Name:Bhushan Mukund Kor **Academic Year:2024-2025**

Division: D15C **Roll No: 28**

Aim: To perform Port, Service monitoring, and Windows/Linux server monitoring using Nagios.

Theory:

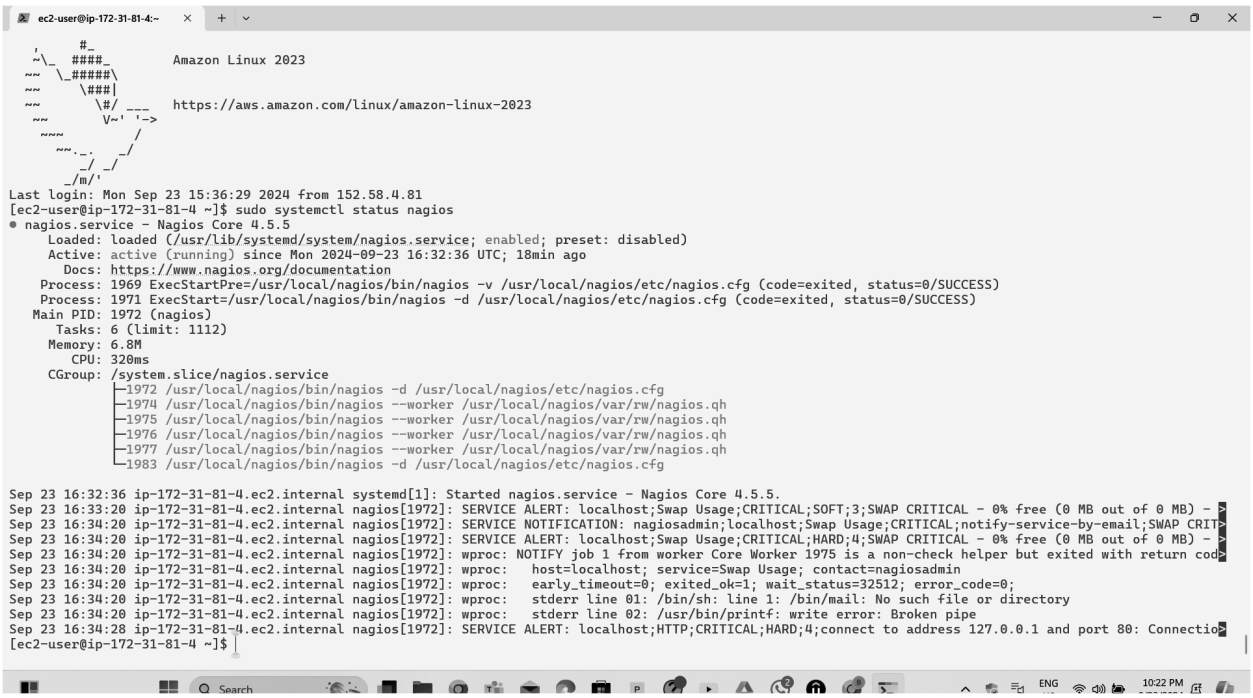
Port and Service Monitoring
Port and service monitoring in Nagios involves checking the availability and responsiveness of network services running on specific ports. This ensures that critical services (like HTTP, FTP, or SSH) are operational. Nagios uses plugins to ping the ports and verify whether services are up and responding as expected, allowing administrators to be alerted in case of outages.

Windows/Linux Server Monitoring
Windows/Linux server monitoring with Nagios entails tracking the performance and health of servers running these operating systems. It includes monitoring metrics such as CPU usage, memory consumption, disk space, and system logs. Nagios employs various plugins to gather data, enabling administrators to ensure optimal performance, identify potential issues, and maintain uptime across their server infrastructure.

Prerequisites:
AWS Academy or Personal account.
Nagios Server running on Amazon Linux Machine. (Refer Experiment No 9)

