**Prerequisites**

* Deploy a fully updated Ubuntu 20.04 LTS server with at least 2GB of RAM and 1 vCPU cores.
* Create a non-root user with sudo access.

**1. Install OpenJDK 11**

1. SSH to your Ubuntu server as a non-root user with sudo access.
2. Install OpenJDK 11.

$ sudo apt-get install openjdk-11-jdk -y

**2. Install and Configure PostgreSQL**

1. 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'

2. Add the PostgreSQL signing key.

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

3. Install PostgreSQL.

$ sudo apt install postgresql postgresql-contrib -y

4. Enable the database server to start automatically on reboot.

$ sudo systemctl enable postgresql

5. Start the database server.

$ sudo systemctl start postgresql

6. Change the default PostgreSQL password.

$ sudo passwd postgres

7. Switch to the postgres user.

$ su - postgres

8. Create a user named sonar.

$ createuser sonar

9. Log in to PostgreSQL.

$ psql

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

ALTER USER sonar WITH ENCRYPTED password 'password';

11. Create a sonarqube database and set the owner to sonar.

CREATE DATABASE sonarqube OWNER sonar;

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

GRANT ALL PRIVILEGES ON DATABASE sonarqube to sonar;

13. Exit PostgreSQL.

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14. Return to your non-root sudo user account.

$ exit

**3. Download and Install SonarQube**

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

$ sudo apt-get install zip -y

2. Locate the latest download URL from the [SonarQube official download page](https://www.sonarqube.org/downloads/).

3. Download the SonarQube distribution files.

$ sudo wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-9.7.1.62043.zip

4. Unzip the downloaded file.

sudo unzip sonarqube-9.7.1.62043.zip

5. Move the unzipped files to /opt/sonarqube directory

sudo mv sonarqube-9.7.1.62043 /opt/sonarqube

**4. Add SonarQube Group and User**

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

1. Create a sonar group.

$ sudo groupadd sonar

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

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

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

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

**5. Configure SonarQube**

1. Edit the SonarQube configuration file.

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

2. Find the following lines:

#sonar.jdbc.username=

#sonar.jdbc.password=

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

sonar.jdbc.username=sonar

sonar.jdbc.password=password

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

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

5. Save and exit the file.

6. Edit the sonar script file **(Optional if you don’t see the RUN\_AS\_USER=).**

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

7. Locate this line:

#RUN\_AS\_USER=

8. Uncomment the line and change it to:

RUN\_AS\_USER=sonar

9. Save and exit the file.

**6. Setup Systemd service**

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

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

2. 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

3. Save and exit the file.

4. Enable the SonarQube service to run at system startup.

$ sudo systemctl enable sonar

5. Start the SonarQube service.

$ sudo systemctl start sonar

6. Check the service status.

$ sudo systemctl status sonar

**7. Modify Kernel System Limits**

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

1. Edit the sysctl configuration file.

$ sudo nano /etc/sysctl.conf

2. Add the following lines.

vm.max\_map\_count=262144 fs.file-max=65536 ulimit -n 65536 ulimit -u 4096

3. Save and exit the file.

4. Reboot the system to apply the changes.

$ sudo reboot

**8. Open inbound 9000 port on VM instance**

**9. Access SonarQube Web Interface**

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

http://<PUBLIC\_IP\_OF\_YOUR\_INSTANCE>:9000

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

Following page will be visible:

Graphical user interface, application, Teams

Description automatically generated

Now you have a powerful tool that can help you create clean and analyse code.

For more details you can read Sonarqube Official docs [here](https://docs.sonarqube.org/latest/).