Name: Akanksha Shinde Class: D15C Roll No: 53

Experiment No 9

Aim: To Understand Continuous monitoring and Installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.

Theory:

What is Nagios?

Nagios is an open-source software for continuous monitoring of systems, networks, and infrastructures. It runs plugins stored on a server that is connected with a host or another server on your network or the Internet. In case of any failure, Nagios alerts about the issues so that the technical team can perform the recovery process immediately.

Nagios is used for continuous monitoring of systems, applications, service and business processes in a DevOps culture.

Why We Need Nagios tool?
Here are the important reasons to use Nagios monitoring tool:

- Detects all types of network or server issues
- Helps you to find the root cause of the problem which allows you to get the permanent solution to the problem
- Active monitoring of your entire infrastructure and business processes
- Allows you to monitor and troubleshoot server performance issues
- Helps you to plan for infrastructure upgrades before outdated systems create failures
- You can maintain the security and availability of the service
- Automatically fix problems in a panic situation

Features of Nagios

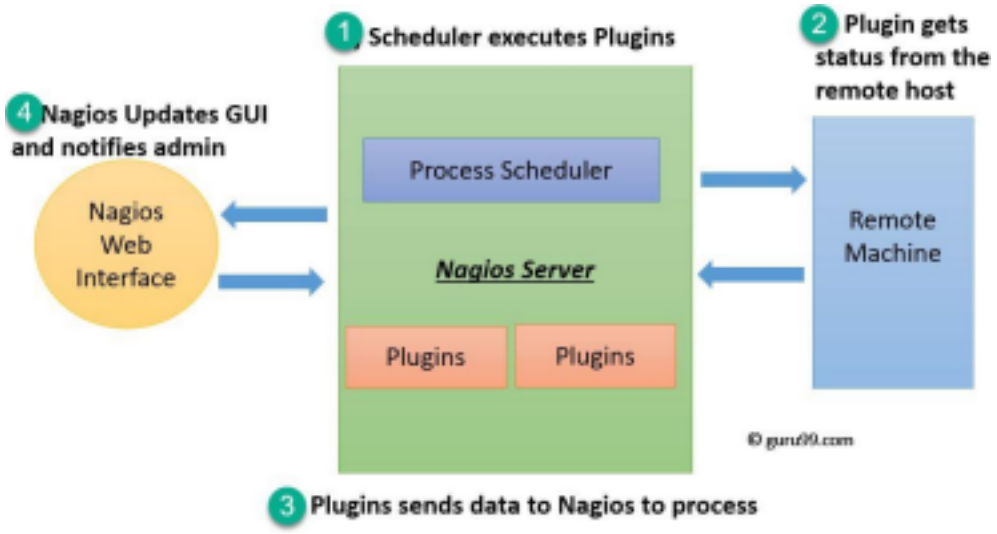
Following are the important features of Nagios monitoring tool:

- Relatively scalable, Manageable, and Secure
- Good log and database system
- Informative and attractive web interfaces
- Automatically send alerts if condition changes
- If the services are running fine, then there is no need to do check that host is an alive
- Helps you to detect network errors or server crashes
- You can troubleshoot the performance issues of the server.
- The issues, if any, can be fixed automatically as they are identified during the monitoring process
- You can monitor the entire business process and IT infrastructure with a single pass ● The product's architecture is easy to write new plugins in the language of your choice ● Nagios allows you to read its configuration from an entire directory which helps you to decide how to define individual files
- Utilizes topology to determine dependencies

- Monitor network services like HTTP, SMTP, HTTP, SNMP, FTP, SSH, POP, etc.
- Helps you to define network host hierarchy using parent hosts
- Ability to define event handlers that runs during service or host events for proactive problem resolution
- Support for implementing redundant monitoring hosts

Nagios Architecture

Nagios is a client-server architecture. Usually, on a network, a Nagios server is running on a host, and plugins are running on all the remote hosts which should be monitored.