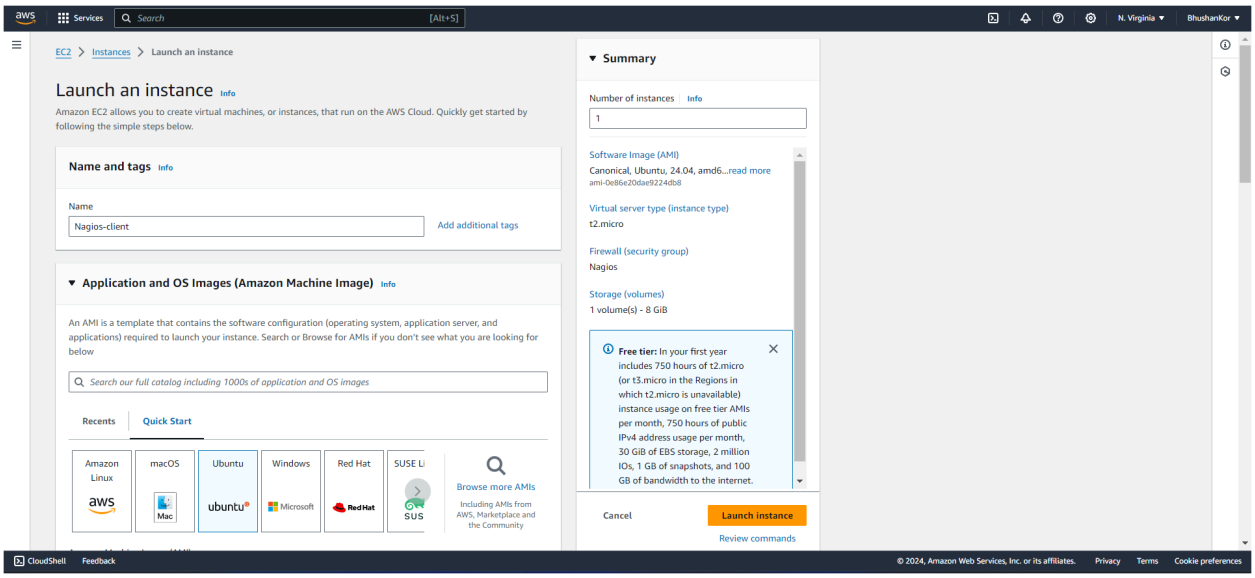
Monitoring Using Nagios:

Step 1: To Confirm Nagios is running on the server side Perform the following command on your Amazon Linux Machine (Nagios-host).
sudo systemctl status nagios



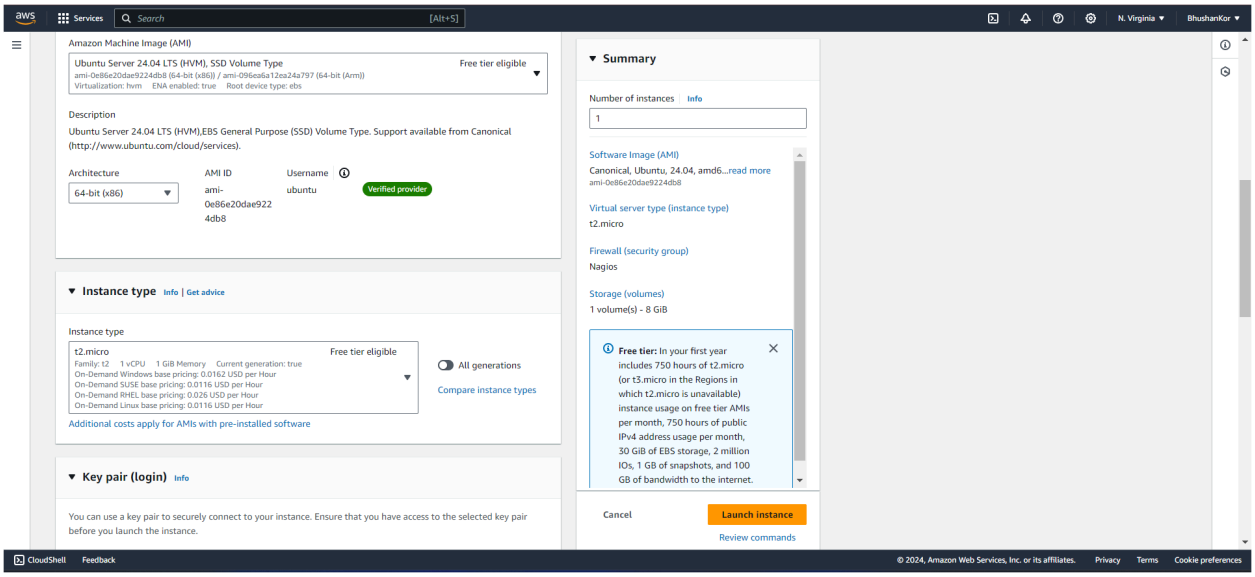
You can now proceed if you get the above message/output.

Step 2: Now Create a new EC2 instance. Name: Nagios-client, AMI: Ubuntu Instance Type: t2.micro.



For Key pair : Click on create key and make key of type RSA with extension .pem . Key will be downloaded to your local machine.

Now select that key in key pair if you already have key with type RSA and extension .pem no need to create new key but you must have that key downloaded.



Select the Existing Security Group and select the Security Group that we have created in Experiment no 9 or the same one you have used for the Nagios server (Nagios-host).

