Advanced DevOps
Lab Experiment 10

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

Nagios. **Steps:**

Prerequisites: AWS Free Tier, Nagios Server running on Amazon Linux Machine.

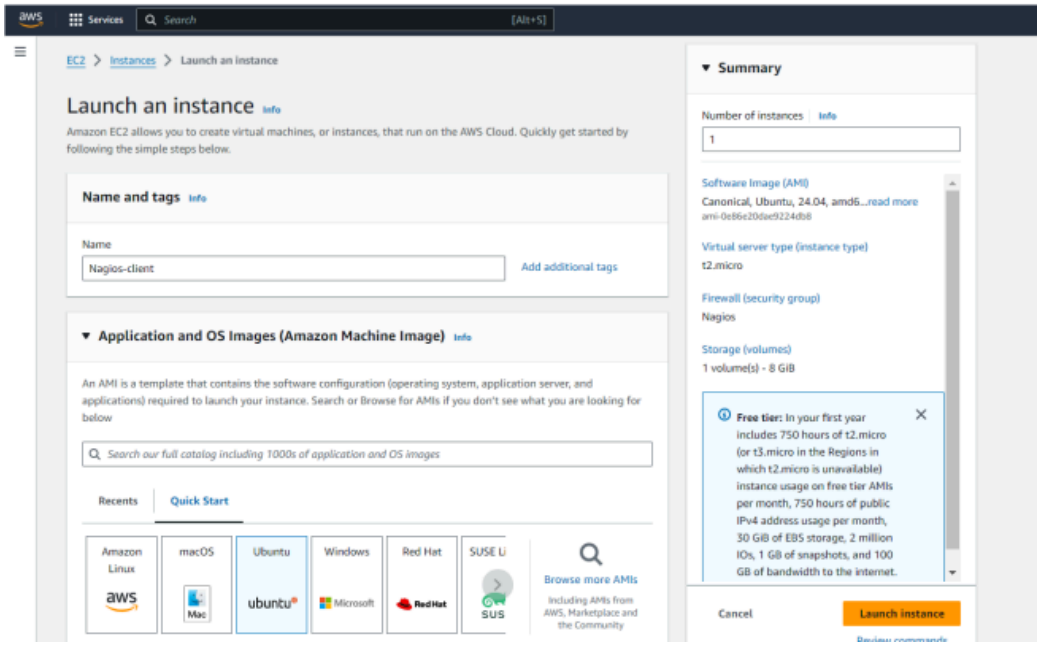
1. To Confirm that Nagios is running **on the server side**, run this
   sudo systemctl status nagios on the "NAGIOS HOST".

```
ec2-user@ip-172-31-81-4:~

       #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
Last login: Mon Sep 23 15:36:29 2024 from 152.58.4.81
[ec2-user@ip-172-31-81-4 ~]$ 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 16:32:36 UTC; 18min ago
       Docs: https://www.nagios.org/documentation
    Process: 1969 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 1971 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 1972 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 6.8M
        CPU: 320ms
     CGroup: /system.slice/nagios.service
             ├─1972 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─1974 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1975 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1976 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1977 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─1983 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Sep 23 16:32:36 ip-172-31-81-4.ec2.internal systemd[1]: Started nagios.service - Nagios Core 4.5.5.
```

   You can proceed if you get this message.

2. Before we begin,
   To monitor a Linux machine, create an Ubuntu 20.04 server EC2 Instance in AWS.

   Provide it with the same security group as the Nagios Host and name it
   'linux-client' alongside the host.



For now, leave this machine as is, and go back to your nagios HOST machine.

3. On the server, run this command

```
ps -ef | grep nagios
```

```
Last login: Sat Oct  5 16:58:17 2024 from 42.111.112.18
[ec2-user@ip-172-31-43-65 ~]$ ps -ef | grep nagios
nagios     97412       1  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios -d /usr/lo
nagios     97413   97412  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios --worker /
s.qh
nagios     97414   97412  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios --worker /
s.qh
nagios     97415   97412  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios --worker /
s.qh
nagios     97416   97412  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios --worker /
s.qh
nagios     97417   97412  0 17:34 ?        00:00:00 /usr/local/nagios/bin/nagios -d /usr/lo
ec2-user   98423   98399  0 17:51 pts/2    00:00:00 grep --color=auto nagios
```

