CASE STUDY: TOPIC NUMBER 6

Topic Name: Automated Deployment with Monitoring

- **Concepts Used**: Jenkins, EC2, Nagios.
- **Problem Statement**: "Set up a Jenkins CI/CD pipeline to deploy a simple web application on an EC2 instance. Configure Nagios to monitor the deployed application's availability."
- **Tasks**:
    - Create a Jenkins pipeline that builds and deploys a sample web app to an EC2 instance.
    - Install and configure Nagios to monitor the HTTP status of the deployed application.
    - Verify the pipeline by triggering a build and checking the monitoring status in Nagios.

1. Introduction

Case Study Overview:

This case study focuses on creating an automated deployment and monitoring system using Jenkins, Amazon EC2, and Nagios. The primary goal is to set up a Jenkins CI/CD pipeline that automates the deployment of a simple web application on an EC2 instance. Additionally, Nagios is used to monitor the deployed application's availability, ensuring continuous functionality. This setup provides a robust solution for teams aiming to automate deployments while maintaining real-time monitoring.

Key Feature and Application:

The unique aspect of this case study is the integration of Jenkins with a CI/CD pipeline, which allows for automated builds, testing, and deployment. This automation reduces manual intervention, leading to a more efficient deployment process. By combining it with Nagios for monitoring, the solution ensures the deployed application remains accessible and responsive. This setup is ideal for dynamic environments where frequent updates and deployments are necessary, such as agile development teams or small-scale applications.

2. Step-by-Step Explanation:

1. Installing Jenkins on AWS EC2

Prerequisites

1. **AWS Account**: Sign up for an AWS account if you don’t have one.

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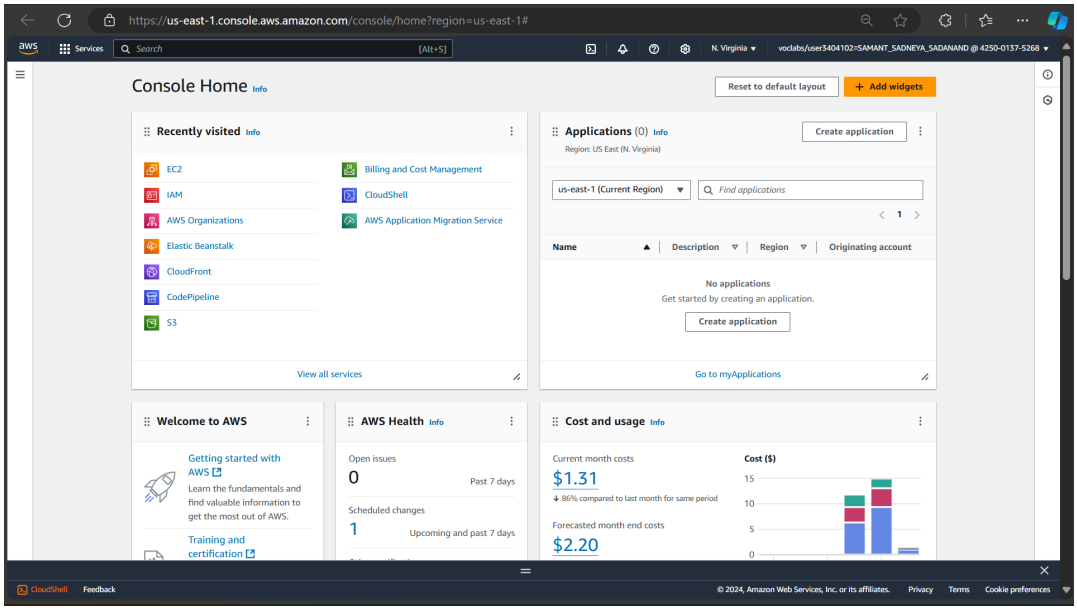
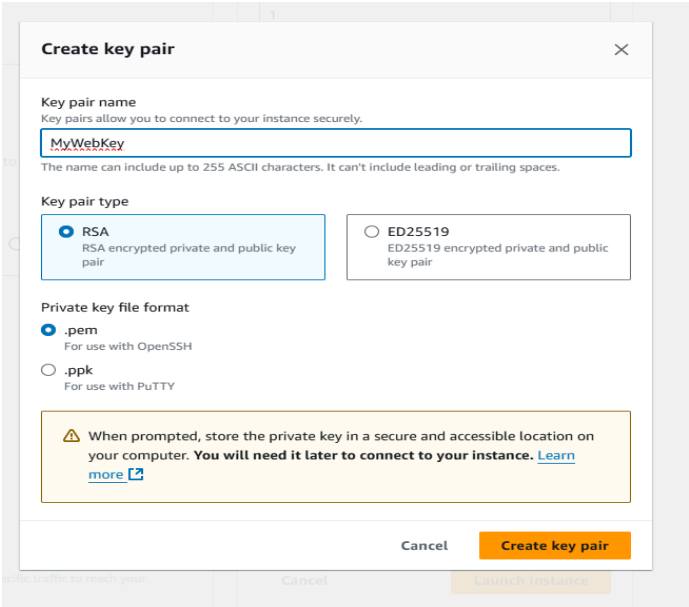


Step 1: Create a Key Pair

1. **Open the EC2 Console**: Go to the Amazon EC2 console.
2. **Key Pairs**: In the navigation pane, under **NETWORK & SECURITY**, select **Key Pairs**.
3. **Create Key Pair**:
   - Click **Create key pair**. Here, I have created “MyWebKey.pem”.
   - Name the key pair and select **pem** for **File format**.

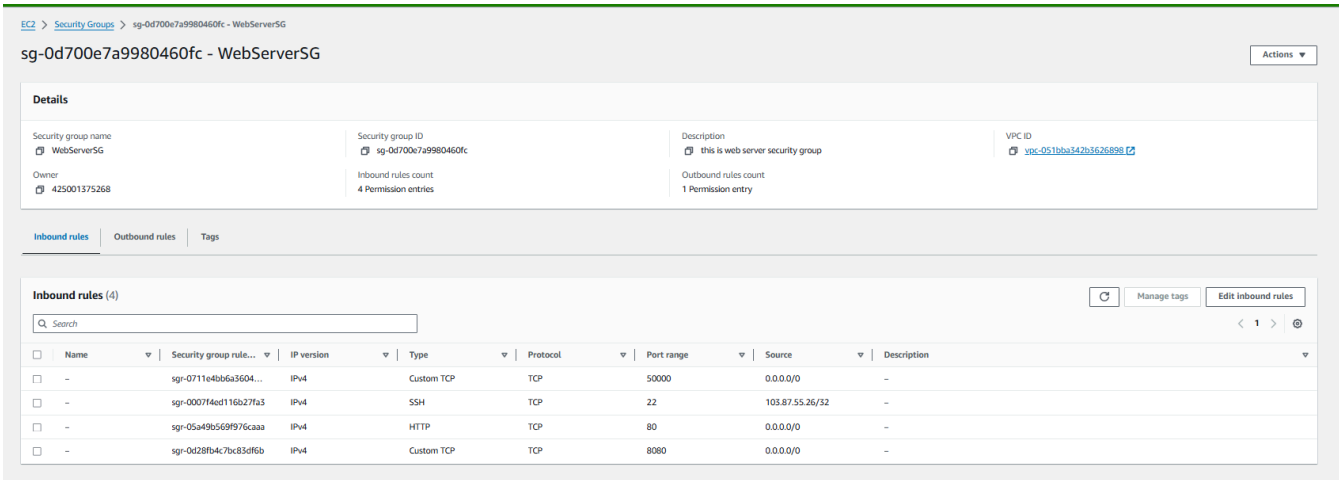


   - Click **Create key pair** to download the private key file. **Store it securely**.
4. **Set Permissions**: chmod 400 /path/to/your-key-pair.pem

Step 2: Create a Security Group

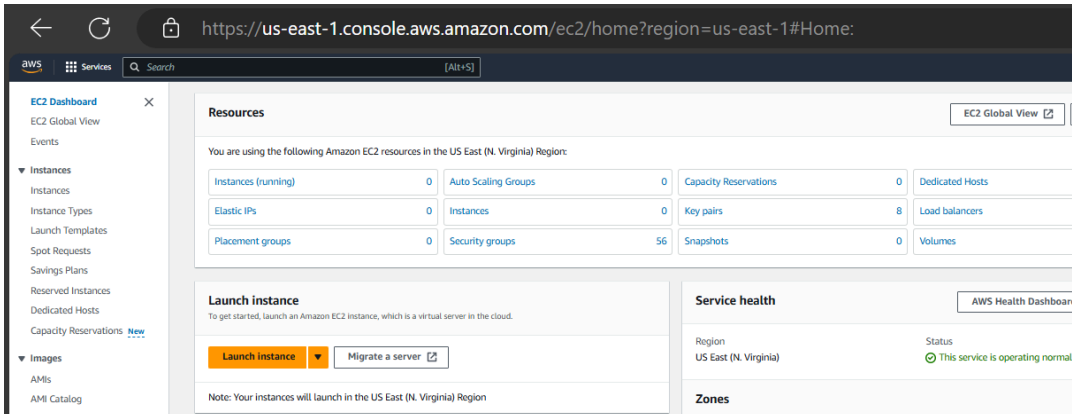
1. **Security Groups**: In the EC2 console, select **Security Groups** and then **Create Security Group**.
2. **Configure Rules**:
    - **Name**: Enter a name.Here I have given name “WebserverSG”
    - **Description**: Provide a description.(optional)
    - **Inbound Rules**:
        - **SSH**: Allow inbound SSH from your IP.
            - Type: SSH
            - Source: Your public IP with /32 (e.g., 103.87.55.26/32).
        - **HTTP**: Allow inbound HTTP from anywhere.
            - Type: HTTP
            - Source: 0.0.0.0/0
        - **Custom TCP Rule**: Allow Jenkins (8080) access.
            - Type: Custom TCP Rule
            - Port Range: 8080
            - Source: 0.0.0.0/0 (or restrict to your IP).
        - **Custom TCP Rule**: Allow Jenkins TCP (50000) for agent access.you will see its use later .
            - Type: Custom TCP Rule
            - Port Range: 50000
            - Source: 0.0.0.0/0 (or restrict to your IP).