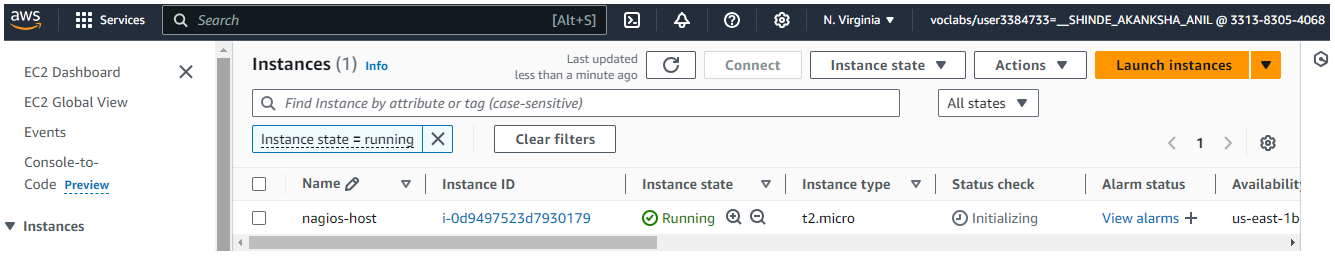
1. The scheduler is a component of the server part of Nagios. It sends a signal to execute the plugins at the remote host.
2. The plugin gets the status from the remote host
3. The plugin sends the data to the process scheduler
4. The process scheduler updates the GUI and notifications are sent to admins.

Installation of Nagios

Prerequisites: AWS Free Tier

Steps:

