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COMP 3104 - 15783

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# Assignment 02 - Part 02

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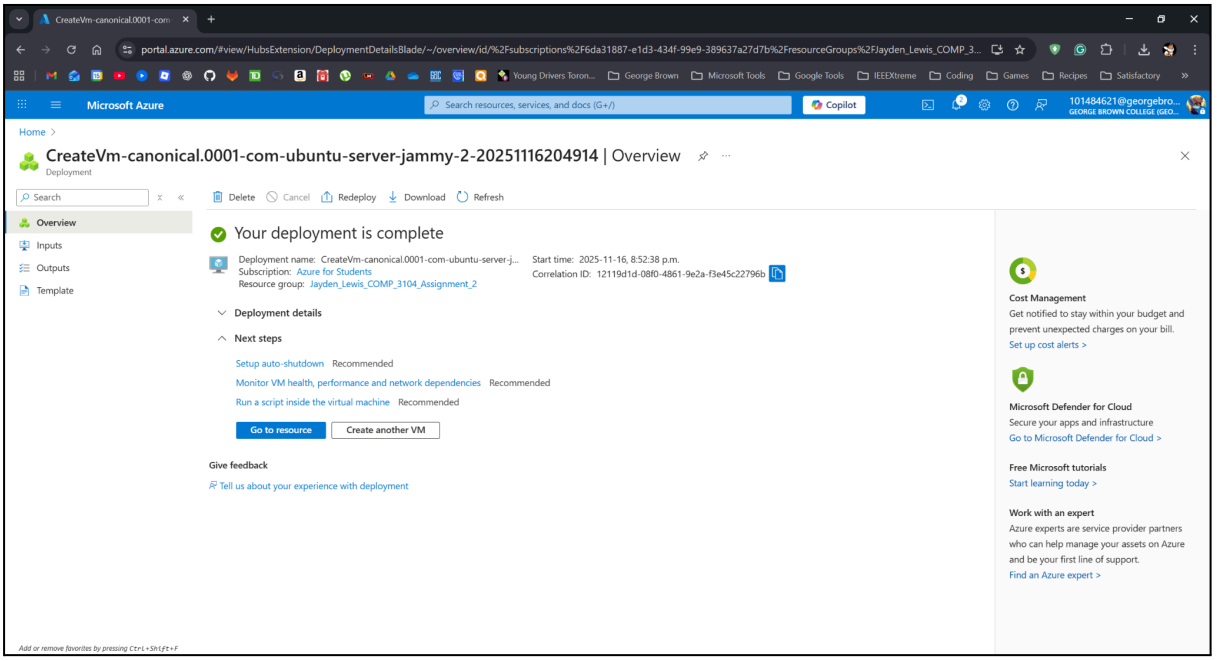
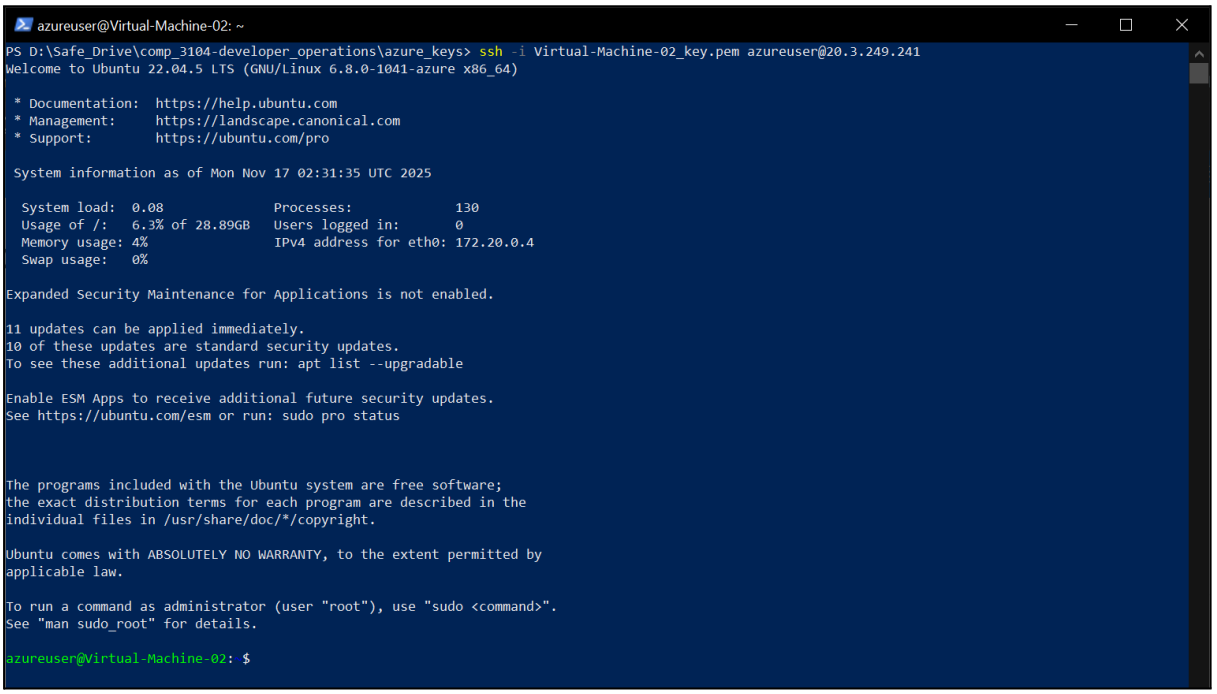
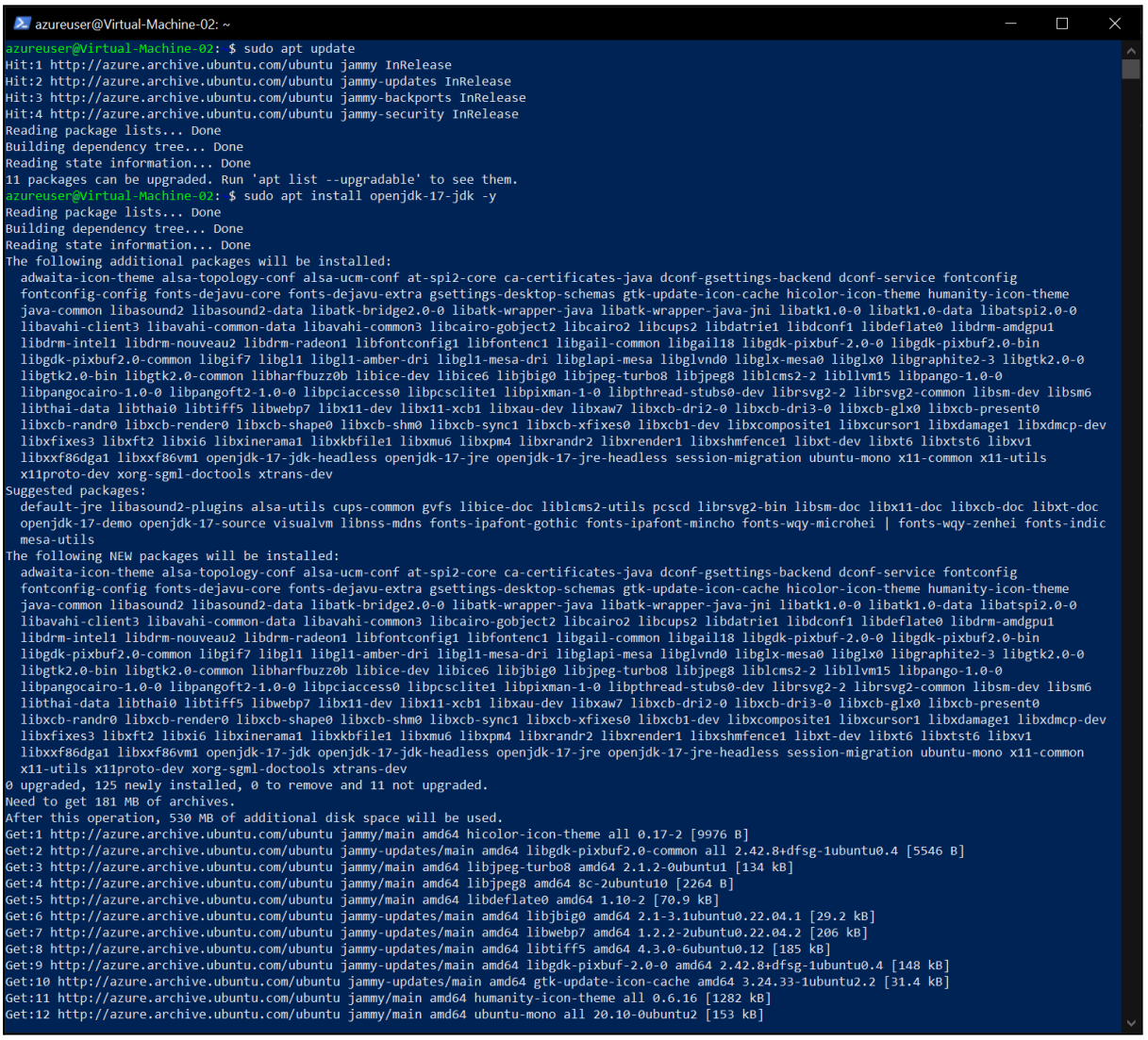
## VM Creation Completion