3. Click on Create the Security Group.

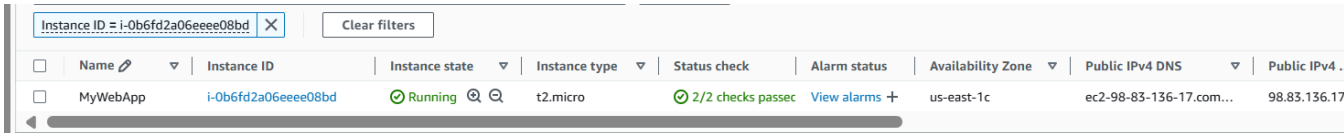


Step 3: Launch an EC2 Instance

1. **Launch Instance**: In the EC2 dashboard, click **Launch Instance**.

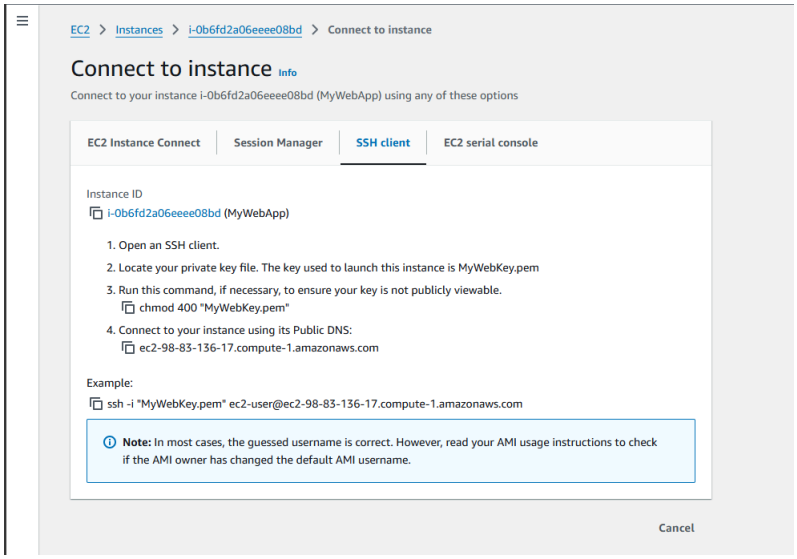


2. **Choose AMI**: Select the Amazon Linux 2023 AMI (Free tier eligible).
3. **Instance Type**: Choose t2.micro (Free tier eligible).
4. **Configure Instance**:
    - **Key Pair**: Select the key pair you created.(MyWebKey)
    - **Security Group**: Select the security group (JenkinsSG) you just created.
5. **Launch**: Review and click **Launch Instance**.
6. **Check Status**: Go to **Instances** in the navigation pane to monitor the instance status. Wait until it shows running. Thus Instance created successfully.



Step 4: Connect to Your EC2 Instance

1. **Get Public DNS**: Select the instance and find the **Public DNS (IPv4)**.Now open your command prompt.



Connect via SSH: ssh -i /path/to/your-key-pair.pem ec2-user@your-instance-public-dns

Step 5: Install Jenkins

1. **Update Packages**:
   sudo yum update -y

```
[ec2-user@ip-172-31-40-207 ~]$ sudo yum update
Last metadata expiration check: 0:05:20 ago on Sat Oct 19 13:33:
03 2024.
Dependencies resolved.
Nothing to do.
Complete!
```

2. **Add Jenkins Repository**:
   sudo wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat-stable/jenkins.re

```
[ec2-user@ip-172-31-40-207 ~]$  sudo wget -O /etc/yum.repos.d/je
nkins.repo \
    https://pkg.jenkins.io/redhat-stable/jenkins.repo
--2024-10-19 14:28:06--  https://pkg.jenkins.io/redhat-stable/je
nkins.repo
Resolving pkg.jenkins.io (pkg.jenkins.io)... 146.75.38.133, 2a04
:4e42:79::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|146.75.38.133|:443
... connected.
HTTP request sent, awaiting response... 200 OK
Length: 85
Saving to: ‘/etc/yum.repos.d/jenkins.repo’

/etc/yum.repos. 100%[=======>]      85  --.-KB/s    in 0s

2024-10-19 14:28:06 (9.62 MB/s) - ‘/etc/yum.repos.d/jenkins.repo
’ saved [85/85]
```

3. **Import Jenkins Key**:
   sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key

```
[ec2-user@ip-172-31-40-207 ~]$ sudo rpm --import https://pkg.jen
kins.io/redhat-stable/jenkins.io-2023.key
```

   Also check any upgradation and upgrade.

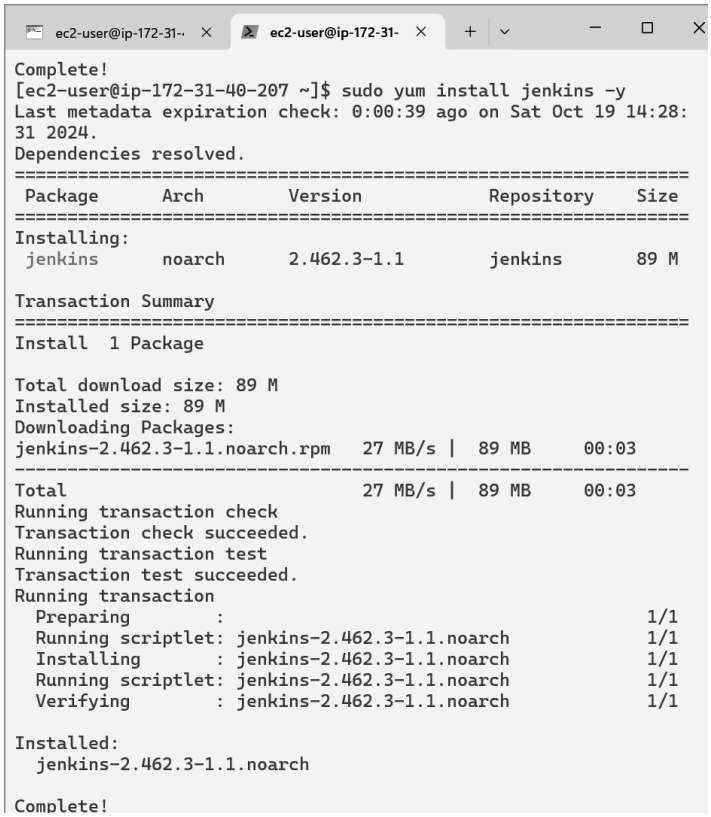
```
[ec2-user@ip-172-31-40-207 ~]$ sudo yum upgrade
Jenkins-stable                  331 kB/s |  29 kB     00:00
Dependencies resolved.
Nothing to do.
Complete!
```

4. **Install Java** (Jenkins requires Java): sudo dnf install java-17-amazon-corretto -y

```
[ec2-user@ip-172-31-40-207 ~]$ sudo dnf install java-17-amazon-c
orretto -y
Last metadata expiration check: 0:00:17 ago on Sat Oct 19 14:28:
31 2024.
Dependencies resolved.
================================================================
 Package      Arch   Version                  Repository   Size
================================================================
Installing:
 java-17-amazon-corretto
              x86_64 1:17.0.12+7-1.amzn2023.1 amazonlinux 187 k
Installing dependencies:
 alsa-lib     x86_64 1.2.7.2-1.amzn2023.0.2   amazonlinux 504 k
 dejavu-sans-fonts
              noarch 2.37-16.amzn2023.0.2     amazonlinux 1.3 M
 dejavu-sans-mono-fonts
              noarch 2.37-16.amzn2023.0.2     amazonlinux 467 k
 dejavu-serif-fonts
              noarch 2.37-16.amzn2023.0.2     amazonlinux 1.0 M
 giflib       x86_64 5.2.1-9.amzn2023.0.1     amazonlinux  49 k
 java-17-amazon-corretto-headless
              x86_64 1:17.0.12+7-1.amzn2023.1 amazonlinux  91 M
 javapackages-filesystem
              noarch 6.0.0-7.amzn2023.0.6     amazonlinux  12 k
 libXi        x86_64 1.8.2-1.amzn2023.0.1     amazonlinux  42 k
 libXinerama  x86_64 1.1.5-6.amzn2023.0.1     amazonlinux  16 k
 libXrandr    x86_64 1.5.4-3.amzn2023.0.1     amazonlinux  29 k
 libXtst      x86_64 1.2.5-1.amzn2023.0.1     amazonlinux  22 k
```

```
Installed:
  alsa-lib-1.2.7.2-1.amzn2023.0.2.x86_64
  dejavu-sans-fonts-2.37-16.amzn2023.0.2.noarch
  dejavu-sans-mono-fonts-2.37-16.amzn2023.0.2.noarch
  dejavu-serif-fonts-2.37-16.amzn2023.0.2.noarch
  giflib-5.2.1-9.amzn2023.0.1.x86_64
  java-17-amazon-corretto-1:17.0.12+7-1.amzn2023.1.x86_64
  java-17-amazon-corretto-headless-1:17.0.12+7-1.amzn2023.1.x86_
64
  javapackages-filesystem-6.0.0-7.amzn2023.0.6.noarch
  libXi-1.8.2-1.amzn2023.0.1.x86_64
  libXinerama-1.1.5-6.amzn2023.0.1.x86_64
  libXrandr-1.5.4-3.amzn2023.0.1.x86_64
  libXtst-1.2.5-1.amzn2023.0.1.x86_64

Complete!
```