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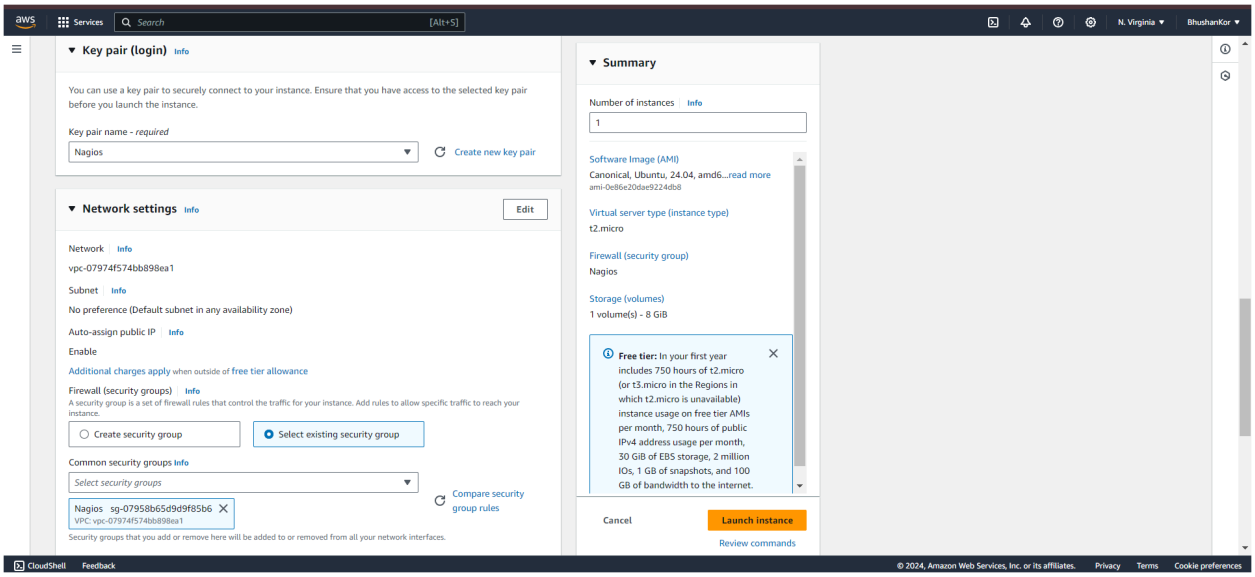

Step 3: Now After creating the EC2 Instance click on connect and then copy the command which is given as example in the SSH Client section .
Now open the terminal in the folder where your key(RSA key with .pem) is located. and paste that copied command.

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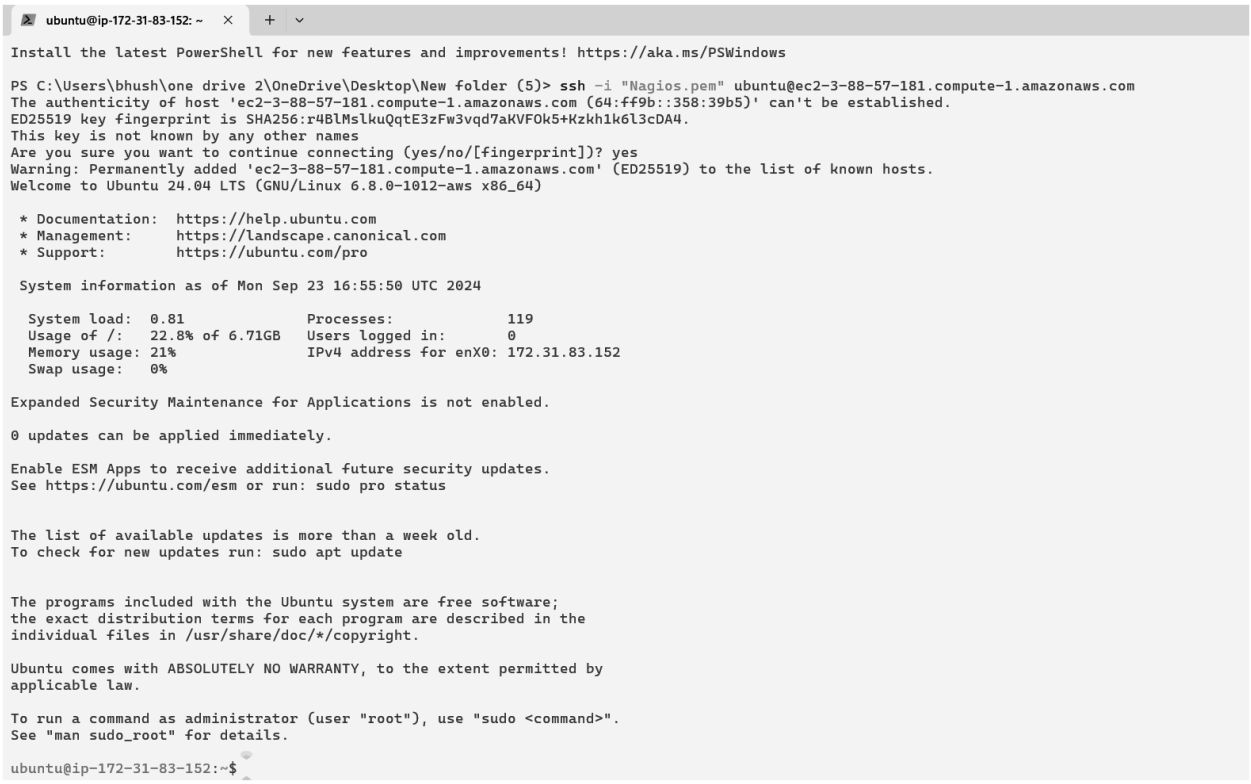
Successfully connected to the instance.