4. Become a root user and create 2 folders

```
sudo su
mkdir /usr/local/nagios/etc/objects/monitorhosts
mkdir /usr/local/nagios/etc/objects/monitorhosts/linuxhosts
```

```
[ec2-user@ip-172-31-43-65 ~]$ sudo su
mkdir /usr/local/nagios/etc/objects/monitorhosts
mkdir /usr/local/nagios/etc/objects/monitorhosts/linuxhosts
[root@ip-172-31-43-65 ec2-user]#
```

5. Copy the sample localhost.cfg file to linuxhost folder

```
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]#
```

6. Open linuxserver.cfg using nano and make the following changes

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

Change the hostname to linuxserver (EVERYWHERE ON THE FILE) Change address to the public IP address of your **LINUX CLIENT**.

```
  GNU nano 5.8                    /usr/local/nagios/etc/objects/monitorhosts/linuxhosts/linuxserver.cfg
###############################################################################
# LOCALHOST.CFG - SAMPLE OBJECT CONFIG FILE FOR MONITORING THIS MACHINE
#
#
# NOTE: This config file is intended to serve as an *extremely* simple
#       example of how you can create configuration entries to monitor
#       the local (Linux) machine.
#
###############################################################################



###############################################################################
#
# HOST DEFINITION
#
###############################################################################

# Define a host for the local machine

define host {

    use                     linux-server            ; Name of host template to use
                                                    ; This host definition will inherit all variables that are defined
                                                    ; in (or inherited by) the linux-server host template definition.
    host_name               localhost
    alias                   localhost
    address                 127.0.0.1
}



###############################################################################
#
# HOST GROUP DEFINITION
#
```

Change hostgroup_name under hostgroup to linux-servers1

Everywhere else on the file, change the hostname to linuxserver instead of localhost.

7. Open the Nagios Config file and add the following line

```
nano /usr/local/nagios/etc/nagios.cfg

##Add this line
cfg_dir=/usr/local/nagios/etc/objects/monitorhosts/
```

```
root@ip-172-31-81-4:/home/e
  GNU nano 5.8                    /usr/local/nagios/etc/nagios.cfg                    Modified
##############################################################################
#
# NAGIOS.CFG - Sample Main Config File for Nagios 4.5.5
#
# Read the documentation for more information on this configuration
# file.  I've provided some comments here, but things may not be so
# clear without further explanation.
#
#
##############################################################################


# LOG FILE
# This is the main log file where service and host events are logged
# for historical purposes.  This should be the first option specified
# in the config file!!!

log_file=/usr/local/nagios/var/nagios.log



# OBJECT CONFIGURATION FILE(S)
# These are the object configuration files in which you define hosts,
# host groups, contacts, contact groups, services, etc.
# You can split your object definitions across several config files
# if you wish (as shown below), or keep them all in a single config file.

# 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

# Definitions for monitoring a Windows machine

^G Help      ^O Write Out  ^W Where Is   ^K Cut       ^T Execute    ^C Location   M-U Undo      M-A Set Mark   M-] To Bracket
^X Exit      ^R Read File  ^\ Replace    ^U Paste     ^J Justify    ^/ Go To Line M-E Redo      M-6 Copy       ^Q Where Was
```

8. Verify the configuration files

/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

```
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

Things look okay - No serious problems were detected during the pre-flight check
[root@ip-172-31-43-65 ec2-user]#
```

You are good to go if there are no errors.

9. Restart the nagios service

```
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
```

Now it is time to switch to the client machine.

10. SSH into the machine or simply use the EC2 Instance Connect feature.

11. Make a package index update and install gcc, nagios-nrpe-server and the plugins.

```
sudo apt update -y
sudo apt install gcc -y
sudo apt install -y nagios-nrpe-server nagios-plugins
```

```
ubuntu@ip-172-31-33-76:~$ 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
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-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 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 Packages [382 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [537 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [132 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [8860 B]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [384 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [159 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [45.0 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [14.9 kB]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [14.4 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3608 B]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [212 B]
```

