# How to Install SonarQube on AWS Ubuntu 18.04 Instance

SonarQube is an open source platform to continuously inspect code quality of applications. It is written in Java language and supports multiple databases. You can inspect code and check the health of an application for more than 20 programming languages including Java, C, C++, C#, PHP, and web languages like JavaScript, HTML and CSS. SonarQube can analyze source code, find security vulnerabilities, detect bugs and show the result on web-based dashboard. You can easily integrate SonarQube with Maven, Ant, Gradle, MSBuild, LDAP, Active Directory and GitHub.

In this tutorial, we will learn how to install SonarQube on an AWS Ubuntu 18.04 Instance.

Step 1:

Install AWS Ubuntu Instance in MPOWER Financing AWS Account by using AWS Ubuntu AMI provided by AWS.

Step 2:

Login into the instance by making use of Key value pair provided by AWS.

Before starting, you will need to update your system with the latest version. You can do this by running the following command:

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

Step 3:

### Install JAVA

SonarQube is written in Java language, so you will need to install Java to your system. First, add the Java repository with the following command:

sudo add-apt-repository ppa:webupd8team/java

Next, update the repository and install Java with the following command:

```
sudo apt-get update -y
sudo apt-get install oracle-java8-installer -y
```

Once the Java is installed, check the Java version using the following command:

```
java -version
```

Output:

```
openjdk version "10.0.2" 2019-09-27
OpenJDK Runtime Environment (build 10.0.2+13-Ubuntu-1ubuntu0.18.04.3)
OpenJDK 64-Bit Server VM (build 10.0.2+13-Ubuntu-1ubuntu0.18.04.3, mixed
mode)
```

Step 4:

### Install and Configure PostgreSQL

By default, the latest version of PostgreSQL is not available in the Ubuntu 18.04 default repository. So you will need to add the PostgreSQL repository to your system.

You can do this with the following command:

```
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 -
```

Next, update the repository and install PostgreSQL with the following command:

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

Once the installation is completed, check the status of PostgreSQL with the following command:

```
sudo systemctl status postgresql
```

Output:

```
? postgresql.service - PostgreSQL RDBMS
   Loaded: loaded (/lib/systemd/system/postgresql.service; enabled;
vendor preset: enabled)
   Active: active (exited) since Sun 2019-10-27 08:49:29 UTC; 4h 30min
ago
  Process: 1295 ExecStart=/bin/true (code=exited, status=0/SUCCESS)
 Main PID: 1295 (code=exited, status=0/SUCCESS)

Dec 02 08:49:29 ubuntu1804 systemd[1]: Starting PostgreSQL RDBMS...
Dec 02 08:49:29 ubuntu1804 systemd[1]: Started PostgreSQL RDBMS.
```

Next, switch to the postgres user with the following command:

```
su - postgres
```

Next, create a sonar user with the following command:

```
createuser sonar
```

Next, switch to the PostgreSQL shell with the following command:

```
psql
```

Next, set password for sonar user and create a sonar database with the following command:

```
ALTER USER sonar WITH ENCRYPTED password 'sonar';
CREATE DATABASE sonar OWNER sonar;
```

Next, exti from the PostgreSQL shell:

```
\q
```

Step 5:

### Install and Configure SonarQube

First, create a user for SonarQube with the following command:

```
sudo adduser sonar
```

Next, download the latest version of SonarQube with the following command:

```
wget
https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-6.7.6.
zip
```

Once the download is completed, unzip the downloaded file with the following command:

```
unzip sonarqube-6.7.6.zip
```

Next, copy the extracted directory to the /opt with the following command:

```
sudo cp -r sonarqube-6.7.6 /opt/sonarqube
```

Next, give ownership to the sonar user with the following command:

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

Next, you will need to configure SonarQube to run as a sonar user. You can do this with the following command:

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

Make the following changes:

```
RUN_AS_USER=sonar
```

Save and close the file. Then, open SonarQube default configuration file and modify the database credentials with the one we created earlier:

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

Make the following changes:

```
sonar.jdbc.username=sonar
sonar.jdbc.password=sonar
sonar.jdbc.url=jdbc:postgresql://localhost/sonar
sonar.web.host=http://ec2-18-232-78-108.compute-1.amazonaws.com
sonar.search.javaOpts=-Xms512m  -Xmx512m
```

Save and close the file, when you are finished.