Now perform all the commands on the Nagios-host till step 10

Step 4: Now on the server Nagios-host run the following command.

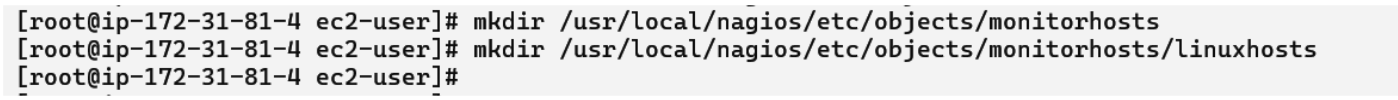
ps -ef | grep nagios

Step 5: Now Become root user and create root directories.

sudo su

mkdir /usr/local/nagios/etc/objects/monitorhosts

mkdir /usr/local/nagios/etc/objects/monitorhosts/linuxhosts



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Step 6: Copy the sample localhost.cfg to linuxhost.cfg by running the following command.(Below command should come in one line see screenshot below)

cp /usr/local/nagios/etc/objects/localhost.cfg /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg

```
[root@ip-172-31-81-4 ec2-user]# cp /usr/local/nagios/etc/objects/localhost.cfg /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg
[root@ip-172-31-81-4 ec2-user]#
```

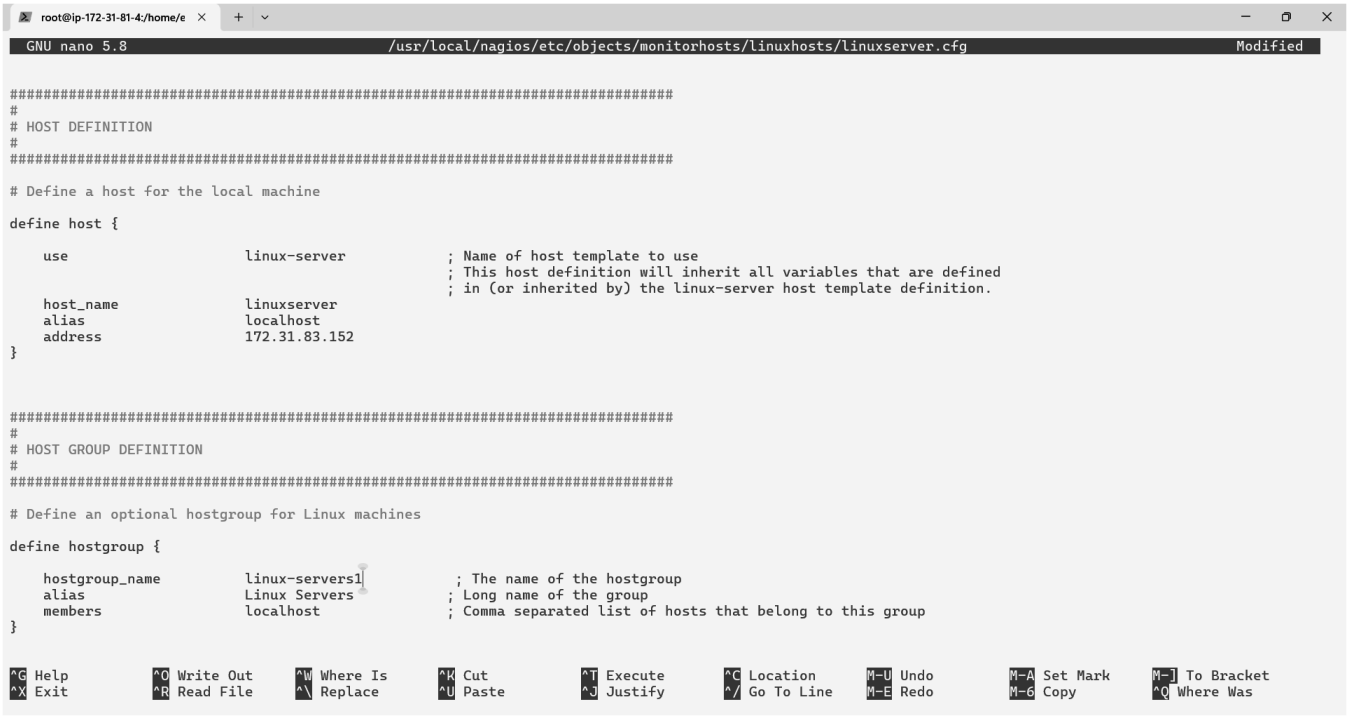
Step 7: Open linuxserver.cfg using nano and make the following changes in all positions?everywhere in file.

Change `hostname` to **linuxserver**.

Change `address` to the public IP of your Linux client.