5. **Install Jenkins**:
   sudo yum install jenkins -y



6. **Enable and Start Jenkins**:
   sudo systemctl enable jenkins

```
[ec2-user@ip-172-31-40-207 ~]$ sudo systemctl enable jenkins
Created symlink /etc/systemd/system/multi-user.target.wants/jenk
ins.service → /usr/lib/systemd/system/jenkins.service.
```

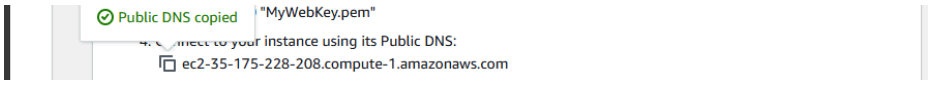
sudo systemctl start jenkins

7. **Check Jenkins Status**:
   sudo systemctl status jenkins

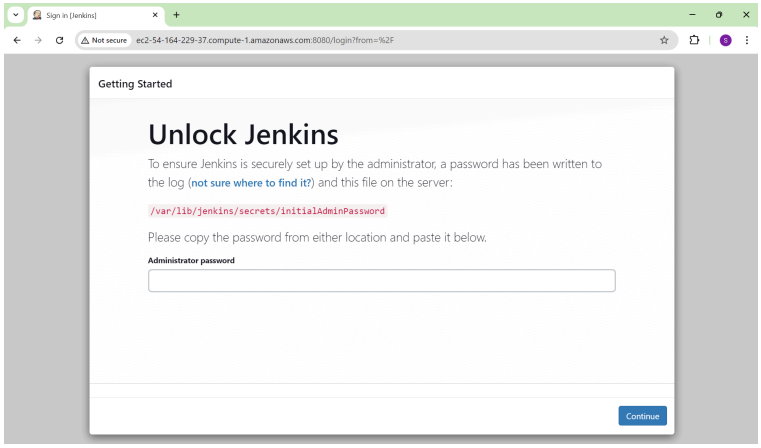
```
[ec2-user@ip-172-31-40-207 ~]$ sudo systemctl start jenkins
[ec2-user@ip-172-31-40-207 ~]$ sudo systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/usr/lib/systemd/system/jenkins.service; e>
     Active: active (running) since Sat 2024-10-19 14:30:01 UTC>
   Main PID: 74158 (java)
      Tasks: 46 (limit: 1112)
     Memory: 337.8M
        CPU: 15.479s
     CGroup: /system.slice/jenkins.service
             └─74158 /usr/bin/java -Djava.awt.headless=true -ja>

Oct 19 14:29:54 ip-172-31-40-207.ec2.internal jenkins[74158]: T>
Oct 19 14:29:54 ip-172-31-40-207.ec2.internal jenkins[74158]: *>
Oct 19 14:29:54 ip-172-31-40-207.ec2.internal jenkins[74158]: *>
Oct 19 14:29:54 ip-172-31-40-207.ec2.internal jenkins[74158]: *>
Oct 19 14:30:01 ip-172-31-40-207.ec2.internal jenkins[74158]: 2>
Oct 19 14:30:01 ip-172-31-40-207.ec2.internal jenkins[74158]: 2>
Oct 19 14:30:01 ip-172-31-40-207.ec2.internal systemd[1]: Start>
Oct 19 14:30:01 ip-172-31-40-207.ec2.internal jenkins[74158]: 2>
Oct 19 14:30:01 ip-172-31-40-207.ec2.internal jenkins[74158]: 2>
Oct 19 14:30:06 ip-172-31-40-207.ec2.internal jenkins[74158]: 2>
lines 1-20/20 (END)
```

Step 6: Configure Jenkins

1. **Access Jenkins**: Open your web browser and go to bowser and type http://<your_instance_public_dns>:8080



2. **Unlock Jenkins**:

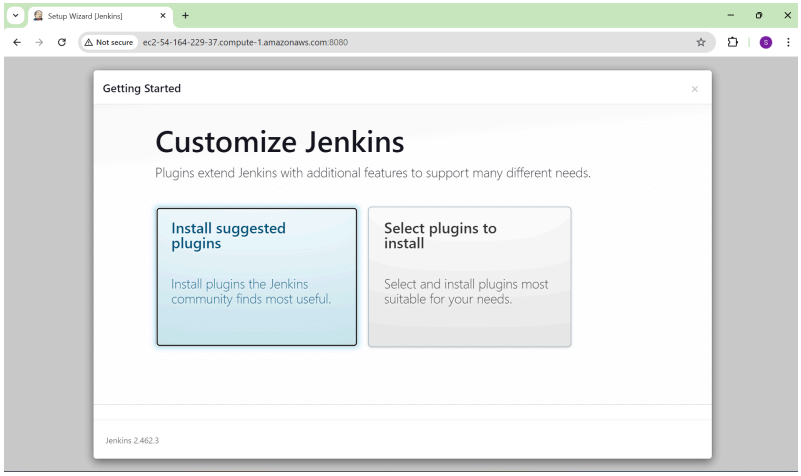


Find the initial admin password:
sudo cat /var/lib/jenkins/secrets/initialAdminPassword

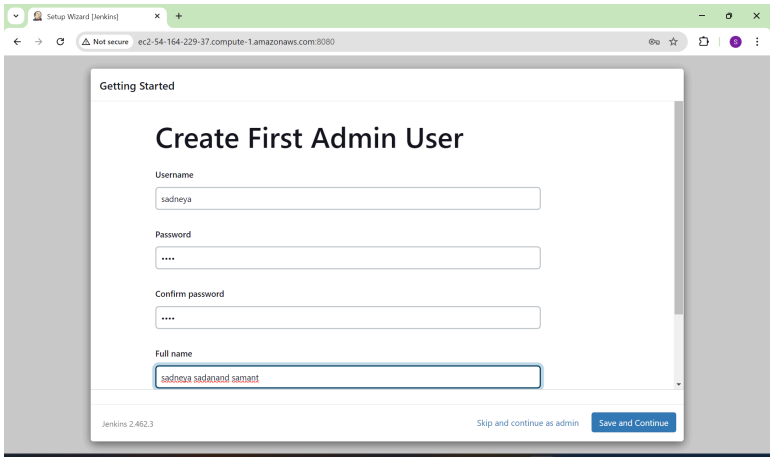
```
[ec2-user@ip-172-31-45-86 ~]$ sudo cat /var/lib/jenkins/secrets/initi
alAdminPassword
da0e63b6884a46359abe8e3a364f7c22
```

- Copy the password and paste it into the web interface to unlock Jenkins.

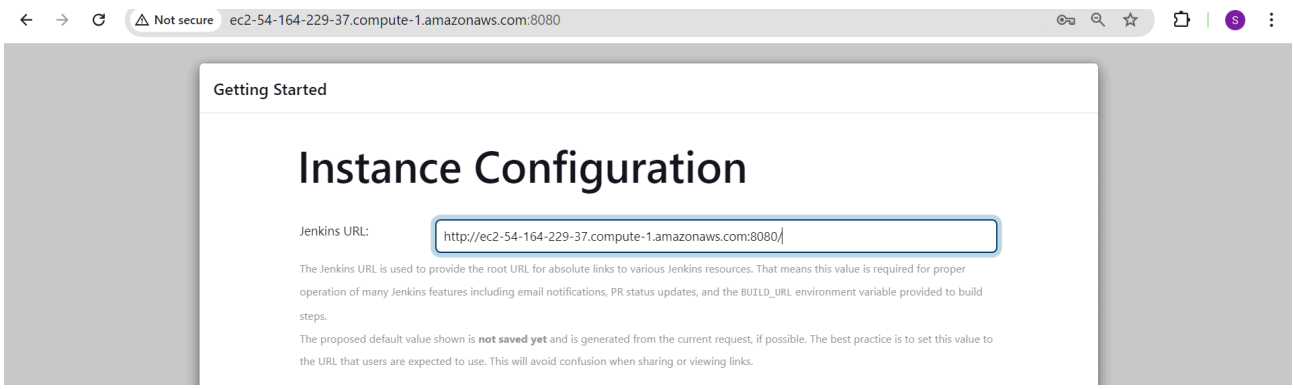
3. **Customize Jenkins**: Follow the setup wizard to install suggested plugins and create an admin user.



