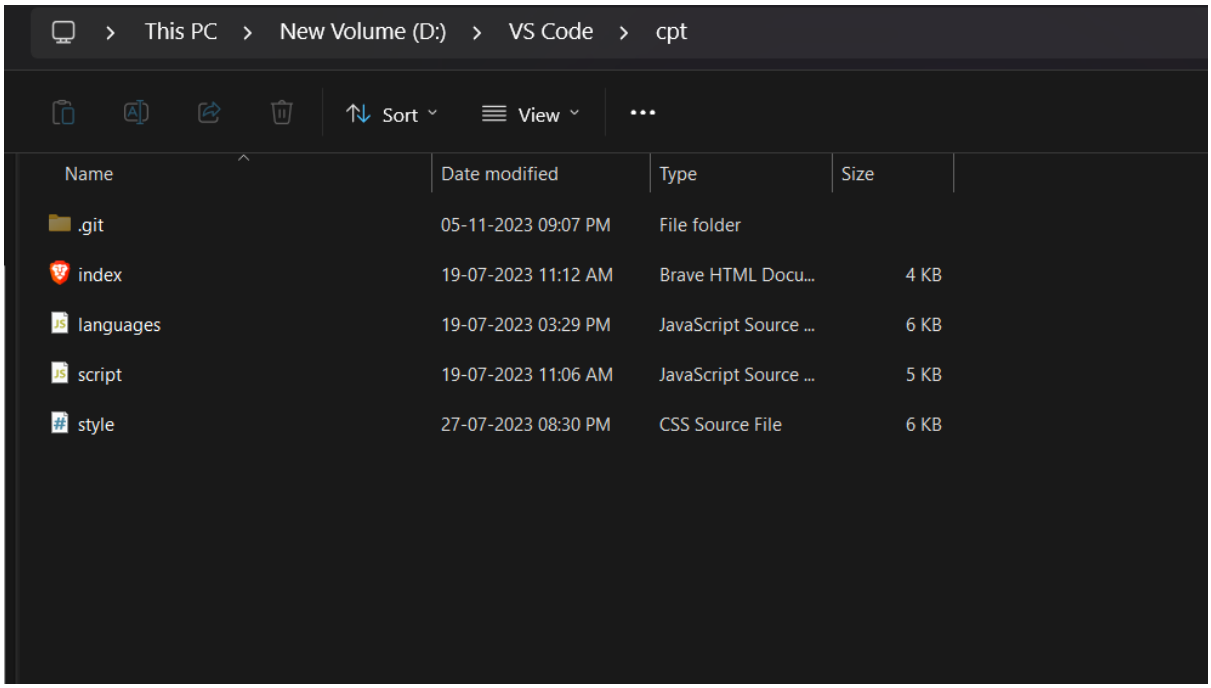
Deploying a Language Translator website on Azure, on windows and ubuntu Virtual machine and analyzing performance metrics, CPU, and memory utilization on Windows and Ubuntu Virtual Machines in OS-specific tools like Task Manager (Windows) or top/htop (Ubuntu).

Deploying on Windows VM:-

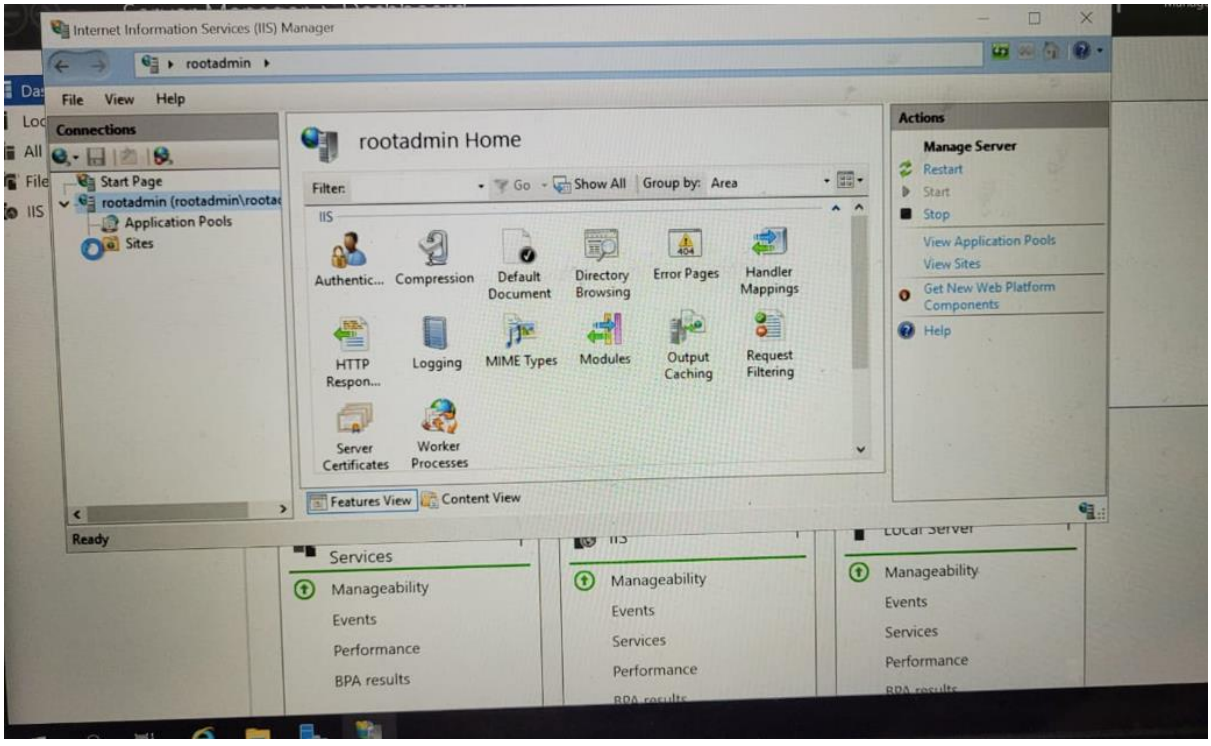
Creating windows virtual machine

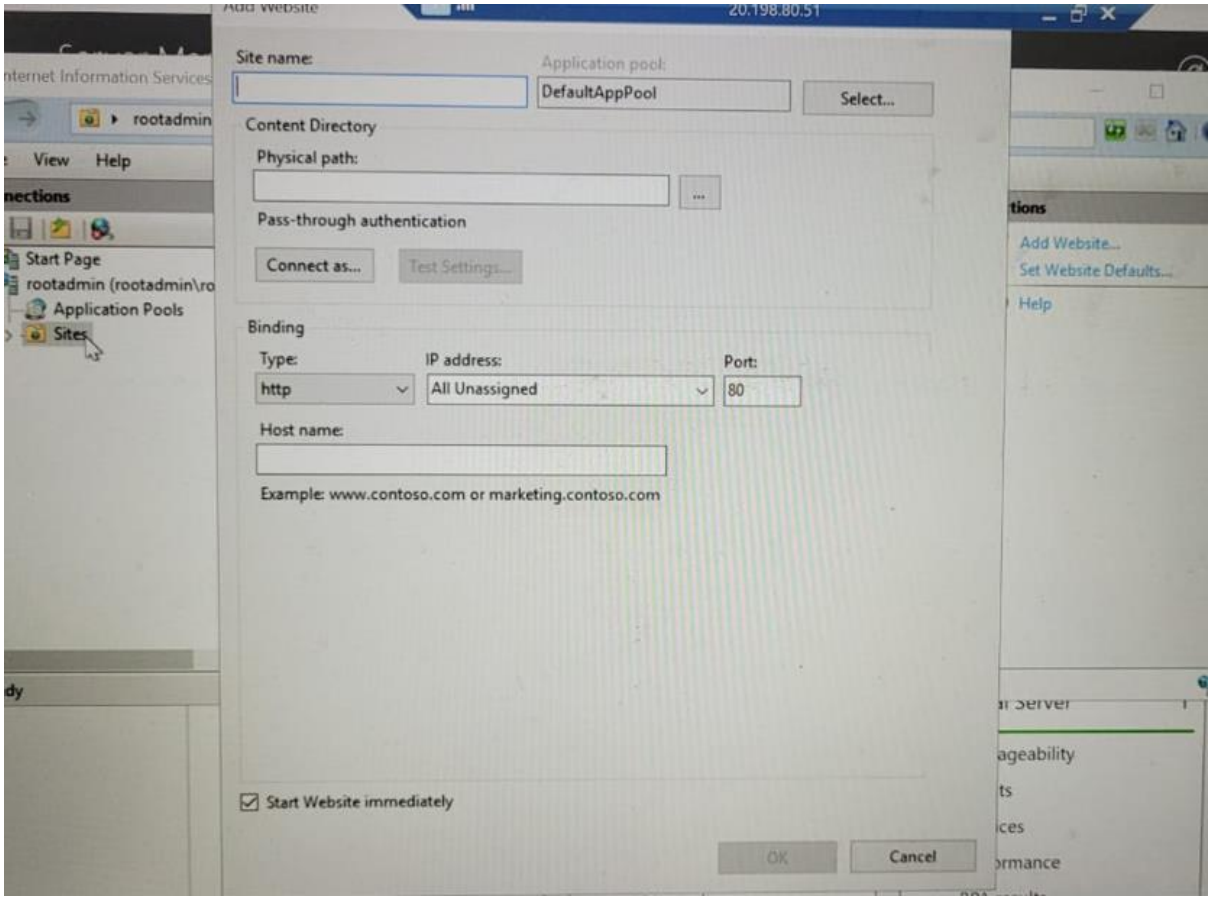


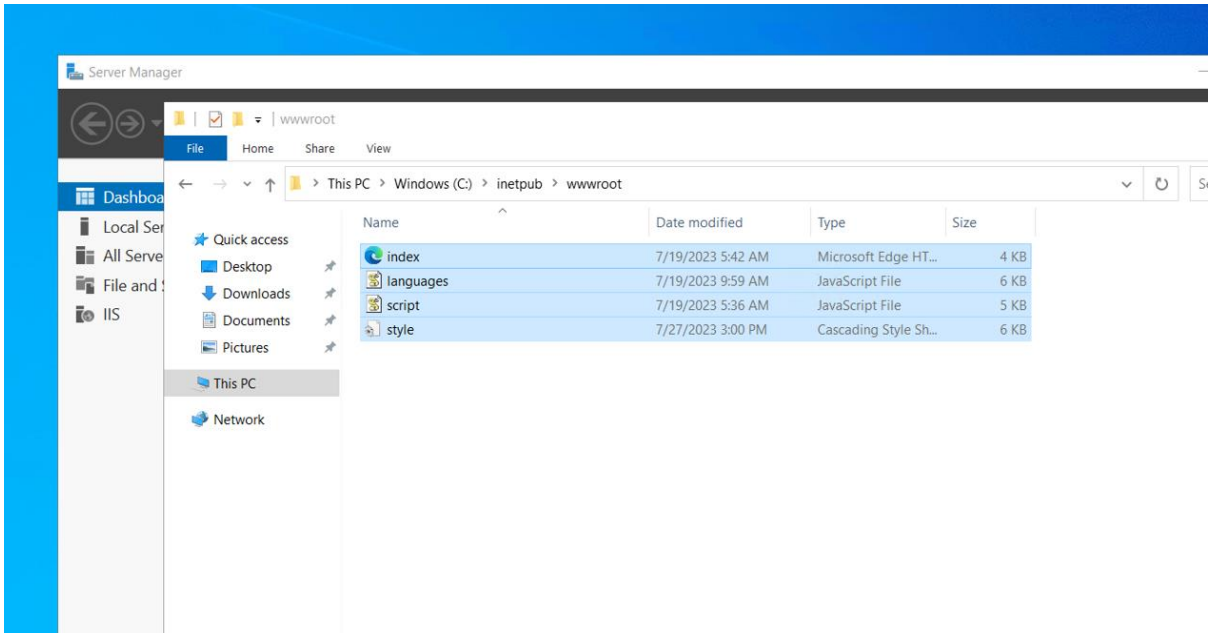
Copied files from host OS to Windows VM in C Drive



