Name: Alok Yadav Div: D15C Roll No. 59

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.

STEPS TO INSTALL AND SETUP NAGIOS ON EC-2 INSTANCE

1. Create an Amazon Linux EC-2 instance and select either existing key pair or create new

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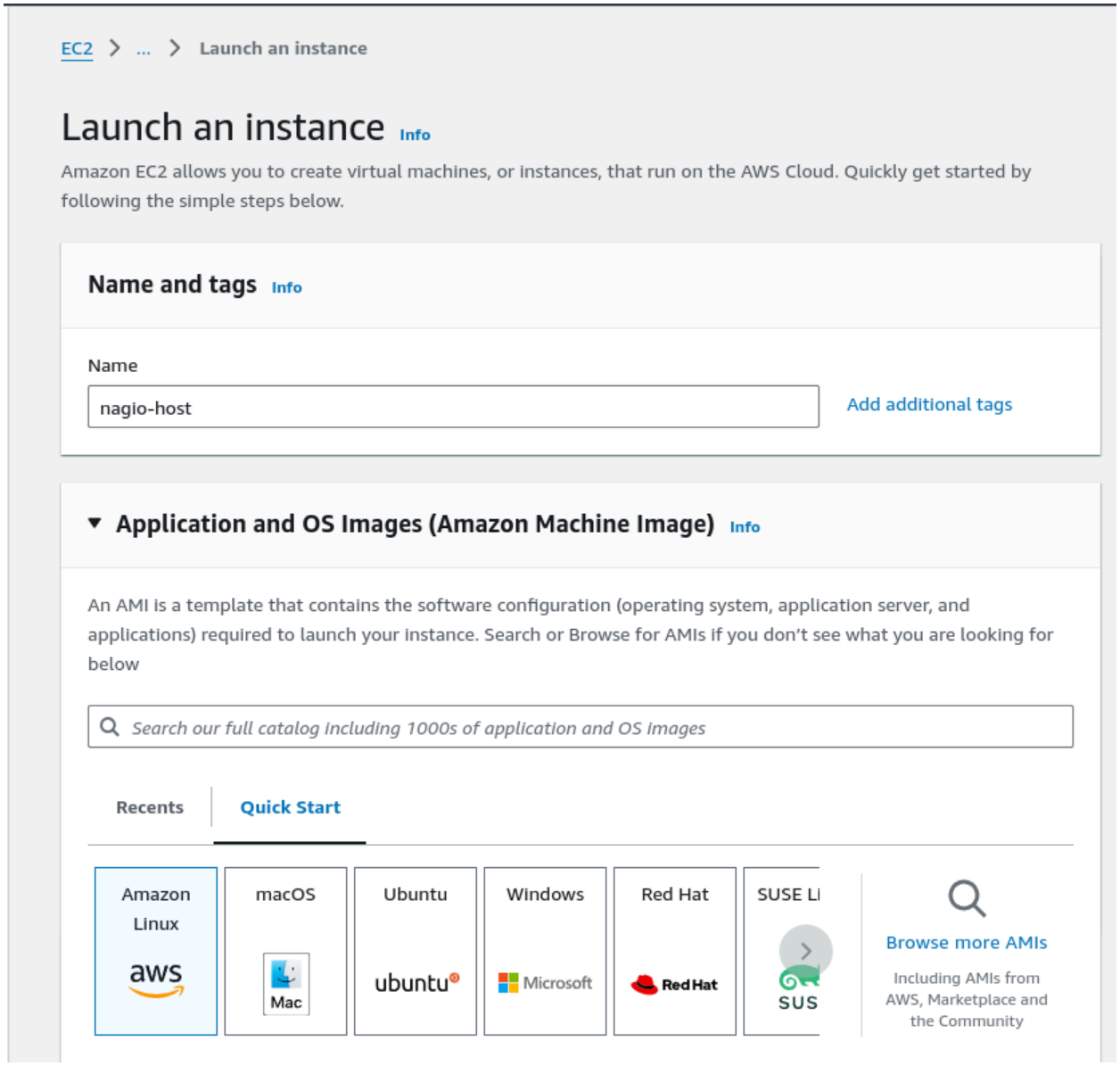