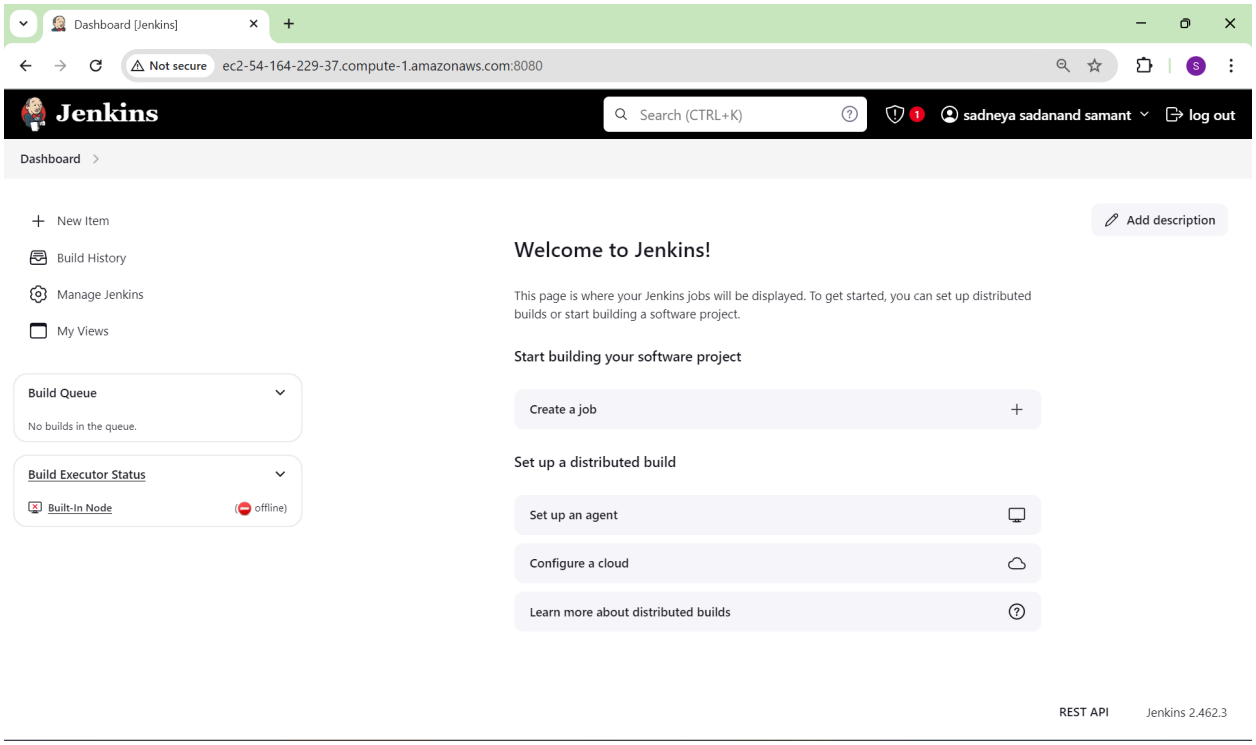
4. set username,password and full name.



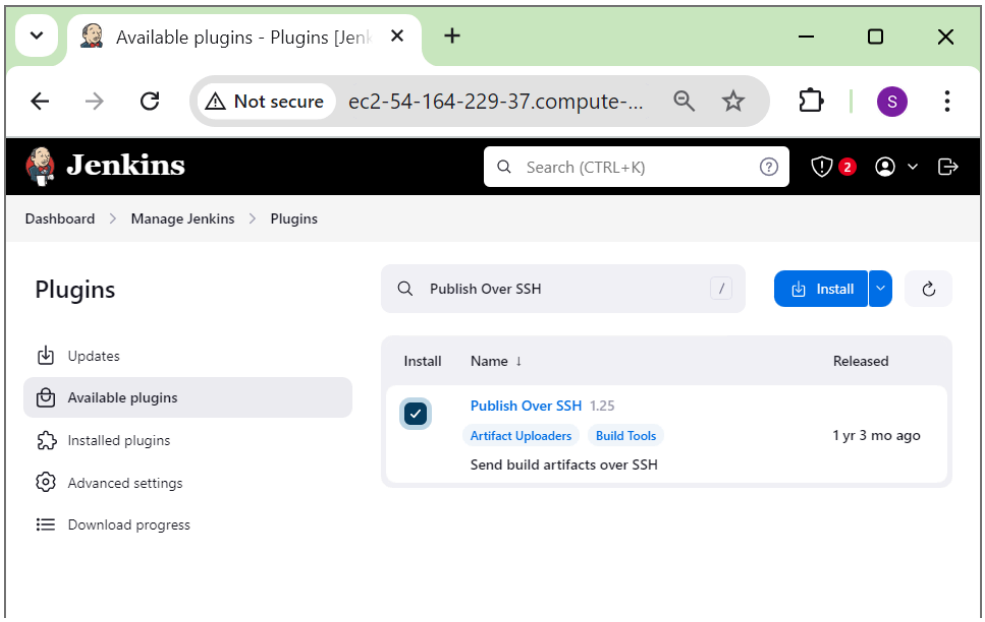
5. **Finish Setup**: Once configured, Jenkins will be accessible at http://<your_instance_public_dns>:8080.



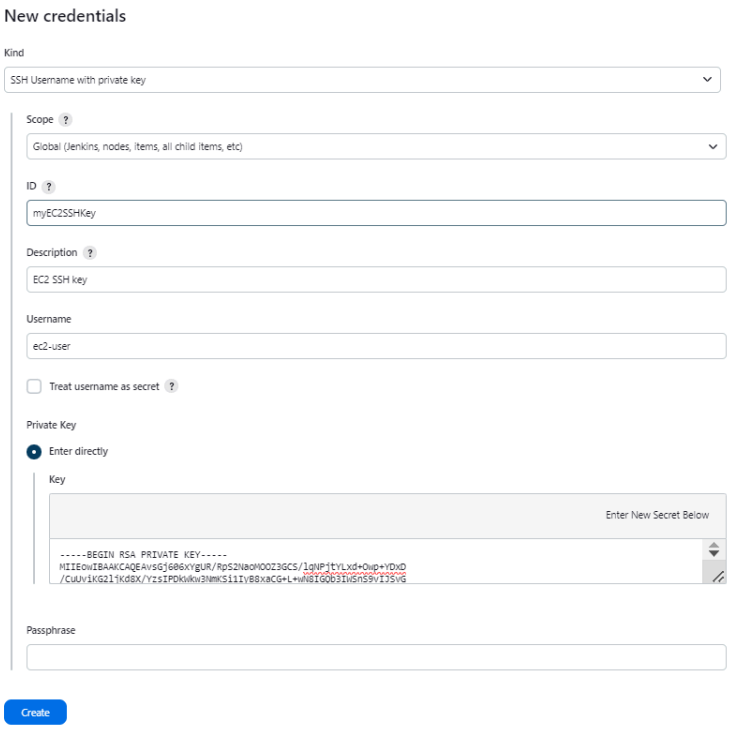
Thus click on finish jenkins will open.



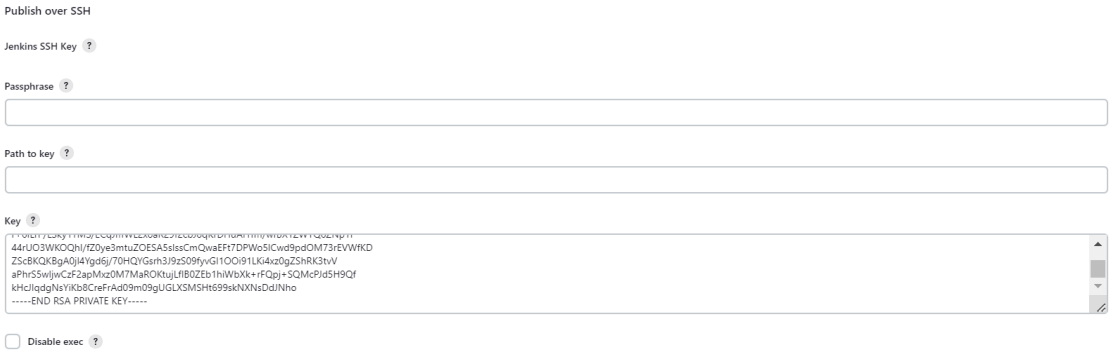
6. Install publish over ssh



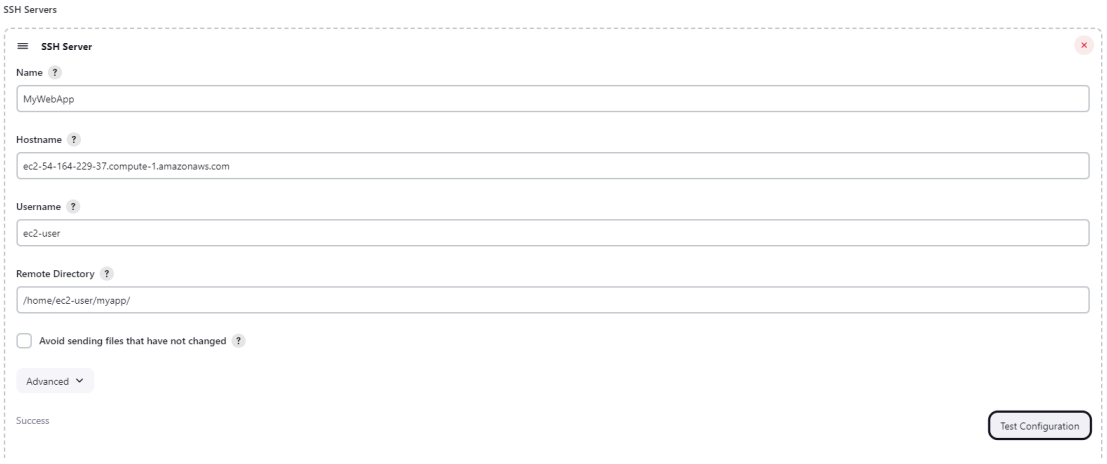
7. Go to Manage Jenkins->credentials create a global credential for ssh.
   1.Add kind: SSH
   2. Scope: Global
   3.ID: assign Id here i have given myEC2SSH
   4.Username:ec2-user for amazon linux
   5.private key: give the key which we created on creating an instance.