Set `hostgroup_name` to **linux-servers1**.

nano /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg



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Step 8: Now update the Nagios config file .Add the following line in the file.

Line to add : cfg_dir=/usr/local/nagios/etc/objects/monitorhosts/
Run the command : **nano /usr/local/nagios/etc/nagios.cfg**

Step 9: Now Verify the configuration files by running the following commands.
/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

```
[root@ip-172-31-81-4 ec2-user]# /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

Nagios Core 4.5.5
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2024-09-17
License: GPL

Website: https://www.nagios.org
Reading configuration data...
   Read main config file okay...
   Read object config files okay...

Running pre-flight check on configuration data...

Checking objects...
        Checked 16 services.
        Checked 2 hosts.
        Checked 2 host groups.
        Checked 0 service groups.
        Checked 1 contacts.
        Checked 1 contact groups.
        Checked 24 commands.
        Checked 5 time periods.
        Checked 0 host escalations.
        Checked 0 service escalations.
Checking for circular paths...
        Checked 2 hosts
        Checked 0 service dependencies
        Checked 0 host dependencies
        Checked 5 timeperiods
Checking global event handlers...
Checking obsessive compulsive processor commands...
Checking misc settings...

Total Warnings: 0
Total Errors:   0

Things look okay - No serious problems were detected during the pre-flight check
[root@ip-172-31-81-4 ec2-user]#
```

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Step 10: Now restart the services of nagios by running the following command.
service nagios restart

```
[root@ip-172-31-81-4 ec2-user]# service nagios restart
Redirecting to /bin/systemctl restart nagios.service
[root@ip-172-31-81-4 ec2-user]# sudo systemctl status nagi
```

Step 11: Now Go to the Nagios-client ssh terminal and update and install the packages by running the following command.
sudo apt update -y
sudo apt install gcc -y
sudo apt install -y nagios-nrpe-server nagios-plugins

```
ubuntu@ip-172-31-83-152:~$ sudo apt update -y
sudo apt install gcc -y
sudo apt install -y nagios-nrpe-server nagios-plugins
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
135 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu gcc-13 gcc-13-base gcc-13-x86-64-linux-gnu gcc-x86-64-linux-gnu libasan8 libatomic1 libcc1-0
  libgcc-13-dev libgomp1 libhwasan0 libisl23 libitm1 liblsan0 libmpc3 libquadmath0 libtsan2 libubsan1
Suggested packages:
  cpp-doc gcc-13-locales cpp-13-doc gcc-multilib make autoconf automake libtool flex bison gdb gcc-doc gcc-13-multilib gcc-13-doc gdb-x86-64-linux-gnu
The following NEW packages will be installed:
  cpp cpp-13 cpp-13-x86-64-linux-gnu cpp-x86-64-linux-gnu gcc gcc-13 gcc-13-base gcc-13-x86-64-linux-gnu gcc-x86-64-linux-gnu libasan8 libatomic1 libcc1-0
  libgcc-13-dev libgomp1 libhwasan0 libisl23 libitm1 liblsan0 libmpc3 libquadmath0 libtsan2 libubsan1
0 upgraded, 22 newly installed, 0 to remove and 135 not upgraded.
Need to get 47.3 MB of archives.
After this operation, 163 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 gcc-13-base amd64 13.2.0-23ubuntu4 [49.0 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libisl23 amd64 0.26-3build1 [680 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libmpc3 amd64 1.3.1-1build1 [54.5 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 cpp-13-x86-64-linux-gnu amd64 13.2.0-23ubuntu4 [11.2 MB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 cpp-13 amd64 13.2.0-23ubuntu4 [1032 B]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 cpp-x86-64-linux-gnu amd64 4:13.2.0-7ubuntu1 [5326 B]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 cpp amd64 4:13.2.0-7ubuntu1 [22.4 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libcc1-0 amd64 14-20240412-0ubuntu1 [47.7 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libgomp1 amd64 14-20240412-0ubuntu1 [147 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libitm1 amd64 14-20240412-0ubuntu1 [28.9 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libatomic1 amd64 14-20240412-0ubuntu1 [10.4 kB]
```



```
ubuntu@ip-172-31-83-152: ~
monitoring-plugins is already the newest version (2.3.5-1ubuntu3).
Suggested packages:
  xinetd | inetd
The following NEW packages will be installed:
  nagios-nrpe-server
0 upgraded, 1 newly installed, 0 to remove and 135 not upgraded.
Need to get 356 kB of archives.
After this operation, 469 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 nagios-nrpe-server amd64 4.1.0-1ubuntu3 [356 kB]
Fetched 356 kB in 0s (15.6 MB/s)
Selecting previously unselected package nagios-nrpe-server.
(Reading database ... 73771 files and directories currently installed.)
Preparing to unpack .../nagios-nrpe-server_4.1.0-1ubuntu3_amd64.deb ...
Unpacking nagios-nrpe-server (4.1.0-1ubuntu3) ...
Setting up nagios-nrpe-server (4.1.0-1ubuntu3) ...
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...

Service restarts being deferred:
 /etc/needrestart/restart.d/dbus.service
 systemctl restart getty@tty1.service
 systemctl restart networkd-dispatcher.service
 systemctl restart serial-getty@ttyS0.service
 systemctl restart systemd-logind.service
 systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
 ubuntu @ session #2: sshd[1001,1111]
 ubuntu @ session #8: sshd[1205,1263]
 ubuntu @ user manager service: systemd[1006]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-83-152:~$
```

