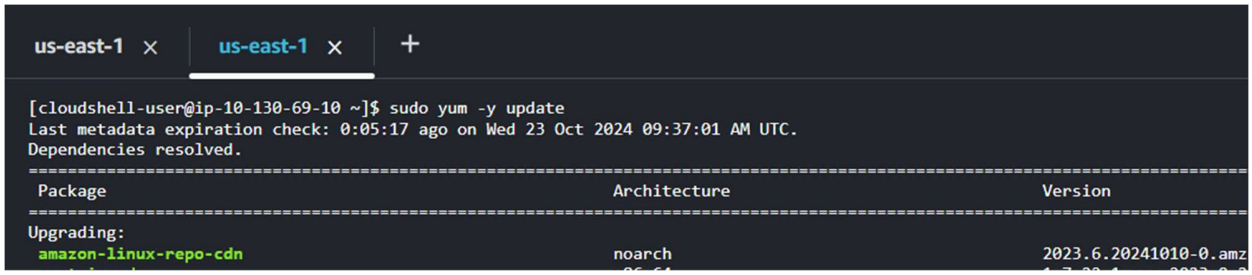
Case Study/ D15A/ 15

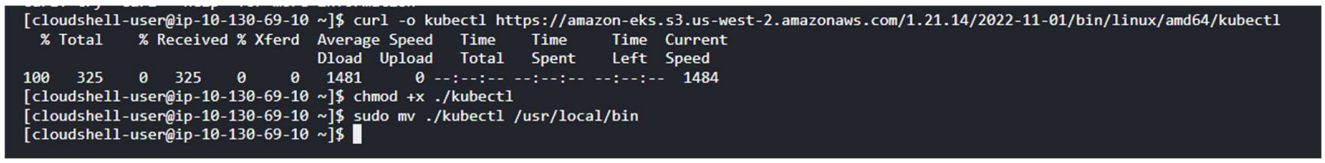
Deploying NGINX server in cloudshell using kubernetes

Using AWS CloudShell:
Access AWS CloudShell
Log into the AWS Management Console.
Click on the CloudShell icon at the top right of the console.

sudo yum -y update



INSTALL KUBECTL
curl -o kubectl
https://amazon-eks.s3.us-west-2.amazonaws.com/1.21.14/2022-11-01/bin/linux/amd64/kubectl
chmod +x ./kubectl
sudo mv ./kubectl /usr/local/bin



INSTALL EKSCTL
curl --silent --location
"https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$(uname
-s)_amd64.tar.gz" | tar xz -C /tmp
sudo mv /tmp/eksctl /usr/local/bin