Step 6:

### Create Systemd Service file for SonarQube

Next, you will need to create a systemd service file to manage SonarQube service. You can do this with the following command:

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

Add the following lines:

```
[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

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

Save and close the file, when you are finished. Then, start SonarQube service and enable it to start on boot time with the following command:

```
sudo systemctl start sonar
sudo systemctl enable sonar
```

You can check the status of SonarQube service with the following command:

```
sudo systemctl status sonar
```

Output:

```
? sonar.service - SonarQube service
   Loaded: loaded (/etc/systemd/system/sonar.service; disabled; vendor
preset: enabled)
   Active: active (running) since Sun 2018-12-02 13:55:34 UTC; 2min 52s
ago
  Process: 2339 ExecStart=/opt/sonarqube/bin/linux-x86-64/sonar.sh start
(code=exited, status=0/SUCCESS)
 Main PID: 2396 (wrapper)
    Tasks: 133 (limit: 2323)
   CGroup: /system.slice/sonar.service
           ??2396 /opt/sonarqube/bin/linux-x86-64/./wrapper
/opt/sonarqube/bin/linux-x86-64/../../conf/wrapper.conf
wrapper.syslog.ident=SonarQ
           ??2399 java -Dsonar.wrapped=true -Djava.awt.headless=true
-Xms8m -Xmx32m -Djava.library.path=./lib -classpath
../../lib/jsw/wrapper-
           ??2445 /usr/lib/jvm/java-8-oracle/jre/bin/java
-XX:+UseConcMarkSweepGC -XX:CMSInitiatingOccupancyFraction=75
-XX:+UseCMSInitiatingOc
           ??2545 /usr/lib/jvm/java-8-oracle/jre/bin/java
-Djava.awt.headless=true -Dfile.encoding=UTF-8
-Djava.io.tmpdir=/opt/sonarqube/temp -
           ??2622 /usr/lib/jvm/java-8-oracle/jre/bin/java
-Djava.awt.headless=true -Dfile.encoding=UTF-8
-Djava.io.tmpdir=/opt/sonarqube/temp -

Dec 02 13:55:33 ubuntu1804 systemd[1]: Starting SonarQube service...
Dec 02 13:55:33 ubuntu1804 sonar.sh[2339]: Starting SonarQube...
Dec 02 13:55:34 ubuntu1804 sonar.sh[2339]: Started SonarQube.
Dec 02 13:55:34 ubuntu1804 systemd[1]: Started SonarQube service.
```

Step 7:

**Configure Apache for SonarQube**

By default, SonarQube listens on port 9000. So, you will need to install and configure Apache as the reverse proxy to access the SonarQube using port 80.

To do so, install Apache with the following command:

```
sudo apt-get install apache2 -y
```

Next, enable mod_proxy module with the following command:

```
sudo a2enmod proxy
sudo a2enmod proxy_http
```

Next, create an Apache virtual host file for SonarQube with the following command:

```
sudo nano /etc/apache2/sites-available/sonar.conf
```

Add the following lines:

```
<VirtualHost *:80>
    ServerName http://ec2-18-232-78-108.compute-1.amazonaws.com:9000
    ServerAdmin http://ec2-18-232-78-108.compute-1.amazonaws.com:9000
    ProxyPreserveHost On
    ProxyPass / http://127.0.0.1:9000/
    ProxyPassReverse / http://127.0.0.1:9000/
    TransferLog /var/log/apache2/sonarm_access.log
    ErrorLog /var/log/apache2/sonar_error.log
</VirtualHost>
```

Replace example.com with your own domain name. Save and close the file. Then, enable SonarQube virtual host file with the following command:

```
sudo a2ensite sonar
```

Finally, restart Apache and SonarQube service to apply all the changes with the following command:

```
sudo systemctl restart apache2
sudo systemctl restart sonar
```

By default, SonarQube stores their logs on /opt/sonarqube/logs directory. You can check SonarQube log with the following command:

```
sudo tail -f /opt/sonarqube/logs/sonar.log
```

Output:

```
Launching a JVM...
Wrapper (Version 3.2.3) http://wrapper.tanukisoftware.org
  Copyright 1999-2006 Tanuki Software, Inc.  All Rights Reserved.