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Step 12: Open nrpe.cfg file to make changes.Under allowed_hosts, add your nagios host IP address.
sudo nano /etc/nagios/nrpe.cfg

Step 13: Now restart the NRPE server by this command.
sudo systemctl restart nagios-nrpe-server

```
ubuntu@ip-172-31-83-152:~$ sudo nano /etc/nagios/nrpe.cfg

ubuntu@ip-172-31-83-152:~$ sudo systemctl restart nagios-nrpe-server
ubuntu@ip-172-31-83-152:~$
```

Step 14: Now again check the status of Nagios by running this command on Nagios-host and also check httpd is active and run the command to active it.

sudo systemctl status nagios

```
[root@ip-172-31-81-4 ec2-user]# service nagios restart
Redirecting to /bin/systemctl restart nagios.service
[root@ip-172-31-81-4 ec2-user]# sudo systemctl status nagios
● nagios.service - Nagios Core 4.5.5
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Mon 2024-09-23 17:26:10 UTC; 1min 39s ago
       Docs: https://www.nagios.org/documentation
    Process: 4227 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 4228 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 4234 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 4.2M
        CPU: 60ms
     CGroup: /system.slice/nagios.service
             ├─4234 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─4236 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─4237 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─4238 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─4239 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─4242 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: qh: echo service query handler registered
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: qh: help for the query handler registered
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: wproc: Successfully registered manager as @wproc with query handler
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: wproc: Registry request: name=Core Worker 4238;pid=4238
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: wproc: Registry request: name=Core Worker 4239;pid=4239
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: wproc: Registry request: name=Core Worker 4237;pid=4237
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: wproc: Registry request: name=Core Worker 4236;pid=4236
Sep 23 17:26:10 ip-172-31-81-4.ec2.internal nagios[4234]: Successfully launched command file worker with pid 4242
Sep 23 17:27:00 ip-172-31-81-4.ec2.internal nagios[4234]: SERVICE ALERT: linuxserver;HTTP;CRITICAL;SOFT;3;connect to address 172.31.83.152 and port 80: Con>
Sep 23 17:27:30 ip-172-31-81-4.ec2.internal nagios[4234]: SERVICE ALERT: linuxserver;Swap Usage;CRITICAL;SOFT;1;SWAP CRITICAL - 0% free (0 MB out of 0 MB) >
[root@ip-172-31-81-4 ec2-user]#
```

