

Experiment No 9

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D15B 07

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- Helps you to plan for infrastructure upgrades before outdated systems create failures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

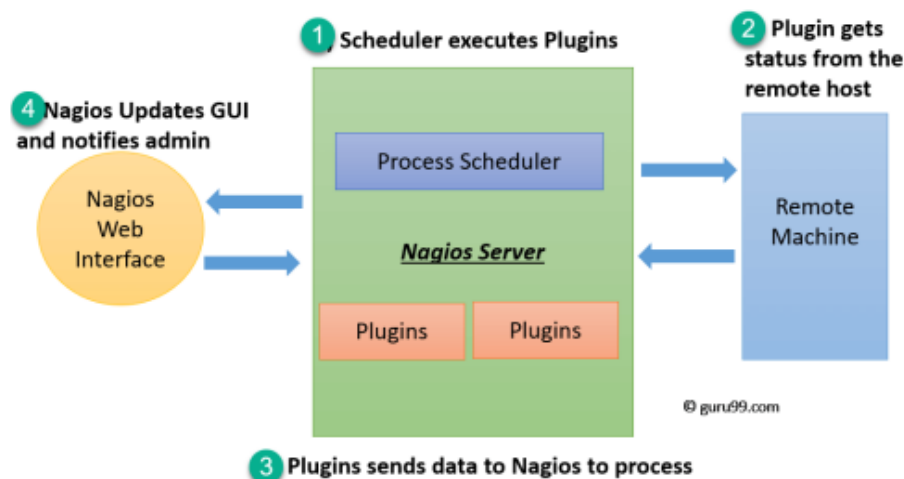
decide how to define individual files

- 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.