12. Open nrpe.cfg file to make changes.

```
sudo nano /etc/nagios/nrpe.cfg
```

Under allowed_hosts, add your nagios host IP address like so

```
ubuntu@ip-172-31-83-152: ~
  GNU nano 7.2                                  /etc/nagios/nrpe.cfg *
# This determines the effective user that the NRPE daemon should run as.
# You can either supply a username or a UID.
#
# NOTE: This option is ignored if NRPE is running under either inetd or xinetd

nrpe_user=nagios



# NRPE GROUP
# This determines the effective group that the NRPE daemon should run as.
# You can either supply a group name or a GID.
#
# NOTE: This option is ignored if NRPE is running under either inetd or xinetd

nrpe_group=nagios



# ALLOWED HOST ADDRESSES
# This is an optional comma-delimited list of IP address or hostnames
# that are allowed to talk to the NRPE daemon. Network addresses with a bit mask
# (i.e. 192.168.1.0/24) are also supported. Hostname wildcards are not currently
# supported.
#
# Note: The daemon only does rudimentary checking of the client's IP
# address.  I would highly recommend adding entries in your /etc/hosts.allow
# 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 inetd or xinetd

allowed_hosts=127.0.0.1,::1,3.86.12.126


# COMMAND ARGUMENT PROCESSING

^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark   M-] To Bracket
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy       ^Q Where Was
```

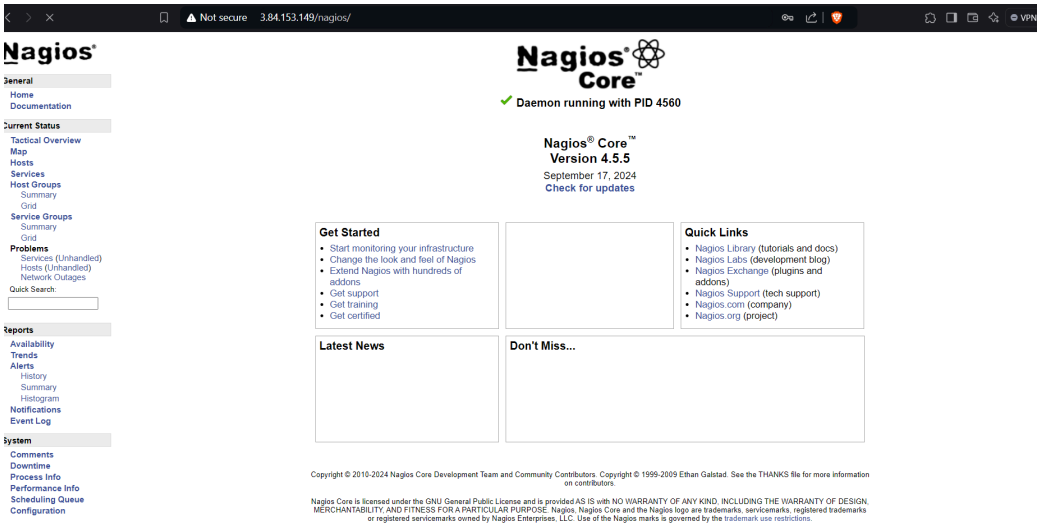
13. Restart the NRPE server

```
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:~$
```

14. Now, check your nagios dashboard and you'll see a new host being added.

Click on Hosts.



NAME: LAUKIK PADGAONKAR DIV: D15C ROLL NO: 37

Click on linuxserver to see the host details

Current Network Status
Last Updated: Sun Oct 6 17:55:03 UTC 2024
Updated every 90 seconds
Nagios® Core™ 4.5.5 - www.nagios.org
Logged in as *nagiosadmin*

View Service Status Detail For All Host Groups
View Status Overview For All Host Groups
View Status Summary For All Host Groups
View Status Grid For All Host Groups

Host Status Totals

Up	Down	Unreachable	Pending
2	0	0	0

All Problems	All Types
0	2

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
6	1	0	1	0

All Problems	All Types
2	8

Host Status Details For All Host Groups

Limit Results: 100

Host	Status	Last Check	Duration	Status Information
linuxserver	UP	10-06-2024 17:50:12	0d 0h 24m 51s	PING OK - Packet loss = 0%, RTA = 0.77 ms
localhost	UP	10-06-2024 17:53:57	1d 0h 21m 53s	PING OK - Packet loss = 0%, RTA = 0.03 ms

Results 1 - 2 of 2 Matching Hosts

You can click Services to see all services and ports being monitored.

