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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.

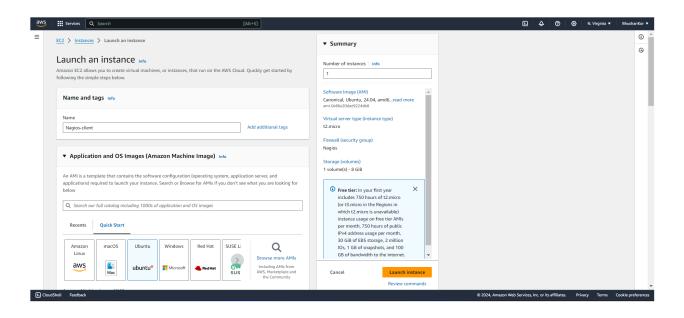
**Step 2:** Now Create a new EC2 instance. Name: Nagios-client, AMI: Ubuntu Instance Type: t2.micro.

```
• nagios.service - Nagios Core 4.5.5

Loaded: loaded (Jusr/lib/systemd/system/nagios.service; enabled; preset: disabled)
Active: active (running) since Fri 2024-10-04 14:11:55 UTC; 28min ago
Docs: https://www.nagios.org/documentation
Main PID: 1998 (nagios)
Tasks: 6 (limit: 1112)
Memory: 6.7M
CPU: 442ms
CGroup: /system.slice/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
-2004 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2005 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2006 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2007 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2008 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2008 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/car/rw/nagios.qh
-2008 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2008 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/str/rw/nagios.qh
-2008 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2007 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-2007
```

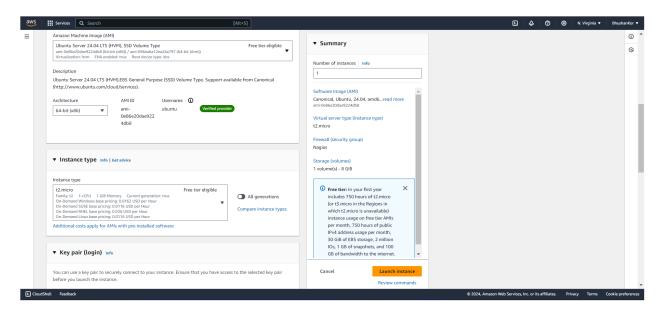
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**For Key pair :** Click on create key and make key of type RSA with extension .pem . Key will be downloaded to your local machine.

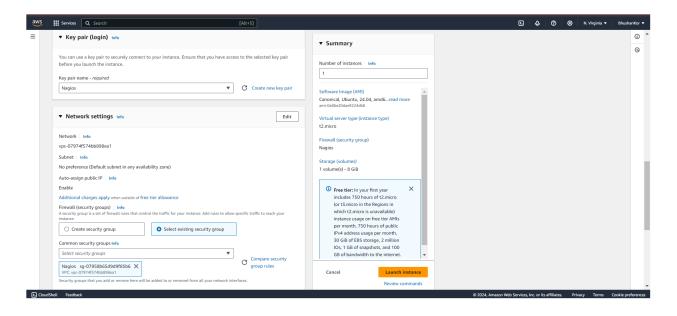
Now select that key in key pair if you already have key with type RSA and extension .pem no need to create new key but you must have that key downloaded.



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.

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

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```
[ec2-user@ip-172-31-34-108 ~]$ ps -ef | grep nagios
                                                                       ep naglos

00:00:00 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

00:00:00 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh

00:00:00 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh

00:00:00 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh

00:00:00 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh

00:00:00 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

00:00:00 sudo systemctl status nagios
                                 1 0 14:11 ?
1998 0 14:11 ?
 nagios
                    1998
                    2004
 nagios
                    2005
                                 1998 0 14:11 ?
                    2006
                                 1998 0 14:11 ?
                    2007
                                 1998 0 14:11 ?
                                 1998 0 14:11 ?
                    2008
                                 2370 0 14:20 pts/0
root
                  16967
                                                                       00:00:00 sudo systemctl status nagios
root
                  16970
                               16967 0 14:20 pts/1
                                          0 14:20 pts/1
                                                                        00:00:00 systemctl status nagios
root
                  16971
                                16970
                  18221
                                18132 0 14:40 pts/2
                                                                        00:00:00 sudo systemctl status nagios
root
                  18223
                               18221 0 14:40 pts/3
                                                                       00:00:00 sudo systematl status nagios
root
                  18224
                               18223 0 14:40 pts/3
                                                                       00:00:00 systemctl status nagios
root
ec2-user
                  19275
                               19251
                                          0 14:59 pts/4
                                                                       00:00:00 grep --color=auto 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

```
[ec2-user@ip-172-31-34-108 ~]$ sudo su
mkdir /usr/local/nagios/etc/objects/monitorhosts
mkdir /usr/local/nagios/etc/objects/monitorhosts/linuxhosts
[root@ip-172-31-34-108 ec2-user]# |
```