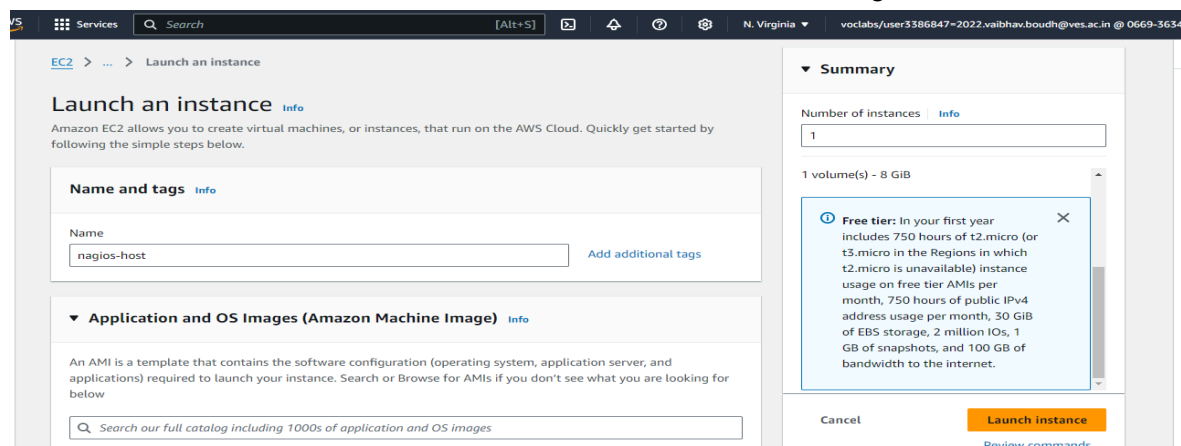


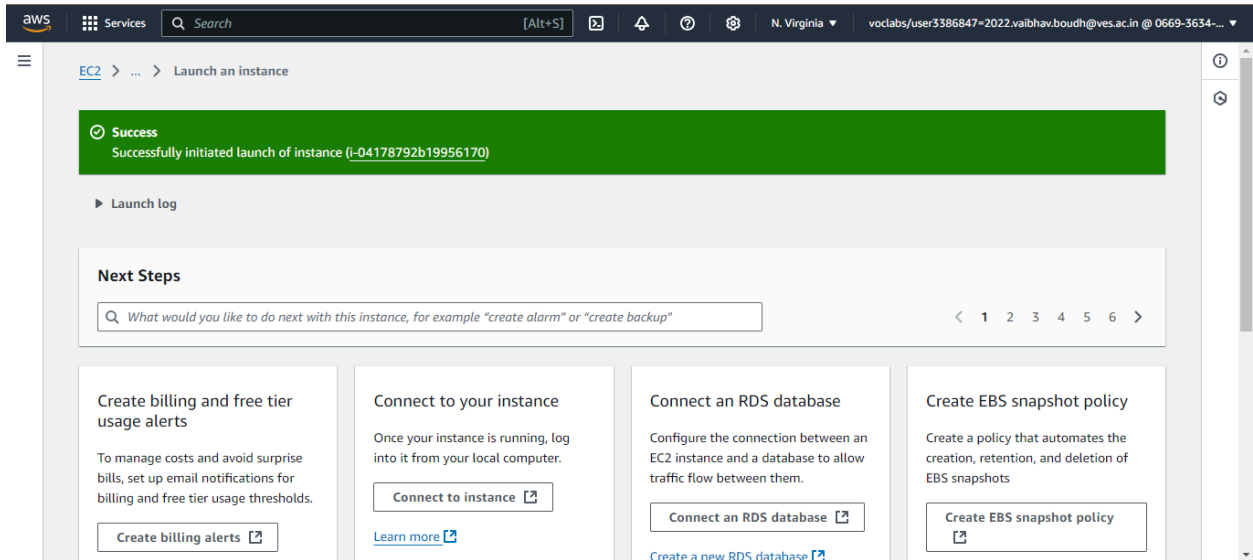
Installation of Nagios

Prerequisites: AWS Free Tier

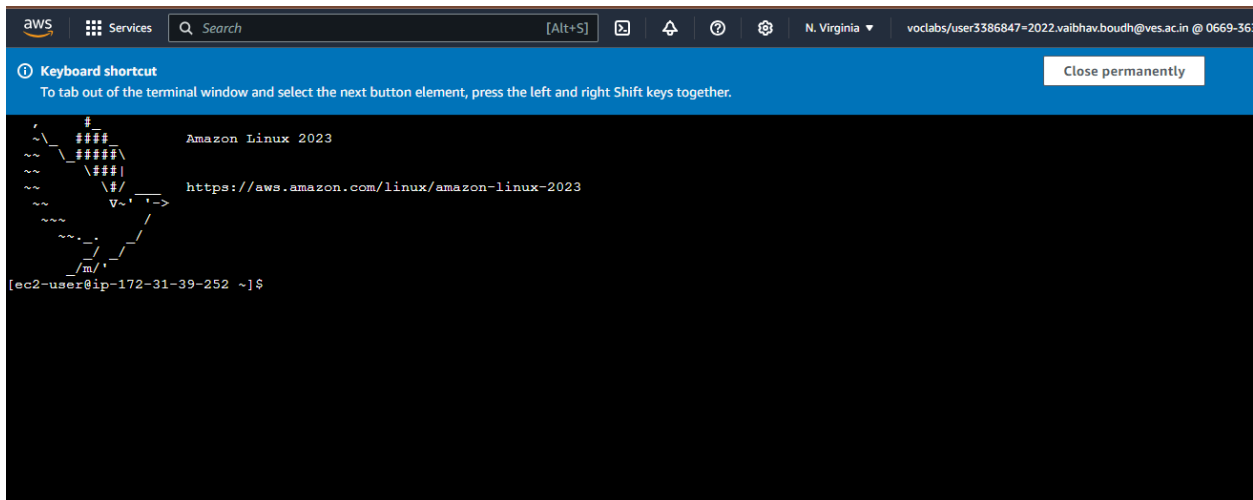
Steps:

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





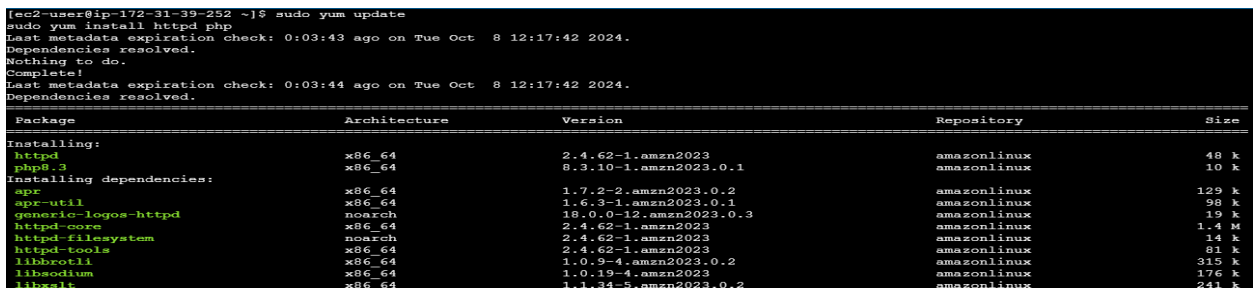
2. SSH into Your EC2 instance or simply use EC2 Instance Connect from the browser.