In IIS manager we are adding the website

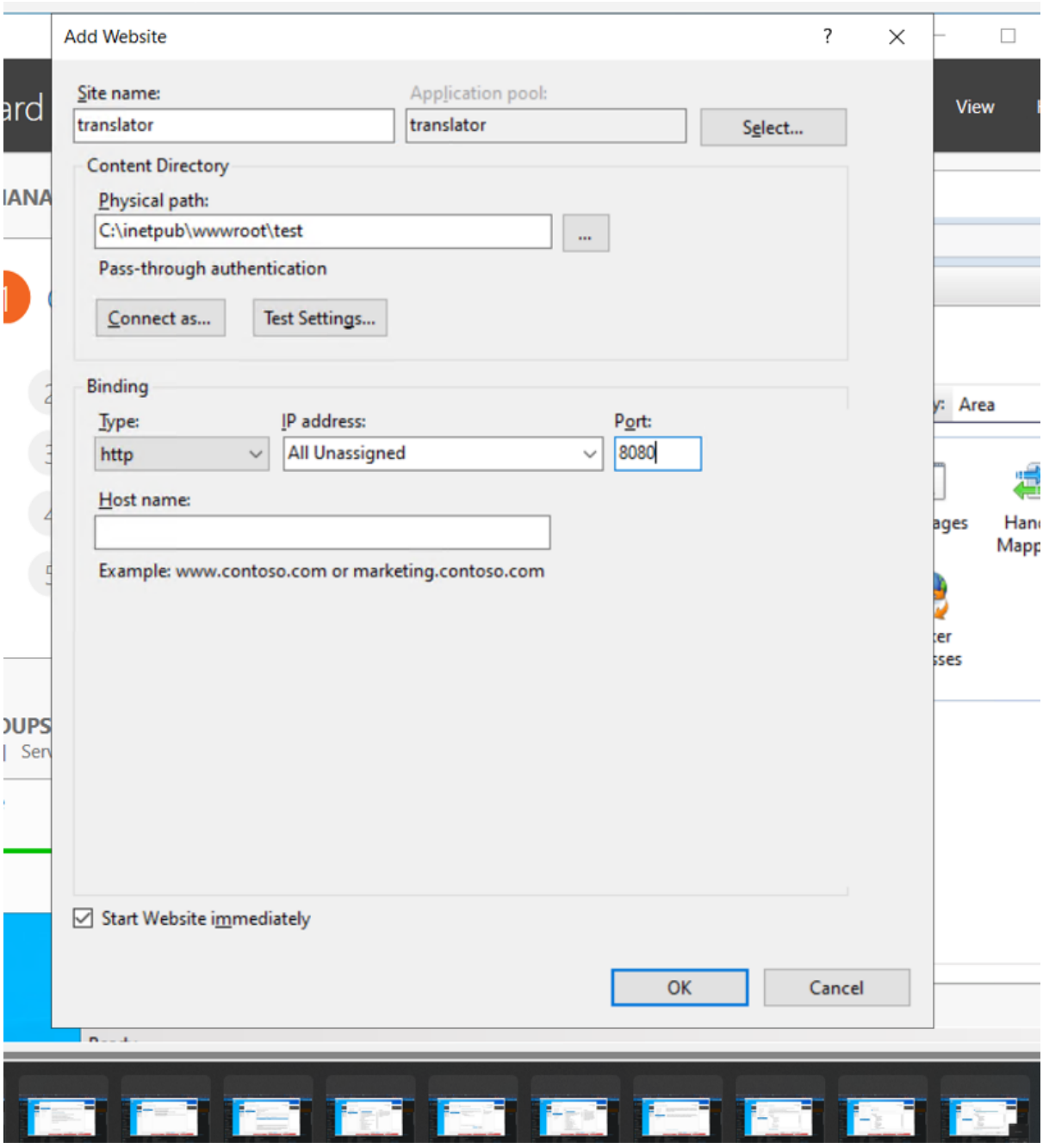



Add Website
20.198.80.51
Site name:
Application pool:
DefaultAppPool
Select...
Content Directory
Physical path:
Pass-through authentication
Connect as...
Test Settings...
Binding
Type:
IP address:
Port:
http
All Unassigned
80
Host name:
Example: www.contoso.com or marketing.contoso.com
Start Website immediately
OK
Cancel
Start Page
Application Pools
Sites
Add Website...
Set Website Defaults...
Help

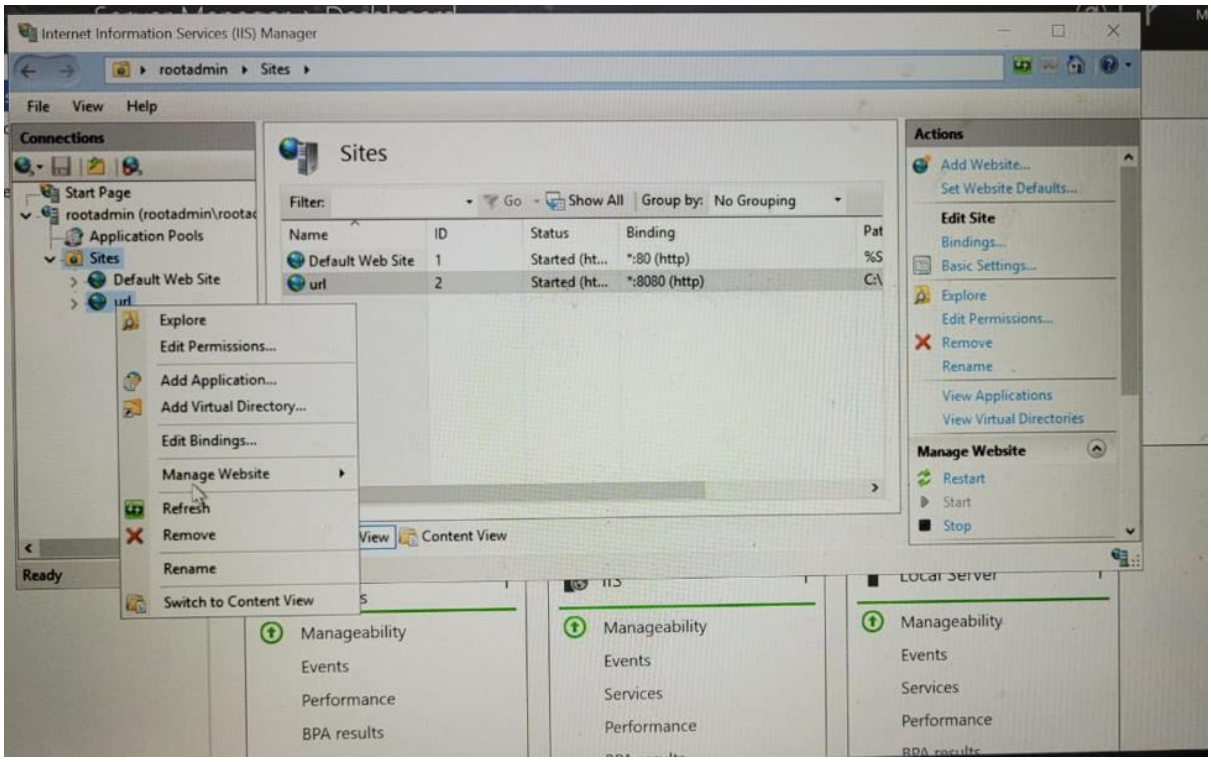

Server Manager
wwwroot
File
Home
Share
View
This PC
Windows (C:)
inetpub
wwwroot
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
Name
Date modified
Type
Size
index
7/19/2023 5:42 AM
Microsoft Edge HT...
4 KB
languages
7/19/2023 9:59 AM
JavaScript File
6 KB
script
7/19/2023 5:36 AM
JavaScript File
5 KB
style
7/27/2023 3:00 PM
Cascading Style Sh...
6 KB
Dashboard
Local Server
All Servers
File and Storage Services
IIS