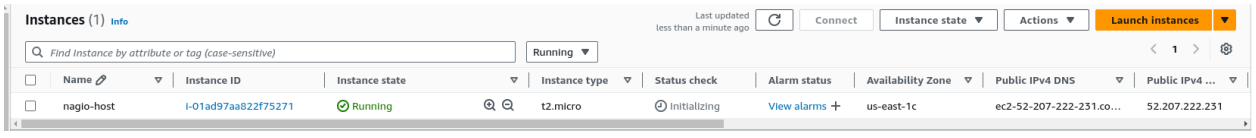

2. Under Security Group, make sure HTTP, HTTPS, SSH, ICMP are open from everywhere.

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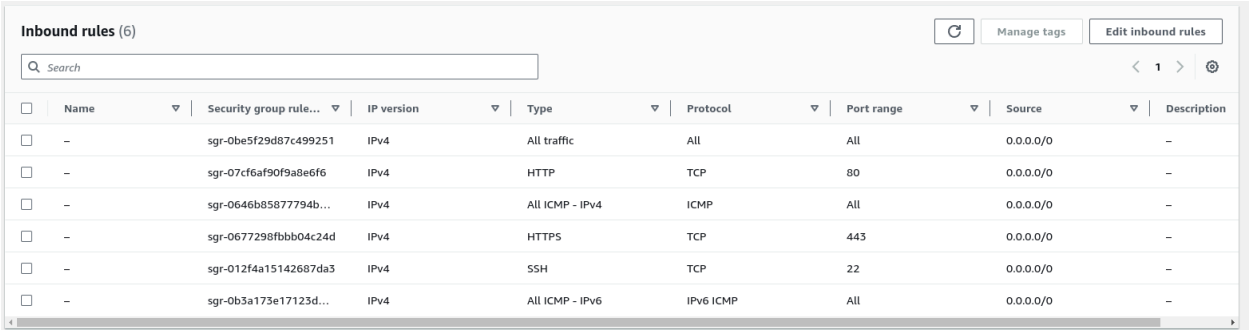
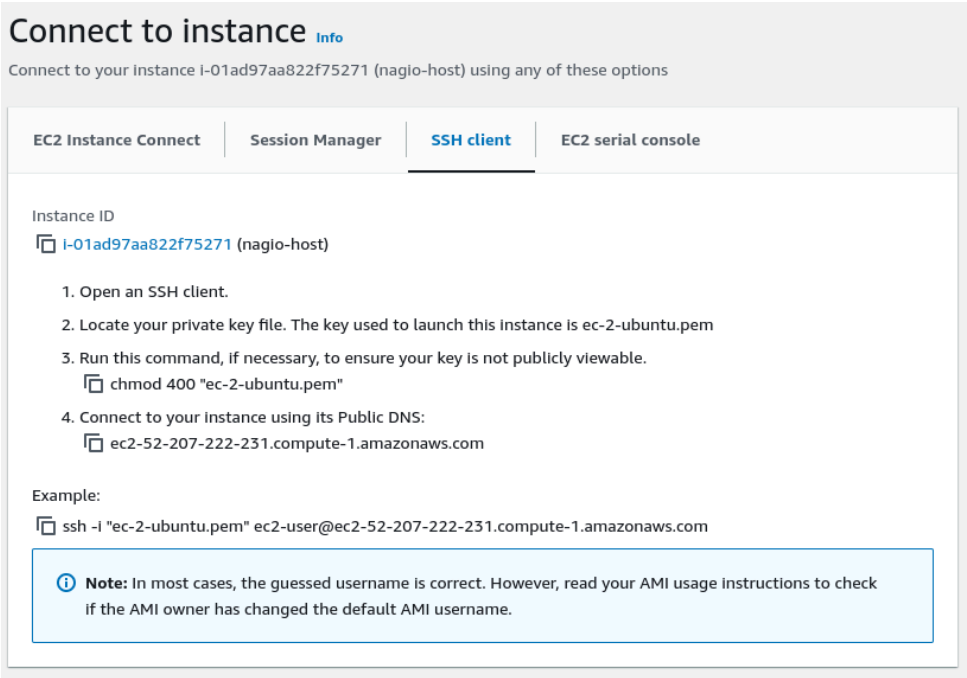