8. 1. Go to manage jenkins then scroll down there you will get publish over ssh section there copy paster your key and



2. then click on ADD you will get SSH Servers give name then give your public DNS as hostname and then give username and remote directory where you want to store the project.
3. Then click on Test configuration.then it will give either success or failure.



9.

1. As my built-in-node have limited space thus i need to use master-slave architecture. here I have created a node named “latop_node”

2. Go to manage jenkins->security and make agent TCP port fixed at 50000.that we before added in security group.

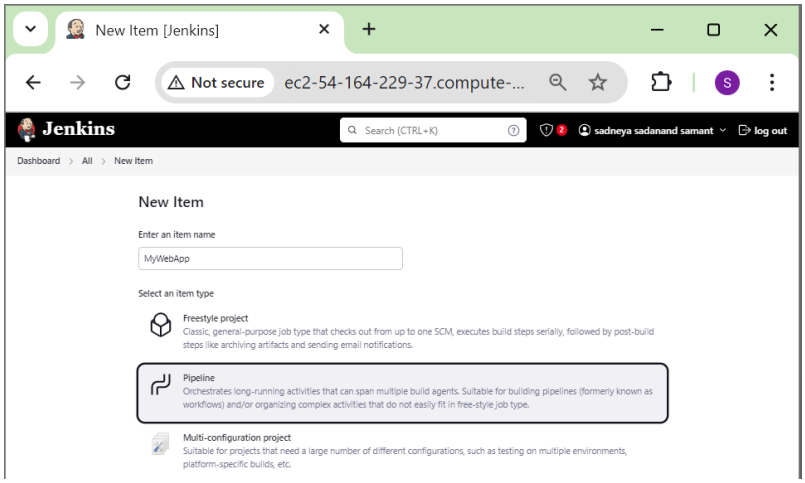
3. Now click on node you created. Here you will get the commands then copy paste this commands on your command prompt.

```
C:\Users\Sadneya\OneDrive\Desktop\jenkins>curl.exe -sO http://ec2-54-164-229-37.compute-1.amazonaws.com:8080/jnlpJars/agent.jar

C:\Users\Sadneya\OneDrive\Desktop\jenkins>java -jar agent.jar -url http://ec2-54-164-229-37.compute-1.amazonaws.com:8080/ -secret 900095ef2c123fd89e791bf751
1528c2b1701dec87739d6a59cd3bd7b6319cad -name "laptop_node" -workDir "C:\Users\Sadneya\OneDrive\Desktop\jenkins"
Oct 19, 2024 10:42:51 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\Users\Sadneya\OneDrive\Desktop\jenkins\remoting as a remoting work directory
Oct 19, 2024 10:42:51 AM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to C:\Users\Sadneya\OneDrive\Desktop\jenkins\remoting
Oct 19, 2024 10:42:51 AM hudson.remoting.Launcher createEngine
INFO: Setting up agent: laptop_node
Oct 19, 2024 10:42:51 AM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 3248.3250.v3277a_8e88c9b_
Oct 19, 2024 10:42:51 AM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\Users\Sadneya\OneDrive\Desktop\jenkins\remoting as a remoting work directory
Oct 19, 2024 10:42:51 AM hudson.remoting.Launcher$CuiListener status
INFO: Locating server among [http://ec2-54-164-229-37.compute-1.amazonaws.com:8080/]
Oct 19, 2024 10:42:52 AM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Oct 19, 2024 10:42:52 AM hudson.remoting.Launcher$CuiListener status
INFO: Agent discovery successful
  Agent address: ec2-54-164-229-37.compute-1.amazonaws.com
  Agent port:    50000
  Identity:      89:0f:ad:cc:3a:7d:24:57:ef:54:87:39:de:74:38:37
Oct 19, 2024 10:42:52 AM hudson.remoting.Launcher$CuiListener status
INFO: Handshaking
Oct 19, 2024 10:42:52 AM hudson.remoting.Launcher$CuiListener status
INFO: Connecting to ec2-54-164-229-37.compute-1.amazonaws.com:50000
Oct 19, 2024 10:42:52 AM hudson.remoting.Launcher$CuiListener status
INFO: Server reports protocol JNLP4-connect-proxy not supported, skipping
Oct 19, 2024 10:42:52 AM hudson.remoting.Launcher$CuiListener status
INFO: Trying protocol: JNLP4-connect
Oct 19, 2024 10:42:53 AM org.jenkinsci.remoting.protocol.impl.BIONetworkLayer$Reader run
INFO: Waiting for ProtocolStack to start.
Oct 19, 2024 10:42:53 AM hudson.remoting.Launcher$CuiListener status
INFO: Remote identity confirmed: 89:0f:ad:cc:3a:7d:24:57:ef:54:87:39:de:74:38:37
Oct 19, 2024 10:42:54 AM hudson.remoting.Launcher$CuiListener status
INFO: Connected
```

Thus at final it gives output connected.

10.