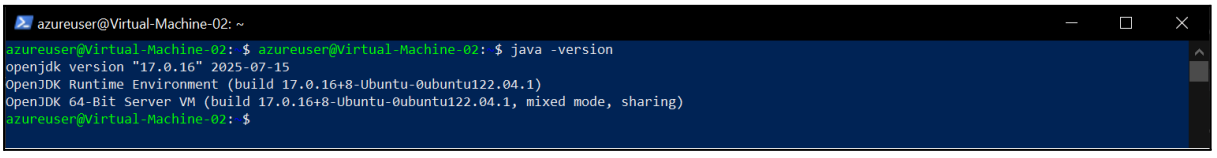
# SSH Connection To VM



# Java Installation & Version Check

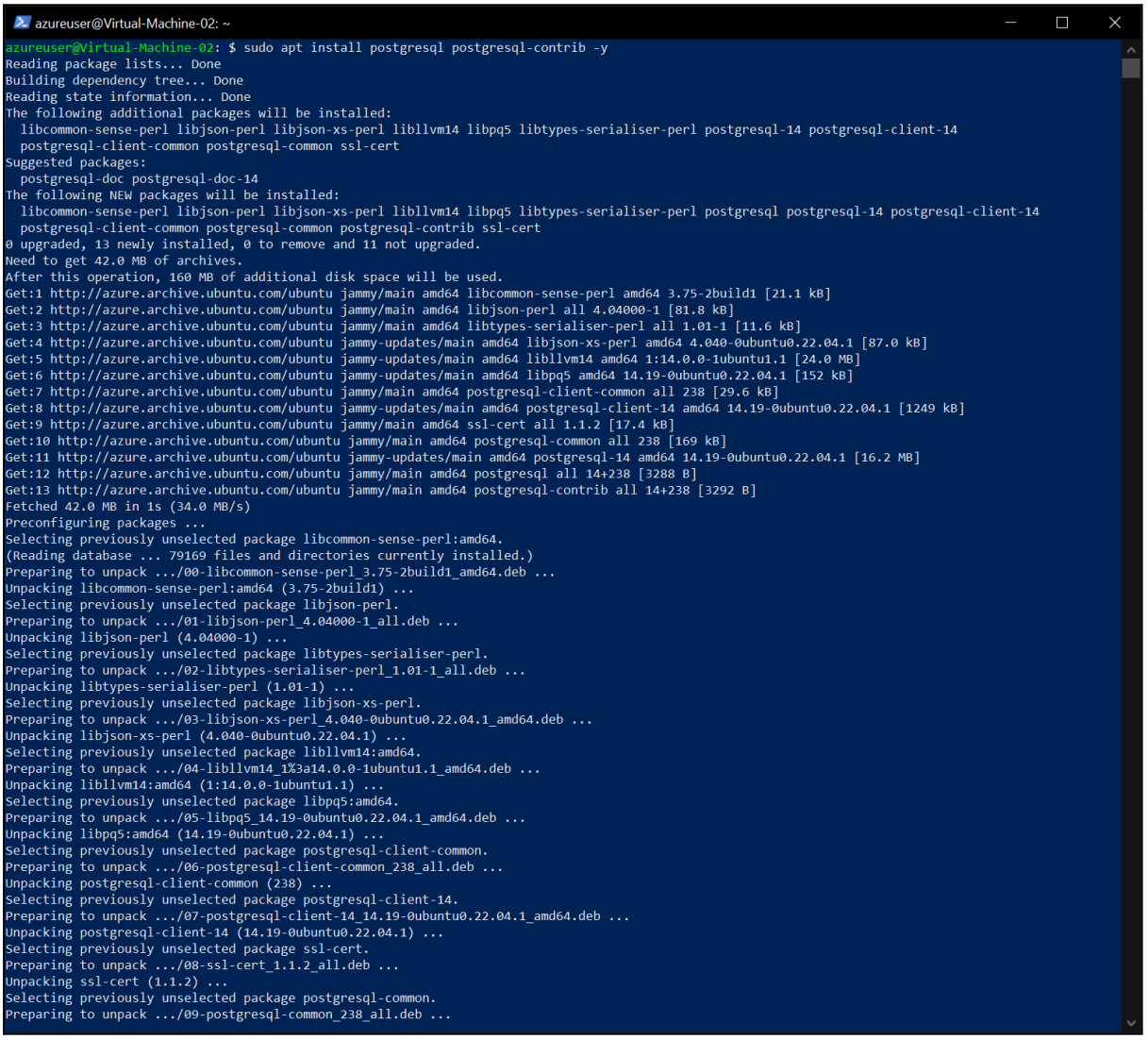


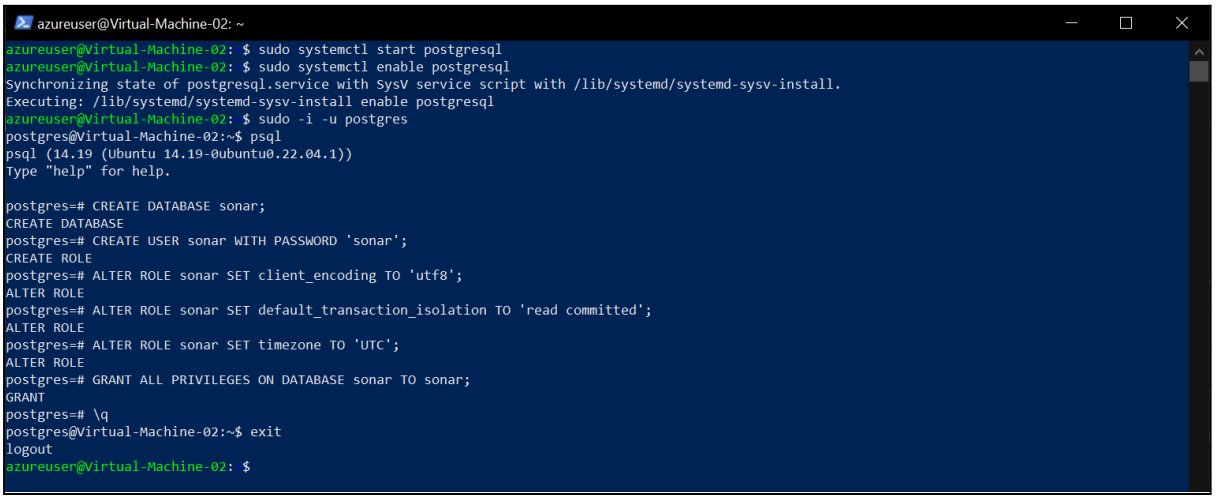
```
azureuser@Virtual-Machine-02: ~
azureuser@Virtual-Machine-02: $ sudo apt update
Hit:1 http://azure.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://azure.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://azure.archive.ubuntu.com/ubuntu jammy-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
11 packages can be upgraded. Run 'apt list --upgradable' to see them.
azureuser@Virtual-Machine-02: $ sudo apt install openjdk-17-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig
  fontconfig-config fonts-dejavu-core fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme humanity-icon-theme
  java-common libasound2 libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data libatspi2.0-0
  libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcups2 libdatrie1 libdconf1 libdeflate0 libdrm-amdgpu1
  libdrm-intel1 libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgail-common libgail18 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin
  libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-amber-dri libgl1-mesa-dri libglapi-mesa libglvnd0 libglx-mesa0 libglx0 libgraphite2-3 libgtk2.0-0
  libgtk2.0-bin libgtk2.0-common libharfbuzz0b libice-dev libice6 libjbig0 libjpeg-turbo8 libjpeg8 liblcms2-2 libllvm15 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1 libpixman-1-0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsm-dev libsm6
  libthai-data libthai0 libtiff5 libwebp7 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0
  libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcb1-dev libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev
  libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1
  libxxf86dga1 libxxf86vm1 openjdk-17-jdk-headless openjdk-17-jre openjdk-17-jre-headless session-migration ubuntu-mono x11-common x11-utils
  x11proto-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  default-jre libasound2-plugins alsa-utils cups-common gvfs libice-doc liblcms2-utils pcscd librsvg2-bin libsm-doc libx11-doc libxcb-doc libxt-doc
  openjdk-17-demo openjdk-17-source visualvm libnss-mdns fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei | fonts-wqy-zenhei fonts-indic
  mesa-utils
The following NEW packages will be installed:
  adwaita-icon-theme alsa-topology-conf alsa-ucm-conf at-spi2-core ca-certificates-java dconf-gsettings-backend dconf-service fontconfig
  fontconfig-config fonts-dejavu-core fonts-dejavu-extra gsettings-desktop-schemas gtk-update-icon-cache hicolor-icon-theme humanity-icon-theme
  java-common libasound2 libasound2-data libatk-bridge2.0-0 libatk-wrapper-java libatk-wrapper-java-jni libatk1.0-0 libatk1.0-data libatspi2.0-0