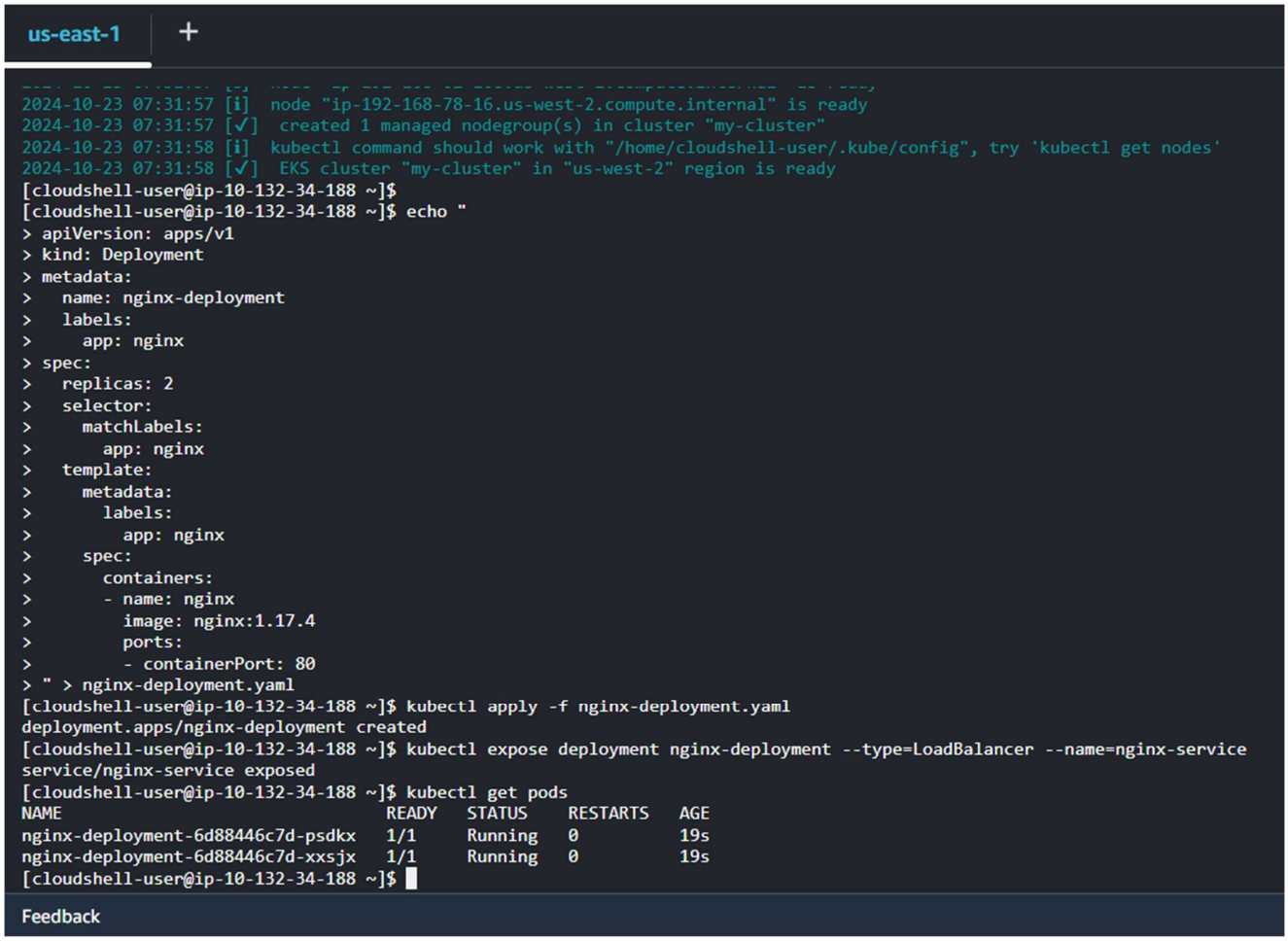
Create an EKS cluster
eksctl create cluster --name my-cluster --version 1.29 --region us-west-2 --nodegroup-name linux-nodes --node-type t2.micro --nodes 2 --nodes-min 1 --nodes-max 4 --managed

kubectl get svc

Create a YAML file named nginx-pod.yaml with the following content:

kubectl apply -f nginx-pod.yaml

kubectl get pods



You can see the pods thus , ngnix server is successfully deployed on kubernetes
Now we have to monitor using Nagios:

Step 4: Set Up Nagios for Monitoring

1. Install Nagios Core:
    - Install Nagios Core on a separate machine or server
    - Download the latest version of Nagios Core from the official website

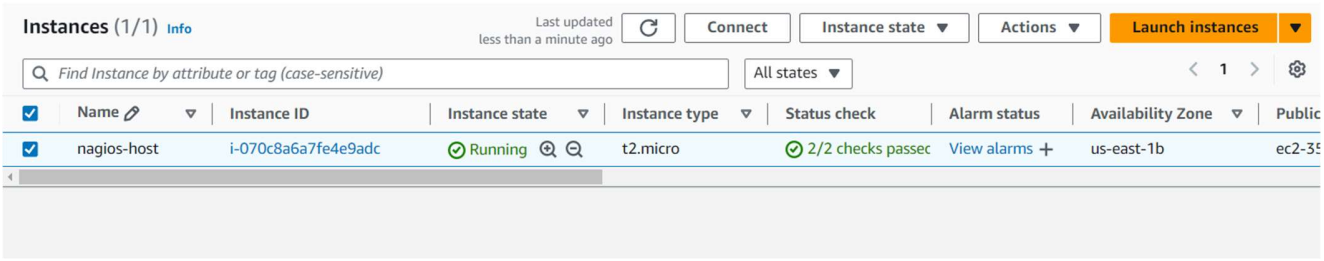
Follow the installation instructions provided in the Nagios documentation

2. Configure Nagios to Monitor the Nginx Deployment:
    - Add the necessary Nagios plugins to monitor HTTP services
    - Configure Nagios to check the health of the Nginx pods by adding a command and service check in the Nagios configuration files.