Host Information
Last Updated: Sun Oct 6 17:43:35 UTC 2024
Updated every 90 seconds
Nagios® Core™ 4.5.5 - www.nagios.org
Logged in as *nagiosadmin*

View Status Detail For This Host
View Alert History For This Host
View Trends For This Host
View Alert Histogram For This Host
View Availability Report For This Host
View Notifications For This Host

Host
localhost
(localhost)

Member of
linux-servers, linux-servers1

127.0.0.1

Host State Information

Host Status:	UP (for 1d 0h 10m 25s)
Status Information:	PING OK - Packet loss = 0%, RTA = 0.03 ms
Performance Data:	rta=0.030000ms;3000.000000;5000.000000;0.000000 pl=0%;80;100;0
Current Attempt:	1/10 (HARD state)
Last Check Time:	10-06-2024 17:38:57
Check Type:	ACTIVE
Check Latency / Duration:	0.000 / 4.140 seconds
Next Scheduled Active Check:	10-06-2024 17:43:57
Last State Change:	10-05-2024 17:33:10
Last Notification:	N/A (notification 0)
Is This Host Flapping?	NO (0.00% state change)
In Scheduled Downtime?	NO
Last Update:	10-06-2024 17:43:34 (0d 0h 0m 1s ago)

Active Checks:	ENABLED
Passive Checks:	ENABLED
Obsessing:	ENABLED
Notifications:	ENABLED
Event Handler:	ENABLED
Flap Detection:	ENABLED

Host Commands

- Locate host on map
- Disable active checks of this host
- Re-schedule the next check of this host
- Submit passive check result for this host
- Stop accepting passive checks for this host
- Stop obsessing over this host
- Disable notifications for this host
- Send custom host notification
- Schedule downtime for this host
- Schedule downtime for all services on this host
- Disable notifications for all services on this host
- Enable notifications for all services on this host
- Schedule a check of all services on this host
- Disable checks of all services on this host
- Enable checks of all services on this host
- Disable event handler for this host
- Disable flap detection for this host
- Clear flapping state for this host

Host Comments

Add a new comment Delete all comments

Entry Time	Author	Comment	Comment ID	Persistent	Type	Expires	Actions
This host has no comments associated with it							

Current Network Status
Last Updated: Sun Oct 6 17:58:02 UTC 2024
Updated every 90 seconds
Nagios® Core™ 4.5.5 - www.nagios.org
Logged in as *nagiosadmin*

View History For all hosts
View Notifications For All Hosts
View Host Status Detail For All Hosts

Host Status Totals

Up	Down	Unreachable	Pending
2	0	0	0

All Problems	All Types
0	2

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
6	1	0	1	0

All Problems	All Types
2	8

Service Status Details For All Hosts

Limit Results: 100

Host	Service	Status	Last Check	Duration	Attempt	Status Information
localhost	Current Load	OK	10-06-2024 17:56:27	1d 0h 24m 52s	1/4	OK - load average: 0.00, 0.00, 0.00
	Current Users	OK	10-06-2024 17:57:42	1d 0h 24m 14s	1/4	USERS OK - 6 users currently logged in
	HTTP	WARNING	10-06-2024 17:53:57	0d 0h 19m 5s	4/4	HTTP WARNING: HTTP/1.1 403 Forbidden - 319 bytes in 0.001 second response time
	PING	OK	10-06-2024 17:55:12	1d 0h 22m 59s	1/4	PING OK - Packet loss = 0%, RTA = 0.03 ms
	Root Partition	OK	10-06-2024 17:57:04	1d 0h 22m 22s	1/4	DISK OK - free space: / 5567 MiB (68.59% inode=98%):
	SSH	OK	10-06-2024 17:53:19	1d 0h 21m 44s	1/4	SSH OK - OpenSSH_8.7 (protocol 2.0)
	Swap Usage	CRITICAL	10-06-2024 17:54:34	1d 0h 31m 7s	4/4	SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.
	Total Processes	OK	10-06-2024 17:56:22	1d 0h 20m 29s	1/4	PROCS OK: 39 processes with STATE = RSZDT

Results 1 - 8 of 8 Matching Services

As you can see, we have our linuxserver up and running. It is showing critical status on HTTP due to permission errors and swap because there is no partition created.

In this case, we have monitored -

Servers: 1 linux server
Services: swap
Ports: 22, 80 (ssh, http)
Processes: User status, Current load, total processes, root partition, etc.

Recommended Cleanup

- Terminate both of your EC-2 instances to avoid charges.
- Delete the security group if you created a new one (it won't affect your bill, you may avoid it)

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.