  libavahi-client3 libavahi-common-data libavahi-common3 libcairo-gobject2 libcairo2 libcups2 libdatrie1 libdconf1 libdeflate0 libdrm-amdgpu1
  libdrm-intel1 libdrm-nouveau2 libdrm-radeon1 libfontconfig1 libfontenc1 libgail-common libgail18 libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin
  libgdk-pixbuf2.0-common libgif7 libgl1 libgl1-amber-dri libgl1-mesa-dri libglapi-mesa libglvnd0 libglx-mesa0 libglx0 libgraphite2-3 libgtk2.0-0
  libgtk2.0-bin libgtk2.0-common libharfbuzz0b libice-dev libice6 libjbig0 libjpeg-turbo8 libjpeg8 liblcms2-2 libllvm15 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpciaccess0 libpcsclite1 libpixman-1-0 libpthread-stubs0-dev librsvg2-2 librsvg2-common libsm-dev libsm6
  libthai-data libthai0 libtiff5 libwebp7 libx11-dev libx11-xcb1 libxau-dev libxaw7 libxcb-dri2-0 libxcb-dri3-0 libxcb-glx0 libxcb-present0
  libxcb-randr0 libxcb-render0 libxcb-shape0 libxcb-shm0 libxcb-sync1 libxcb-xfixes0 libxcb1-dev libxcomposite1 libxcursor1 libxdamage1 libxdmcp-dev
  libxfixes3 libxft2 libxi6 libxinerama1 libxkbfile1 libxmu6 libxpm4 libxrandr2 libxrender1 libxshmfence1 libxt-dev libxt6 libxtst6 libxv1
  libxxf86dga1 libxxf86vm1 openjdk-17-jdk openjdk-17-jdk-headless openjdk-17-jre openjdk-17-jre-headless session-migration ubuntu-mono x11-common
  x11-utils x11proto-dev xorg-sgml-doctools xtrans-dev
0 upgraded, 125 newly installed, 0 to remove and 11 not upgraded.
Need to get 181 MB of archives.
After this operation, 530 MB of additional disk space will be used.
Get:1 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 hicolor-icon-theme all 0.17-2 [9976 B]
Get:2 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgdk-pixbuf2.0-common all 2.42.8+dfsg-1ubuntu0.4 [5546 B]
Get:3 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 libjpeg-turbo8 amd64 2.1.2-0ubuntu1 [134 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 libjpeg8 amd64 8c-2ubuntu10 [2264 B]
Get:5 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 libdeflate0 amd64 1.10-2 [70.9 kB]
Get:6 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libjbig0 amd64 2.1-3.1ubuntu0.22.04.1 [29.2 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libwebp7 amd64 1.2.2-2ubuntu0.22.04.2 [206 kB]
Get:8 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libtiff5 amd64 4.3.0-6ubuntu0.12 [185 kB]
Get:9 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgdk-pixbuf-2.0-0 amd64 2.42.8+dfsg-1ubuntu0.4 [148 kB]
Get:10 http://azure.archive.ubuntu.com/ubuntu jammy-updates/main amd64 gtk-update-icon-cache amd64 3.24.33-1ubuntu2.2 [31.4 kB]
Get:11 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 humanity-icon-theme all 0.6.16 [1282 kB]
Get:12 http://azure.archive.ubuntu.com/ubuntu jammy/main amd64 ubuntu-mono all 20.10-0ubuntu2 [153 kB]
```



