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How to Install SonarQube on Ubuntu 22.04 LTS

March 17, 2023 by FOSS TechNix

In this article, we are going to perform, Install and Setup PostgreSQL 10 Database For SonarQube, How to Install SonarQube on Ubuntu 22.04 LTS.

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Introduction

SonarQube is an opensource web based tool to manage code quality and code analysis. It is most widely used in continuous code inspection which performs reviews of code to detect bugs, code smells and vulnerability issues of programming languages such as PHP, C#, JavaScript, C/C++ and Java , Also tracks statistics and creates charts that enable developers to quickly identify problems in their code.

Prerequisites

- Ubuntu 22.04 LTS with minimum 2GB RAM and 1 CPU.
- PostgreSQL Version 9.3 or higher
- SSH access with sudo privileges
- Firewall Port: 9000

Here, We are installing **SonarQube 8.9** version and have to install Oracle JAVA/Open JDK, Postgres/MS-SQL as database and Latest browser before installing SonarQube. To know Prerequisite visit sonarqube official page

Note: MySQL Support for SonarQube is depricated. Increase the vm.max_map_count kernal ,file discriptor and ulimit for current session at runtime.

```
sysctl -w vm.max_map_count=524288
```

```
sysctl -w fs.file-max=131072
```

```
ulimit -n 131072
```

```
ulimit -u 8192
```

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To Increase the vm.max_map_count kernal ,file discriptor and ulimit permanently . Open the below config file and Insert the below value as shown below,

```
sudo nano /etc/security/limits.conf
```

/etc/security/limits.conf

```
sonarqube   -   nofile   65536
sonarqube   -   nproc    4096
```

OR If you are using systemd to manage the sonarqube services then add below value in sonarqube unit file under **[service]** section.

```
[Service]
...
LimitNOFILE=65536
LimitNPROC=4096
...
```

Before installing, Lets update and upgrade System Packages

```
sudo apt-get update
sudo apt-get upgrade
```

Install wget and unzip package

```
sudo apt-get install wget unzip -y
```

Step #1: Install OpenJDK

Install OpenJDK and JRE 11 using following command,

```
sudo apt-get install openjdk-17-jdk -y
sudo apt-get install openjdk-17-jre -y
```

SET Default JDK

To set default JDK or switch to OpenJDK enter below command,

```
sudo update-alternatives --config java
```

You will see below choices for the alternative java (providing **/usr/bin/java**).

```
Selection    Path                                            Priority   Status

------------------------------------------------------------

  0            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1111      auto mode

  1            /usr/lib/jvm/java-11-openjdk-amd64/bin/java      1111      manual mode

  2            /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java   1081      manual mode

* 3            /usr/lib/jvm/java-8-oracle/jre/bin/java          1081      manual mode
```

Type **1** to switch OpenJDK 17.

Check JAVA Version:

```
java -version
```

Output:

```
java -version

openjdk version "17.0.7" 2023-03-14

OpenJDK Runtime Environment (build 17.0.7+10-post-Ubuntu-3ubuntu1)

OpenJDK 64-Bit Server VM (build 17.0.7+10-post-Ubuntu-3ubuntu1, mixed mode, sharing)
```

Step #2: Install and Setup PostgreSQL 10 Database For SonarQube

Add and download the PostgreSQL Repo

```
sudo sh -c 'echo "deb http://apt.postgresql.org/pub/repos/apt/ `lsb_release -cs`-pgdg main" >> /etc/apt/sources.list.d/pgdg.list'
```

```
wget -q https://www.postgresql.org/media/keys/ACCC4CF8.asc -O - | sudo apt-key add -
```


Install the PostgreSQL database Server by using following command,

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Sonarqube Docker Windows

```
sudo apt-get -y install postgresql postgresql-contrib
```

Start PostgreSQL Database server

```
sudo systemctl start postgresql
```

Enable it to start automatically at boot time.

```
 sudo systemctl enable postgresql
```

Change the password for the default PostgreSQL user.

```
 sudo passwd postgres
```

Switch to the postgres user.

```
su - postgres
```

Create a new user by typing:

```
createuser sonar
```

Switch to the PostgreSQL shell.

```
psql
```

Set a password for the newly created user for SonarQube database.

```
ALTER USER sonar WITH ENCRYPTED password 'sonar';
```

Create a new database for PostgreSQL database by running:

```
CREATE DATABASE sonarqube OWNER sonar;
```

grant all privileges to sonar user on sonarqube Database.

```
grant all privileges on DATABASE sonarqube to sonar;
```

Exit from the psql shell:

```
\q
```

Switch back to the sudo user by running the exit command.

```
exit
```

Step #3: How to Install SonarQube on Ubuntu 22.04 LTS

Download sonaqube installer files archive To download latest version of visit SonarQube download page.

```
cd /tmp
```

```
sudo wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-9.9.0.65466.zip
```