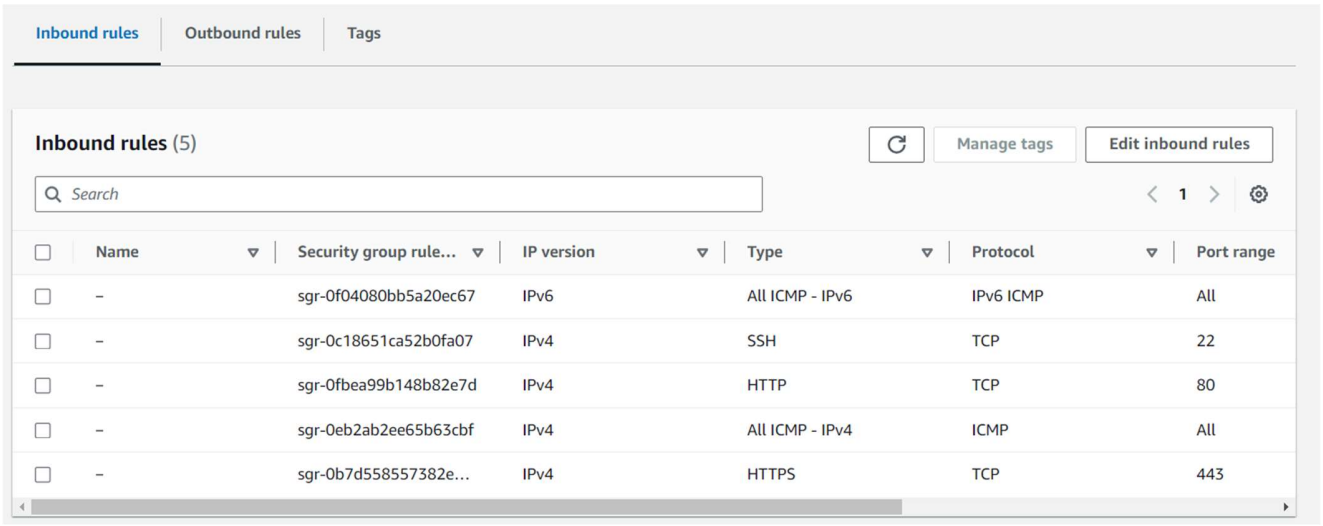
Steps for Installing Nagios

1. Create EC2 Instance:

Launch an Amazon Linux EC2 instance named nagios-host.