3. SSH into Your EC2 instance or simply use **EC2 Instance Connect** from the browser.




```
❯ ssh -i "ec-2-ubuntu.pem" ec2-user@ec2-52-207-222-231.compute-1.amazonaws.com
The authenticity of host 'ec2-52-207-222-231.compute-1.amazonaws.com (52.207.222.231)' can't be established.
ED25519 key fingerprint is SHA256:/s4gfn/CHOBlXNdwi7aFEQPNXd+F3gfT+c8lsjldby8.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-52-207-222-231.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
X11 forwarding request failed on channel 0
   ,     #_
   ~\_  ####_        Amazon Linux 2023
  ~~  \_#####\
  ~~     \###|
  ~~       \#/ ___   https://aws.amazon.com/linux/amazon-linux-2023
   ~~       V~' '->
    ~~~         /
      ~~._.   _/
         _/ _/
       _/m/'
[ec2-user@ip-172-31-33-179 ~]$
```

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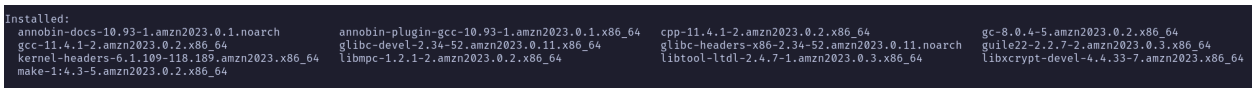
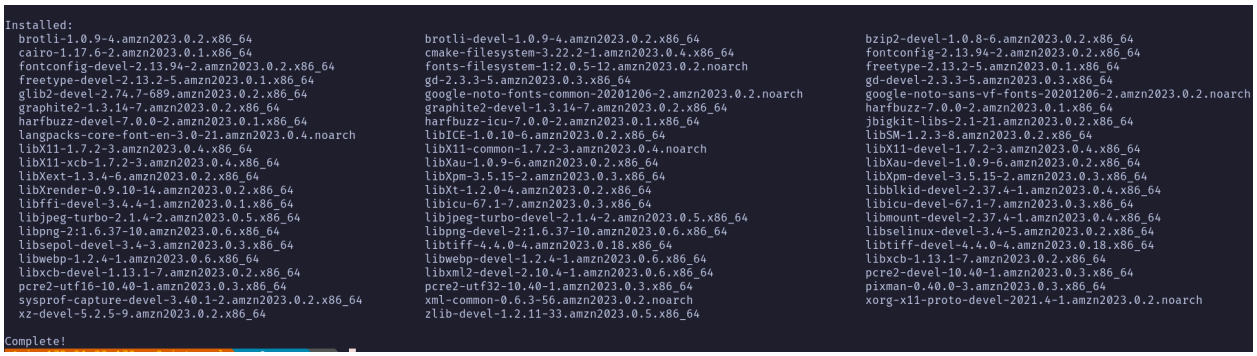
Now, we need to install necessary packages that are required to run nagios properly

sudo yum install httpd php

sudo yum install gcc glibc glibc-common



sudo yum install gd gd-devel



4. Create a new Nagios User with its password. You'll have to enter the password twice for confirmation. This is require as to give separate permissions for nagios

   sudo adduser -m nagios

   sudo passwd nagios

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```
ip-172-31-33-179.ec2.internal ec2-user ~ sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

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

```
ip-172-31-33-179.ec2.internal ec2-user ~ sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache
```

8. Create a new directory for Nagios downloads

mkdir ~/downloads

cd ~/downloads

9. Use wget to download the installation source zip files.

wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz
--2024-10-04 13:40:59--  https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz
Resolving assets.nagios.com (assets.nagios.com)... 45.79.49.120, 2600:3c00::f03c:92ff:fef7:45ce
Connecting to assets.nagios.com (assets.nagios.com)|45.79.49.120|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2065473 (2.0M) [application/x-gzip]
Saving to: 'nagios-4.5.5.tar.gz'

nagios-4.5.5.tar.gz                 100%[===========================================================================================================>]