[root@ip-172-31-34-108 ec2-user]# mkdir /usr/local/nagios/etc/objects/monitorhosts
[root@ip-172-31-34-108 ec2-user]# mkdir /usr/local/nagios/etc/objects/monitorhosts/linu
xhosts

**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-172-31-34-108 ec2-user]# cp /usr/local/nagios/etc/objects/localhost.cfg /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg [root@ip-172-31-34-108 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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```
define host {
                                                    ; Name of host template to use
    use
                            linux-server
                                                    ; This host definition will inheri>
                                                    ; in (or inherited by) the linux-s>
   host_name
                            linuxserver
    alias
                            localhost
    address
                            54.172.217.167
define hostgroup {
    hostgroup_name
                            linux-servers1
                                                     ; The name of the hostgroup
                            Linux Servers
                                                    ; Long name of the group
    alias
    members
                            localhost
                                                    ; Comma separated list of hosts th>
```

**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

```
# You can specify individual object config files as shown below:
cfg_file=/usr/local/nagios/etc/objects/commands.cfg
cfg_file=/usr/local/nagios/etc/objects/contacts.cfg
cfg_file=/usr/local/nagios/etc/objects/timeperiods.cfg
cfg_file=/usr/local/nagios/etc/objects/templates.cfg
cfg_dir=/usr/local/nagios/etc/objects/monitorhosts/
# Definitions for monitoring the local (Linux) host
cfg_file=/usr/local/nagios/etc/objects/localhost.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

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```
[root@ip-172-31-34-108 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...
Warning: Duplicate definition found for service 'HTTP' on host 'localhost' (config file '/usr/loca
l/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 152)
Warning: Duplicate definition found for service 'SSH' on host 'localhost' (config file '/usr/local
/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 138)
Warning: Duplicate definition found for service 'Swap Usage' on host 'localhost' (config file '/us
r/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 125)
Warning: Duplicate definition found for service 'Current Load' on host 'localhost' (config file '/
usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 112)
Warning: Duplicate definition found for service 'Total Processes' on host 'localhost' (config file
'/usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 100)
Warning: Duplicate definition found for service 'Current Users' on host 'localhost' (config file '
/usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 86)
Warning: Duplicate definition found for service 'Root Partition' on host 'localhost' (config file
'/usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 72)
Warning: Duplicate definition found for service 'PING' on host 'localhost' (config file '/usr/loca
l/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg', starting on line 58)
   Read object config files okay...
Running pre-flight check on configuration data...
Checking objects...
        Checked 8 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
```

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

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```
[root@ip-172-31-34-108 ec2-user]# service nagios restart
Redirecting to /bin/systemctl restart nagios.service
[root@ip-172-31-34-108 ec2-user]# |
```

**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-172-31-47-124:~$ 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 InReleas
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates
InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backport
s InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [1
26 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe
amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 P
ackages [382 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Transla
tion-en [83.9 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c
-n-f Metadata [4704 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd
64 Packages [277 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/univers
e Translation-en [5982 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/universe Tr
anslation-en [117 kB]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe am
d64 Components [8632 B]
Get:13 http://security.ubuntu.com/ubuntu noble-security/universe am
d64 c-n-f Metadata [10.4 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/multiverse
```

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

```
/etc/nagios/nrpe.cfg
  GNU nano 7.2
# NOTE: This option is ignored if NRPE is running under either ine>
nrpe_user=nagios
# NRPE GROUP
# This determines the effective group that the NRPE daemon should >
# You can either supply a group name or a GID.
# NOTE: This option is ignored if NRPE is running under either ine>
nrpe_group=nagios
# ALLOWED HOST ADDRESSES
# This is an optional comma-delimited list of IP address or hostna>
# that are allowed to talk to the NRPE daemon. Network addresses w>
# (i.e. 192.168.1.0/24) are also supported. Hostname wildcards are>
# supported.
# Note: The daemon only does rudimentary checking of the client's > # address. I would highly recommend adding entries in your /etc/h>
# file to allow only the specified host to connect to the port
# you are running this daemon on.
# NOTE: This option is ignored if NRPE is running under either ine>
allowed_hosts=127.0.0.1,::1,54.161.62.217
```

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