1. Create an Amazon Linux EC2 Instance in AWS and name it - nagios-host



2. Under Security Group, make sure HTTP, HTTPS, SSH, ICMP are open from everywhere.

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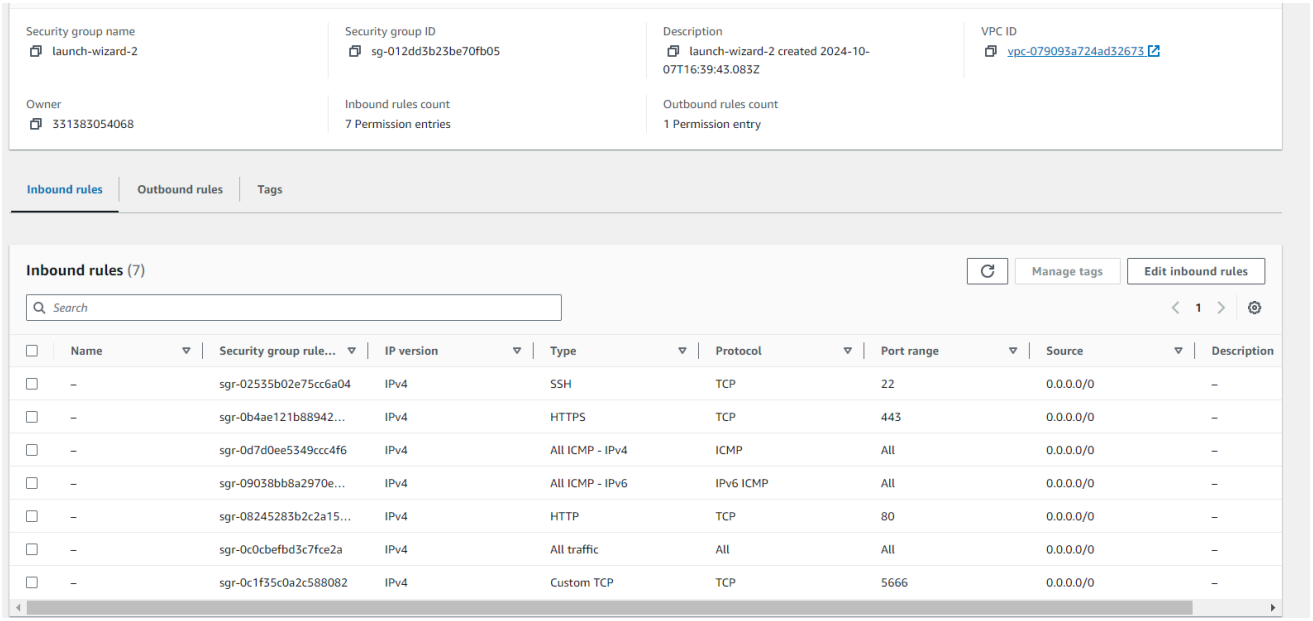
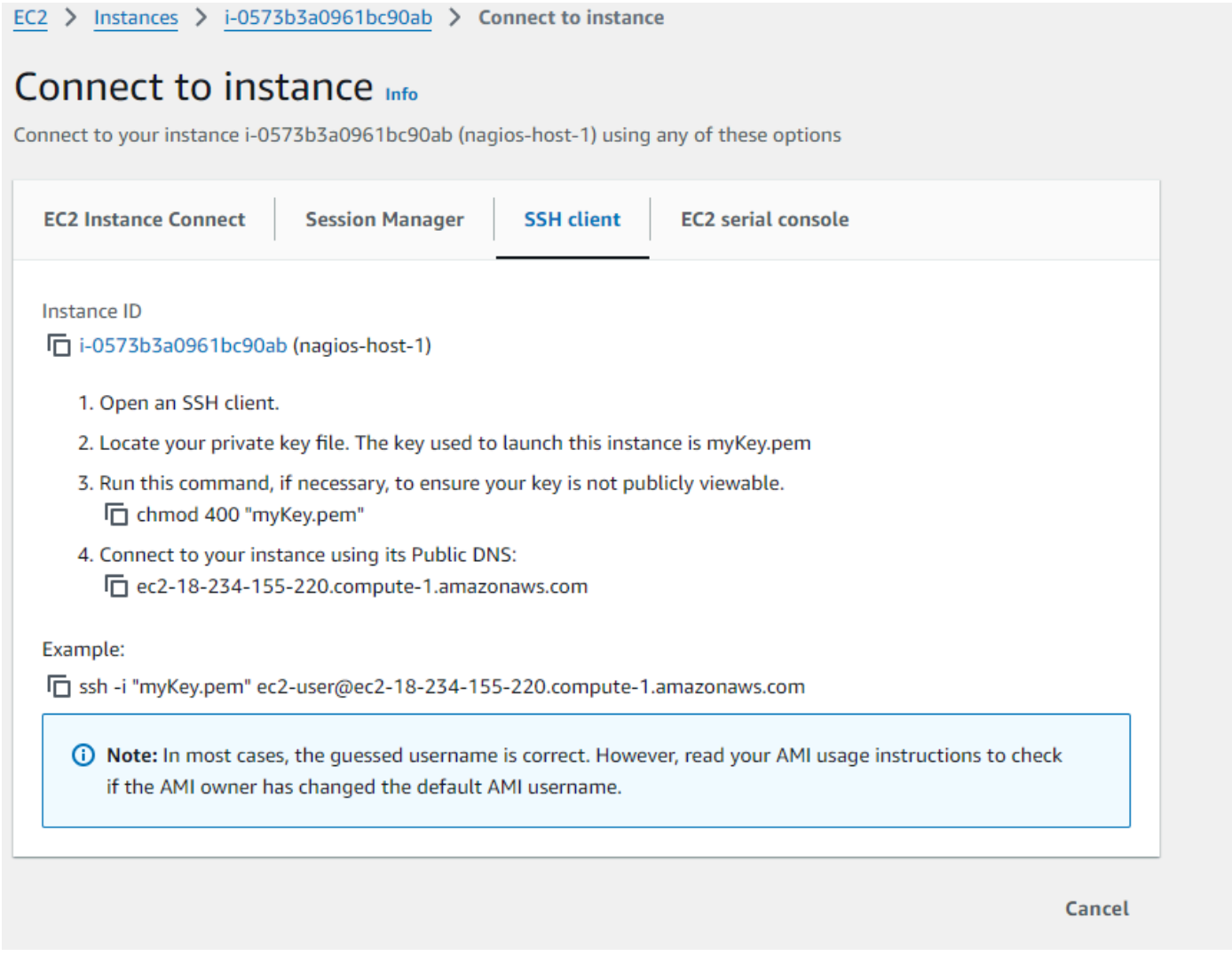


You have to edit the inbound rules of the specified Security Group for this like above.

Go in ssh client copy the command



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3. SSH into Your EC2 instance or simply use EC2 Instance Connect from the browser.

```
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\akank> ssh -i "C:\Users\akank\Downloads\nagiosExp.pem" ec2-user@ec2-54-91-248-79.compute-1.amazonaws.com
The authenticity of host 'ec2-54-91-248-79.compute-1.amazonaws.com (54.91.248.79)' can't be established.
ED25519 key fingerprint is SHA256:4dvXOJ92bJuuoDfhNtTc2oFlpN/S/Cu9H9YbZjfYsSg.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-91-248-79.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
   ,     #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
Last login: Mon Oct  7 17:04:25 2024 from 18.206.107.28
[ec2-user@ip-172-31-36-137 ~]$
```