1. Create a pipeline here i have created pipeline name MyWebApp

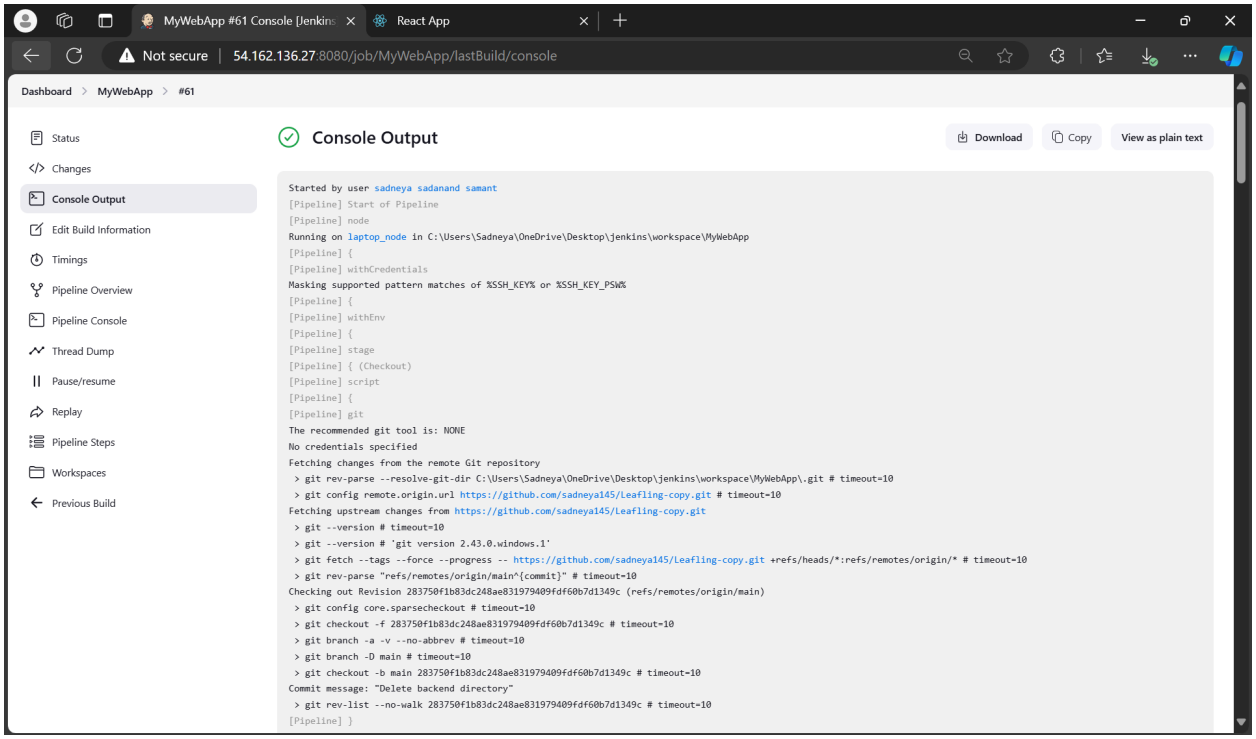


1. Deploy your code in the pipeline you created before

```
pipeline {
    agent any

    environment {
        EC2_USER = 'ec2-user'  // Your EC2 user
        EC2_IP = '54.162.136.27' // Your EC2 public IP address without trailing slash
        SSH_KEY = credentials('myEC2SSHKey')  // Your Jenkins credential ID for SSH
    }

    stages {
        stage('Checkout') {
            steps {
                script {
                    git branch: 'main', url: 'https://github.com/sadneya145/Leafling-copy.git'
                }
            }
        }

        stage('Clean Previous Installations') {
            steps {
                script {
                    dir('frontend') {
                        if (fileExists('node_modules')) {
                            bat 'rmdir /s /q node_modules'
                        }
                        if (fileExists('package-lock.json')) {
                            bat 'del package-lock.json'
                        }
                    }
                }
            }
        }

        stage('Install Frontend Dependencies') {
            steps {
                script {
                    try {
                        dir('frontend') {
                            bat 'npm install'
                        }
                    } catch (Exception e) {
                        error "Dependency installation failed: ${e.message}"
                    }
```

```
            }
        }
    }

    stage('Build Frontend') {
        steps {
            script {
                dir('frontend') {
                    try {
                        bat 'npm run build'
                    } catch (Exception e) {
                        error "Frontend build failed: ${e.message}"
                    }
                }
            }
        }
    }

    stage('Deploy to EC2') {
        steps {
            script {
                // Create the target directory on EC2 and copy frontend build files
                bat """
                    ssh -i C:\\Users\\Sadneya\\Downloads\\MyWebKey.pem -o
StrictHostKeyChecking=no ${EC2_USER}@${EC2_IP} "mkdir -p /home/ec2-user/myapp"
                    scp -i C:\\Users\\Sadneya\\Downloads\\MyWebKey.pem -o
StrictHostKeyChecking=no -r frontend\\build\\*
${EC2_USER}@${EC2_IP}:/home/ec2-user/myapp/
                """
            }
        }
    }
}

post {
    success {
        echo 'Frontend deployment successful!'
    }
    failure {
        echo 'Frontend deployment failed. Check logs for more details.'
    }
}
}
```

Then after build the output will be:




```
C:\Users\Sadneya\OneDrive\Desktop\jenkins\workspace\MyWebApp@2>ssh -i C:\Users\Sadneya\Downloads\MyWebKey.pem -o StrictHostKeyChecking=no ec2-user@54.162.136.27 "mkdir -p
/home/ec2-user/myapp"
Warning: Permanently added '54.162.136.27' (ED25519) to the list of known hosts.

C:\Users\Sadneya\OneDrive\Desktop\jenkins\workspace\MyWebApp@2>scp -i C:\Users\Sadneya\Downloads\MyWebKey.pem -o StrictHostKeyChecking=no -r frontend\build\* ec2-
user@54.162.136.27:/home/ec2-user/myapp/
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] echo
Frontend deployment successful!
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

2. Installation Of Nagios For Monitoring:

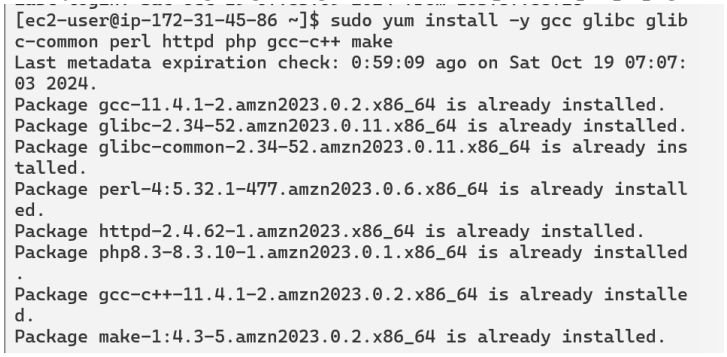
1. **Installing Required Packages**

   Update the Instance:

   sudo yum update -y

2. **Install Required Packages:**

   sudo yum install gcc glibc glibc-common perl httpd php gcc-c++ make



3. **User and Group Creation**

   Create a New User:

   sudo adduser -m nagios

   sudo passwd nagios

```
[ec2-user@ip-172-31-40-207 ~]$ sudo adduser -m nagios
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.
```

4. **Create a New User Group:**
   sudo groupadd nagcmd
5. **Modify User Groups:**
   sudo usermod -a -G nagcmd nagios
   sudo usermod -a -G nagcmd apache

```
[ec2-user@ip-172-31-40-207 ~]$ sudo groupadd nagcmd
[ec2-user@ip-172-31-40-207 ~]$ sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache
```

6. **Setting Up Nagios**
   Create a Directory for Nagios Downloads:
   mkdir ~/downloads
   cd ~/downloads

```
[ec2-user@ip-172-31-40-207 ~]$ mkdir ~/downloads
cd ~/downloads
```

7. **Download Nagios Source Files:**
   wget https://go.nagios.org/l/975333/2024-09-17/6kqcx

```
[ec2-user@ip-172-31-40-207 downloads]$ wget https://go.nagios.org/l/975333/
2024-09-17/6kqcx
--2024-10-19 13:42:27--  https://go.nagios.org/l/975333/2024-09-17/6kqcx
Resolving go.nagios.org (go.nagios.org)... 34.237.219.119, 18.208.125.13, 3
.92.120.28, ...
Connecting to go.nagios.org (go.nagios.org)|34.237.219.119|:443... connecte
d.
HTTP request sent, awaiting response... 302 Found
Location: http://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5
.5.tar.gz?utm_source=Nagios.org&utm_content=Download+Form&utm_campaign=Core
+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a7f01125e969f2a75
b0e2254439d4a81d8 [following]
--2024-10-19 13:42:27--  http://assets.nagios.com/downloads/nagioscore/rele
ases/nagios-4.5.5.tar.gz?utm_source=Nagios.org&utm_content=Download+Form&ut
m_campaign=Core+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a7
f01125e969f2a75b0e2254439d4a81d8
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|:80... con
nected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.
5.5.tar.gz?utm_source=Nagios.org&utm_content=Download+Form&utm_campaign=Cor
e+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a7f01125e969f2a7
5b0e2254439d4a81d8 [following]
--2024-10-19 13:42:27--  https://assets.nagios.com/downloads/nagioscore/rel
eases/nagios-4.5.5.tar.gz?utm_source=Nagios.org&utm_content=Download+Form&u
tm_campaign=Core+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a
7f01125e969f2a75b0e2254439d4a81d8
Connecting to assets.nagios.com (assets.nagios.com)|45.79.49.120|:443... co
nnected.
HTTP request sent, awaiting response... 200 OK
Length: 2065473 (2.0M) [application/x-gzip]
Saving to: '6kqcx'

6kqcx             100%[==========>]   1.97M  6.72MB/s    in 0.3s

2024-10-19 13:42:28 (6.72 MB/s) - '6kqcx' saved [2065473/2065473]
```

8. **Download Nagios Plugins:**
   wget http://nagios-plugins.org/download/nagios-plugins-2.0.3.tar.gz

```
[ec2-user@ip-172-31-40-207 downloads]$ wget http://nagios-plugins.org/downl
oad/nagios-plugins-2.0.3.tar.gz
--2024-10-19 13:43:09--  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
Length: 2659772 (2.5M) [application/x-gzip]
Saving to: ‘nagios-plugins-2.0.3.tar.gz’

nagios-plugins-2.0 100%[===============>]   2.54M  7.78MB/s    in 0.3s

2024-10-19 13:43:10 (7.78 MB/s) - ‘nagios-plugins-2.0.3.tar.gz’ saved [2659
772/2659772]
```

9. **Unzip the Nagios Source Files:**
   tar zxvf 6kqcx

```
[ec2-user@ip-172-31-40-207 downloads]$ tar zxvf 6kqcx
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
```

   cd nagios-4.5.5

```
[ec2-user@ip-172-31-40-207 downloads]$ cd nagios-4.5.5
```

10. **Run Configuration Script:**
./configure --with-command-group=nagcmd

```
[ec2-user@ip-172-31-40-207 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
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether the compiler supports GNU C... yes
checking whether gcc accepts -g... yes
checking for gcc option to enable C11 features... none needed
checking whether make sets $(MAKE)... yes
checking whether ln -s works... yes
checking for strip... /usr/bin/strip
checking for sys/wait.h that is POSIX.1 compatible... yes
checking for stdio.h... yes
checking for stdlib.h... yes
checking for string.h... yes
checking for inttypes.h... yes
checking for stdint.h... yes
checking for strings.h... yes
checking for sys/stat.h... yes
```

```
checking for pkg-config... pkg-config
checking for SSL headers... configure: error: Cannot find ssl headers
```

****Error Handling:** If you encounter an error about missing SSL headers, install the following:

11. **Install SSL Development Package:**
sudo yum install openssl-devel -y

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo yum install openssl-devel
Last metadata expiration check: 0:11:20 ago on Sat Oct 19 13:33:03 2024.
Dependencies resolved.
================================================================================
 Package          Arch       Version                       Repository       Size
================================================================================
Installing:
 openssl-devel    x86_64     1:3.0.8-1.amzn2023.0.16       amazonlinux     3.0 M

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

Total download size: 3.0 M
Installed size: 4.7 M
Is this ok [y/N]: y
Downloading Packages:
openssl-devel-3.0.8-1.amzn2023.0.16.x86_64.rpm     30 MB/s | 3.0 MB     00:00
--------------------------------------------------------------------------------
Total                                              21 MB/s | 3.0 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                        1/1
  Installing       : openssl-devel-1:3.0.8-1.amzn2023.0.16.x86_64           1/1
  Running scriptlet: openssl-devel-1:3.0.8-1.amzn2023.0.16.x86_64           1/1
  Verifying        : openssl-devel-1:3.0.8-1.amzn2023.0.16.x86_64           1/1

Installed:
  openssl-devel-1:3.0.8-1.amzn2023.0.16.x86_64

Complete!
```