Giving name and adding website

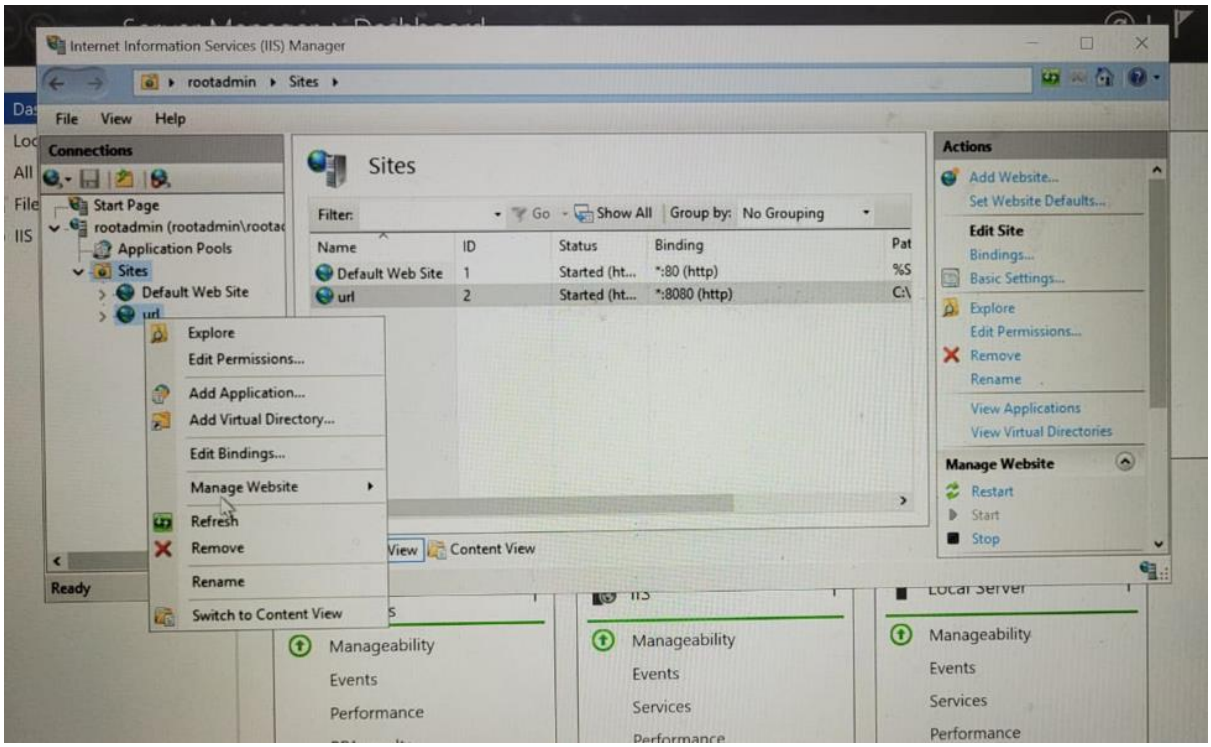
Assigning port number

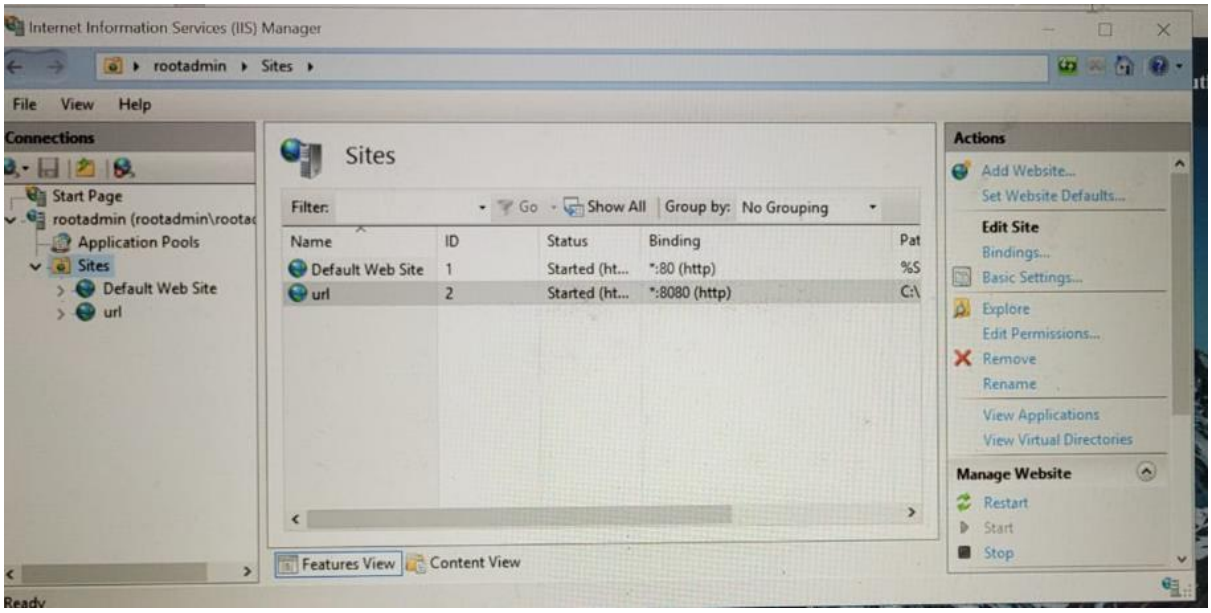


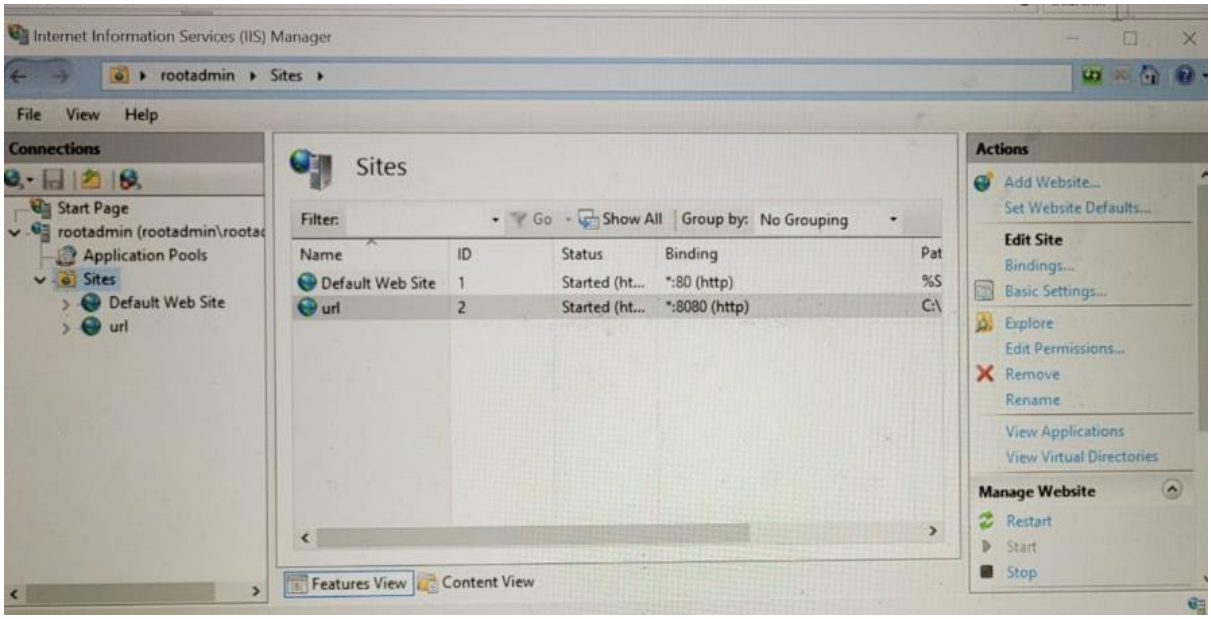
Going to manage website



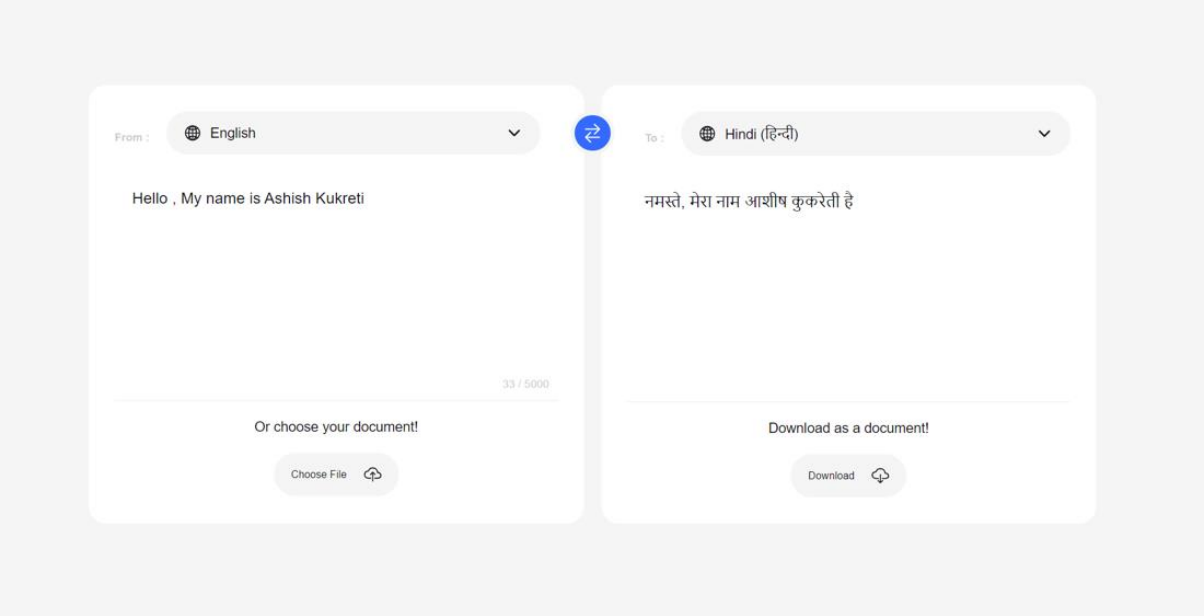
Selecting browse to open the website



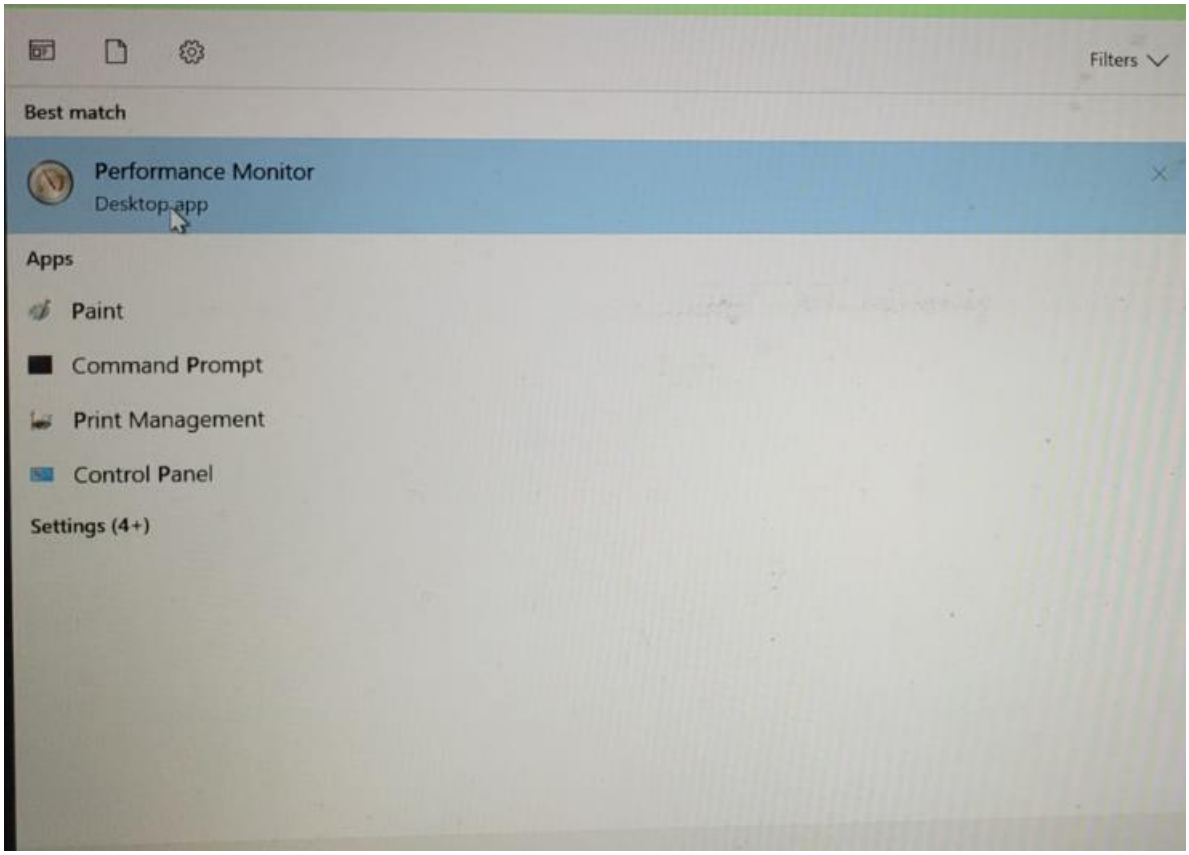

Internet Information Services (IIS) Manager
rootadmin ▸ Sites ▸
File View Help
Connections
Start Page
rootadmin (rootadmin\rootac
Application Pools
Sites
Default Web Site
url
Sites
Filter:
Go
Show All
Group by: No Grouping
Name
ID
Status
Binding
Pat
Default Web Site
1
Started (ht...
*:80 (http)
%S
url
2
Started (ht...
*:8080 (http)
C:\
Features View
Content View
Actions
Add Website...
Set Website Defaults...
Edit Site
Bindings...
Basic Settings...
Explore
Edit Permissions...
Remove
Rename
View Applications
View Virtual Directories
Manage Website
Restart
Start
Stop
Ready


Internet Information Services (IIS) Manager
rootadmin ▸ Sites ▸
File View Help
Connections
Start Page
rootadmin (rootadmin\rootac
Application Pools
Sites
Default Web Site
url
Sites
Filter:
Go
Show All
Group by: No Grouping
Name
ID
Status
Binding
Pat
Default Web Site
1
Started (ht...
*:80 (http)
%S
url
2
Started (ht...
*:8080 (http)
C:\
Features View
Content View
Actions
Add Website...
Set Website Defaults...
Edit Site
Bindings...
Basic Settings...
Explore
Edit Permissions...
Remove
Rename
View Applications
View Virtual Directories
Manage Website
Restart
Start
Stop