4. Update the package indices and install the following packages using yum

sudo yum update
sudo yum install httpd php
sudo yum install gcc glibc glibc-common
sudo yum install gd gd-devel

```
Installed:
  apr-1.7.2-2.amzn2023.0.2.x86_64                    apr-util-1.6.3-1.amzn2023.0.1.x86_64          apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_
  generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch  httpd-2.4.62-1.amzn2023.x86_64                httpd-core-2.4.62-1.amzn2023.x86_64
  httpd-filesystem-2.4.62-1.amzn2023.noarch          httpd-tools-2.4.62-1.amzn2023.x86_64          libbrotli-1.0.9-4.amzn2023.0.2.x86_64
  libsodium-1.0.19-4.amzn2023.x86_64                 libxslt-1.1.34-5.amzn2023.0.2.x86_64          mailcap-2.1.49-3.amzn2023.0.3.noarch
  mod_http2-2.0.27-1.amzn2023.0.3.x86_64             mod_lua-2.4.62-1.amzn2023.x86_64              nginx-filesystem-1:1.24.0-1.amzn2023.0.4.n
  php8.3-8.3.10-1.amzn2023.0.1.x86_64                php8.3-cli-8.3.10-1.amzn2023.0.1.x86_64       php8.3-common-8.3.10-1.amzn2023.0.1.x86_64
  php8.3-fpm-8.3.10-1.amzn2023.0.1.x86_64            php8.3-mbstring-8.3.10-1.amzn2023.0.1.x86_64  php8.3-opcache-8.3.10-1.amzn2023.0.1.x86_6
  php8.3-pdo-8.3.10-1.amzn2023.0.1.x86_64            php8.3-process-8.3.10-1.amzn2023.0.1.x86_64   php8.3-sodium-8.3.10-1.amzn2023.0.1.x86_64
  php8.3-xml-8.3.10-1.amzn2023.0.1.x86_64

Complete!
[ec2-user@ip-172-31-46-30 ~]$
```

5. Create a new Nagios User with its password. You'll have to enter the password twice for confirmation.

sudo adduser -m nagios
sudo passwd nagios

```
[ec2-user@ip-172-31-46-30 ~]$ sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-46-30 ~]$
```

6. Create a new user group

sudo groupadd nagcmd

7. Use these commands so that you don't have to use sudo for Apache and Nagios

sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache

```
[ec2-user@ip-172-31-46-30 ~]$ sudo groupadd nagcmd
[ec2-user@ip-172-31-46-30 ~]$ sudo usermod -a -G nagcmd nagios
[ec2-user@ip-172-31-46-30 ~]$ sudo usermod -a -G nagcmd apache
[ec2-user@ip-172-31-46-30 ~]$
```

8. Create a new directory for Nagios downloads

mkdir ~/downloads
cd ~/downloads

```
[ec2-user@ip-172-31-46-30 ~]$ mkdir ~/downloads
[ec2-user@ip-172-31-46-30 ~]$ cd ~/downloads
[ec2-user@ip-172-31-46-30 downloads]$
```

9. Use wget to download the source zip files.

wget
http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar. gz

wget http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz

```
nagios-4.0.8.tar.gz                 100%[=================================================================>]   1.72M  --.-KB/s    in 0

2024-10-04 03:59:15 (24.4 MB/s) - 'nagios-4.0.8.tar.gz' saved [1805059/1805059]
```

```
[ec2-user@ip-172-31-46-30 downloads]$ wget http://nagios-plugins.org/download/nagios-plugins-2.0.3
--2024-10-04 04:00:01--  http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
Resolving nagios-plugins.org (nagios-plugins.org)... 45.56.123.251
Connecting to nagios-plugins.org (nagios-plugins.org)|45.56.123.251|:80... connected.
HTTP request sent, awaiting response... 200 OK
```

10. Use tar to unzip and change to that directory.
tar zxvf 6kqcx

Go to update nagios 4.5.5 run following command.

```
[ec2-user@ip-172-31-46-30 downloads]$ cd nagios-4.5.5
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$
```

11. configure file by this command

./configure --with-command-group=nagcmd

```
checking for snprintf... yes
checking for asprintf... yes
checking for vasprintf... yes
checking for sigaction... yes
checking for C99 vsnprintf... yes
checking for library containing getservbyname... none required
checking for library containing connect... none required
checking for initgroups... yes
checking for setenv... yes
checking for strdup... yes
checking for strstr... yes
checking for strtoul... yes
```