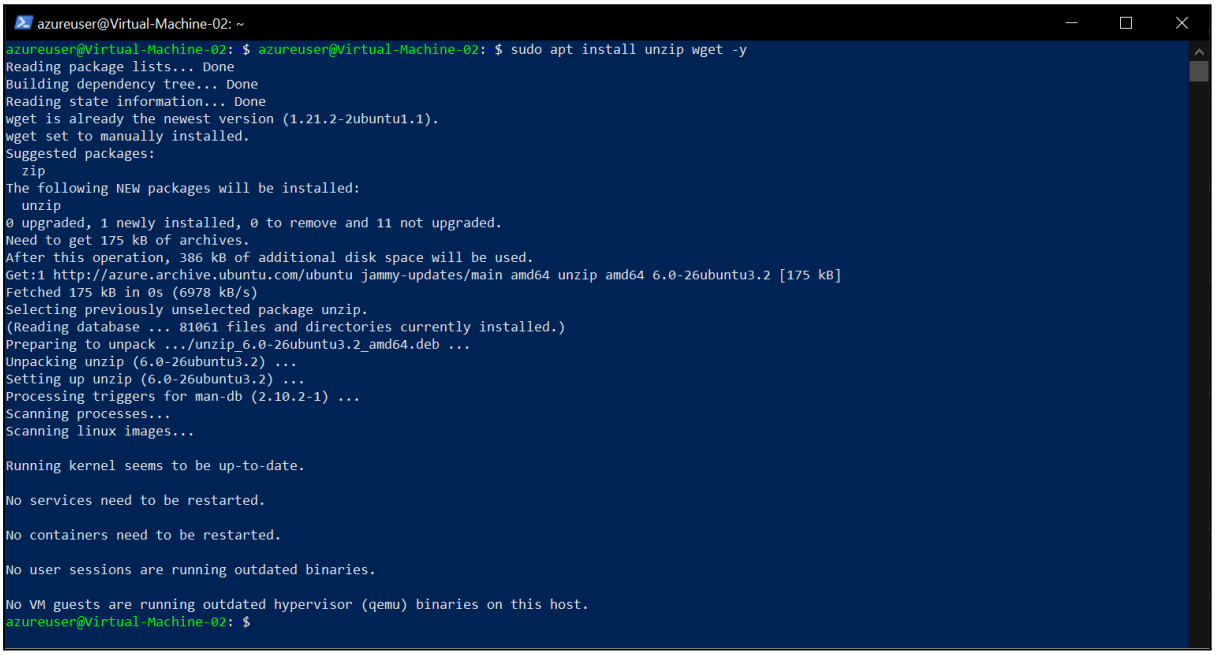
```
azureuser@Virtual-Machine-02: ~
azureuser@Virtual-Machine-02: $ azureuser@Virtual-Machine-02: $ java -version
openjdk version "17.0.16" 2025-07-15
OpenJDK Runtime Environment (build 17.0.16+8-Ubuntu-0ubuntu122.04.1)
OpenJDK 64-Bit Server VM (build 17.0.16+8-Ubuntu-0ubuntu122.04.1, mixed mode, sharing)
azureuser@Virtual-Machine-02: $
```

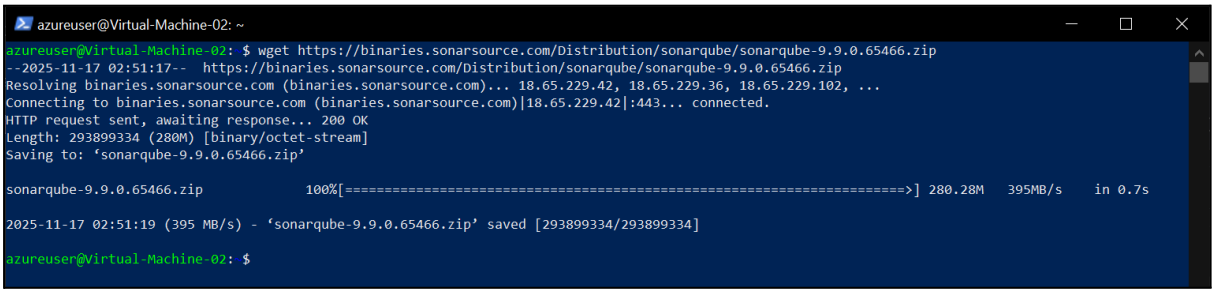
# PostgreSQL Installation & User Setup For SonarQube