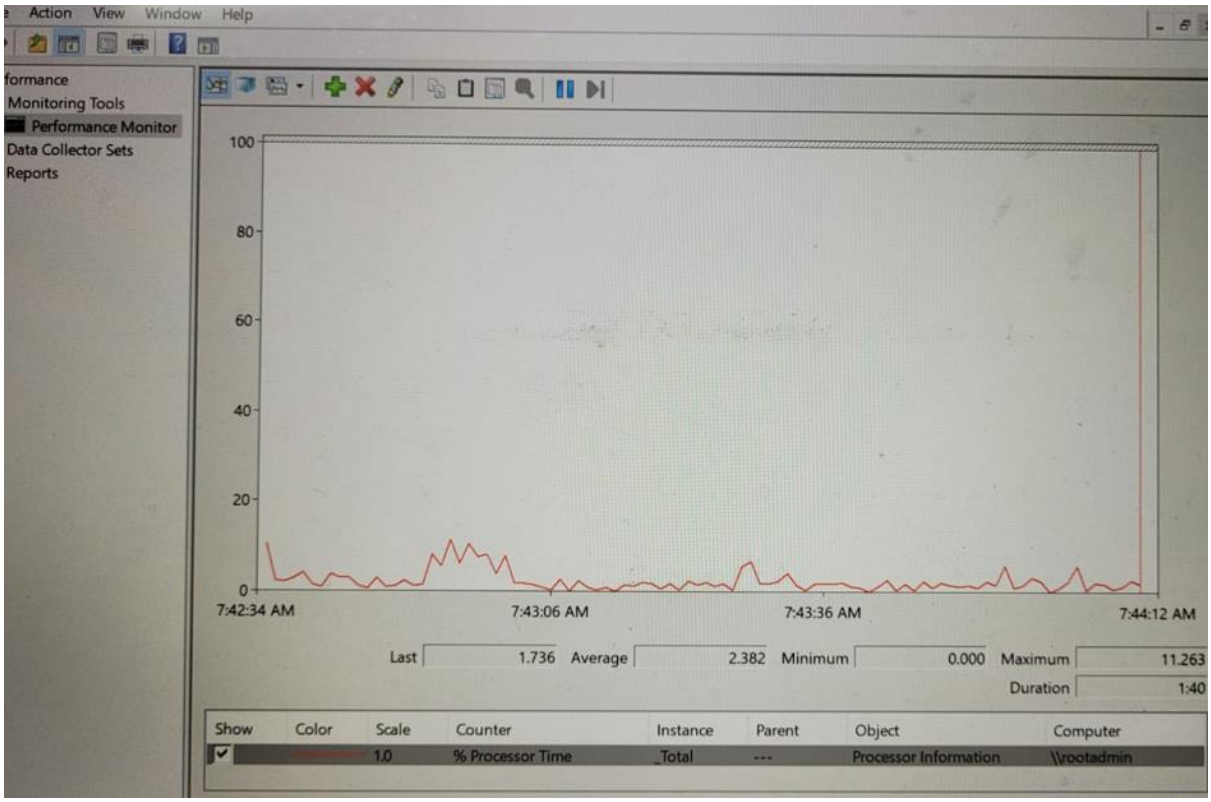
Website opened



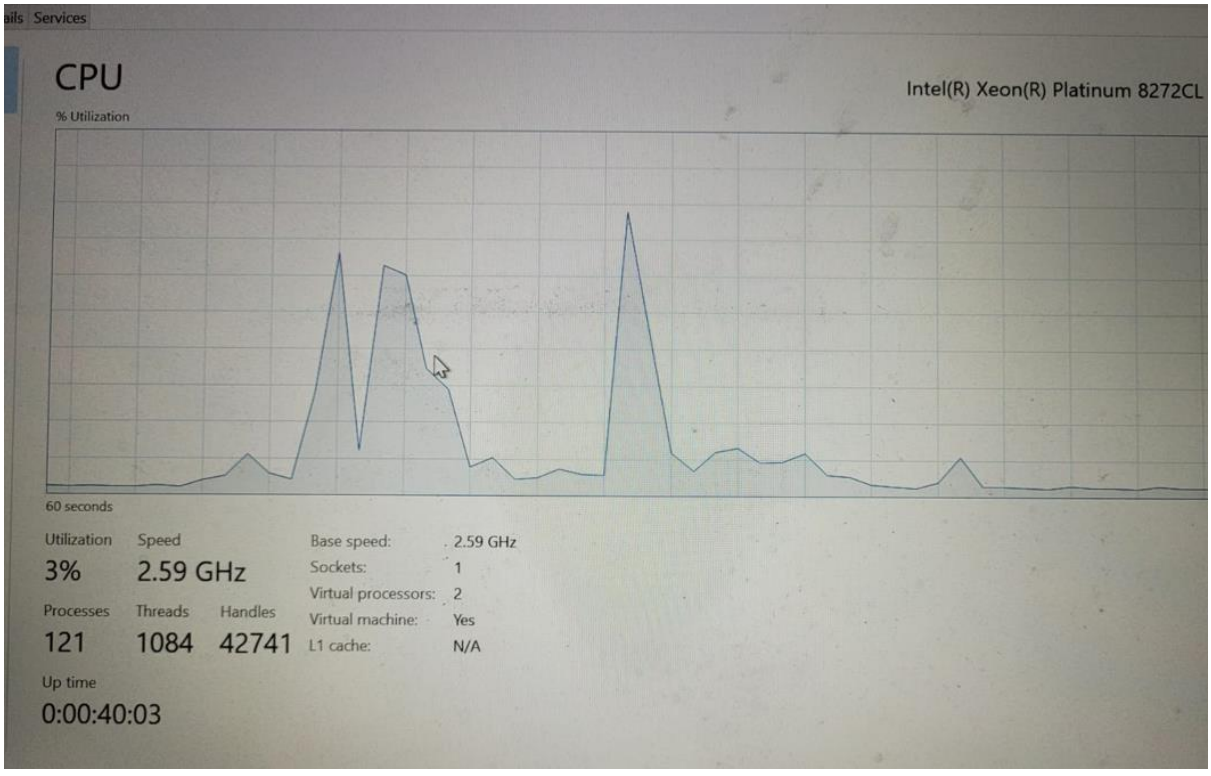
Checking Performance



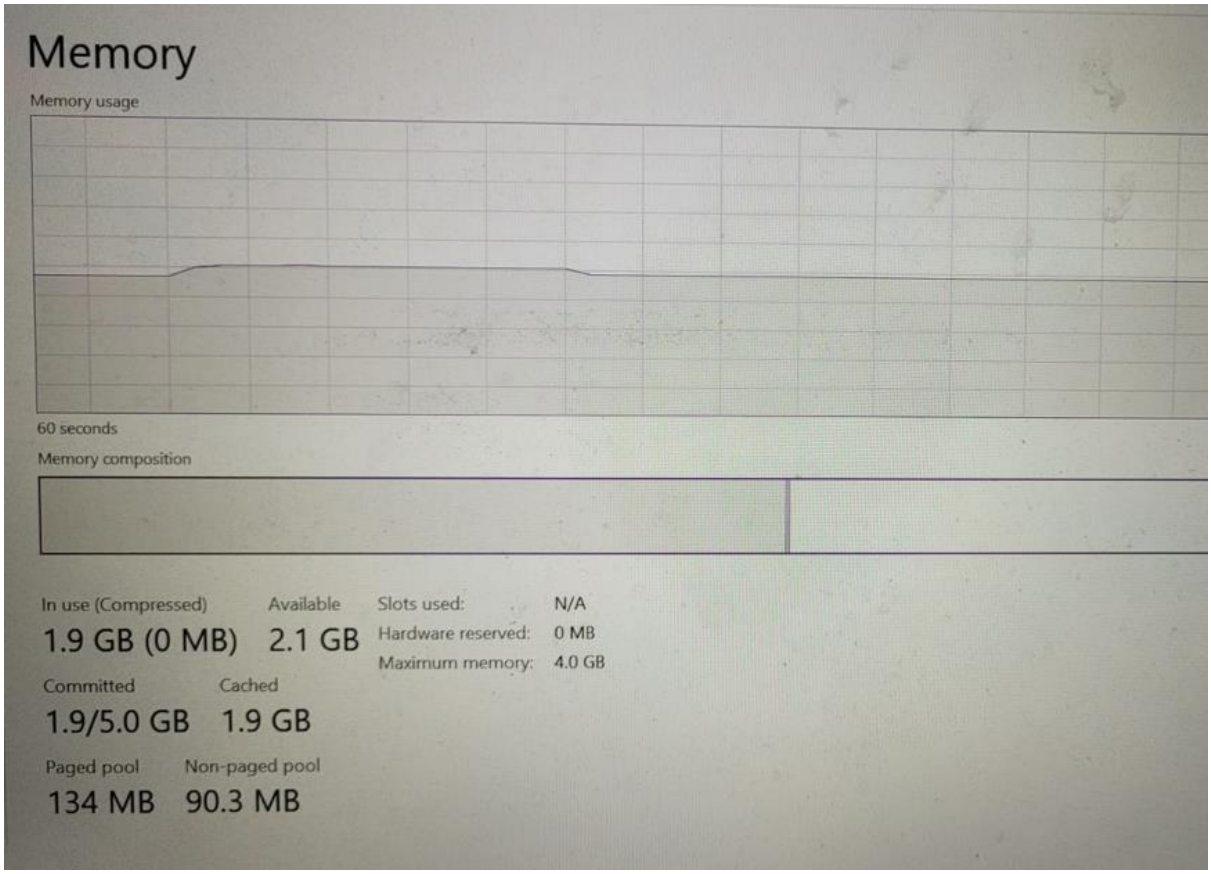
Performance



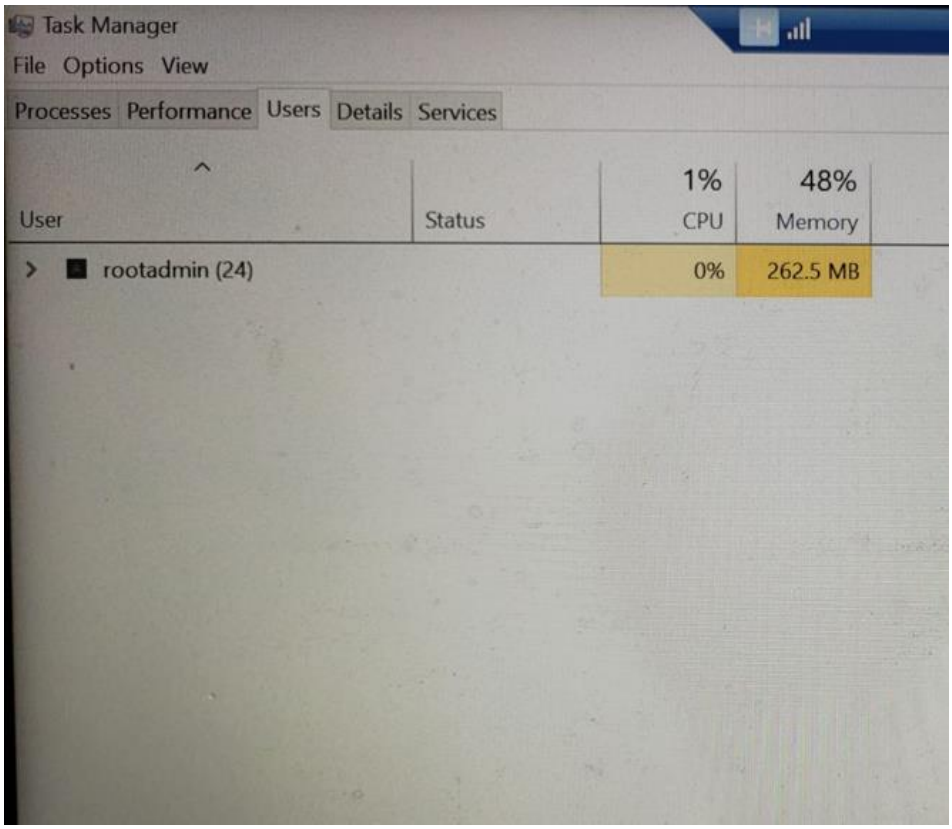
CPU Utilization