Output:

```
sudo wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-9.9.0.65466.zip

https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-9.9.0.65466.zip

Resolving binaries.sonarsource.com (binaries.sonarsource.com)... 91.134.125.245

Connecting to binaries.sonarsource.com (binaries.sonarsource.com)|91.134.125.245|:443... connected.

HTTP request sent, awaiting response... 200 OK

Length: 209531101 (200M) [application/zip]

Saving to: ‘sonarqube-8.9.1.zip’

sonarqube-9.9.0.65466.zip                   100%
[=========================================================================>] 199.82M
1.31MB/s    in 34s

 ‘sonarqube-9.9.0.65466.zip’ saved [209531101/209531101]
```

Unzip the archeve setup to **/opt** directory

```
sudo unzip sonarqube-9.9.0.65466.zip -d /opt
```

Move extracted setup to **/opt/sonarqube** directory

```
sudo mv /opt/sonarqube-9.9.0.65466 /opt/sonarqube
```

Step #4:Configure SonarQube on Ubuntu 22.04 LTS

We can’t run Sonarqube as a root user , if you run using root user it stops automatically. We have found solution on this to create separate group and user to run sonarqube.

1. Create Group and User:

Create a group as sonar

```
sudo groupadd sonar
```

```
sudo useradd -c "user to run SonarQube" -d /opt/sonarqube -g sonar sonar
sudo chown sonar:sonar /opt/sonarqube -R
```

Open the SonarQube configuration file using your favorite text editor.

```
sudo nano /opt/sonarqube/conf/sonar.properties
```

Find the following lines.

```
#sonar.jdbc.username=
#sonar.jdbc.password=
```

Uncomment and Type the PostgreSQL Database username and password which we have created in above steps and add the postgres connection string.

/opt/sonarqube/conf/sonar.properties

```
#--------------------------------------------------------------------------------
-----------

# DATABASE

#

# IMPORTANT:

# - The embedded H2 database is used by default. It is recommended for tests but not for

#   production use. Supported databases are Oracle, PostgreSQL and Microsoft SQLServer.

# - Changes to database connection URL (sonar.jdbc.url) can affect SonarSource licensed
products.

# User credentials.

# Permissions to create tables, indices and triggers must be granted to JDBC user.

# The schema must be created first.

sonar.jdbc.username=sonar
sonar.jdbc.password=sonar
sonar.jdbc.url=jdbc:postgresql://localhost:5432/sonarqube
```

Edit the sonar script file and set RUN_AS_USER

```
sudo nano /opt/sonarqube/bin/linux-x86-64/sonar.sh
```

/opt/sonarqube/bin/linux-x86-64/sonar.sh

```
# If specified, the Wrapper will be run as the specified user.

# IMPORTANT - Make sure that the user has the required privileges to write

#  the PID file and wrapper.log files.  Failure to be able to write the log

#  file will cause the Wrapper to exit without any way to write out an error
```

```
# NOTE - This will set the user which is used to run the Wrapper as well as
#  the JVM and is not useful in situations where a privileged resource or
#  port needs to be allocated prior to the user being changed.
 RUN_AS_USER=sonar
```

Type **CTRL+X** to save and close the file.

2. Start SonarQube:

Now to start SonarQube we need to do following: Switch to sonar user

```
sudo su sonar
```

Move to the script directory

```
cd /opt/sonarqube/bin/linux-x86-64/
```

Run the script to start SonarQube

```
./sonar.sh start
```

Output:

```
Starting SonarQube...
Started SonarQube
```

We can also add this in service and can run as a service.

3. Check SonarQube Running Status:

To check if sonaqube is running enter below command,

```
./sonar.sh status
```

Output:

```
sonar@fosstechnix:~/bin/linux-x86-64$ ./sonar.sh status
SonarQube is running (9490).
```

4. SonarQube Logs:

To check sonarqube logs, navigate to **/opt/sonarqube/logs/sonar.log** directory

```
tail /opt/sonarqube/logs/sonar.log
```

Output:

```
INFO  app[][o.s.a.ProcessLauncherImpl] Launch process[[key='ce', ipcIndex=3,
logFilenamePrefix=ce]] from [/opt/sonarqube]: /usr/lib/jvm/java-11-openjdk-
```

```
Djava.io.tmpdir=/opt/sonarqube/temp --add-opens=java.base/java.util=ALL-UNNAMED -Xmx512m
-Xms128m -XX:+HeapDumpOnOutOfMemoryError -Dhttp.nonProxyHosts=localhost|127.*|[::1] -cp
./lib/common/*:/opt/sonarqube/lib/jdbc/h2/h2-1.3.176.jar org.sonar.ce.app.CeServer
/opt/sonarqube/temp/sq-process1505995614837198848properties

 INFO  app[][o.s.a.SchedulerImpl] Process[ce] is up

 INFO  app[][o.s.a.SchedulerImpl] SonarQube is up
```

using about output you will see that sonaqube is up and running successfully.