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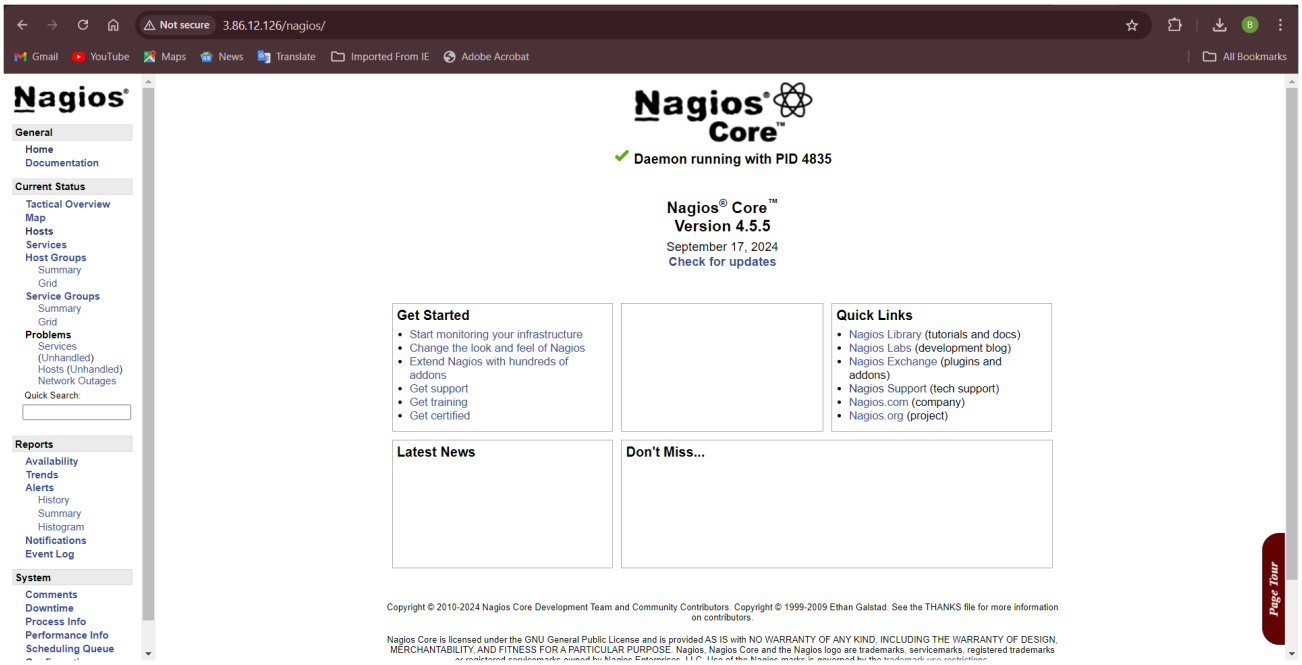
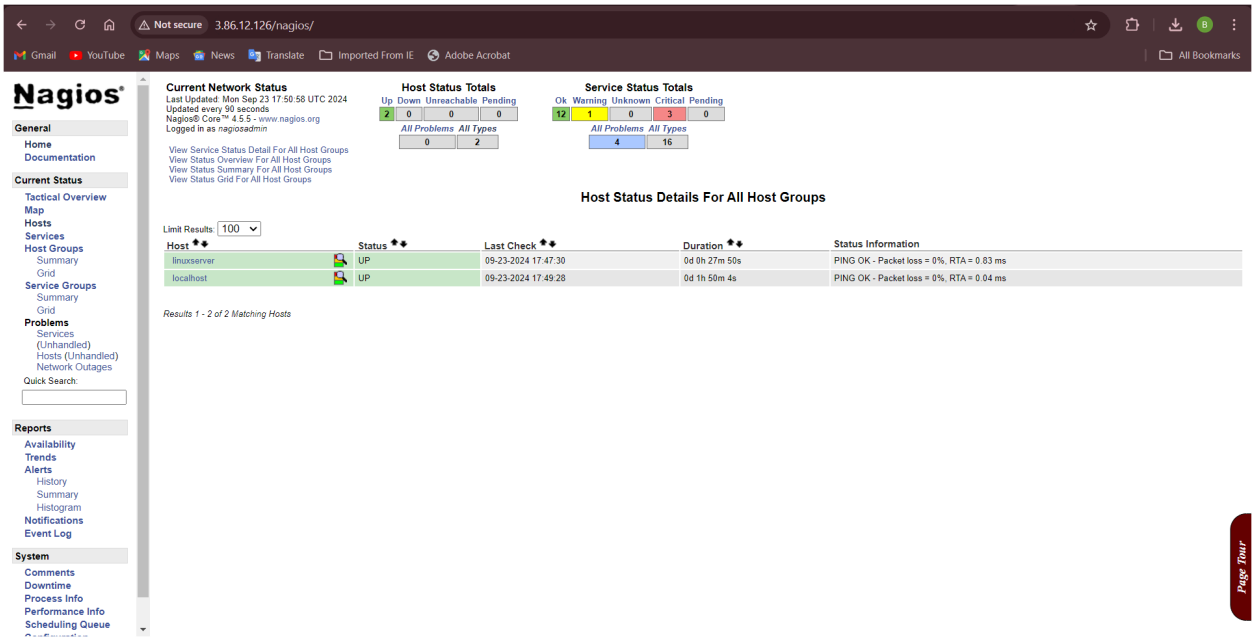
sudo systemctl status httpd
sudo systemctl start httpd
sudo systemctl enable httpd

```
[root@ip-172-31-81-4 ec2-user]# sudo systemctl status httpd
○ httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)
    Drop-In: /usr/lib/systemd/system/httpd.service.d
             └─php-fpm.conf
     Active: inactive (dead)
       Docs: man:httpd.service(8)
[root@ip-172-31-81-4 ec2-user]# sudo systemctl start httpd
[root@ip-172-31-81-4 ec2-user]# sudo systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-81-4 ec2-user]#
```

Step 15: Now to check Nagios dashboard go to http://<Nagios-host ip>/nagios .