2024-10-04 13:41:00 (4.15 MB/s) - 'nagios-4.5.5.tar.gz' saved [2065473/2065473]
```

wget https://nagios-plugins.org/download/nagios-plugins-2.4.11.tar.gz

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```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads wget https://nagios-plugins.org/download/nagios-plugins-2.4.11.tar.gz
--2024-10-04 13:41:25--  https://nagios-plugins.org/download/nagios-plugins-2.4.11.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|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2753049 (2.6M) [application/x-gzip]
Saving to: 'nagios-plugins-2.4.11.tar.gz'

nagios-plugins-2.4.11.tar.gz                  100%[=========================================================================================================>]

2024-10-04 13:41:26 (7.55 MB/s) - 'nagios-plugins-2.4.11.tar.gz' saved [2753049/2753049]
```

10. Use tar to unzip the downloaded archive and change to that directory.

tar zxvf nagios-4.5.5.tar.gz

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads tar zxvf nagios-4.5.5.tar.gz
nagios-4.5.5/
nagios-4.5.5/.github/
nagios-4.5.5/.github/workflows/
nagios-4.5.5/.github/workflows/test.yml
nagios-4.5.5/.gitignore
nagios-4.5.5/CONTRIBUTING.md
nagios-4.5.5/Changelog
nagios-4.5.5/INSTALLING
nagios-4.5.5/LEGAL
nagios-4.5.5/LICENSE
nagios-4.5.5/Makefile.in
```

11. Navigate to the extracted folder and Run the configuration script with the same group name you previously created.

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

```
checking for Kerberos include files... configure: WARNING: could not find include files
checking for pkg-config... pkg-config
checking for SSL headers... configure: error: Cannot find ssl headers
```

We got error, because ssl headers library is not installed

It can be installed using **sudo yum install openssl-devel**

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-4.5.5 sudo yum install openssl-devel
Last metadata expiration check: 0:28:57 ago on Fri Oct  4 13:16:25 2024.
Dependencies resolved.
================================================================================
 Package                 Architecture          Version                    Repository                 Size
================================================================================
Installing:
 openssl-devel           x86_64                1:3.0.8-1.amzn2023.0.14    amazonlinux                3.0 M

Transaction Summary
================================================================================
Install  1 Package
```

Now rerun

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

```
Creating sample config files in sample-config/ ...


*** Configuration summary for nagios 4.5.5 2024-09-17 ***:

 General Options:
 -------------------------
        Nagios executable:  nagios
        Nagios user/group:  nagios,nagios
       Command user/group:  nagios,nagcmd
            Event Broker:  yes
        Install ${prefix}:  /usr/local/nagios
    Install ${includedir}:  /usr/local/nagios/include/nagios
                Lock file:  /run/nagios.lock
   Check result directory:  /usr/local/nagios/var/spool/checkresults
           Init directory:  /lib/systemd/system
  Apache conf.d directory:  /etc/httpd/conf.d
             Mail program:  /bin/mail
                  Host OS:  linux-gnu
          IOBroker Method:  epoll

 Web Interface Options:
 ------------------------
                HTML URL:  http://localhost/nagios/
                 CGI URL:  http://localhost/nagios/cgi-bin/
 Traceroute (used by WAP):  /usr/bin/traceroute


Review the options above for accuracy.  If they look okay,
type 'make all' to compile the main program and CGIs.
```