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
```

```
Total                                     39 MB/s | 76 MB   00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                               1/1
  Installing : zlib-devel-1.2.11-33.amzn2023.0.5.x86_64 1/75
  Installing : libpng-2:1.6.37-10.amzn2023.0.6.x86_64 2/75
  Installing : libwebp-1.2.4-1.amzn2023.0.6.x86_64 3/75
  Installing : libjpeg-turbo-2.1.4-2.amzn2023.0.5.x86_64 4/75
  Installing : cmake-filesystem-3.22.2-1.amzn2023.0.4.x86_64 5/75
  Installing : libpng-devel-2:1.6.37-10.amzn2023.0.6.x86_64 6/75
  Installing : xorg-x11-proto-devel-2021.4-1.amzn2023.0.2.noarch 7/75
  Installing : libmpc-1.2.1-2.amzn2023.0.2.x86_64 8/75
  Installing : libicu-67.1-7.amzn2023.0.3.x86_64 9/75
  Installing : libXau-1.0.9-6.amzn2023.0.2.x86_64 10/75
  Installing : libxcb-1.13.1-7.amzn2023.0.2.x86_64 11/75
  Installing : libICE-1.0.10-6.amzn2023.0.2.x86_64 12/75
  Installing : graphite2-1.3.14-7.amzn2023.0.2.x86_64 13/75
  Installing : fonts-filesystem-1:2.0.5-12.amzn2023.0.2.noarch 14/75
  Installing : graphite2-devel-1.3.14-7.amzn2023.0.2.x86_64 15/75
  Installing : libSM-1.2.3-8.amzn2023.0.2.x86_64 16/75
  Installing : libXau-devel-1.0.9-6.amzn2023.0.2.x86_64 17/75
```

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-172-31-39-252 ~]$ sudo adduser -m nagios
sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic
Retype new password:
passwd: all authentication tokens updated successfully.
```

6. Create a new user group

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

```
[ec2-user@ip-172-31-39-252 ~]$ sudo groupadd nagcmd
sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache
```

7. Create a new directory for Nagios downloads

```
mkdir ~/downloads
cd ~/downloads
```

```
[ec2-user@ip-172-31-39-252 ~]$ mkdir ~/downloads
cd ~/downloads
```

8. Use wget to download the source zip files.

```
[ec2-user@ip-172-31-39-252 downloads]$ 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
--2024-10-08 12:29:06-- http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
Resolving prdownloads.sourceforge.net (prdownloads.sourceforge.net)... 204.68.111.105
Connecting to prdownloads.sourceforge.net (prdownloads.sourceforge.net)|204.68.111.105|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz [following]
--2024-10-08 12:29:07-- http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz
Resolving downloads.sourceforge.net (downloads.sourceforge.net)... 204.68.111.105
Reusing existing connection to prdownloads.sourceforge.net:80.
HTTP request sent, awaiting response... 302 Found
Location: http://netactuate.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1 [following]
--2024-10-08 12:29:07-- http://netactuate.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1
Resolving netactuate.dl.sourceforge.net (netactuate.dl.sourceforge.net)... 104.225.3.66
Connecting to netactuate.dl.sourceforge.net (netactuate.dl.sourceforge.net)|104.225.3.66|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1805059 (1.7M) [application/x-gzip]
Saving to: 'nagios-4.0.8.tar.gz'

nagios-4.0.8.tar.gz          100%[=====>] 1.72M  --.-KB/s  in 0.09s

2024-10-08 12:29:07 (19.1 MB/s) - 'nagios-4.0.8.tar.gz' saved [1805059/1805059]

--2024-10-08 12:29:07-- http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz
```

