

1. Install and Configure PostgreSQL

Add the PostgreSQL repository.

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

Installing wget

```
$ sudo apt-get install wget
```

Add the PostgreSQL signing key.

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

Install PostgreSQL.

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

Enable the database server to start automatically on reboot.

```
$ sudo systemctl enable postgresql
```

Start the database server.

```
$ sudo systemctl start postgresql
```

Change the default PostgreSQL password.

```
$ sudo passwd postgres
```

Switch to the postgres user.

```
$ su - postgres
```

Create a user named sonar.

```
$ createuser sonar
```

Log in to PostgreSQL.

```
$ psql
```

Set a password for the sonar user. Use a strong password in place of my_strong_password.

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

Create a sonarqube database and set the owner to sonar.

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

Grant all the privileges on the sonarqube database to the sonar user.

```
GRANT ALL PRIVILEGES ON DATABASE sonarqube to sonar;
```

Exit PostgreSQL.

```
\q
```

Return to your non-root sudo user account.

```
$ exit
```

2. Download and Install SonarQube

Install the zip utility, which is needed to unzip the SonarQube files.

```
$ sudo apt-get install zip -y
```

Locate the latest download URL from the [SonarQube official download page](#).

Download the SonarQube distribution files.

```
$ sudo wget
```

```
https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-8.9.9.56886.zip
```

Unzip the downloaded file.

```
sudo unzip sonarqube-8.9.9.56886.zip
```

Move the unzipped files to /opt/sonarqube directory

```
sudo mv sonarqube-8.9.9.56886 /opt/sonarqube
```

3. Add SonarQube Group and User

Create a dedicated user and group for SonarQube, which can not run as the root user.

Create a sonar group.

```
$ sudo groupadd sonar
```

Create a sonar user and set /opt/sonarqube as the home directory.

```
$ sudo useradd -d /opt/sonarqube -g sonar sonar
```

Grant the sonar user access to the /opt/sonarqube directory.

```
$ sudo chown sonar:sonar /opt/sonarqube -R
```

4. Configure SonarQube

Edit the SonarQube configuration file.

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

Find the following lines:

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

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

Uncomment the lines, and add the database user and password you created in Step 2.

```
sonar.jdbc.username=sonar
```

```
sonar.jdbc.password=my_strong_password
```

Below those two lines, add the sonar.jdbc.url.

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

Edit the sonar script file.

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

About 50 lines down, locate this line:

```
#RUN_AS_USER=
```

Uncomment the line and change it to:

```
RUN_AS_USER=sonar
```

5. Setup Systemd service

Create a systemd service file to start SonarQube at system boot.

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

Paste the following lines to the file.

```
[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
```

Enable the SonarQube service to run at system startup.

```
$ sudo systemctl enable sonar
```

Start the SonarQube service.

```
$ sudo systemctl start sonar
```

Check the service status.

```
$ sudo systemctl status sonar
```

6. Modify Kernel System Limits

SonarQube uses Elasticsearch to store its indices in an MMap FS directory. It requires some changes to the system defaults.

Edit the sysctl configuration file.

```
$ sudo nano /etc/sysctl.conf
```

Add the following lines.

```
vm.max_map_count=262144
fs.file-max=65536
ulimit -n 65536
ulimit -u 4096
```

Reboot the system to apply the changes.

```
$ sudo reboot
```

8. Access SonarQube Web Interface

Access SonarQube in a web browser at your server's IP address on port 9000. For example:

```
http://192.0.2.123:9000
```

Log in with username `admin` and password `admin`. SonarQube will prompt you to change your password.