12. Compile the source code.

make all

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```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-4.5.5 make all
cd ./base && make
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/base'
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o nagios.o ./nagios.c
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o broker.o broker.c
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o nebmods.o nebmods.c
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o ../common/shared.o ../common/shared.c
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o query-handler.o query-handler.c
gcc -Wall -I.. -I. -I../lib -I../include  -I../include -I..  -g -O2  -DHAVE_CONFIG_H -DNSCORE -c -o workers.o workers.c
In function 'get_wproc_list',
```

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

command directory.

sudo make install

sudo make install-init

sudo make install-config

sudo make install-commandmode

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-4.5.5 sudo make install
cd ./base && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/base'
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/bin
/usr/bin/install -c -s -m 774 -o nagios -g nagios nagios /usr/local/nagios/bin
/usr/bin/install -c -s -m 774 -o nagios -g nagios nagiostats /usr/local/nagios/bin
make[1]: Leaving directory '/home/ec2-user/downloads/nagios-4.5.5/base'
cd ./cgi && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
make install-basic
make[2]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/sbin
for file in *.cgi; do \
        /usr/bin/install -c -s -m 775 -o nagios -g nagios $file /usr/local/nagios/sbin; \
done
make[2]: Leaving directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
make[1]: Leaving directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
cd ./html && make install
```

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads 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
```

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```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-4.5.5 sudo make install-config
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/etc
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/etc/objects
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/nagios.cfg /usr/local/nagios/etc/nagios.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/cgi.cfg /usr/local/nagios/etc/cgi.cfg
/usr/bin/install -c -b -m 660 -o nagios -g nagios sample-config/resource.cfg /usr/local/nagios/etc/resource.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/templates.cfg /usr/local/nagios/etc/objects/templates.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/commands.cfg /usr/local/nagios/etc/objects/commands.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/contacts.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/timeperiods.cfg /usr/local/nagios/etc/objects/timeperiods.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/localhost.cfg /usr/local/nagios/etc/objects/localhost.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/windows.cfg /usr/local/nagios/etc/objects/windows.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/printer.cfg /usr/local/nagios/etc/objects/printer.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/switch.cfg /usr/local/nagios/etc/objects/switch.cfg
```

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads 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 ***
```

14. Edit the config file and change the email address so that we can receive timely alerts about the status of our system.

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.alok.yadav@ves.ac.in ; <<***** CHANGE THIS TO YOUR EMAIL ADDRESS ******
}



################################################################################
```

And change email with your email

15. Configure the web interface. This is used to set up web server configuration of nagios dashboard.

sudo make install-webconf

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads 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

*** Nagios/Apache conf file installed ***
```

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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

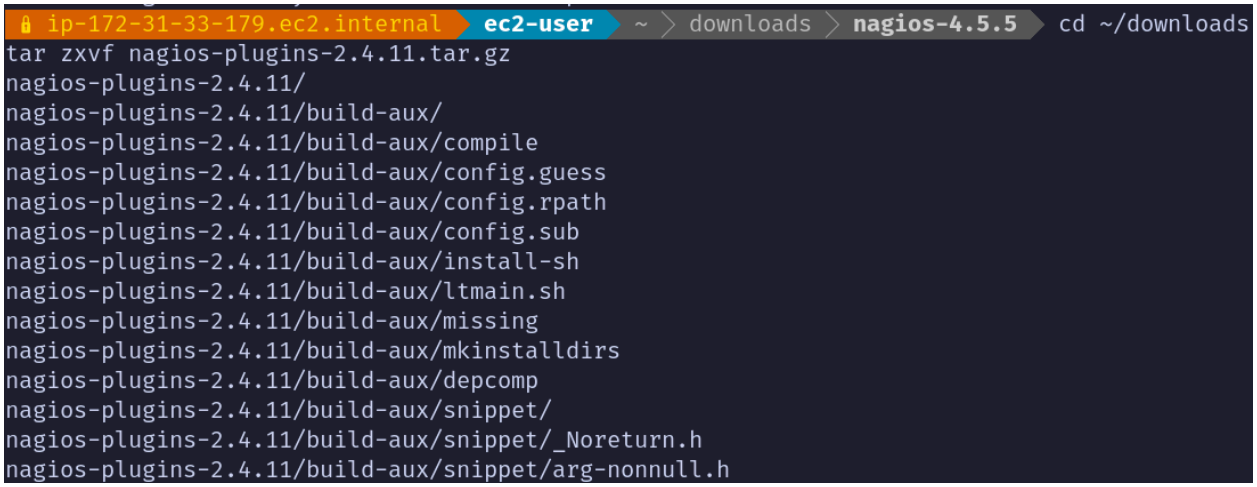
17. Restart Apache

sudo service httpd restart

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

cd ~/downloads

tar zxvf nagios-plugins-2.4.11.tar.gz



19. Compile and install plugins

cd nagios-plugins-2.4.11

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

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```
checking that generated files are newer than configure... done
configure: creating ./config.status
config.status: creating gl/Makefile
config.status: creating nagios-plugins.spec
config.status: creating tools/build_perl_modules
config.status: creating Makefile
config.status: creating tap/Makefile
config.status: creating lib/Makefile
config.status: creating plugins/Makefile
config.status: creating lib/tests/Makefile
config.status: creating plugins-root/Makefile
config.status: creating plugins-scripts/Makefile
config.status: creating plugins-scripts/utils.pm
config.status: creating plugins-scripts/utils.sh
config.status: creating perlmods/Makefile
config.status: creating test.pl
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
```