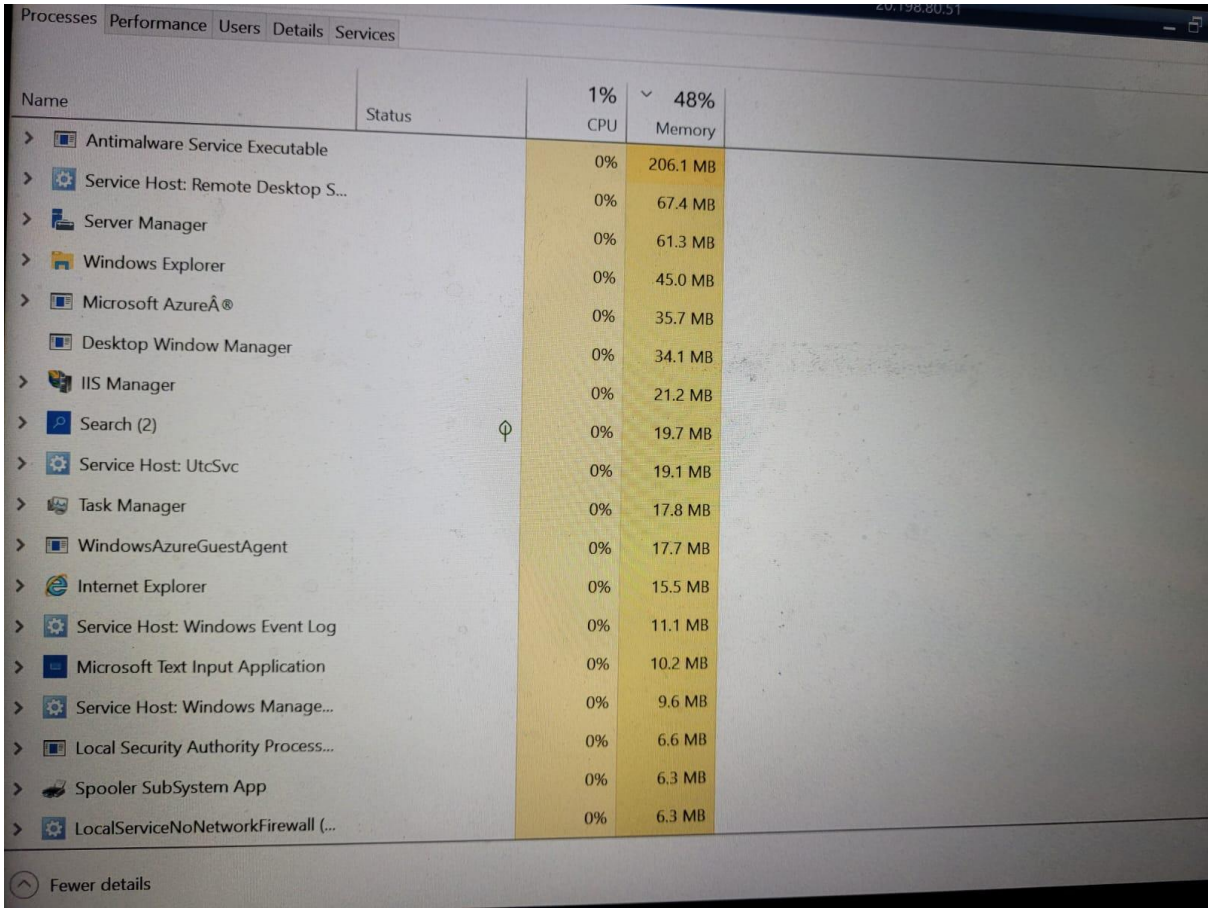


Memory Utilization



Other metrics:

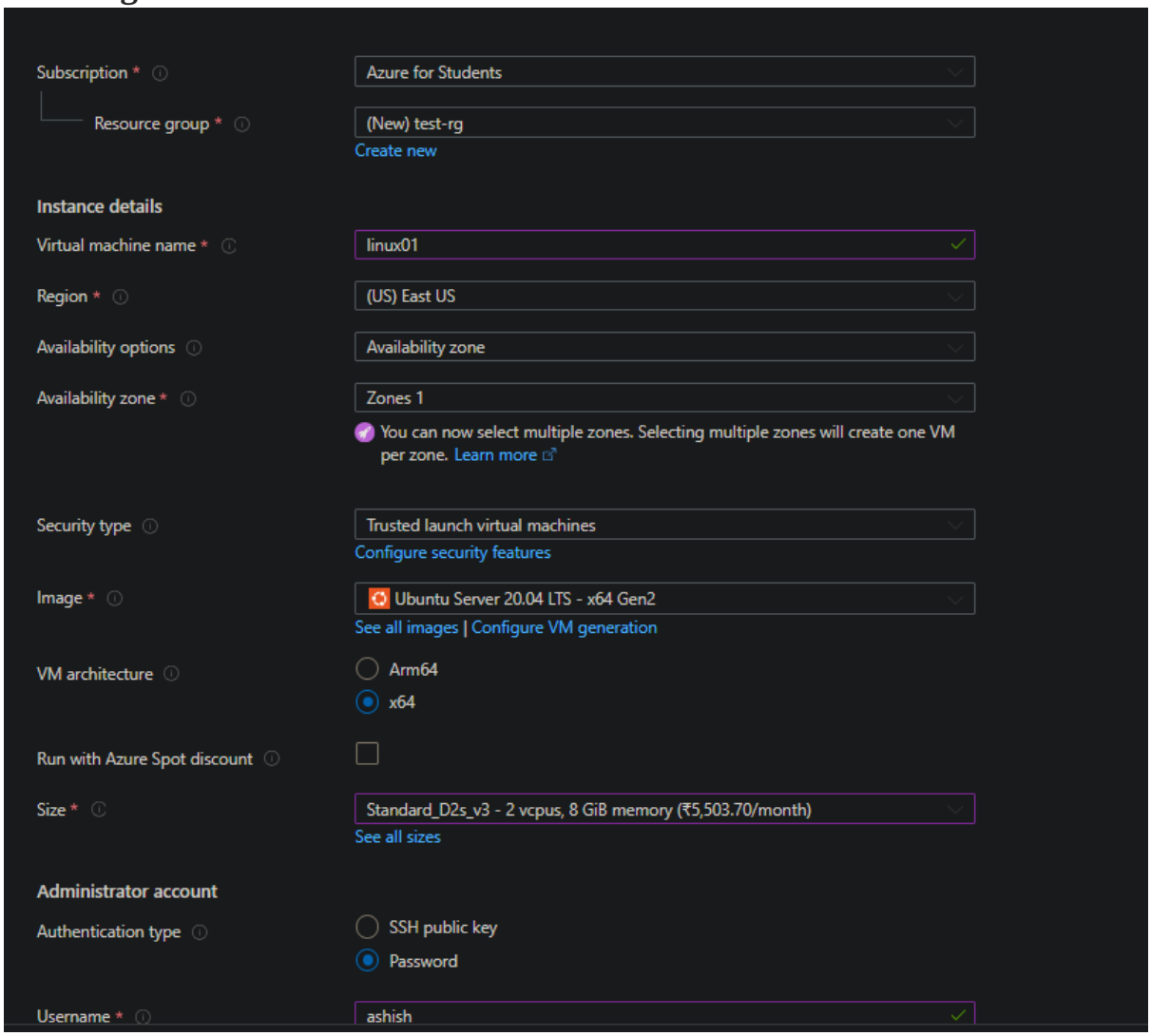


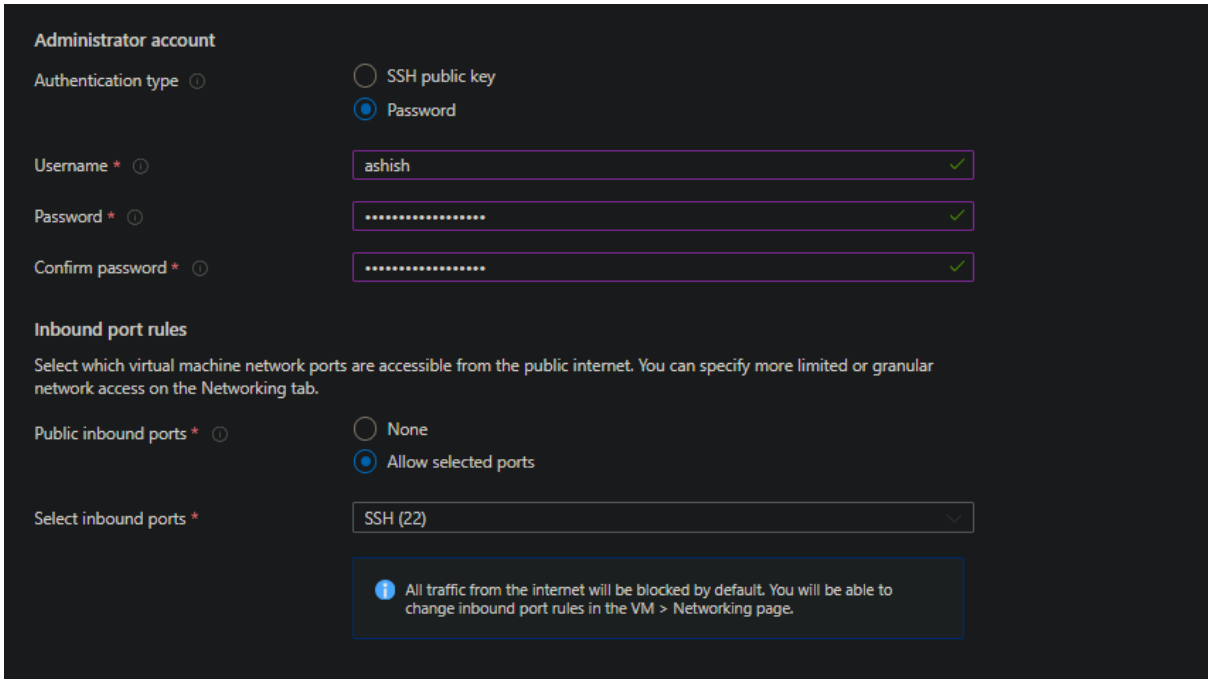


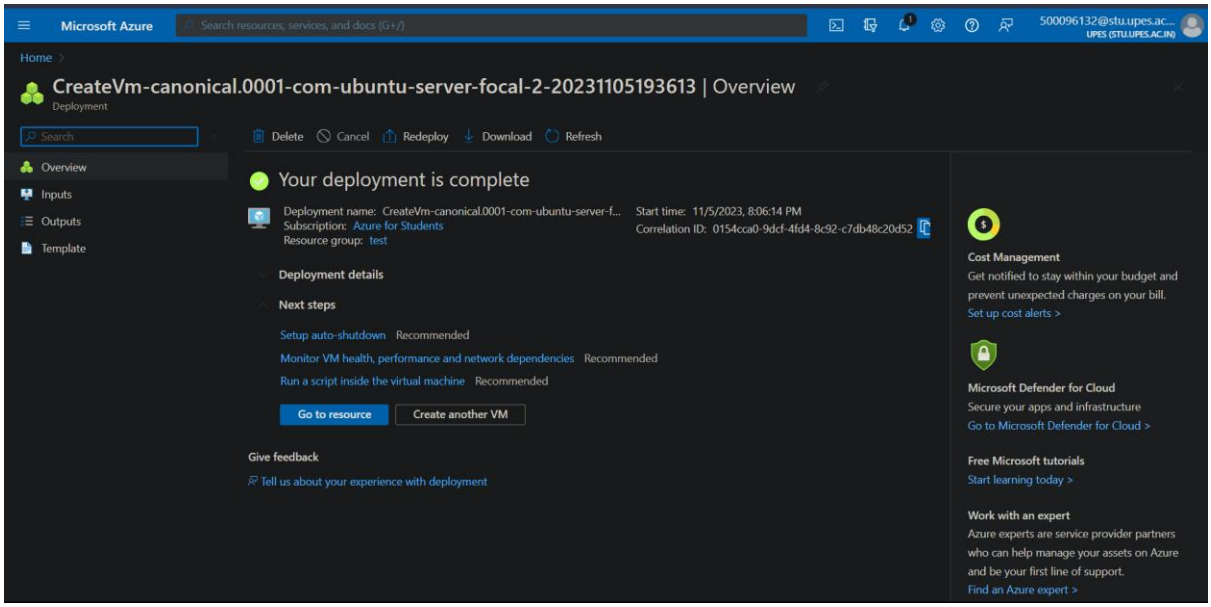
Response Time: 13 minutes and 30 seconds.