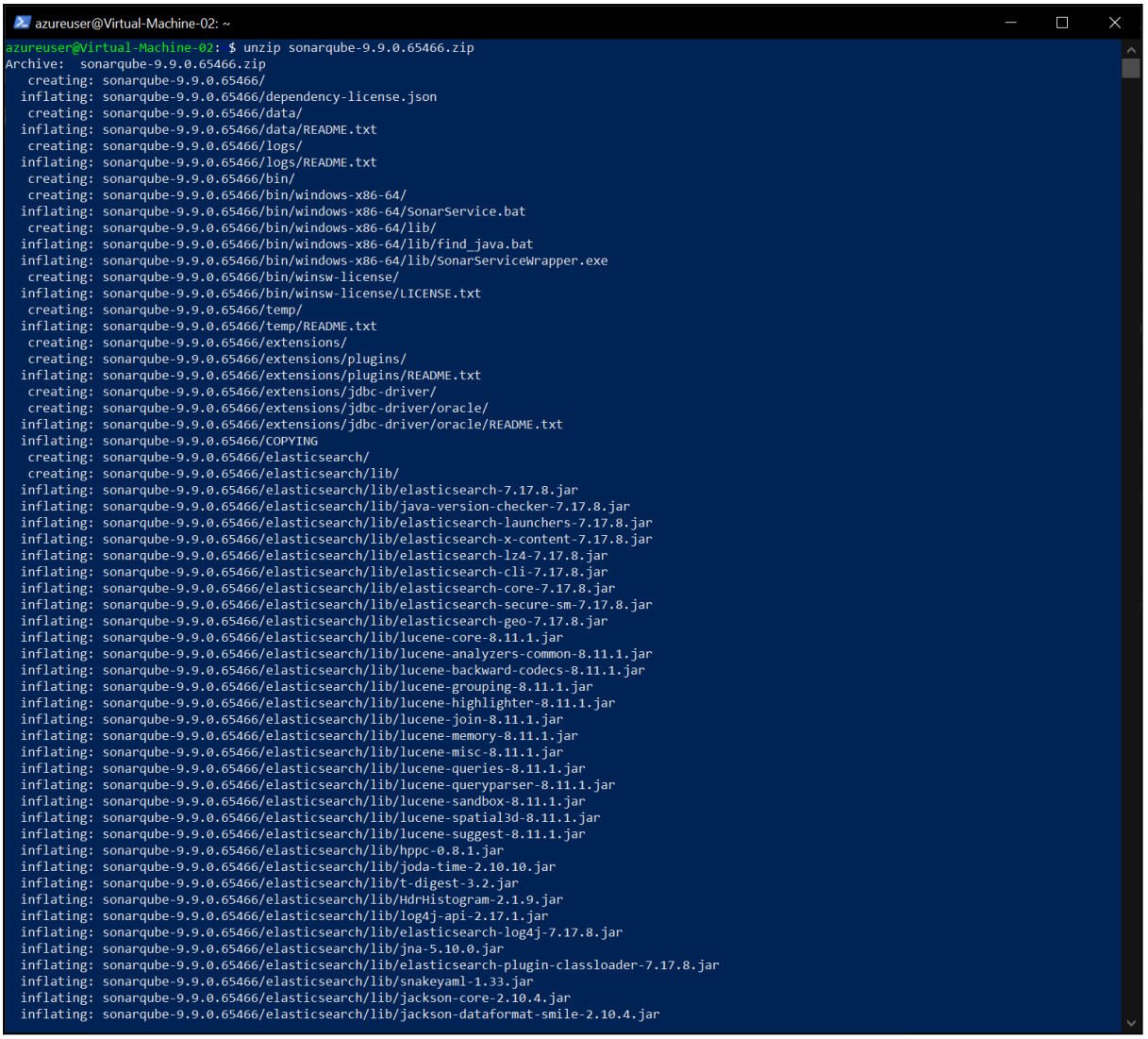


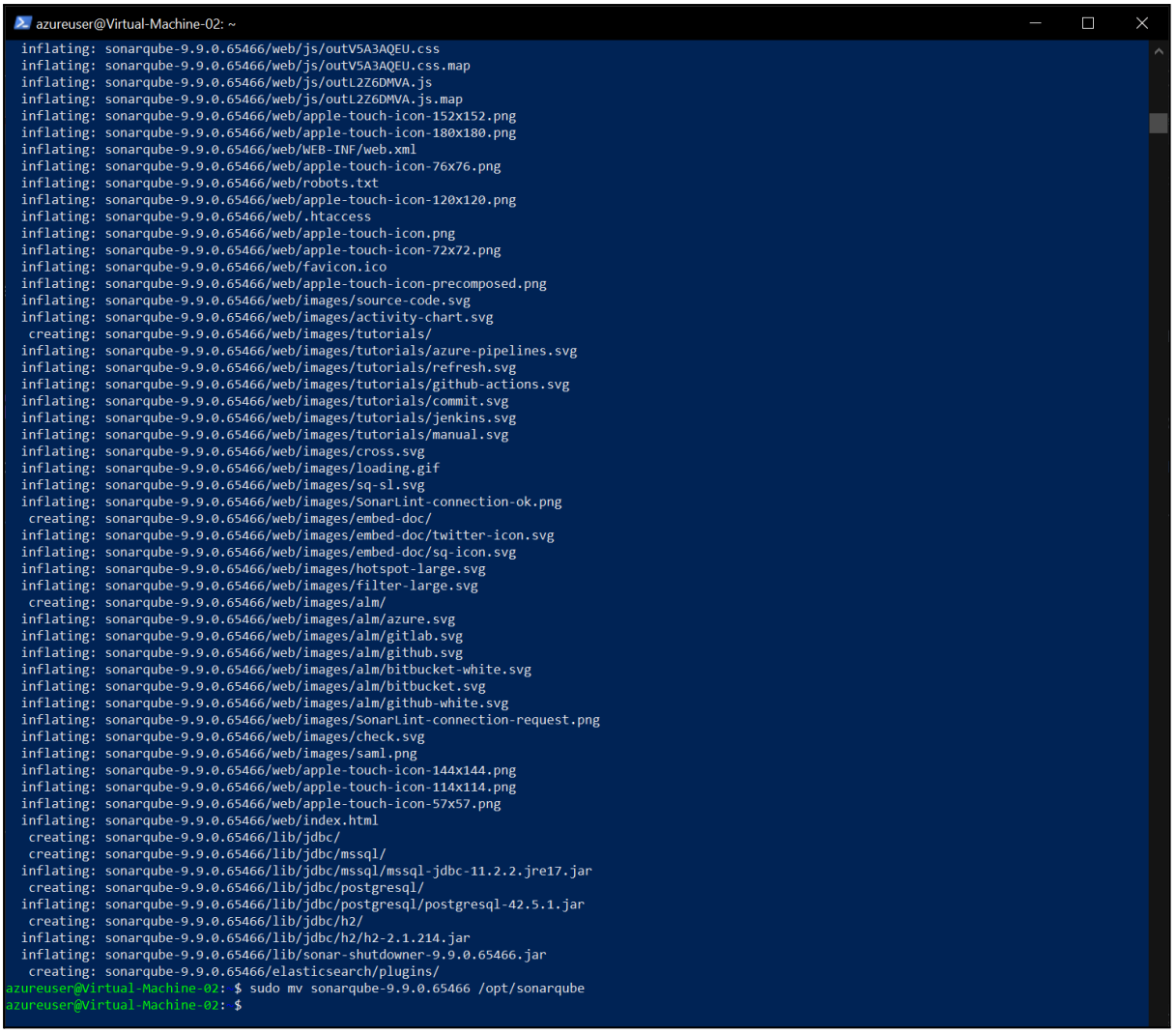



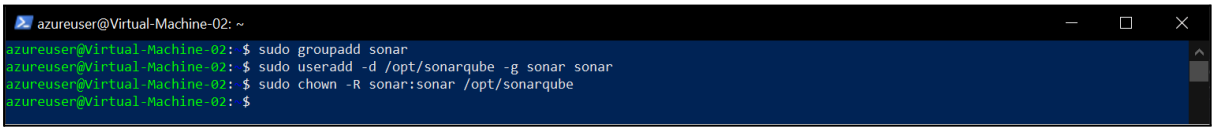
# SonarQube Configuration & Service Status Check