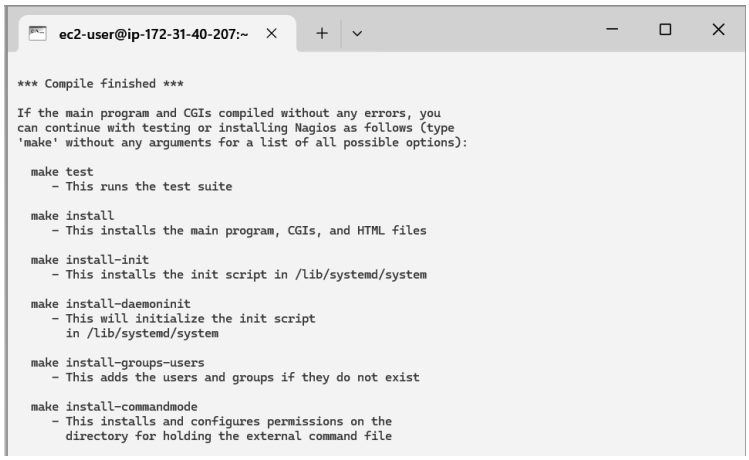
12. **Rerun Configuration Script:** You will get final output like this
./configure --with-command-group=nagcmd

```
config.status: creating t/Makefile
config.status: creating t-tap/Makefile
config.status: creating include/ignored_config.h
config.status: creating include/config.h
config.status: creating lib/snprintf.h
config.status: creating lib/iobroker.h

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.
```

13. **Install Nagios:**

sudo make install
sudo make install-init
sudo make install-config
sudo make install-commandmode

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo make install
sudo make install-init
sudo make install-config
sudo make install-commandmode
```



```
*** Main program, CGIs and HTML files installed ***

You can continue with installing Nagios as follows (type 'make'
without any arguments for a list of all possible options):

  make install-init
     - This installs the init script in /lib/systemd/system

  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
```

14. **Configure Nagios Web Interface:**
    sudo make install-webconf

```
[ec2-user@ip-172-31-40-207 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 ***
```

15. **Create Nagios Admin Account:**
    sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagi
osadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
```

16. **.Restart Apache:**
    sudo service httpd restart

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo service httpd restart
Redirecting to /bin/systemctl restart httpd.service
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo chkconfig --add nagios
error reading information on service nagios: No such file or directory
```

17. **Unzip Nagios Plugins:**
    cd ~/downloads
    tar zxvf nagios-plugins-2.0.3.tar.gz
    cd nagios-plugins-2.0.3

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ cd ~/downloads
[ec2-user@ip-172-31-40-207 downloads]$ tar zxvf nagios-plugins-2.0.3.tar.gz
nagios-plugins-2.0.3/
nagios-plugins-2.0.3/perlmods/
nagios-plugins-2.0.3/perlmods/Config-Tiny-2.14.tar.gz
nagios-plugins-2.0.3/perlmods/parent-0.226.tar.gz
nagios-plugins-2.0.3/perlmods/Test-Simple-0.98.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile.in
nagios-plugins-2.0.3/perlmods/version-0.9903.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile.am
nagios-plugins-2.0.3/perlmods/Module-Runtime-0.013.tar.gz
nagios-plugins-2.0.3/perlmods/Module-Metadata-1.000014.tar.gz
nagios-plugins-2.0.3/perlmods/Params-Validate-1.08.tar.gz
nagios-plugins-2.0.3/perlmods/Class-Accessor-0.34.tar.gz
nagios-plugins-2.0.3/perlmods/Try-Tiny-0.18.tar.gz
nagios-plugins-2.0.3/perlmods/Module-Implementation-0.07.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile
```

```
nagios-plugins-2.0.3/pkg/solaris/pkginfo.in
nagios-plugins-2.0.3/pkg/solaris/pkginfo
nagios-plugins-2.0.3/pkg/redhat/
nagios-plugins-2.0.3/pkg/redhat/requires
[ec2-user@ip-172-31-40-207 downloads]$
```

18. **Verify Nagios Configuration:**
    sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc
/nagios.cfg

Nagios Core 4.5.5
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2024-09-17
License: GPL

Website: https://www.nagios.org
Reading configuration data...
   Read main config file okay...
   Read object config files okay...

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
```

19. **Start Nagios Service:** sudo service nagios start
20. **Check Nagios Status:** sudo systemctl status nagios

```
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ sudo service nagios start
Redirecting to /bin/systemctl start nagios.service
[ec2-user@ip-172-31-40-207 nagios-4.5.5]$ 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 Sat 2024-10-19 13:56:27 UTC; 5s ago
       Docs: https://www.nagios.org/documentation
    Process: 72024 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (c>
    Process: 72025 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code>
   Main PID: 72026 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 5.5M
        CPU: 79ms
     CGroup: /system.slice/nagios.service
             ├─72026 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─72027 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─72028 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─72029 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─72030 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─72031 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: qh: Socket '/usr/local/nagios/var/rw/n>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: qh: core query handler registered
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: qh: echo service query handler registe>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: qh: help for the query handler registe>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: wproc: Successfully registered manager>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: wproc: Registry request: name=Core Wor>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: wproc: Registry request: name=Core Wor>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: wproc: Registry request: name=Core Wor>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: wproc: Registry request: name=Core Wor>
Oct 19 13:56:27 ip-172-31-40-207.ec2.internal nagios[72026]: Successfully launched command file wor>
lines 1-28/28 (END)
```

21. **Get Public IP Address:**Go back to the EC2 Console and copy the public IP address of your instance.
22. **.Access Nagios Web Interface:** Open your web browser and navigate to: http://<your_public_ip_address>/nagios

Enter the username (nagiosadmin) and the password you set in Step 15.

Making Changes for application in Nagios

1. **Goto cofigurations file**

```
[ec2-user@ip-172-31-45-86 ~]$ sudo nano /usr/local/nagios/etc/nagios.cfg
```

Add the file which we are newly creating for montoring of our application

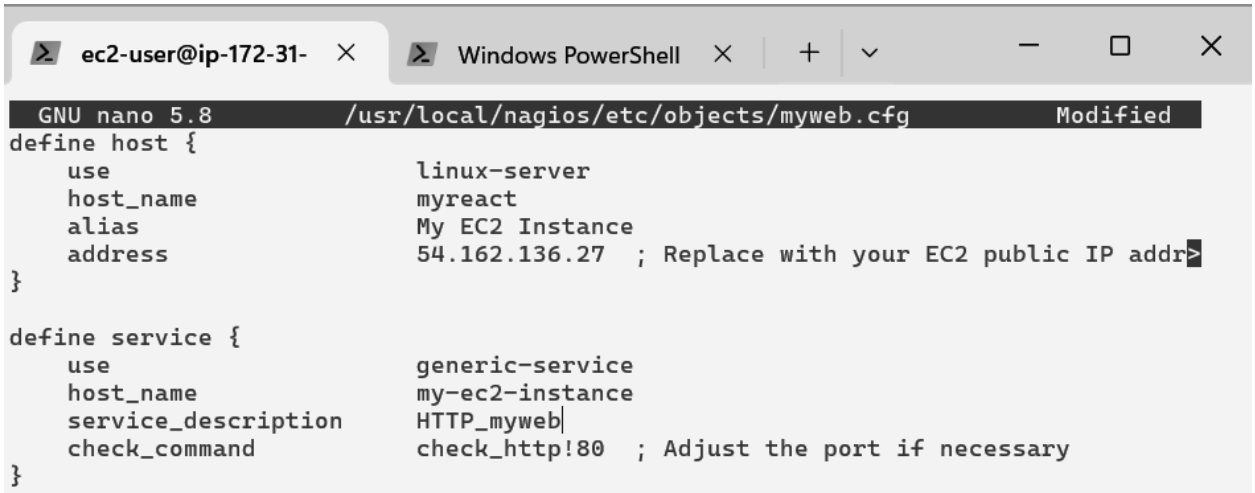
cfg_file=/usr/local/nagios/etc/objects/myweb.cfg add this

```
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_file=/usr/local/nagios/etc/objects/myec2.cfg
# Definitions for monitoring the local (Linux) host
cfg_file=/usr/local/nagios/etc/objects/myweb.cfg
cfg_file=/usr/local/nagios/etc/objects/localhost.cfg
```

2. **.**write inside that file the required information

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

```
[ec2-user@ip-172-31-45-86 backend]$ sudo nano /usr/local/nagios/etc/objects/myweb.
cfg
```



3. **Again Verify the changes** by : sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

```
[ec2-user@ip-172-31-45-86 backend]$ sudo /usr/local/nagios/bin/nagios -v /usr/loca
l/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...
   Read main config file okay...
   Read object config files okay...

Running pre-flight check on configuration data...