make

sudo make install

```
ip-172-31-33-179.ec2.internal ec2-user ~ > downloads > nagios-plugins-2.4.11 sudo make install
Making install in gl
make[1]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.4.11/gl'
make  install-recursive
make[2]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.4.11/gl'
make[3]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.4.11/gl'
make[4]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.4.11/gl'
if test yes = no; then \
  case 'linux-gnu' in \
    darwin[56]*) \
      need_charset_alias=true ;; \
    darwin* | cygwin* | mingw* | pw32* | cegcc*) \
      need_charset_alias=false ;; \
    *) \
      need_charset_alias=true ;; \
  esac ; \
else \
  need_charset_alias=false ; \
fi ; \
if $need_charset_alias; then \
  /bin/sh ../build-aux/mkinstalldirs /usr/local/nagios/lib ; \
fi ; \
```

20. Start Nagios and Add Nagios to the list of system services

sudo chkconfig --add nagios

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sudo chkconfig nagios on

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-plugins-2.4.11 sudo chkconfig --add nagios
error reading information on service nagios: No such file or directory
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-plugins-2.4.11 sudo chkconfig nagios on
Note: Forwarding request to 'systemctl enable nagios.service'.
Created symlink /etc/systemd/system/multi-user.target.wants/nagios.service → /usr/lib/systemd/system/nagios.service.
```

Verify the sample configuration files

```
Running pre-flight check on configuration data...

Checking objects...
        Checked 8 services.
        Checked 1 hosts.
        Checked 1 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 1 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
```

As we can see no errors were detected

sudo service nagios start