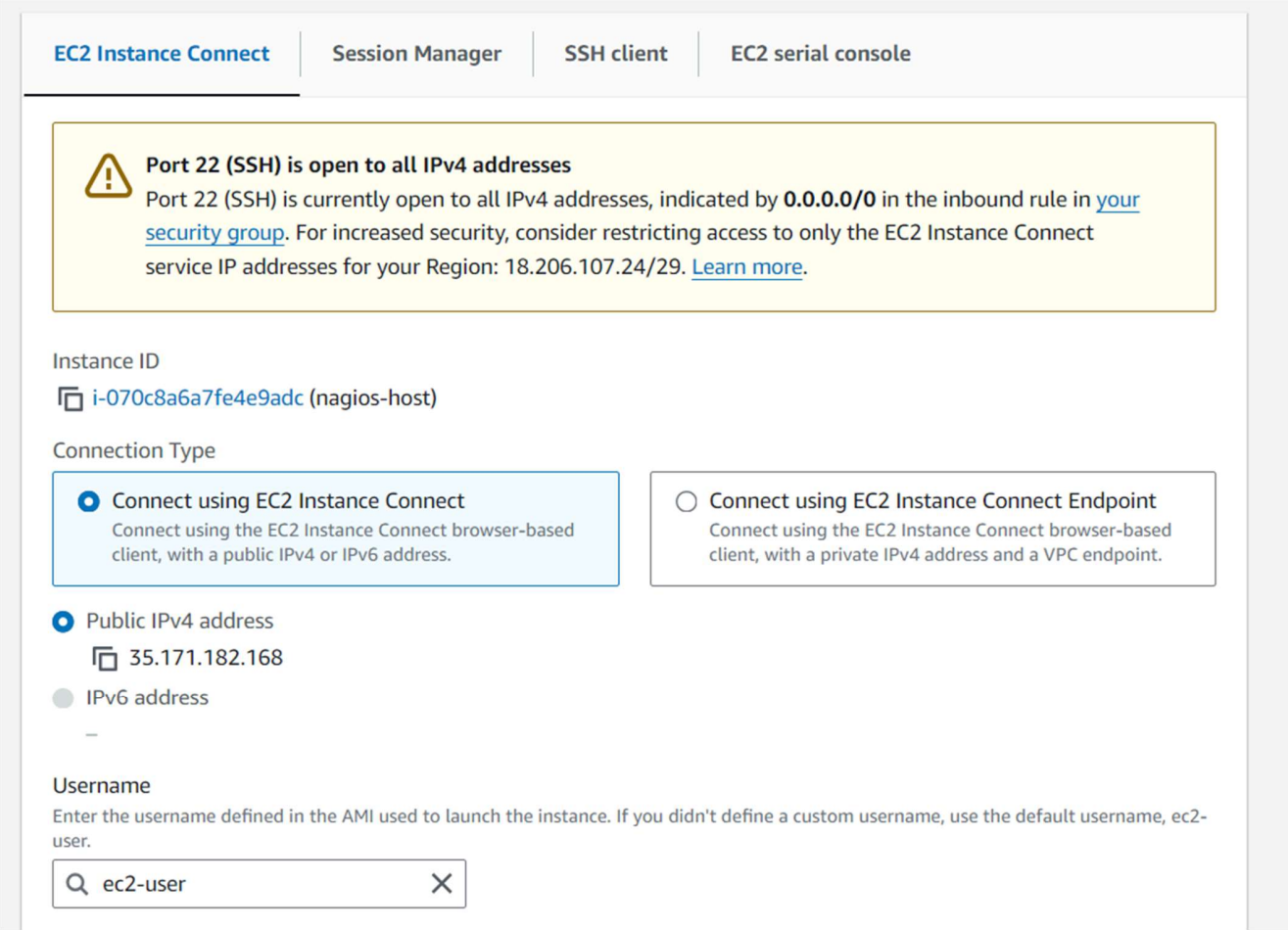


2. Configure Security Group:
Open inbound rules for HTTP, HTTPS, SSH, and ICMP



3. SSH into EC2 Instance:

○ Connect to the instance via SSH or EC2 Instance Connect.



4.Update Package Indices and Install Required Packages

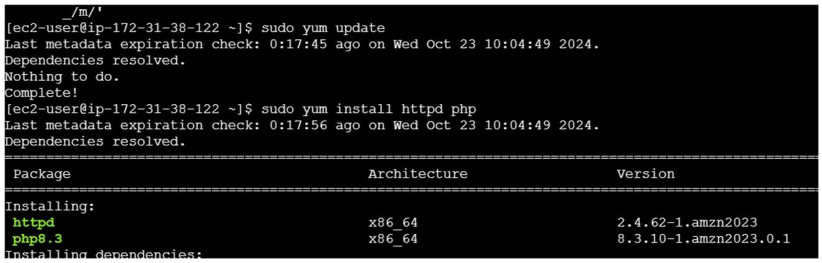
Commands -

sudo yum update

sudo yum install httpd php

sudo yum install gcc glibc glibc-common

sudo yum install gd gd-devel



```
Complete!
[ec2-user@ip-172-31-38-122 ~]$ sudo yum install gcc glibc glibc-common
Last metadata expiration check: 0:19:01 ago on Wed Oct 23 10:04:49 2024.
Package glibc-2.34-52.amzn2023.0.11.x86_64 is already installed.
Package glibc-common-2.34-52.amzn2023.0.11.x86_64 is already installed.
Dependencies resolved.
================================================================================
 Package                                 Architecture                 Ver
================================================================================
Installing:
 gcc                                     x86_64                       11.
Installing dependencies:
 annobin-docs                            noarch                       10.
 annobin-plugin-gcc                      x86_64                       10.
```

```
Complete!
[ec2-user@ip-172-31-38-122 ~]$ sudo yum install gd gd-devel
Last metadata expiration check: 0:19:57 ago on Wed Oct 23 10:04:49 2024.
Dependencies resolved.
================================================================================
 Package                                 Architecture
================================================================================
Installing:
 gd                                      x86_64
 gd-devel                                x86_64
Installing dependencies:
 brotli                                  x86_64
```

5.Create a New Nagios User

Commands -

sudo adduser -m nagios

sudo passwd nagios

```
Complete!
[ec2-user@ip-172-31-38-122 ~]$ sudo adduser -m nagios
[ec2-user@ip-172-31-38-122 ~]$ sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-38-122 ~]$
```

6.create a New User Group

Commands -

sudo groupadd nagcmd

Add Users to the Group

Commands -

sudo usermod -a -G nagcmd nagios

sudo usermod -a -G nagcmd apache

```
[ec2-user@ip-172-31-38-122 ~]$ sudo usermod -a -G nagcmd nagios
[ec2-user@ip-172-31-38-122 ~]$ sudo usermod -a -G nagcmd apache
```