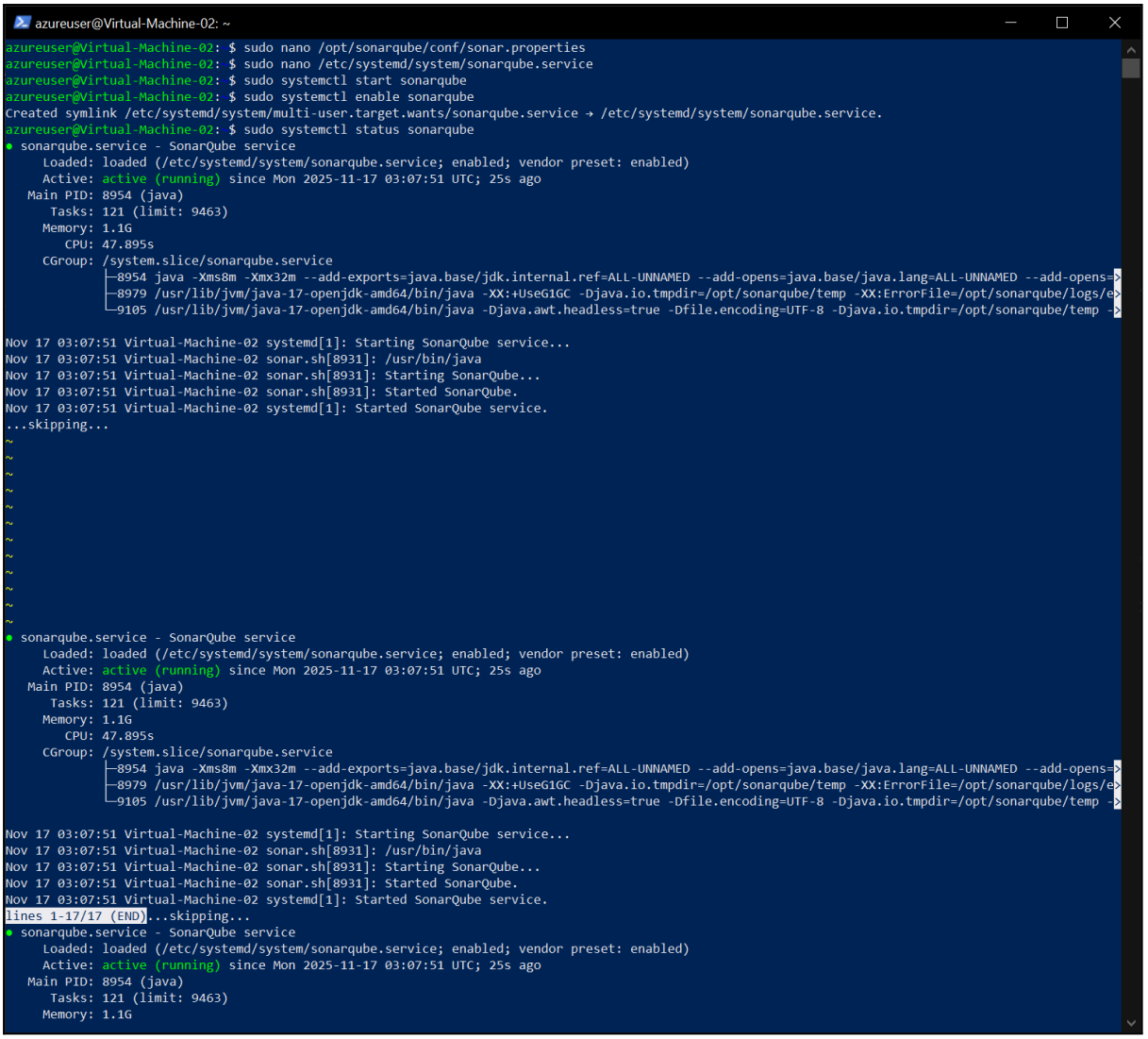



azureuser@Virtual-Machine-02: ~
azureuser@Virtual-Machine-02: $ unzip sonarqube-9.9.0.65466.zip
Archive:  sonarqube-9.9.0.65466.zip
   creating: sonarqube-9.9.0.65466/
  inflating: sonarqube-9.9.0.65466/dependency-license.json
   creating: sonarqube-9.9.0.65466/data/
  inflating: sonarqube-9.9.0.65466/data/README.txt
   creating: sonarqube-9.9.0.65466/logs/
  inflating: sonarqube-9.9.0.65466/logs/README.txt
   creating: sonarqube-9.9.0.65466/bin/
   creating: sonarqube-9.9.0.65466/bin/windows-x86-64/
  inflating: sonarqube-9.9.0.65466/bin/windows-x86-64/SonarService.bat
   creating: sonarqube-9.9.0.65466/bin/windows-x86-64/lib/
  inflating: sonarqube-9.9.0.65466/bin/windows-x86-64/lib/find_java.bat
  inflating: sonarqube-9.9.0.65466/bin/windows-x86-64/lib/SonarServiceWrapper.exe
   creating: sonarqube-9.9.0.65466/bin/winsw-license/
  inflating: sonarqube-9.9.0.65466/bin/winsw-license/LICENSE.txt
   creating: sonarqube-9.9.0.65466/temp/
  inflating: sonarqube-9.9.0.65466/temp/README.txt
   creating: sonarqube-9.9.0.65466/extensions/
   creating: sonarqube-9.9.0.65466/extensions/plugins/
  inflating: sonarqube-9.9.0.65466/extensions/plugins/README.txt
   creating: sonarqube-9.9.0.65466/extensions/jdbc-driver/
   creating: sonarqube-9.9.0.65466/extensions/jdbc-driver/oracle/
  inflating: sonarqube-9.9.0.65466/extensions/jdbc-driver/oracle/README.txt
  inflating: sonarqube-9.9.0.65466/COPYING
   creating: sonarqube-9.9.0.65466/elasticsearch/
   creating: sonarqube-9.9.0.65466/elasticsearch/lib/
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/java-version-checker-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-launchers-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-x-content-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-lz4-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-cli-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-core-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-secure-sm-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-geo-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-core-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-analyzers-common-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-backward-codecs-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-grouping-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-highlighter-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-join-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-memory-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-misc-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-queries-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-queryparser-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-sandbox-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-spatial3d-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/lucene-suggest-8.11.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/hppc-0.8.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/joda-time-2.10.10.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/t-digest-3.2.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/HdrHistogram-2.1.9.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/log4j-api-2.17.1.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-log4j-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/jna-5.10.0.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/elasticsearch-plugin-classloader-7.17.8.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/snakeyaml-1.33.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/jackson-core-2.10.4.jar