9. Use tar to unzip and change to that directory.

tar zxvf nagios-4.0.8.tar.gz

```
[ec2-user@ip-172-31-39-252 downloads]$ tar zxvf nagios-4.0.8.tar.gz
cd nagios-4.0.8
nagios-4.0.8/
nagios-4.0.8/.gitignore
nagios-4.0.8/Changelog
nagios-4.0.8/INSTALLING
nagios-4.0.8/LLEGAL
nagios-4.0.8/LICENSE
nagios-4.0.8/Makefile.in
nagios-4.0.8/README
nagios-4.0.8/README.asciidoc
nagios-4.0.8/THANKS
nagios-4.0.8/UPGRADING
nagios-4.0.8/base/
nagios-4.0.8/base/.gitignore
nagios-4.0.8/base/Makefile.in
nagios-4.0.8/base/broker.c
nagios-4.0.8/base/checks.c
nagios-4.0.8/base/commands.c
nagios-4.0.8/base/config.c
nagios-4.0.8/base/events.c
nagios-4.0.8/base/flapping.c
nagios-4.0.8/base/logging.c
nagios-4.0.8/base/nagios.c
```

10. Run the configuration script with the same group name you previously created.

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

```
[ec2-user@ip-172-31-39-252 nagios-4.0.8]$ ./configure --with-command-group=nagcmd
checking for a BSD-compatible install... /usr/bin/install -c
checking build system type... x86_64-unknown-linux-gnu
checking host system type... x86_64-unknown-linux-gnu
checking for gcc... gcc
checking for C compiler default output file name... a.out
checking whether the C compiler works... yes
checking whether we are cross compiling... no
checking for suffix of executables...
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for gcc option to accept ISO C89... none needed
checking whether make sets $(MAKE)... yes
checking for strip... /usr/bin/strip
checking how to run the C preprocessor... gcc -E
checking for grep that handles long lines and -e... /usr/bin/grep
checking for egrep... /usr/bin/grep -E
checking for ANSI C header files... yes
checking whether time.h and sys/time.h may both be included... yes
checking for sys/wait.h that is POSIX.1 compatible... yes
checking for sys/types.h... yes
checking for sys/stat.h... yes
checking for stdlib.h... yes
```

11. Compile the source code.

`sudo make install, sudo make install-init, sudo make install-config`

`sudo make install-commandmode`

```
[ec2-user@ip-172-31-39-252 nagios-4.0.8]$ make all
sudo make install
sudo make install-init
sudo make install-config
sudo make install-commandmode
cd ./base && make
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.0.8/base'
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o nagios.o nagios.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o broker.o broker.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o nebmodes.o nebmodes.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o ../common/shared.o ../common/shared.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o nerd.o nerd.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o query-handler.o query-handler.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o workers.o workers.c
In function 'get_wproc_list',
    inlined from 'get_worker' at workers.c:224:12:
workers.c:209:17: warning: '%s' directive argument is null [-Wformat-overflow=]
   209 |         log_debug_info(DEBUGL_CHECKS, 1, "Found specialized worker(s) for '%s'", (slash && *slash != '/') ? slash : cmd_name);
       |         ^~~~~~
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o checks.o checks.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o config.o config.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o commands.o commands.c
commands.c: In function 'process_passive_service_check':
commands.c:2247:19: warning: assignment discards 'const' qualifier from pointer target type [-Wdiscarded-qualifiers]

netutils.c:50:46: note: directive argument in the range [-2147483648, 65535]
   50 |         snprintf(port_str, sizeof(port_str), "%d", port);
       |         ^~~~~~
netutils.c:50:9: note: 'snprintf' output between 2 and 12 bytes into a destination of size 6
   50 |         snprintf(port_str, sizeof(port_str), "%d", port);
       |         ^~~~~~
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o notifications.o notifications.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o sehndlers.o sehndlers.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o utils.o utils.c
utils.c: In function 'process_check_result_queue':
utils.c:2038:52: warning: 'snprintf' output may be truncated before the last format character [-Wformat-truncation=]
  2038 |         snprintf(file, sizeof(file), "%s/%s", dirname, dirfile->d_name);
       |         ^~~~~~
utils.c:2038:17: note: 'snprintf' output 2 or more bytes (assuming 257) into a destination of size 256
  2038 |         snprintf(file, sizeof(file), "%s/%s", dirname, dirfile->d_name);
       |         ^~~~~~
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o retention-base.o sretention.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o xretention-base.o ../xdata/xrddefault.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o comments-base.o ../common/comments.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o xcomments-base.o ../xdata/xcddefault.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o objects-base.o ../common/objects.c
gcc -Wall -I... -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o xobjects-base.o ../xdata/xodtemplate.c
```