Create a Directory for Nagios Downloads

Commands -

mkdir ~/downloads

cd ~/downloads

```
[ec2-user@ip-172-31-38-122 ~]$ mkdir ~/downloads
[ec2-user@ip-172-31-38-122 ~]$ cd ~/downloads
```

Download Nagios and Plugins Source Files

Commands -

wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4.6.tar.gz

wget https://nagios-plugins.org/download/nagios-plugins-2.3.3.tar.gz

```
[ec2-user@ip-172-31-38-122 downloads]$ wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4.6.tar.gz
--2024-10-23 10:29:12--  https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4.6.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: 11333414 (11M) [application/x-gzip]
Saving to: 'nagios-4.4.6.tar.gz'

nagios-4.4.6.tar.gz                     100%[=============================================================================

2024-10-23 10:29:13 (13.5 MB/s) - 'nagios-4.4.6.tar.gz' saved [11333414/11333414]
```

```
[ec2-user@ip-172-31-38-122 downloads]$ wget https://nagios-plugins.org/download/nagios-plugins-2.3.3.tar.gz
--2024-10-23 10:30:20--  https://nagios-plugins.org/download/nagios-plugins-2.3.3.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|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2782610 (2.7M) [application/x-gzip]
Saving to: 'nagios-plugins-2.3.3.tar.gz'

nagios-plugins-2.3.3.tar.gz             100%[=============================================================================

2024-10-23 10:30:21 (7.65 MB/s) - 'nagios-plugins-2.3.3.tar.gz' saved [2782610/2782610]
```

```
2024-10-23 10:30:21 (7.65 MB/s) - 'nagios-plugins-2.3.3.tar.gz' saved [2782610/2782610]

[ec2-user@ip-172-31-38-122 downloads]$ tar zxvf nagios-4.4.6.tar.gz
nagios-4.4.6/
nagios-4.4.6/.gitignore
nagios-4.4.6/.travis.yml
nagios-4.4.6/CONTRIBUTING.md
```

Extract the Nagios Source File

Commands -

tar zxvf nagios-4.4.6.tar.gz

cd nagios-4.4.6

Run the Configuration Script
Commands -
./configure --with-command-

group=nagcmd

```
nagios-4.4.6/xdata/xsddefault.h
[ec2-user@ip-172-31-38-122 downloads]$ cd nagios-4.4.6
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ ./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
```

Compile the Source Code
Commands –
make all

```
  - What version of Nagios you are using
  - What version of the plugins you are using
  - Relevant snippets from your config files
  - Relevant error messages from the Nagios log file

r more information on obtaining support for Nagios, visit:

    https://support.nagios.com

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

joy.

c2-user@ip-172-31-38-122 nagios-4.4.6]$
```

Install Binaries, Init Script, and Sample Config Files
Commands -

./sudo make install

sudo make install-init

sudo make install-config

sudo make install-commandmode

```
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ sudo make install
cd ./base && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/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-4.4.6/base'
cd ./cgi && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/cgi'
make install-basic
make[2]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/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 install-config
     - This installs sample config files in /usr/local/nagios/etc

make[1]: Leaving directory '/home/ec2-user/downloads/nagios-4.4.6'
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ 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-172-31-38-122 nagios-4.4.6]$ 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
```

```
c2-user@ip-172-31-38-122 nagios-4.4.6]$ sudo make install-commandmode
sr/bin/install -c -m 775 -o nagios -g nagcmd -d /usr/local/nagios/var/rw
nod g+s /usr/local/nagios/var/rw

* External command directory configured ***

c2-user@ip-172-31-38-122 nagios-4.4.6]$
```

Edit the Config File

Commands -
sudo nano /usr/local/nagios/etc/objects/commands.cfg sudo

nano /usr/local/nagios/etc/objects/services.cfg

```
define command {

    command_name    notify-host-by-email
    command_line    /usr/bin/printf "%b" "***** Nagios *****\n\nNotification Type: $NOTIFICATIONTYPE$\nHost: $HOSTNAME$\nState: $HOSTSTATE$\nAddress: $HOSTADDRES$
}


define command {

    command_name    notify-service-by-email
    command_line    /usr/bin/printf "%b" "***** Nagios *****\n\nNotification Type: $NOTIFICATIONTYPE$\n\nService: $SERVICEDESC$\nHost: $HOSTALIAS$\nAddress: $HOST
}
define command {
    command_name    check_nginx
    command_line    $USER1$/check_http -I $HOSTADDRESS$ -p 80
}


#############################################################################
#
^G Help      ^O Write Out  ^W Where Is   ^K Cut         ^T Execute   ^C Location   M-U Undo      M-A Set Mark  M-] To Bracket  M-Q Previous
```

```
  GNU nano 5.8
define service {
    use                     generic-service
    host_name               localhost
    service_description     Nginx
    check_command           check_nginx
    check_interval          0.5
    retry_interval          0.5
    max_check_attempts      3
}
```