Deploying on ubuntu VM

Creating Ubuntu virtual machine




Administrator account
Authentication type
SSH public key
Password
Username *
ashish
Password *
Confirm password *
Inbound port rules
Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.
Public inbound ports *
None
Allow selected ports
Select inbound ports *
SSH (22)
All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.


Microsoft Azure
Search resources, services, and docs (G+/)
500096132@stu.upes.ac...
UPES (STU.UPES.AC.IN)
Home
CreateVm-canonical.0001-com-ubuntu-server-focal-2-20231105193613 | Overview
Deployment
Search
Overview
Inputs
Outputs
Template
Delete
Cancel
Redeploy
Download
Refresh
Your deployment is complete
Deployment name: CreateVm-canonical.0001-com-ubuntu-server-f...
Subscription: Azure for Students
Resource group: test
Start time: 11/5/2023, 8:06:14 PM
Correlation ID: 0154cca0-9dcf-4fd4-8c92-c7db48c20d52
Deployment details
Next steps
Setup auto-shutdown Recommended
Monitor VM health, performance and network dependencies Recommended
Run a script inside the virtual machine Recommended
Go to resource
Create another VM
Give feedback
Tell us about your experience with deployment
Cost Management
Get notified to stay within your budget and prevent unexpected charges on your bill.
Set up cost alerts >
Microsoft Defender for Cloud
Secure your apps and infrastructure
Go to Microsoft Defender for Cloud >
Free Microsoft tutorials
Start learning today >
Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
Find an Azure expert >

Opened SSH terminal and running commands.

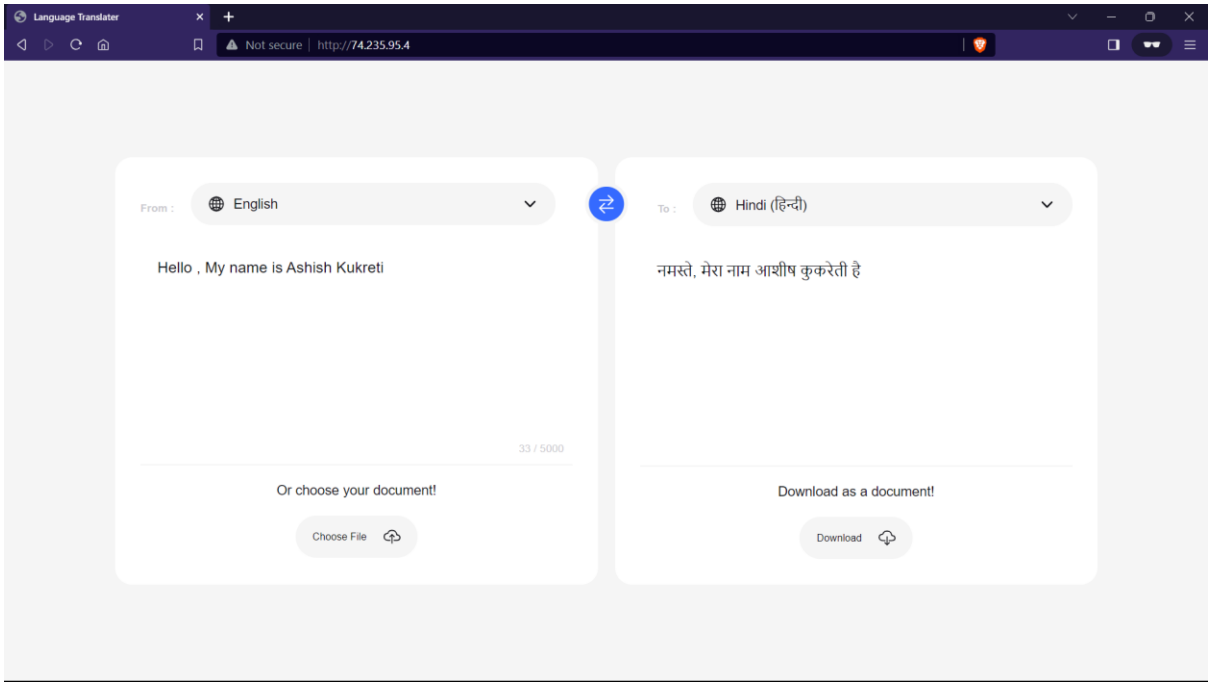
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Ashish> ssh ashish@74.235.95.4
The authenticity of host '74.235.95.4 (74.235.95.4)' can't be established.
ED25519 key fingerprint is SHA256:Sxi0x+Q58qJOAw8ncOElJOFTvefEH5zODqlalmM+hVg.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '74.235.95.4' (ED25519) to the list of known hosts.
ashish@74.235.95.4's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1050-azure x86_64)

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

  System information as of Sun Nov  5 15:27:48 UTC 2023

  System load:  0.42              Processes:             130
  Usage of /:   5.2% of 28.89GB   Users logged in:       0
  Memory usage: 4%                IPv4 address for eth0: 10.1.0.4
  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


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


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.

ashish@linux01:~$
```

```
ashish@linux01:~$ sudo apt update
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 [265 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 [9136 B]
Get:11 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2973 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [481 kB]
Get:13 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [17.2 kB]
Get:14 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [2479 kB]
Get:15 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [346 kB]
Get:16 http://azure.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [552 B]
Get:17 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1130 kB]
Get:18 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [269 kB]
Get:19 http://azure.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [25.7 kB]
Get:20 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [25.8 kB]
Get:21 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [7484 B]
Get:22 http://azure.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [620 B]
Get:23 http://azure.archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [45.7 kB]
Get:24 http://azure.archive.ubuntu.com/ubuntu focal-backports/main Translation-en [16.3 kB]
Get:25 http://azure.archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [1420 B]
Get:26 http://azure.archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [116 B]
Get:27 http://azure.archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [25.0 kB]
```

```
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service
Processing triggers for ufw (0.36-6ubuntu1.1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
ashish@linux01:~$ sudo apt install -y apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
apache2 is already the newest version (2.4.41-4ubuntu3.14).
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.
ashish@linux01:~$
```