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

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

```
GNU nano 5.8 /usr/local/nagios/etc/objects/contacts.cfg
#####
# CONTACTS.CFG - SAMPLE CONTACT/CONTACTGROUP DEFINITIONS
#
#
# NOTES: This config file provides you with some example contact and contact
#        group definitions that you can reference in host and service
#        definitions.
#
#        You don't need to keep these definitions in a separate file from your
#        other object definitions. This has been done just to make things
#        easier to understand.
#
#####
#
#####
#
# CONTACTS
```

13. Configure the web interface.

`sudo make install-webcon`

```
[ec2-user@ip-172-31-46-218 nagios-4.0.8]$ sudo make install-webconf
/usr/bin/install -c -m 644 sample-config/httpd.conf /etc/httpd/conf.d/nagios.conf
*** Nagios/Apache conf file installed ***
```

14. 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-172-31-46-218 nagios-4.0.8]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
[ec2-user@ip-172-31-46-218 nagios-4.0.8]$ |
```

15. 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-172-31-46-218 ~]$ cd ~/downloads/
[ec2-user@ip-172-31-46-218 downloads]$ tar zxvf nagios-plugins-2.0.3.tar.gz
```

16. Start Nagios

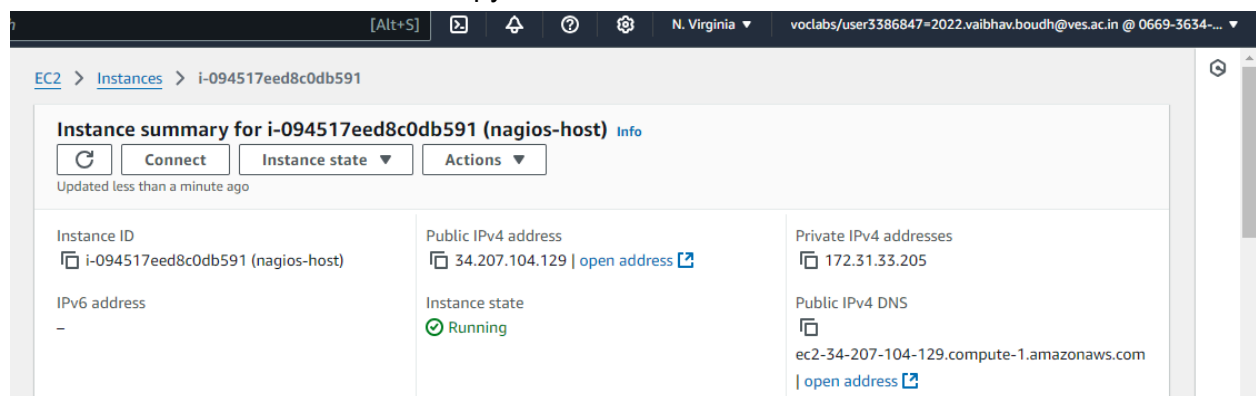
```
[ec2-user@ip-172-31-46-218 ~]$ sudo service nagios start
Starting nagios (via systemctl): [ OK ]
[ec2-user@ip-172-31-46-218 ~]$ |
```