Configure the Web Interface
Commands –
sudo make install-webconf

```
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ 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 ***

[ec2-user@ip-172-31-38-122 nagios-4.4.6]$
```

Create a Nagios Admin Account
Commands –
sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
You will be prompted to enter and confirm the password for the nagiosadmin user

```
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$
```

Restart Apache
Commands -
sudo systemctl restart httpd
Extract the Plugins Source File

Commands –

cd ~/downloads

tar zxvf nagios-plugins-2.3.3.tar.gz

```
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ sudo systemctl restart httpd
[ec2-user@ip-172-31-38-122 nagios-4.4.6]$ cd ~/downloads
[ec2-user@ip-172-31-38-122 downloads]$ tar zxvf nagios-plugins-2.3.3.tar.gz
nagios-plugins-2.3.3/
nagios-plugins-2.3.3/perlmods/
nagios-plugins-2.3.3/perlmods/Config-Tiny-2.14.tar.gz
nagios-plugins-2.3.3/perlmods/parent-0.226.tar.gz
nagios-plugins-2.3.3/perlmods/Test-Simple-0.98.tar.gz
nagios-plugins-2.3.3/perlmods/Makefile.in
nagios-plugins-2.3.3/perlmods/version-0.9903.tar.gz
nagios-plugins-2.3.3/perlmods/Makefile.am
nagios-plugins-2.3.3/perlmods/Module-Runtime-0.013.tar.gz
nagios-plugins-2.3.3/perlmods/Module-Metadata-1.000014.tar.gz
nagios-plugins-2.3.3/perlmods/Params-Validate-1.08.tar.gz
nagios-plugins-2.3.3/perlmods/Class-Accessor-0.34.tar.gz
nagios-plugins-2.3.3/perlmods/Try-Tiny-0.18.tar.gz
nagios-plugins-2.3.3/perlmods/Module-Implementation-0.07.tar.gz
nagios-plugins-2.3.3/perlmods/Makefile
```

If Error
sudo mkdir -p /usr/local/nagios/var/spool/checkresults

sudo chown -R nagios:nagcmd /usr/local/nagios/var

Compile and Install Plugins

Commands -

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

make

sudo make install

```
[ec2-user@ip-172-31-38-122 nagios-plugins-2.3.3]$ ./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 to disable maintainer-specific portions of Makefiles... yes
checking build system type... x86_64-unknown-linux-gnu
```

```
[ec2-user@ip-172-31-38-122 nagios-plugins-2.3.3]$ sudo /usr/local/nagios/bin/nagios -v usr/local/nagios/etc/nagios.cfg

Nagios Core 4.4.6
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2020-04-28
License: GPL

Website: https://www.nagios.org
Reading configuration data...
Error: Cannot open main configuration file '/home/ec2-user/downloads/nagios-plugins-2.3.3/usr/local/nagios/etc/nagios.cfg' fo
[ec2-user@ip-172-31-38-122 nagios-plugins-2.3.3]$ sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg
```

Start Nagios

Commands -

sudo chkconfig --add nagios

sudo chkconfig nagios on

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

sudo systemctl start nagios

Check Nagios Status: sudo

systemctl status nagios

```
Total Warnings: 0
Total Errors:   0

Things look okay - No serious problems were detected during the pre-flight che
[ec2-user@ip-172-31-38-122 nagios-plugins-2.3.3]$ sudo service nagios start
Redirecting to /bin/systemctl start nagios.service
[ec2-user@ip-172-31-38-122 nagios-plugins-2.3.3]$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.6
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset:
     Active: active (running) since Wed 2024-10-23 11:14:47 UTC; 3min 45s ago
       Docs: https://www.nagios.org/documentation
   Main PID: 70052 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 2.8M
        CPU: 62ms
     CGroup: /system.slice/nagios.service
             ├─70052 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nag
             ├─70053 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v
             ├─70054 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v
             ├─70055 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v
             ├─70056 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v
             └─70057 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nag
```

Nagios Page will be visible:

Username : nagiosadmin
Password : your password