2018.12.02 13:55:43 INFO  app[][o.s.a.AppFileSystem] Cleaning or
creating temp directory /opt/sonarqube/temp
2018.12.02 13:55:44 INFO  app[][o.s.a.es.EsSettings] Elasticsearch
listening on /127.0.0.1:9001
2018.12.02 13:55:45 INFO  app[][o.s.a.p.ProcessLauncherImpl] Launch
process[[key='es', ipcIndex=1, logFilenamePrefix=es]] from
[/opt/sonarqube/elasticsearch]:
/opt/sonarqube/elasticsearch/bin/elasticsearch
-Epath.conf=/opt/sonarqube/temp/conf/es
2018.12.02 13:55:45 INFO  app[][o.s.a.SchedulerImpl] Waiting for
Elasticsearch to be up and running
2018.12.02 13:55:48 INFO  app[][o.e.p.PluginsService] no modules loaded
2018.12.02 13:55:48 INFO  app[][o.e.p.PluginsService] loaded plugin
[org.elasticsearch.transport.Netty4Plugin]
2018.12.02 13:56:34 INFO  app[][o.s.a.SchedulerImpl] Process[es] is up
2018.12.02 13:56:34 INFO  app[][o.s.a.p.ProcessLauncherImpl] Launch
process[[key='web', ipcIndex=2, logFilenamePrefix=web]] from
[/opt/sonarqube]: /usr/lib/jvm/java-8-oracle/jre/bin/java
-Djava.awt.headless=true -Dfile.encoding=UTF-8
-Djava.io.tmpdir=/opt/sonarqube/temp -Xmx512m -Xms128m
-XX:+HeapDumpOnOutOfMemoryError -cp
./lib/common/*:./lib/server/*:/opt/sonarqube/lib/jdbc/postgresql/postgre
sql-42.2.1.jar org.sonar.server.app.WebServer
/opt/sonarqube/temp/sq-process420500314195865484properties
```

You can also check SonarQube web log using the following command:

```
sudo tail -f /opt/sonarqube/logs/web.log
```

Output:

```
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarJava / 4.15.0.12310 /
572454b93016ec73a53fe0e07b2ffdc356d21ba9
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarPHP / 2.11.0.2485 / 741861a29e5f9a26c6c99c06268facb6c4f4a882
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarPython / 1.8.0.1496 /
3fe3bc4d0273a5721ea2fb368dc45b1bb82fede3
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarQube :: Plugins :: SCM :: Git / 1.3.0.869 /
4da53e3f9e55f4f2e5796625cb0c5768ed152079
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarQube :: Plugins :: SCM :: SVN / 1.6.0.860 /
2111fdbd1dddda4ad6d4ed6486fd0b18c1010d3b
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarTS / 1.1.0.1079 / 042c9e65239a47d92d305f9767f730b3cc1e5ed3
2018.12.02 13:57:03 INFO  web[][o.s.s.p.ServerPluginRepository] Deploy
plugin SonarXML / 1.4.3.1027 / 39588245cecf538bb27be4e496ff303b0143d20b
2018.12.02 13:57:07 INFO  web[][o.s.s.p.d.m.c.PostgresCharsetHandler]
Verify that database charset supports UTF8
2018.12.02 13:57:09 INFO  web[][o.s.s.p.w.MasterServletFilter]
Initializing servlet filter
org.sonar.server.ws.WebServiceFilter@792e6771
[pattern=UrlPattern{inclusions=[/api/system/migrate_db/*, ...],
exclusions=[/api/properties*, ...]}]
2018.12.02 13:57:09 INFO  web[][o.s.s.a.EmbeddedTomcat] HTTP connector
enabled on port 9000
2018.12.02 13:57:16 INFO  web[][o.s.s.p.UpdateCenterClient] Update
center: https://update.sonarsource.org/update-center.properties (no
proxy)
```

Step 8:

### Access SonarQube

SonarQube is now installed and configured. It's time to access it through web browser.

Open your web browser and type the URL http://ec2-18-232-78-108.compute-1.amazonaws.com:9000. You will be redirected to the following page:

Here, click on the **Log In** button. You should see the following page:

Provide the default administrator account username and password as admin / admin and click on the **Log In** button. You should see the SonarQube default dashboard in the following page:

Congratulations! you have successfully installed SonarQube on Ubuntu 18.04 server. You can now easily perform automatic reviews and check the health of an application using SonarQube.