Checking objects...
        Checked 12 services.
        Checked 3 hosts.
        Checked 1 host groups.
        Checked 0 service groups.
        Checked 1 contacts.
        Checked 1 contact groups.
        Checked 25 commands.
        Checked 5 time periods.
        Checked 0 host escalations.
        Checked 0 service escalations.
Checking for circular paths...
        Checked 3 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
```

4. **again start nagios** sudo systemctl start nagios and check status by sudo systemctl status nagios

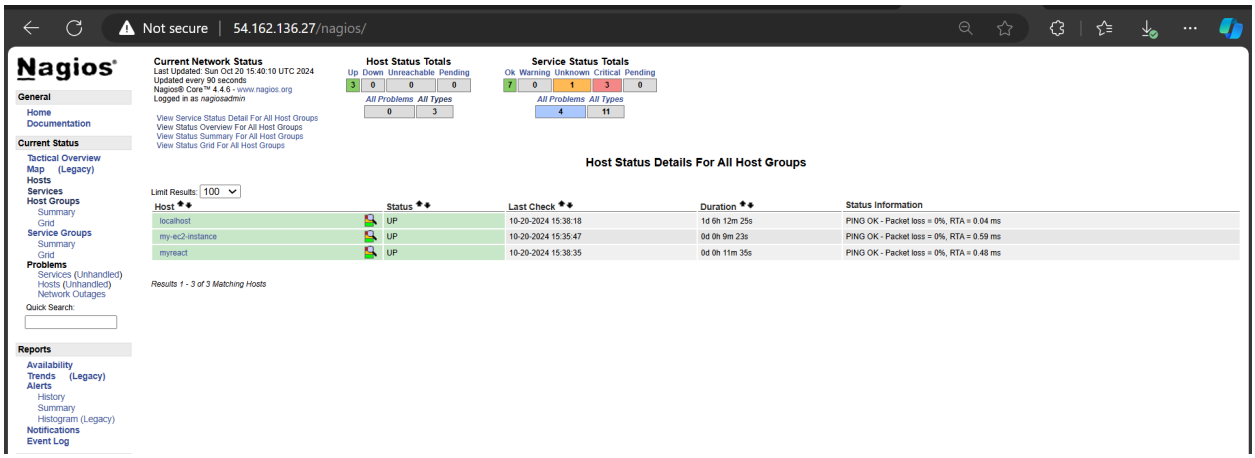
```
[ec2-user@ip-172-31-45-86 ~]$ sudo systemctl start nagios
[ec2-user@ip-172-31-45-86 ~]$ sudo systemctl enable nagios
[ec2-user@ip-172-31-45-86 ~]$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.5.5
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Sat 2024-10-19 15:39:56 UTC; 1min 34s ago
       Docs: https://www.nagios.org/documentation
   Main PID: 11217 (nagios)
      Tasks: 8 (limit: 1112)
     Memory: 4.1M
        CPU: 40ms
     CGroup: /system.slice/nagios.service
             ├─11217 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─11218 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─11219 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─11220 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─11221 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─11222 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─11355 /usr/local/nagios/libexec/check_ping -H 98.82.169.214 -w 3000.0,80% -c 5000.0,>
             └─11356 /usr/bin/ping -n -U -w 30 -c 5 98.82.169.214

Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: qh: echo service query handler register>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: qh: help for the query handler register>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: wproc: Successfully registered manager >
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: wproc: Registry request: name=Core Work>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: wproc: Registry request: name=Core Work>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: wproc: Registry request: name=Core Work>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: wproc: Registry request: name=Core Work>
Oct 19 15:39:56 ip-172-31-45-86.ec2.internal nagios[11217]: Successfully launched command file work>
Oct 19 15:40:26 ip-172-31-45-86.ec2.internal nagios[11217]: HOST ALERT: my-ec2-instance;DOWN;SOFT;1>
Oct 19 15:40:58 ip-172-31-45-86.ec2.internal nagios[11217]: SERVICE ALERT: my-ec2-instance;HTTP;WAR>
lines 1-28/28 (END)
```

5. **Go to commands file** there make changes in check_http section

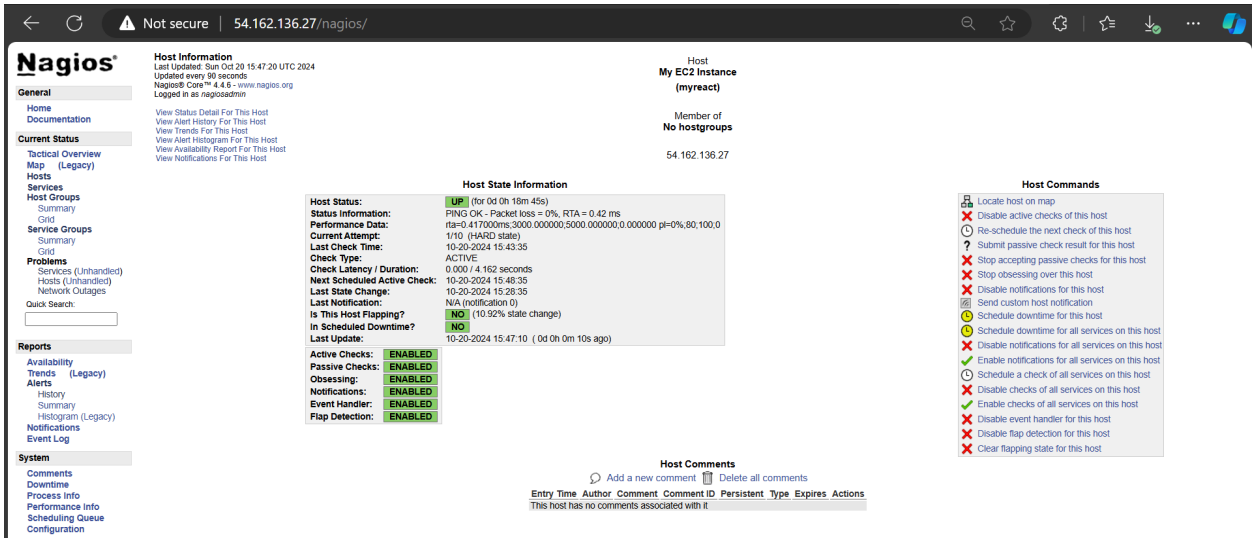
Add -> command line /usr/local/nagios/libexec/check_http -H $HOSTADDRESS$ -p $ARG1$ $ARG2$

```
define command {

    command_name    check_snmp
    command_line    $USER1$/check_snmp -H $HOSTADDRESS$ $ARG1$
}


define command {

    command_name    check_http
#    command_line    $USER1$/check_http -I $HOSTADDRESS$ $ARG1$
    command_line    /usr/local/nagios/libexec/check_http -H $HOSTADDRESS$ -p $ARG1$ $ARG2$
}


define command {

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

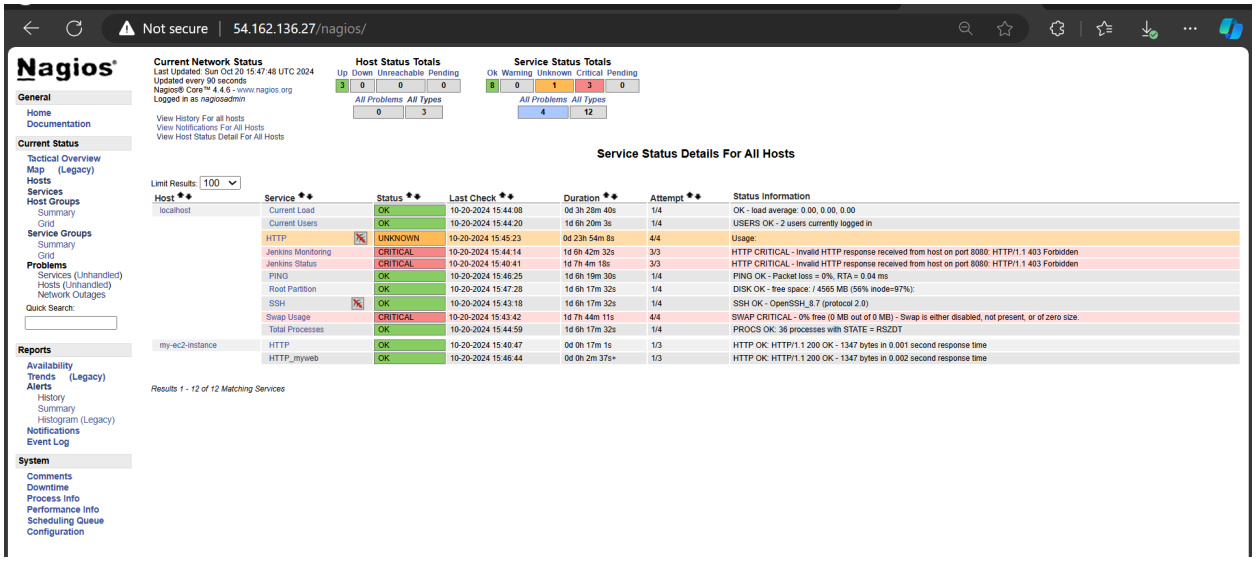
6. **Nagios page:** Go back to your nagios page you will se output.here you will see **my-ec2-instance.**



Go to host section present on left sidebar and click on “my-ec2-intsance” it will give host information.



Now click on services on left sidebar you will get detailed information about network status.



Conclusion

This case study involved setting up an automated CI/CD pipeline with Jenkins to deploy a web app on AWS EC2, and using Nagios for monitoring. We faced challenges like SSH configuration, limited Jenkins disk space, and SSL issues with Nagios, which were resolved through security adjustments and required package installations. Key takeaways included the importance of secure automation and effective monitoring for maintaining a reliable deployment process.