```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-plugins-2.4.11 sudo service nagios start
Redirecting to /bin/systemctl start nagios.service
```

21. Check the status of Nagios

sudo systemctl status nagios

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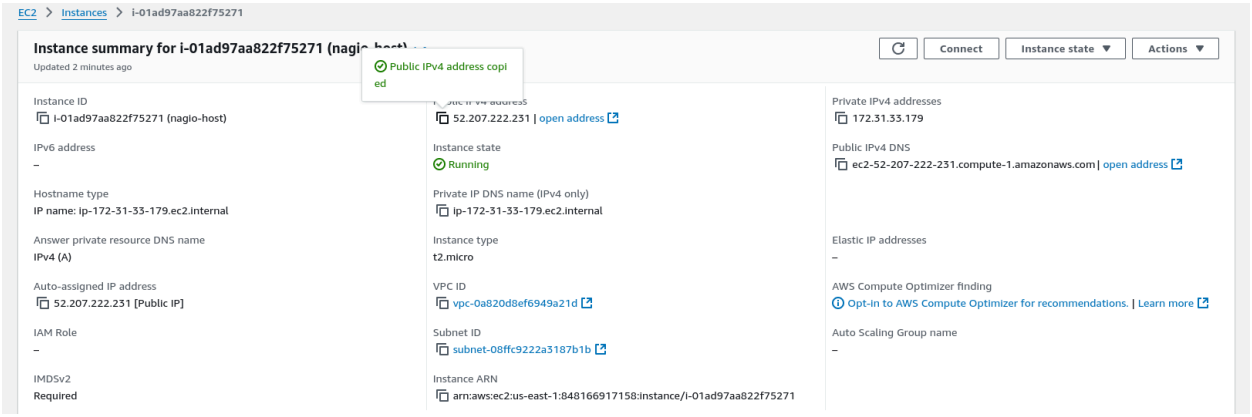
```
ip-172-31-33-179.ec2.internal ec2-user ~ downloads nagios-plugins-2.4.11 sudo systemctl status nagios
● nagios.service - Nagios Core 4.5.5
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Fri 2024-10-04 14:05:21 UTC; 33s ago
       Docs: https://www.nagios.org/documentation
    Process: 67432 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 67433 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 67434 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 5.6M
        CPU: 67ms
     CGroup: /system.slice/nagios.service
             ├─67434 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─67438 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67439 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67440 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67441 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─67446 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: qh: Socket '/usr/local/nagios/var/rw/nagios.qh' successfully initialized
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: qh: core query handler registered
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: qh: echo service query handler registered
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: qh: help for the query handler registered
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: wproc: Successfully registered manager as @wproc with query handler