Now Click on Hosts from left side panel



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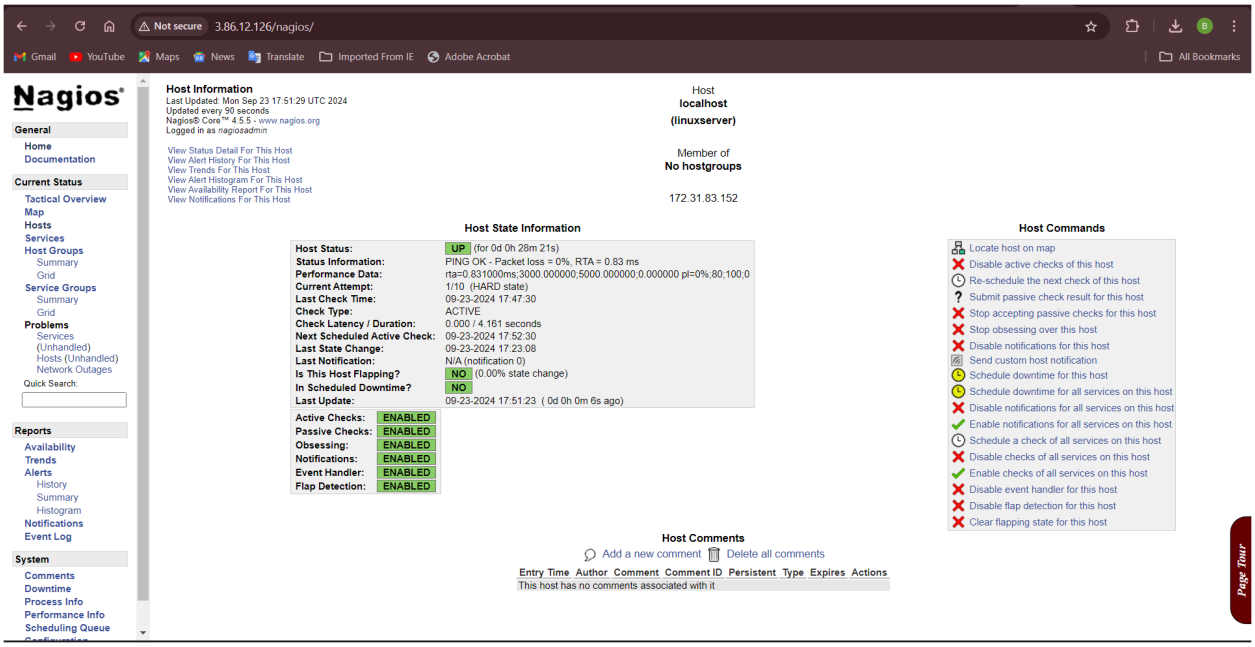
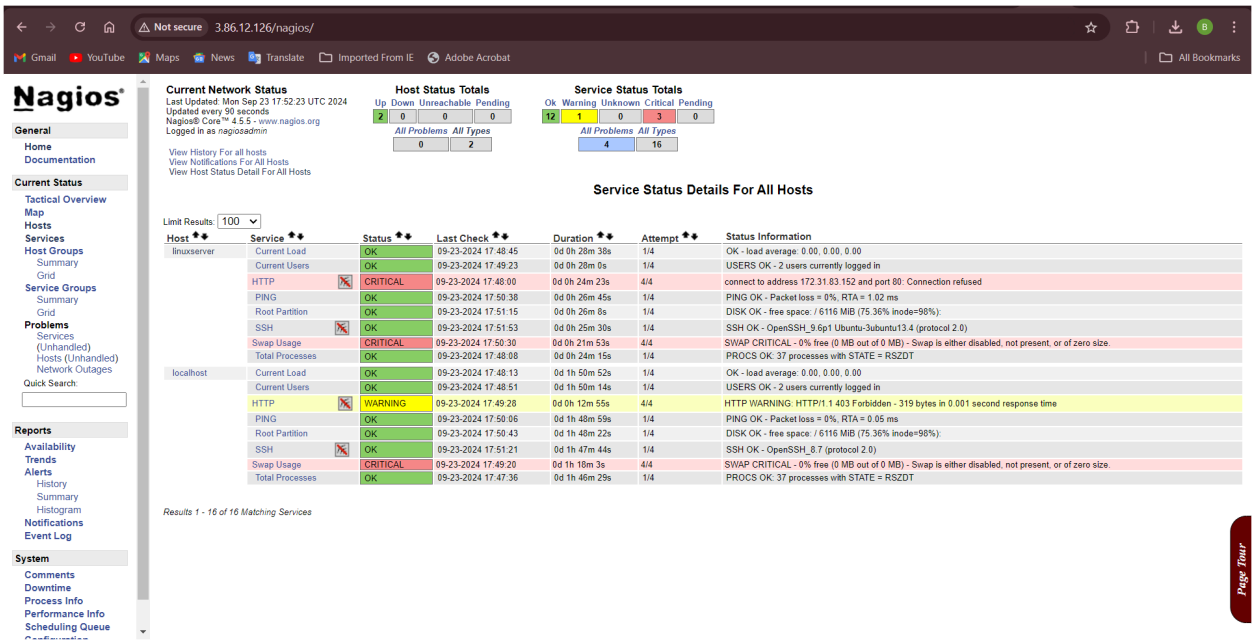
We can see our linuxserver now click on it we can see the host information.



Current Network Status



Conclusion: In conclusion, the experiment focused on monitoring ports, services, and a Linux server using Nagios. Through the step-by-step process, we successfully configured Nagios to monitor essential network services on the Linux server. By setting up both the Nagios host and client, we were able to track system performance, ensure service availability, and monitor key metrics like CPU and memory usage.