  inflating: sonarqube-9.9.0.65466/elasticsearch/lib/jackson-dataformat-smile-2.10.4.jar


azureuser@Virtual-Machine-02: ~
inflating: sonarqube-9.9.0.65466/web/js/outV5A3AQEU.css
inflating: sonarqube-9.9.0.65466/web/js/outV5A3AQEU.css.map
inflating: sonarqube-9.9.0.65466/web/js/outL2Z6DMVA.js
inflating: sonarqube-9.9.0.65466/web/js/outL2Z6DMVA.js.map
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-152x152.png
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-180x180.png
inflating: sonarqube-9.9.0.65466/web/WEB-INF/web.xml
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-76x76.png
inflating: sonarqube-9.9.0.65466/web/robots.txt
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-120x120.png
inflating: sonarqube-9.9.0.65466/web/.htaccess
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon.png
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-72x72.png
inflating: sonarqube-9.9.0.65466/web/favicon.ico
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-precomposed.png
inflating: sonarqube-9.9.0.65466/web/images/source-code.svg
inflating: sonarqube-9.9.0.65466/web/images/activity-chart.svg
creating: sonarqube-9.9.0.65466/web/images/tutorials/
inflating: sonarqube-9.9.0.65466/web/images/tutorials/azure-pipelines.svg
inflating: sonarqube-9.9.0.65466/web/images/tutorials/refresh.svg
inflating: sonarqube-9.9.0.65466/web/images/tutorials/github-actions.svg
inflating: sonarqube-9.9.0.65466/web/images/tutorials/commit.svg
inflating: sonarqube-9.9.0.65466/web/images/tutorials/jenkins.svg
inflating: sonarqube-9.9.0.65466/web/images/tutorials/manual.svg
inflating: sonarqube-9.9.0.65466/web/images/cross.svg
inflating: sonarqube-9.9.0.65466/web/images/loading.gif
inflating: sonarqube-9.9.0.65466/web/images/sq-sl.svg
inflating: sonarqube-9.9.0.65466/web/images/SonarLint-connection-ok.png
creating: sonarqube-9.9.0.65466/web/images/embed-doc/
inflating: sonarqube-9.9.0.65466/web/images/embed-doc/twitter-icon.svg
inflating: sonarqube-9.9.0.65466/web/images/embed-doc/sq-icon.svg
inflating: sonarqube-9.9.0.65466/web/images/hotspot-large.svg
inflating: sonarqube-9.9.0.65466/web/images/filter-large.svg
creating: sonarqube-9.9.0.65466/web/images/alm/
inflating: sonarqube-9.9.0.65466/web/images/alm/azure.svg
inflating: sonarqube-9.9.0.65466/web/images/alm/gitlab.svg
inflating: sonarqube-9.9.0.65466/web/images/alm/github.svg
inflating: sonarqube-9.9.0.65466/web/images/alm/bitbucket-white.svg
inflating: sonarqube-9.9.0.65466/web/images/alm/bitbucket.svg
inflating: sonarqube-9.9.0.65466/web/images/alm/github-white.svg
inflating: sonarqube-9.9.0.65466/web/images/SonarLint-connection-request.png
inflating: sonarqube-9.9.0.65466/web/images/check.svg
inflating: sonarqube-9.9.0.65466/web/images/saml.png
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-144x144.png
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-114x114.png
inflating: sonarqube-9.9.0.65466/web/apple-touch-icon-57x57.png
inflating: sonarqube-9.9.0.65466/web/index.html
creating: sonarqube-9.9.0.65466/lib/jdbc/
creating: sonarqube-9.9.0.65466/lib/jdbc/mssql/
inflating: sonarqube-9.9.0.65466/lib/jdbc/mssql/mssql-jdbc-11.2.2.jre17.jar
creating: sonarqube-9.9.0.65466/lib/jdbc/postgresql/
inflating: sonarqube-9.9.0.65466/lib/jdbc/postgresql/postgresql-42.5.1.jar
creating: sonarqube-9.9.0.65466/lib/jdbc/h2/
inflating: sonarqube-9.9.0.65466/lib/jdbc/h2/h2-2.1.214.jar
inflating: sonarqube-9.9.0.65466/lib/sonar-shutdowner-9.9.0.65466.jar
creating: sonarqube-9.9.0.65466/elasticsearch/plugins/
azureuser@Virtual-Machine-02: $ sudo mv sonarqube-9.9.0.65466 /opt/sonarqube
azureuser@Virtual-Machine-02: $