```
ubuntu@ip-172-31-47-124:~$ sudo systemctl restart nagios-nrpe-serve
```

**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

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```
[ec2-user@ip-172-31-34-108 ~]$ 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 Fri 2024-10-04 15:39:38 UTC; 14min ago
       Docs: https://www.nagios.org/documentation
    Process: 21775 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg
  Process: 21776 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (co>Main PID: 21781 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 4.1M
        CPU: 244ms
     CGroup: /system.slice/nagios.service
              —21781 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
              -21782 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-21783 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
              —21784 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
              -21785 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
              L_21790 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found >
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found >
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Warning: Duplicate definition found
Oct 04 15:39:38 ip-172-31-34-108.ec2.internal nagios[21781]: Successfully launched command file w>
Oct 04 15:40:20 ip-172-31-34-108.ec2.internal nagios[21781]: HOST ALERT: linuxserver;UP;SOFT;1;PI>
lines 1-28/28 (END)
```

#### sudo systemctl status httpd

```
[ec2-user@ip-172-31-34-108 ~]$ sudo systemctl status httpd
httpd.service - The Apache HTTP Server
    Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
    Drop-In: /usr/lib/systemd/system/httpd.service.d
             ∟php-fpm.conf
     Active: active (running) since Fri 2024-10-04 14:18:18 UTC; 1h 37min ago
       Docs: man:httpd.service(8)
   Main PID: 2495 (httpd)
     Status: "Total requests: 48; Idle/Busy workers 100/0; Requests/sec: 0.0082; Bytes served/sec:
     Tasks: 230 (limit: 1112)
    Memory: 24.0M
        CPU: 3.655s
     CGroup: /system.slice/httpd.service
              2495 /usr/sbin/httpd -DFOREGROUND
              2543 /usr/sbin/httpd -DFOREGROUND
              — 2544 /usr/sbin/httpd -DFOREGROUND

    2545 /usr/sbin/httpd -DFOREGROUND

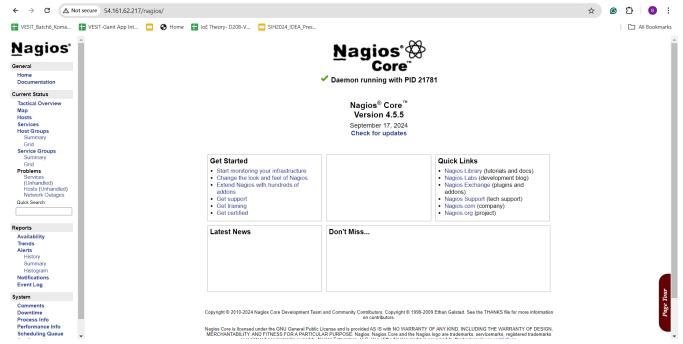
    2546 /usr/sbin/httpd -DFOREGROUND

             L_20138 /usr/sbin/httpd -DFOREGROUND
Oct 04 14:18:18 ip-172-31-34-108.ec2.internal systemd[1]: Starting httpd.service - The Apache HTT>
Oct 04 14:18:18 ip-172-31-34-108.ec2.internal systemd[1]: Started httpd.service - The Apache HTTF
Oct 04 14:18:18 ip-172-31-34-108.ec2.internal httpd[2495]: Server configured, listening on: port >
lines 1-22/22 (END)
```

sudo systemctl start httpd sudo systemctl enable httpd

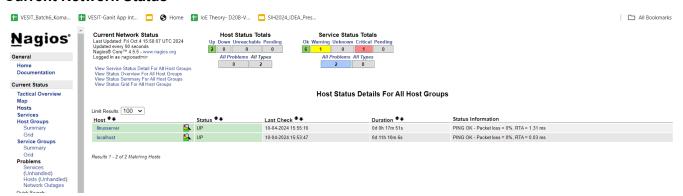
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Step 15: Now to check Nagios dashboard go to http://<Nagios-host ip>/nagios .

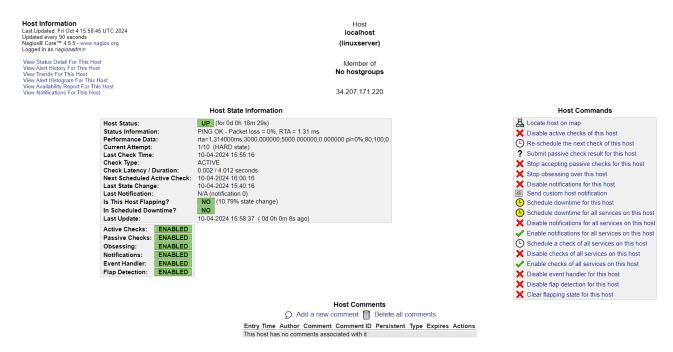


# Now Click on Hosts from left side panel

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



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**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.