Step #5:Configure Systemd service

First stop the SonarQube service as we started manually using above steps Navigate to the SonarQube installed path

```
cd /opt/sonarqube/bin/linux-x86-64/
```

Run the script to start SonarQube

```
./sonar.sh stop
```

Create a systemd service file for SonarQube to run as System Startup.

```
sudo nano /etc/systemd/system/sonar.service
```

Add the below lines,

/etc/systemd/system/sonar.service

```
[Unit]
Description=SonarQube service
After=syslog.target network.target

[Service]
Type=forking

ExecStart=/opt/sonarqube/bin/linux-x86-64/sonar.sh start
ExecStop=/opt/sonarqube/bin/linux-x86-64/sonar.sh stop

User=sonar
Group=sonar
Restart=always

LimitNOFILE=65536
LimitNPROC=4096

[Install]
WantedBy=multi-user.target
```

Save and close the file. Now stop the sonarqube script earlier we started to run using as daemon. Start the Sonarqube daemon by running:

```
sudo systemctl start sonar
```

Enable the SonarQube service to automatically at boot time System Startup.

```
sudo systemctl enable sonar
```

check if the sonarqube service is running,

```
sudo systemctl status sonar
```

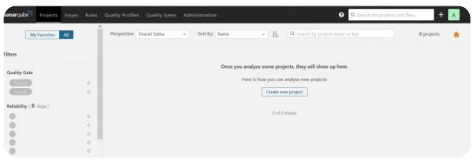
Successfully, We have covered How to Install SonarQube on Ubuntu 22.04 LTS .

Step #6: Access SonarQube

To access the SonarQube using browser type server IP followed by port 9000.

```
http://server_IP:9000 OR http://localhost:9000
```

Login to SonarQube with default administrator username and password is **admin**.



Finally, We have successfully performed all steps to for sonarqube setup.. If you want to change IP address , adding multipla IP address and change the default change in SonarQube Properties as shown below

```
sudo nano /opt/sonarqube/conf/sonar.properties
```

/opt/sonarqube/conf/sonar.properties

```
# Binding IP address. For servers with more than one IP address, this property specifies which

# address will be used for listening on the specified ports.

# By default, ports will be used on all IP addresses associated with the server.

sonar.web.host=0.0.0.0


# Web context. When set, it must start with forward slash (for example /sonarqube).

# The default value is root context (empty value).

#sonar.web.context=

# TCP port for incoming HTTP connections. Default value is 9000.

sonar.web.port=9000
```

Troubleshooting

*loaded plugin [org.elasticsearch.transport.Netty4Plugin] ERROR: [1] bootstrap checks failed. max virtual memory areas vm.max_map_count [65530] is too low, increase to at least [262144].***Solution:** Elasticsearch uses a MMap FS directory to store its indices. The default operating system limits on mmap counts is possibly to be too low, which may result in out of memory exceptions. Enter the below command to increase virtual memory value using sudo privileges,

```
sudo sysctl -w vm.max_map_count=262144
```

Output:

```
sudo sysctl -w vm.max_map_count=262144
vm.max_map_count = 262144
```

To set value permanently, update the **vm.max_map_count** value in **/etc/sysctl.conf**. To verify after rebooting,

```
sysctl vm.max_map_count
```

Conclusion:

In this article, We have performed ,How to Download and How to Install SonarQube on Ubuntu 22.04 LTS with Configure Sonarqube, Creating Systemd Service and Troubleshooting sonarqube.

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9 thoughts on “How to Install SonarQube on Ubuntu 22.04 LTS”

Ajay
October 11, 2022 at 3:56 PM

once i stop instance and start again instance refusing to connect to 9000 port

Reply

satyam
February 28, 2023 at 3:38 AM

Where can I find the Sonarqube binary for ARM64?
I’m having Ubuntu installed as VM in my Macbook with M1 processor

Reply

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venkataprasad
April 26, 2023 at 7:42 AM

after restart the server unable to listen the sonarqube port number 9000 but sonarqube service is running. And in browser also service not reachable

Reply

kishore
May 15, 2023 at 10:47 AM

when i use this command ‘sudo systemctl start sonar’

it asks password and i gave password as sonar, but this is not working

Reply

shahebaz
May 28, 2023 at 9:13 AM

same problems occers ,
after restart the server unable to listen the sonarqube port number 9000 but sonarqube service is running. And in browser also service not reachablethat

Reply

Punit
July 2, 2023 at 5:47 PM

same problems occers ,
after restart the server unable to listen the sonarqube port number 9000 but sonarqube service is running. And application can't connect to database, And in browser also service not reachable that

Reply

Pako
November 2, 2023 at 1:03 PM

I solved it.

these values are removed once instance is restarted.
so placed it inside this file, after restating it was working.
File Location: /etc/sysctl.conf

sysctl -w vm.max_map_count=524288
sysctl -w fs.file-max=131072
ulimit -n 131072
ulimit -u 8192

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