```
Nov 05 15:29:18 linux01 systemd[1]: Started The Apache HTTP Server.
ashish@linux01:~$ git clone https://github.com/AshishKukreti2003/Cloud_Performance_Tuning
Cloning into 'Cloud_Performance_Tuning'...
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 6 (delta 0), reused 6 (delta 0), pack-reused 0
Unpacking objects: 100% (6/6), 5.04 KiB | 5.04 MiB/s, done.
ashish@linux01:~$ cd web
-bash: cd: web: No such file or directory
ashish@linux01:~$ ls
Cloud_Performance_Tuning
ashish@linux01:~$ cd Cloud_Performance_Tuning/
ashish@linux01:~/Cloud_Performance_Tuning$ ls
index.html  languages.js  script.js  style.css
ashish@linux01:~/Cloud_Performance_Tuning$ sudo rm /var/www/html/index.html
ashish@linux01:~/Cloud_Performance_Tuning$ sudo cp -r * /var/www/html/
ashish@linux01:~/Cloud_Performance_Tuning$ ls
index.html  languages.js  script.js  style.css
ashish@linux01:~/Cloud_Performance_Tuning$ sudo systemctl restart apache2
ashish@linux01:~/Cloud_Performance_Tuning$
```

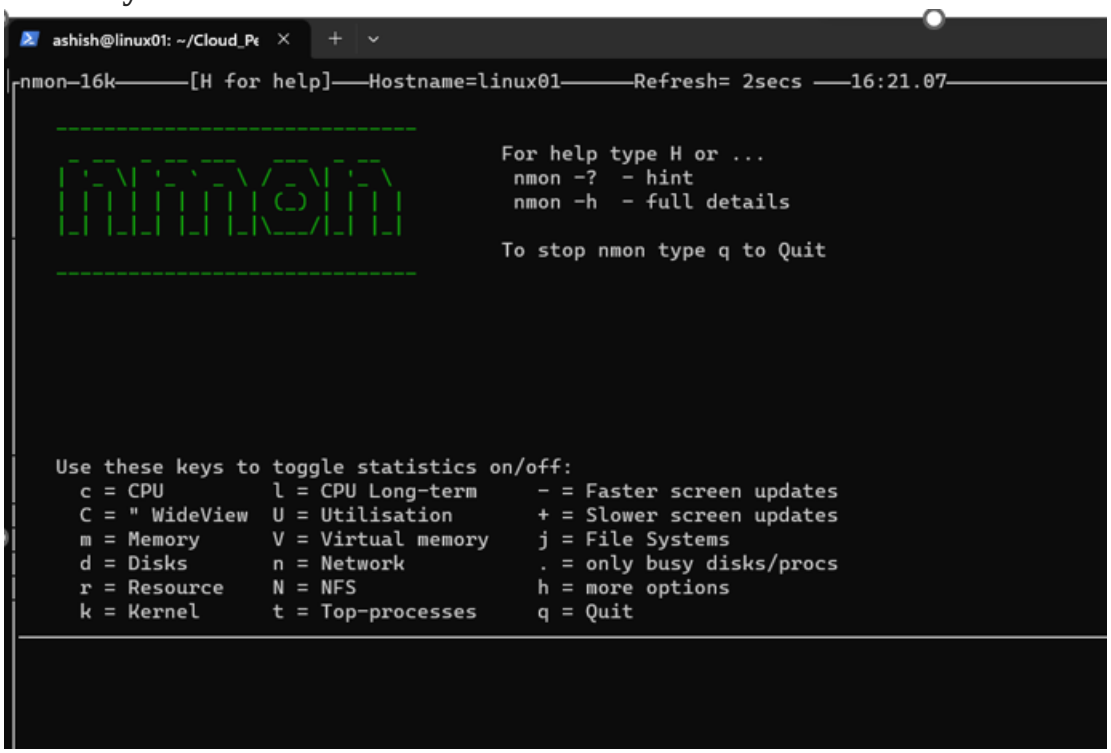
Website opened

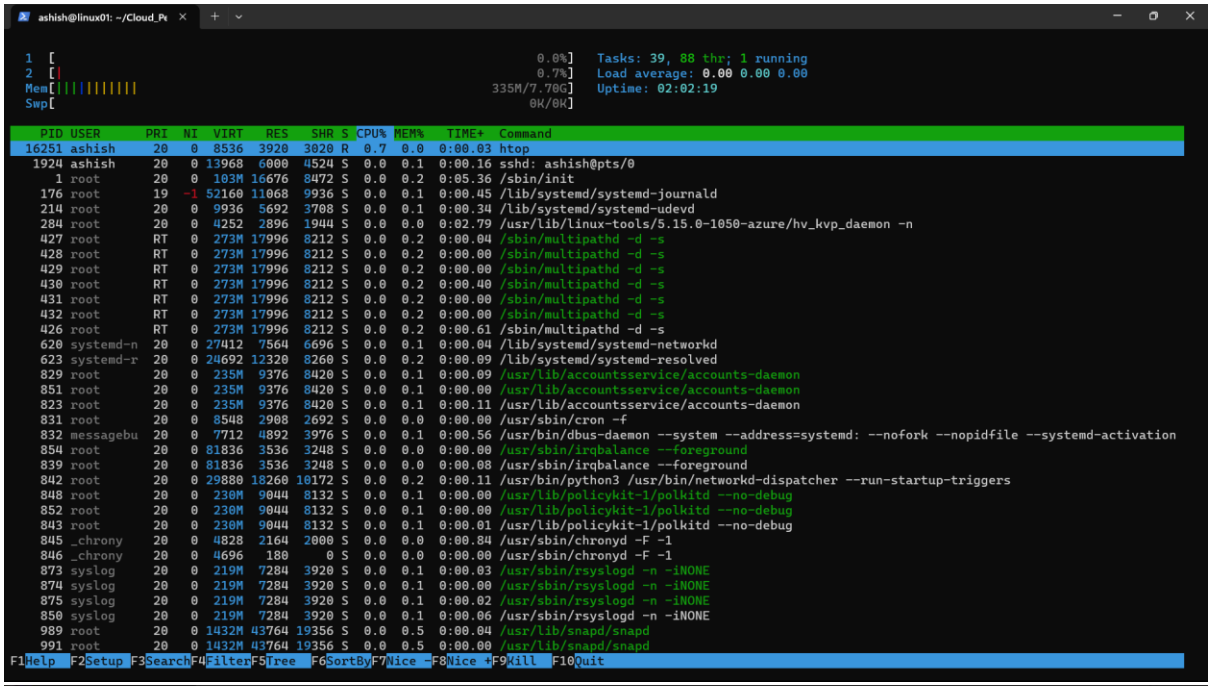


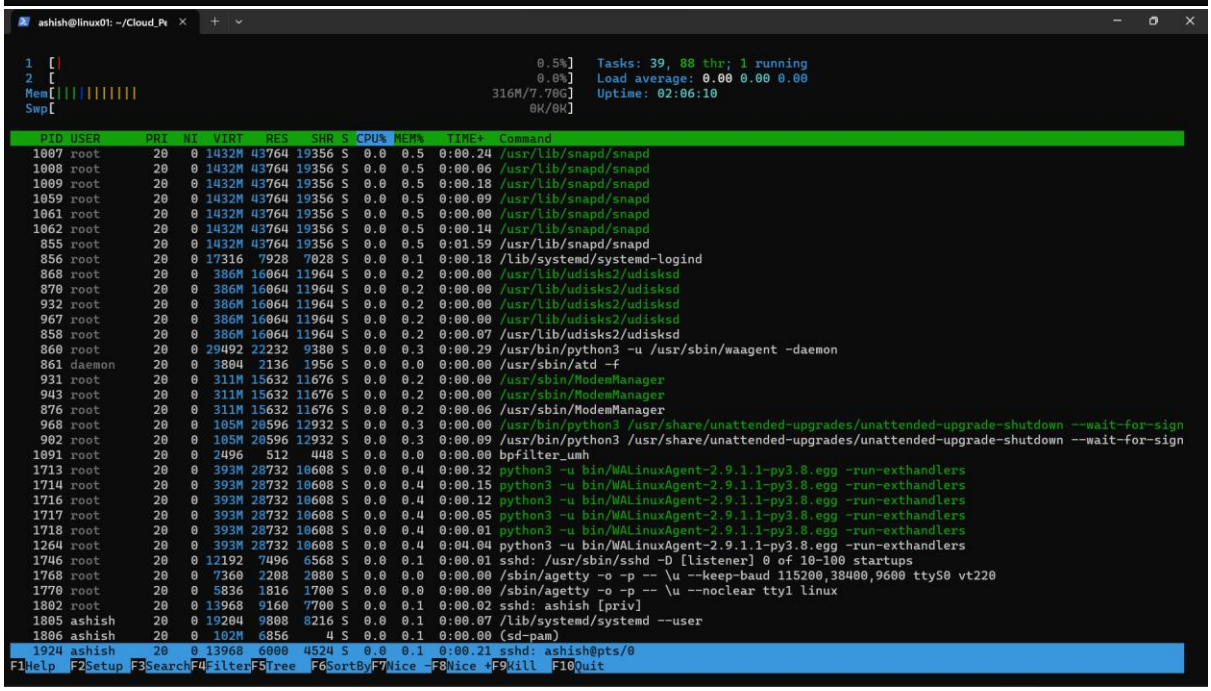
Using NMON and HTOP commands to check performance, CPU utilization, memory utilization.

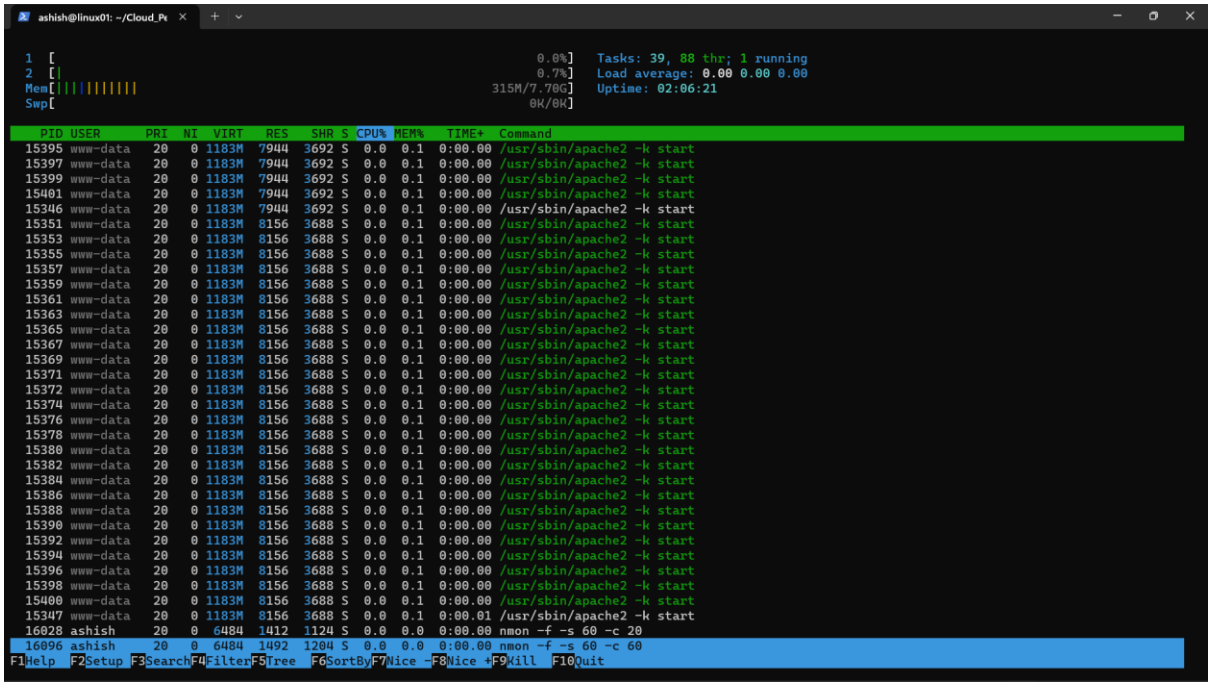
```
Reading package lists... Done
ashish@linux01:~/Cloud_Performance_Tuning$ sudo apt-get install nmon
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  nmon
0 upgraded, 1 newly installed, 0 to remove and 8 not upgraded.
Need to get 68.8 kB of archives.
After this operation, 187 kB of additional disk space will be used.
Get:1 http://azure.archive.ubuntu.com/ubuntu focal/universe amd64 nmon amd64 16m+debian-1 [68.8 kB]
Fetched 68.8 kB in 0s (2261 kB/s)
Selecting previously unselected package nmon.
(Reading database ... 59632 files and directories currently installed.)
Preparing to unpack .../nmon_16m+debian-1_amd64.deb ...
Unpacking nmon (16m+debian-1) ...
Setting up nmon (16m+debian-1) ...
Processing triggers for man-db (2.9.1-1) ...
```

Memory utilization

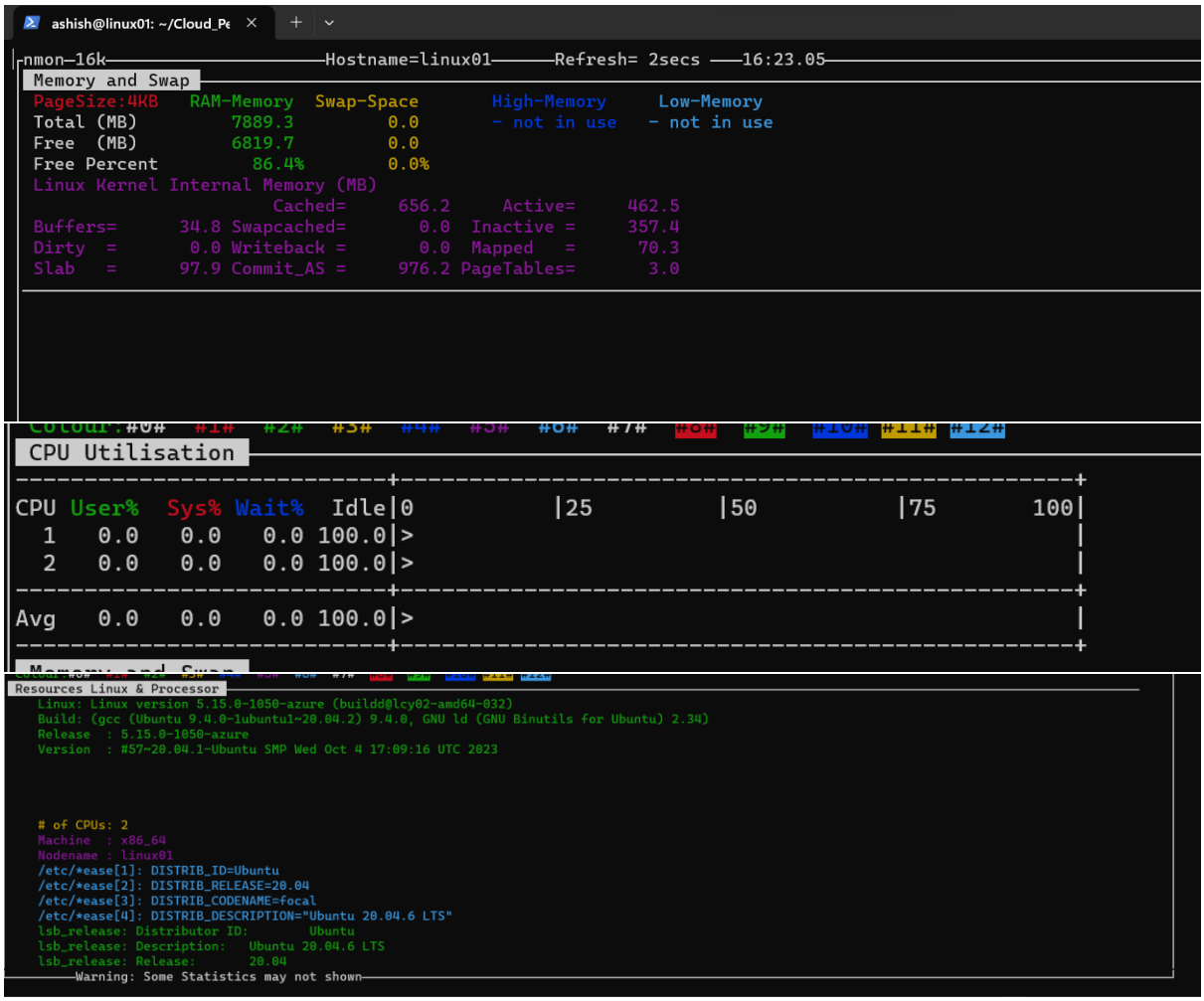


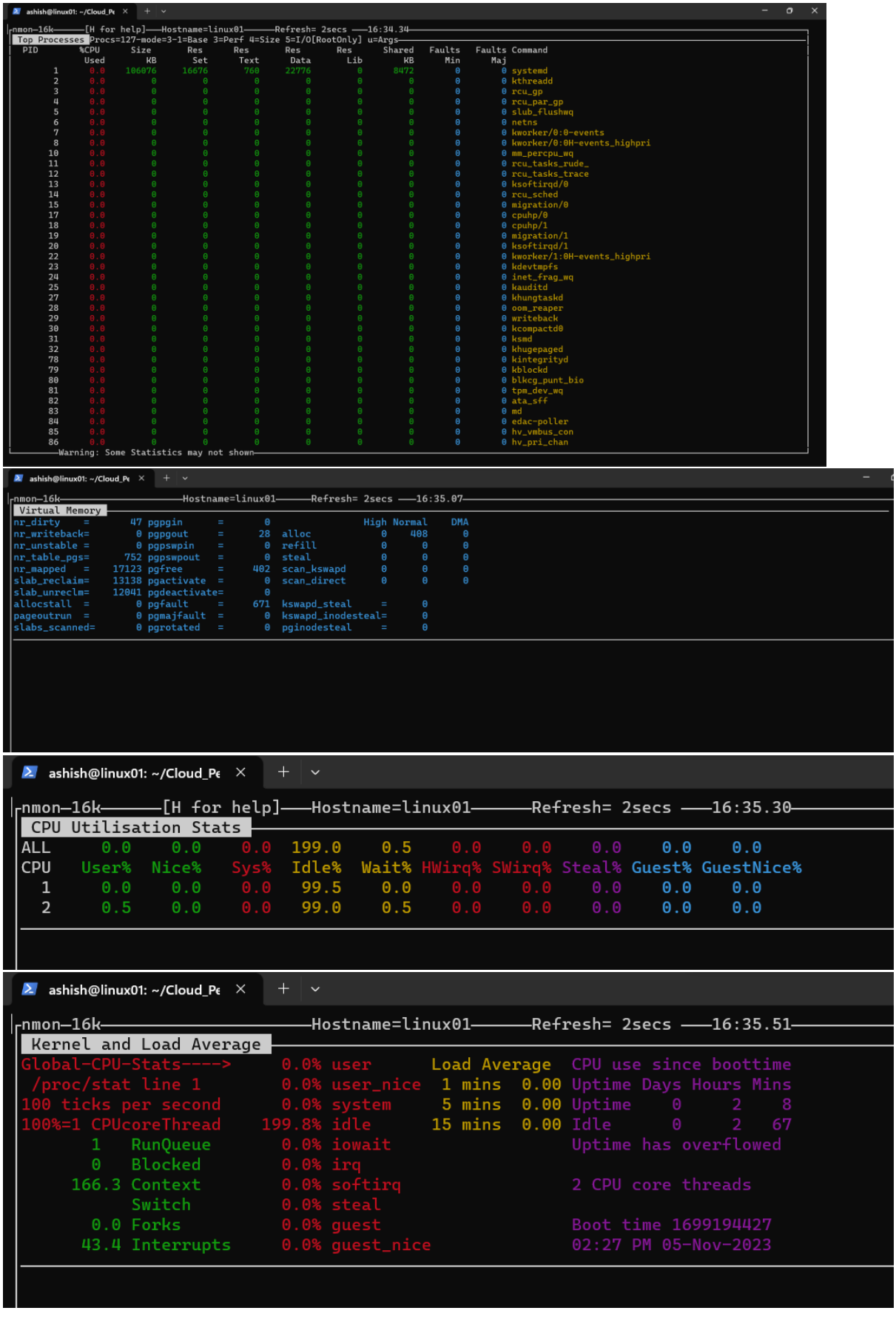

ashish@linux01: ~/Cloud_Pe
1 [0.0%] Tasks: 39, 88 thr; 1 running
2 [| 0.7%] Load average: 0.00 0.00 0.00
Mem[|||||||||| 335M/7.70G] Uptime: 02:02:19
Swp[0K/0K]
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
16251 ashish 20 0 8536 3920 3020 R 0.7 0.0 0:00.03 htop
1924 ashish 20 0 13968 6000 4524 S 0.0 0.1 0:00.16 sshd: ashish@pts/0
1 root 20 0 103M 16676 8472 S 0.0 0.2 0:05.36 /sbin/init
176 root 19 -1 52160 11068 9936 S 0.0 0.1 0:00.45 /lib/systemd/systemd-journald
214 root 20 0 9936 5692 3708 S 0.0 0.1 0:00.34 /lib/systemd/systemd-udevd
284 root 20 0 4252 2896 1944 S 0.0 0.0 0:02.79 /usr/lib/linux-tools/5.15.0-1050-azure/hv_kvp_daemon -n
427 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.04 /sbin/multipathd -d -s
428 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.00 /sbin/multipathd -d -s
429 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.00 /sbin/multipathd -d -s
430 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.40 /sbin/multipathd -d -s
431 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.00 /sbin/multipathd -d -s
432 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.00 /sbin/multipathd -d -s
426 root RT 0 273M 17996 8212 S 0.0 0.2 0:00.61 /sbin/multipathd -d -s
620 systemd-n 20 0 27412 7564 6696 S 0.0 0.1 0:00.04 /lib/systemd/systemd-networkd
623 systemd-r 20 0 24692 12320 8260 S 0.0 0.2 0:00.09 /lib/systemd/systemd-resolved
829 root 20 0 235M 9376 8420 S 0.0 0.1 0:00.09 /usr/lib/accountsservice/accounts-daemon
851 root 20 0 235M 9376 8420 S 0.0 0.1 0:00.00 /usr/lib/accountsservice/accounts-daemon
823 root 20 0 235M 9376 8420 S 0.0 0.1 0:00.11 /usr/lib/accountsservice/accounts-daemon
831 root 20 0 8548 2908 2692 S 0.0 0.0 0:00.00 /usr/sbin/cron -f
832 messagebu 20 0 7712 4892 3976 S 0.0 0.1 0:00.56 /usr/bin/dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation
854 root 20 0 81836 3536 3248 S 0.0 0.0 0:00.00 /usr/sbin/irqbalance --foreground
839 root 20 0 81836 3536 3248 S 0.0 0.0 0:00.08 /usr/sbin/irqbalance --foreground
842 root 20 0 29880 18260 10172 S 0.0 0.2 0:00.11 /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
848 root 20 0 230M 9044 8132 S 0.0 0.1 0:00.00 /usr/lib/policykit-1/polkitd --no-debug
852 root 20 0 230M 9044 8132 S 0.0 0.1 0:00.00 /usr/lib/policykit-1/polkitd --no-debug
843 root 20 0 230M 9044 8132 S 0.0 0.1 0:00.01 /usr/lib/policykit-1/polkitd --no-debug
845 _chrony 20 0 4828 2164 2000 S 0.0 0.0 0:00.84 /usr/sbin/chronyd -F -1
846 _chrony 20 0 4696 180 0 S 0.0 0.0 0:00.00 /usr/sbin/chronyd -F -1
873 syslog 20 0 219M 7284 3920 S 0.0 0.1 0:00.03 /usr/sbin/rsyslogd -n -iNONE