Will get an error saying **ssl not found** so we need to install it by running the following command sudo yum install openssl-devel

```
Installed:
  openssl-devel-1:3.0.8-1.amzn2023.0.14.x86_64

Complete!
```

Now again run the command ./configure --with-command-group=nagcmd

```
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$  ./configure --with-command-group=nagcmd
checking for a BSD-compatible install... /usr/bin/install -c
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for gcc... gcc
```

12. Compile the source code.

make all

At the end you see this message

```
For more information on obtaining support for Nagios, visit:

       https://support.nagios.com

**************************************************************

Enjoy.
```

13. Install binaries, init script and sample config files. Lastly, set permissions on the external command directory.

sudo make install

```
  make install-commandmode
     - This installs and configures permissions on the
       directory for holding the external command file

  make install-config
     - This installs sample config files in /usr/local/nagios/etc

make[1]: Leaving directory '/home/ec2-user/downloads/nagios-4.5.5'
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$
```

sudo make install-init

```
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$ sudo make install-init
/usr/bin/install -c -m 755 -d -o root -g root /lib/systemd/system
/usr/bin/install -c -m 755 -o root -g root startup/default-service /lib/systemd/system/nagios.service
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$
```

sudo make install-config

```
*** Config files installed ***

Remember, these are *SAMPLE* config files.  You'll need to read
the documentation for more information on how to actually define
services, hosts, etc. to fit your particular needs.

[ec2-user@ip-172-31-46-30 nagios-4.5.5]$
```

sudo make install-commandmode

```
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$ sudo make install-commandmode
/usr/bin/install -c -m 775 -o nagios -g nagcmd -d /usr/local/nagios/var/rw
chmod g+s /usr/local/nagios/var/rw

*** External command directory configured ***
```

Run the command sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin for setting the password.

```
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
```

Restart the services with sudo service httpd restart

```
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$ sudo service httpd restart
Redirecting to /bin/systemctl restart httpd.service
[ec2-user@ip-172-31-46-30 nagios-4.5.5]$
```

14: Extract the files from the downloaded Nagios plugin 2.4.11 run the following command first change the directory.
cd ~/downloads
tar zxvf nagios-plugins-2.4.11.tar.gz

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15: Change the directory to nagios-plugins-2.4.11 and run the config command to configure. cd nagios-plugins-2.4.11

```
[ec2-user@ip-172-31-46-30 downloads]$ cd nagios-plugins-2.4.11
[ec2-user@ip-172-31-46-30 nagios-plugins-2.4.11]$
```

./configure --with-nagios-user=nagios --with-nagios-group=nagios

```
config.status: creating pkg/solaris/pkginfo
config.status: creating po/Makefile.in
config.status: creating config.h
config.status: config.h is unchanged
config.status: executing depfiles commands
config.status: executing libtool commands
config.status: executing po-directories commands
config.status: creating po/POTFILES
config.status: creating po/Makefile
[ec2-user@ip-172-31-46-30 nagios-plugins-2.4.11]$
```

```
       Checked 0 service escalations.
necking for circular paths...
       Checked 1 hosts
       Checked 0 service dependencies
       Checked 0 host dependencies
       Checked 5 timeperiods
necking global event handlers...
necking obsessive compulsive processor commands...
necking misc settings...

otal Warnings: 0
otal Errors:   0
```

14. Edit the config file and change the email address.

sudo nano /usr/local/nagios/etc/objects/contacts.cfg

```
define contact {

    contact_name            nagiosadmin             ; Short name of user
    use                     generic-contact         ; Inherit default values from generic-contact template (defined above)
    alias                   Nagios Admin            ; Full name of user
    email                   2022.akanksha.shinde@ves.ac.in ; <****** CHANGE THIS TO YOUR EMAIL ADDRESS ******
}

|

###############################################################################
#
# CONTACT GROUPS
#
###############################################################################

# We only have one contact in this simple configuration file, so there is
                                [ Cancelled ]
^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
```

15. Configure the web interface.

sudo make install-webconf

```
[ec2-user@ip-172-31-87-75 nagios-4.5.5]$ sudo make install-webconf
/usr/bin/install -c -m 644 sample-config/httpd.conf /etc/httpd/conf.d/nagios.conf
if [ 0 -eq 1 ]; then \
        ln -s /etc/httpd/conf.d/nagios.conf /etc/apache2/sites-enabled/nagios.conf;
fi
```