azureuser@Virtual-Machine-02: ~
azureuser@Virtual-Machine-02: $ sudo groupadd sonar
azureuser@Virtual-Machine-02: $ sudo useradd -d /opt/sonarqube -g sonar sonar
azureuser@Virtual-Machine-02: $ sudo chown -R sonar:sonar /opt/sonarqube
azureuser@Virtual-Machine-02: $


azureuser@Virtual-Machine-02: ~
azureuser@Virtual-Machine-02: $ sudo nano /opt/sonarqube/conf/sonar.properties
azureuser@Virtual-Machine-02: $ sudo nano /etc/systemd/system/sonarqube.service
azureuser@Virtual-Machine-02: $ sudo systemctl start sonarqube
azureuser@Virtual-Machine-02: $ sudo systemctl enable sonarqube
Created symlink /etc/systemd/system/multi-user.target.wants/sonarqube.service → /etc/systemd/system/sonarqube.service.
azureuser@Virtual-Machine-02: $ sudo systemctl status sonarqube
● sonarqube.service - SonarQube service
Loaded: loaded (/etc/systemd/system/sonarqube.service; enabled; vendor preset: enabled)
Active: active (running) since Mon 2025-11-17 03:07:51 UTC; 25s ago
Main PID: 8954 (java)
Tasks: 121 (limit: 9463)
Memory: 1.1G
CPU: 47.895s
CGroup: /system.slice/sonarqube.service
├─8954 java -Xms8m -Xmx32m --add-exports=java.base/jdk.internal.ref=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=
├─8979 /usr/lib/jvm/java-17-openjdk-amd64/bin/java -XX:+UseG1GC -Djava.io.tmpdir=/opt/sonarqube/temp -XX:ErrorFile=/opt/sonarqube/logs/e
└─9105 /usr/lib/jvm/java-17-openjdk-amd64/bin/java -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.io.tmpdir=/opt/sonarqube/temp -
Nov 17 03:07:51 Virtual-Machine-02 systemd[1]: Starting SonarQube service...
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: /usr/bin/java
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: Starting SonarQube...
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: Started SonarQube.
Nov 17 03:07:51 Virtual-Machine-02 systemd[1]: Started SonarQube service.
...skipping...
● sonarqube.service - SonarQube service
Loaded: loaded (/etc/systemd/system/sonarqube.service; enabled; vendor preset: enabled)
Active: active (running) since Mon 2025-11-17 03:07:51 UTC; 25s ago
Main PID: 8954 (java)
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├─8954 java -Xms8m -Xmx32m --add-exports=java.base/jdk.internal.ref=ALL-UNNAMED --add-opens=java.base/java.lang=ALL-UNNAMED --add-opens=
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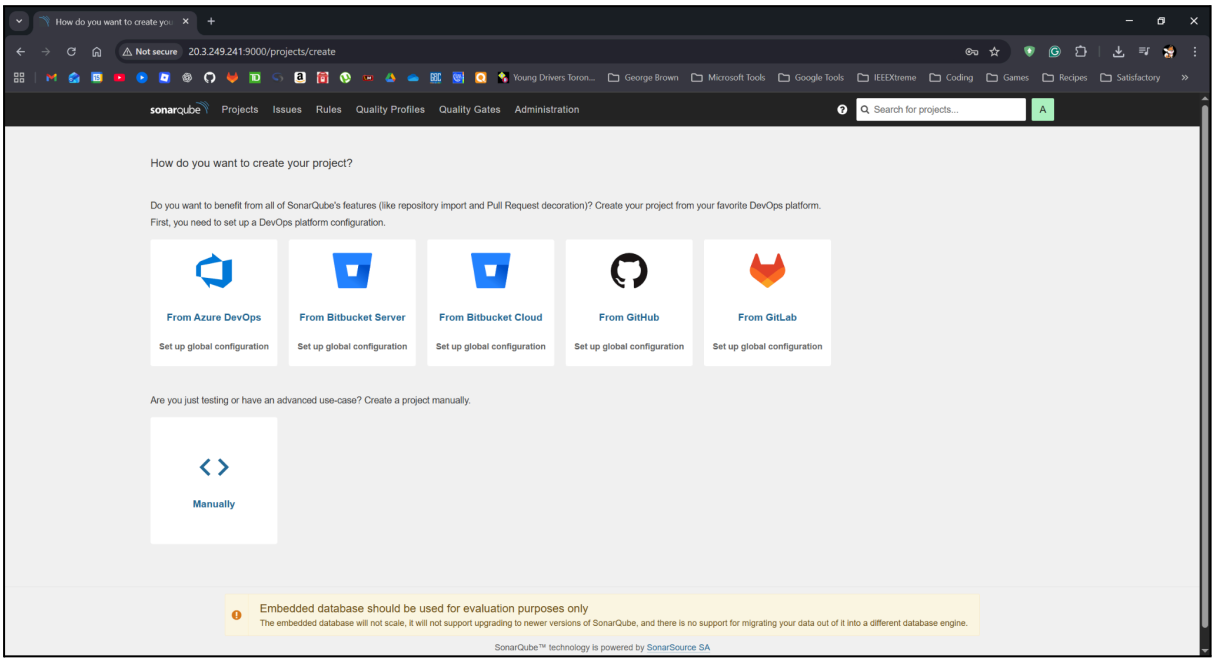
└─9105 /usr/lib/jvm/java-17-openjdk-amd64/bin/java -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djava.io.tmpdir=/opt/sonarqube/temp -
Nov 17 03:07:51 Virtual-Machine-02 systemd[1]: Starting SonarQube service...
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: /usr/bin/java
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: Starting SonarQube...
Nov 17 03:07:51 Virtual-Machine-02 sonar.sh[8931]: Started SonarQube.
Nov 17 03:07:51 Virtual-Machine-02 systemd[1]: Started SonarQube service.
lines 1-17/17 (END)...skipping...
● sonarqube.service - SonarQube service
Loaded: loaded (/etc/systemd/system/sonarqube.service; enabled; vendor preset: enabled)
Active: active (running) since Mon 2025-11-17 03:07:51 UTC; 25s ago
Main PID: 8954 (java)
Tasks: 121 (limit: 9463)
Memory: 1.1G

# IP Address / SonarQube Server URL

[http://20.3.249.241:9000/projects/create](http://20.3.249.241:9000/projects/create)