874 syslog 20 0 219M 7284 3920 S 0.0 0.1 0:00.00 /usr/sbin/rsyslogd -n -iNONE
875 syslog 20 0 219M 7284 3920 S 0.0 0.1 0:00.02 /usr/sbin/rsyslogd -n -iNONE
850 syslog 20 0 219M 7284 3920 S 0.0 0.1 0:00.06 /usr/sbin/rsyslogd -n -iNONE
989 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.04 /usr/lib/snapd/snapd
991 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.00 /usr/lib/snapd/snapd
F1Help F2Setup F3SearchF4FilterF5Tree F6SortByF7Nice -F8Nice +F9Kill F10Quit


ashish@linux01: ~/Cloud_Pe
1 [| 0.5%] Tasks: 39, 88 thr; 1 running
2 [0.0%] Load average: 0.00 0.00 0.00
Mem[|||||||||| 316M/7.70G] Uptime: 02:06:10
Swp[0K/0K]
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
1007 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.24 /usr/lib/snapd/snapd
1008 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.06 /usr/lib/snapd/snapd
1009 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.18 /usr/lib/snapd/snapd
1059 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.09 /usr/lib/snapd/snapd
1061 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.00 /usr/lib/snapd/snapd
1062 root 20 0 1432M 43764 19356 S 0.0 0.5 0:00.14 /usr/lib/snapd/snapd
855 root 20 0 1432M 43764 19356 S 0.0 0.5 0:01.59 /usr/lib/snapd/snapd
856 root 20 0 17316 7928 7028 S 0.0 0.1 0:00.18 /lib/systemd/systemd-logind
868 root 20 0 386M 16064 11964 S 0.0 0.2 0:00.00 /usr/lib/udisks2/udisksd
870 root 20 0 386M 16064 11964 S 0.0 0.2 0:00.00 /usr/lib/udisks2/udisksd
932 root 20 0 386M 16064 11964 S 0.0 0.2 0:00.00 /usr/lib/udisks2/udisksd
967 root 20 0 386M 16064 11964 S 0.0 0.2 0:00.00 /usr/lib/udisks2/udisksd
858 root 20 0 386M 16064 11964 S 0.0 0.2 0:00.07 /usr/lib/udisks2/udisksd
860 root 20 0 29492 22232 9380 S 0.0 0.3 0:00.29 /usr/bin/python3 -u /usr/sbin/waagent -daemon
861 daemon 20 0 3804 2136 1956 S 0.0 0.0 0:00.00 /usr/sbin/atd -f
931 root 20 0 311M 15632 11676 S 0.0 0.2 0:00.00 /usr/sbin/ModemManager
943 root 20 0 311M 15632 11676 S 0.0 0.2 0:00.00 /usr/sbin/ModemManager
876 root 20 0 311M 15632 11676 S 0.0 0.2 0:00.06 /usr/sbin/ModemManager
968 root 20 0 105M 20596 12932 S 0.0 0.3 0:00.00 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-sign
902 root 20 0 105M 20596 12932 S 0.0 0.3 0:00.09 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-sign
1091 root 20 0 2496 512 448 S 0.0 0.0 0:00.00 bpfilter_umh
1713 root 20 0 393M 28732 10608 S 0.0 0.4 0:00.32 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1714 root 20 0 393M 28732 10608 S 0.0 0.4 0:00.15 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1716 root 20 0 393M 28732 10608 S 0.0 0.4 0:00.12 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1717 root 20 0 393M 28732 10608 S 0.0 0.4 0:00.05 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1718 root 20 0 393M 28732 10608 S 0.0 0.4 0:00.01 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1264 root 20 0 393M 28732 10608 S 0.0 0.4 0:04.04 python3 -u bin/WALinuxAgent-2.9.1.1-py3.8.egg -run-exthandlers
1746 root 20 0 12192 7496 6568 S 0.0 0.1 0:00.01 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
1768 root 20 0 7360 2208 2080 S 0.0 0.0 0:00.00 /sbin/agetty -o -p -- \u --keep-baud 115200,38400,9600 ttyS0 vt220
1770 root 20 0 5836 1816 1700 S 0.0 0.0 0:00.00 /sbin/agetty -o -p -- \u --noclear tty1 linux
1802 root 20 0 13968 9160 7700 S 0.0 0.1 0:00.02 sshd: ashish [priv]
1805 ashish 20 0 19204 9808 8216 S 0.0 0.1 0:00.07 /lib/systemd/systemd --user
1806 ashish 20 0 102M 6856 4 S 0.0 0.1 0:00.00 (sd-pam)
1924 ashish 20 0 13968 6000 4524 S 0.0 0.1 0:00.21 sshd: ashish@pts/0
F1Help F2Setup F3SearchF4FilterF5Tree F6SortByF7Nice -F8Nice +F9Kill F10Quit



CPU Utilization





Response Time: 10 minutes and 18 seconds.

Conclusion:-

Response Time:

Both Linux and Windows can provide good response times. but Linux, due to its efficiency and minimal resource usage, we have seen in this case linux have less response time compared to windows.

Response Time: 10 minutes and 18 seconds.

Response Time: 13 minutes and 30 seconds.

Fast OS Performance:

Linux ubuntu are often known for their fast performance due to their lightweight nature and efficient resource handling. They generally have lower overhead and tend to be very responsive, making them favorable in terms of quick performance.

CPU Utilization:

As we have seen in both the cases, the CPU utilization is less in ubuntu in comparison to windows.

Windows might tend to use more CPU resources for its background services and GUI, potentially leading to slightly higher CPU utilization in some cases.

Memory Utilization:

Ubuntu generally has a reputation for efficient memory management. It tends to use less memory for the operating system itself, leaving more available for applications and services.