16. Create a nagiosadmin account for nagios login along with password. You'll have to specify the password twice.

sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin

```
[ec2-user@ip-172-31-87-75 nagios-4.5.5]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
```

17. Restart Apache

sudo service httpd restart

```
[ec2-user@ip-172-31-87-75 nagios-4.5.5]$ sudo service httpd restart
Redirecting to /bin/systemctl restart httpd.service
[ec2-user@ip-172-31-87-75 nagios-4.5.5]$
```

18. Go back to the downloads folder and unzip the plugins zip file.

cd ~/downloads

tar zxvf nagios-plugins-2.0.3.tar.gz

```
[ec2-user@ip-172-31-87-75 nagios-4.5.5]$ cd ~/downloads
tar zxvf nagios-plugins-2.4.11.tar.gz
nagios-plugins-2.4.11/
```

19. Compile and install plugins

cd nagios-plugins-2.0.3

./configure --with-nagios-user=nagios --with-nagios-group=nagios make

sudo make install

```
[ec2-user@ip-172-31-87-75 downloads]$ cd nagios-plugins-2.4.11
./configure --with-nagios-user=nagios --with-nagios-group=nagios
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /usr/bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking whether make supports nested variables... yes
checking whether to enable maintainer-specific portions of Makefiles... yes
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for gcc... gcc
checking whether the C compiler works... yes
```

20. Start Nagios

Add Nagios to the list of system services

sudo chkconfig --add nagios

sudo chkconfig nagios on

Verify the sample configuration files

sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg If there are no errors, you can go ahead and start Nagios.

sudo service nagios start

```
2-user@ip-172-31-46-218 ~]$ sudo service nagios start
rting nagios (via systemctl):                              [  OK  ]
2-user@ip-172-31-46-218 ~]$
```

21. Check the status of Nagios

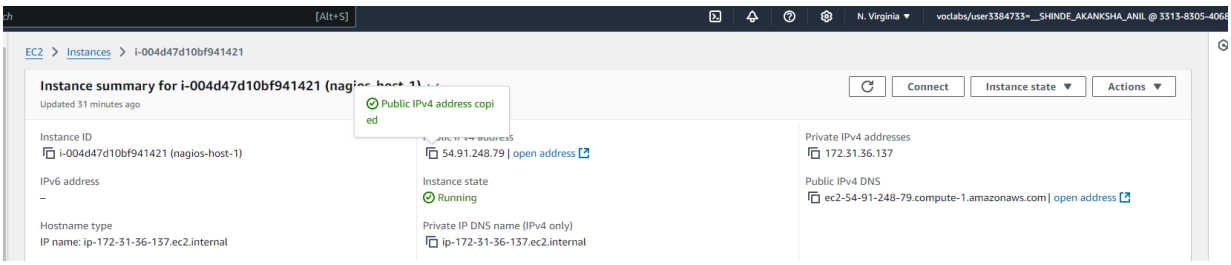
sudo systemctl status nagios

22. Go back to EC2 Console and copy the Public IP address of this instance

```
ec2-user@ip-172-31-36-137:~,
        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
[ec2-user@ip-172-31-36-137 nagios-plugins-2.4.11]$ sudo service nagios start
Redirecting to /bin/systemctl start nagios.service
[ec2-user@ip-172-31-36-137 nagios-plugins-2.4.11]$ 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 2024-10-07 17:42:18 UTC; 21s ago
       Docs: https://www.nagios.org/documentation
    Process: 65198 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 65204 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 65207 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 5.6M
        CPU: 70ms
     CGroup: /system.slice/nagios.service
             ├─65207 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─65208 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─65209 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─65210 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─65211 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─65254 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
```



23. Open up your browser and look for http://<your_public_ip_address>/nagios Enter username as nagiosadmin and password which you set in Step 16.

24. After entering the correct credentials, you will see this page.

This means that Nagios was correctly installed and configured with its plugins so far.

Conclusion:

While performing the experiment initially I faced error in the end that service is dead this was due to I had not properly given the access to necessary networks in the security groups so after giving all the access and additionally my password was not matching eventhough it was the same that I entered previously so we still can change the password not need to perform the whole experiment again just go back and copy the ssh link and go where you have downloaded the .pem file again and use the command "sudo cat/usr/local/nagios/etc/htpasswd.users" then "sudo htpasswd /usr/local/nagios/etc/htpasswd.users nagiosadmin" and restart the nagios service again by running "sudo systemctl restart nagios". Hence the experiment was performed successfully.