17. Check the status of Nagios

`sudo systemctl status nagios`

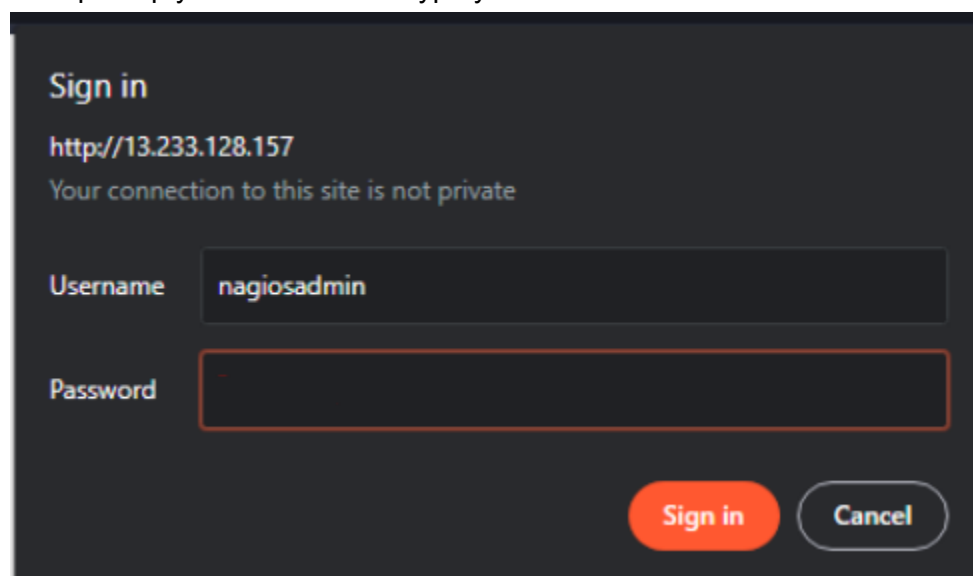
```
[ec2-user@ip-172-31-46-218 ~]$ sudo systemctl status nagios
● nagios.service - LSB: Starts and stops the Nagios monitoring server
   Loaded: loaded (/etc/rc.d/init.d/nagios; bad; vendor preset: disabled)
   Active: active (running) since Sun 2021-10-24 08:05:00 UTC; 1min 21s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 30073 ExecStart=/etc/rc.d/init.d/nagios start (code=exited, status=0/SUCCESS)
    CGroup: /system.slice/nagios.service
            └─30094 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios
            └─30096 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var
            └─30097 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var
            └─30098 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var
            └─30099 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var
            └─30100 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios
```

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



The screenshot shows the AWS Management Console interface for an EC2 instance. The instance is named 'i-094517eed8c0db591 (nagios-host)' and is in the 'Running' state. The public IPv4 address is '34.207.104.129'. The private IPv4 address is '172.31.33.205'. The public IPv4 DNS is 'ec2-34-207-104-129.compute-1.amazonaws.com'. The instance is located in the 'N. Virginia' region. The console shows the 'Instance summary' section with buttons for 'Connect', 'Instance state', and 'Actions'. The 'Instance state' dropdown is set to 'Running'.

19. Open up your browser and type your link



The screenshot shows a web browser window with a sign-in page. The URL bar shows 'http://13.233.128.157'. The page title is 'Sign in'. Below the title, it says 'Your connection to this site is not private'. There are two input fields: 'Username' with the value 'nagiosadmin' and 'Password' which is empty. At the bottom right, there are two buttons: 'Sign in' (orange) and 'Cancel' (grey).

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

The screenshot displays the Nagios Core 4.0.8 web interface. On the left is a sidebar with navigation links under categories like 'General', 'Current Status', 'Reports', and 'System'. The main content area features the Nagios Core logo and version information (Version 4.0.8, August 12, 2014). A blue banner announces a new version (4.4.6) is available. Below this are three product tiles: 'Nagios XI', 'Nagios Log Server', and 'Nagios Network Analyzer', each with a 'Download' button. The main content area is divided into four sections: 'Get Started' (with links to start monitoring, change look and feel, extend Nagios, get support, get training, and get certified), 'Quick Links' (with links to Nagios Library, Nagios Wiki, Nagios Exchange, Nagios Support, Nagios.com, and Nagios.org), 'Latest News' (with links to Nagios Update 3.5.6.6, Nagios Update 3.5.6.5, Nagios Update 3.5.6.4, and More news), and 'Don't Miss...' (with links to Monitoring Log Data with Nagios, Can Nagios monitor netflow?, Nagios XI 5 Available Now!, and Nagios XI 5 Available Now! - Easier configuration, Advanced Reporting, Download Today!).

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Conclusion:

Thus, we learned about Nagios and successfully set it up as a host on our Amazon Linux machine.