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: wproc: Registry request: name=Core Worker 67441;pid=67441
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: wproc: Registry request: name=Core Worker 67440;pid=67440
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: wproc: Registry request: name=Core Worker 67438;pid=67438
Oct 04 14:05:21 ip-172-31-33-179.ec2.internal nagios[67434]: wproc: Registry request: name=Core Worker 67439;pid=67439
Oct 04 14:05:22 ip-172-31-33-179.ec2.internal nagios[67434]: Successfully launched command file worker with pid 67446
```

The nagios service is running and working normally

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



23. Open up your browser and look for http://<your_public_ip_address>/nagios

Enter username as nagiosadmin and password which we had set previously

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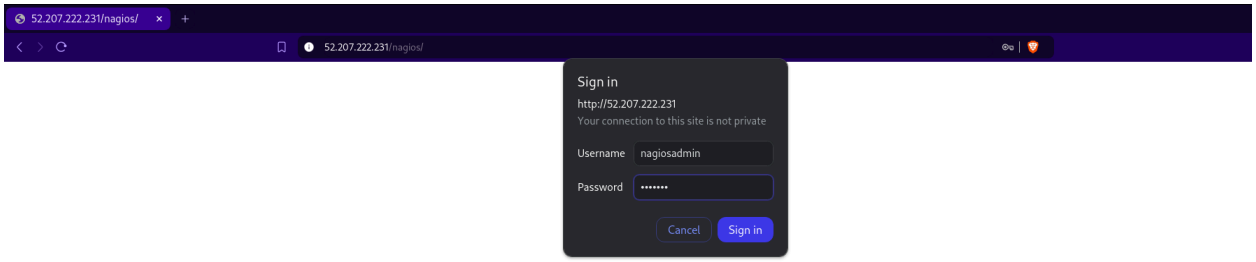

24. After entering the correct credentials, you will see the Home page of Nagios.

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

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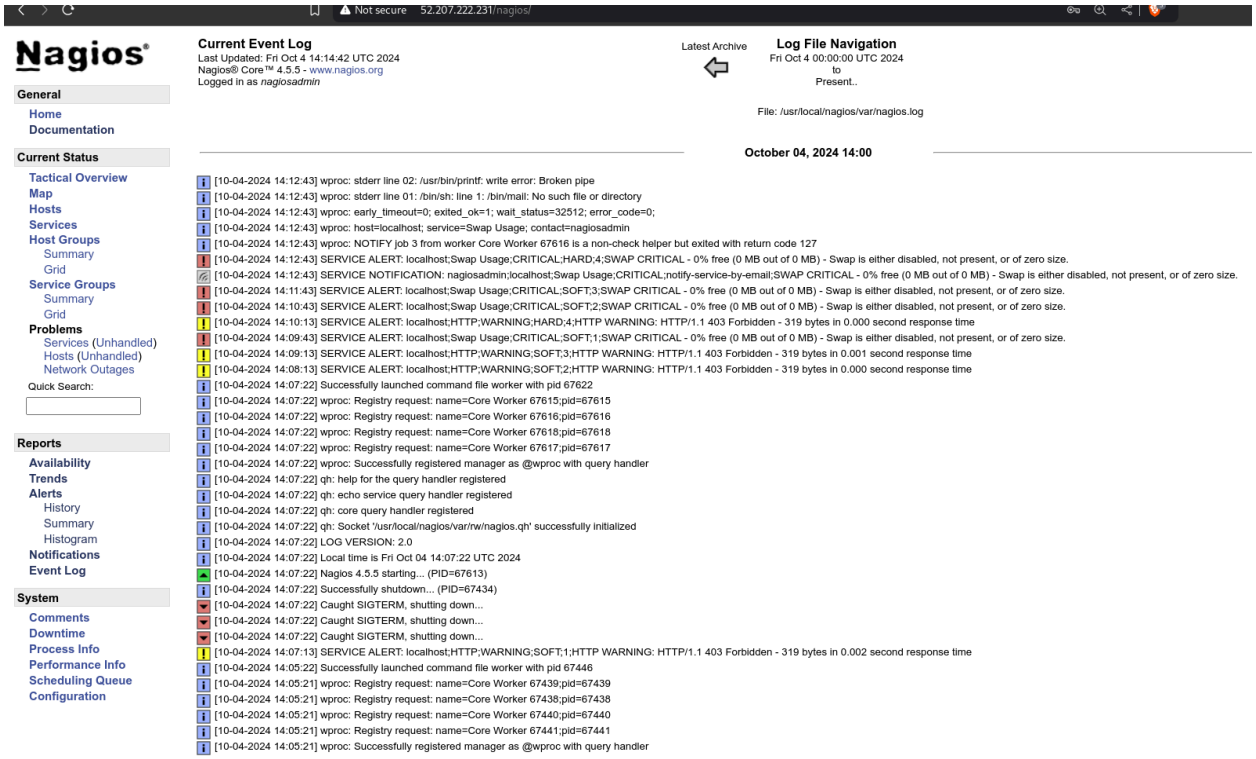
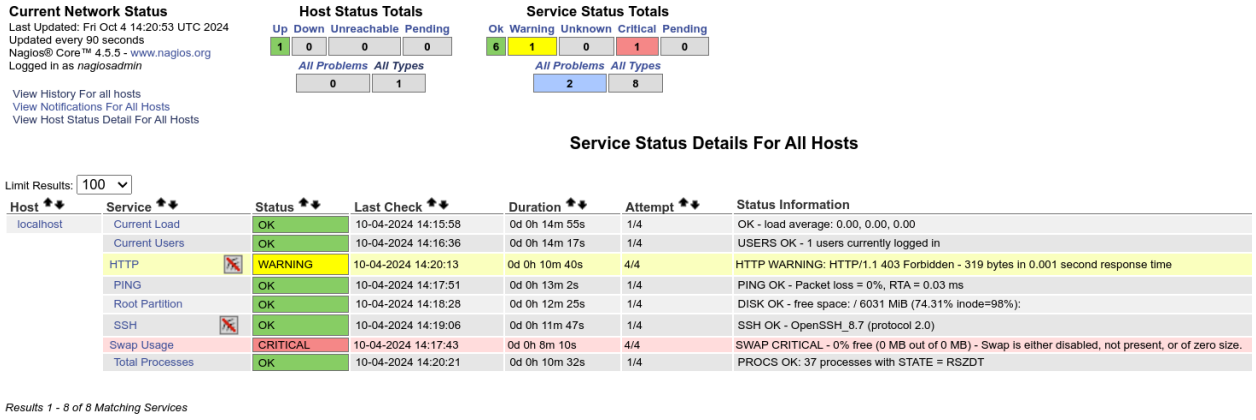


Now we can see system logs using nagios



Above is the status of all the services running on Host Machine

Conclusion:

We began the experiment by installing all the necessary packages required for Nagios. Next, we created a new user and group for Nagios, followed by installing the Nagios software through local compilation. Proper compilation is crucial to avoid errors during operation. After installation, we started both the `httpd` and Nagios services, enabling access to the Nagios dashboard, where critical system information is displayed.