**Individual Assignment**

**COMP 3104 – DevOps**

**Total Points (10%)**

**Submission Deadline: Sunday, 27th Nov 2021, 11:59 PM (Week 12)**

**Not submission extension as it might affect other coursework**

**Please do research if any command is not working. Command list are only for you reference.**

**Todo Checklist and Rubric**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. #** | **Task** | **Description** | **Marks** |
| **1** | Create AWS Ubuntu instance | Install Java, Jenkins, Docker, and Git  *Submit Screenshots of all command list you have executed with proper name. For example, java installation command list screenshot name like* ***java.png.***  ***Share Jenkins URL*** | Java = 10  Docker = 10  Git = 05  GitHub Repo = 05  Jenkins = 30  **Only AWS EC2 instance=05** |
| **2** | Create AWS Ubuntu instance | Install Java (***prerequisite***), Postgres and SonarQube Server  *Submit Screenshots of all command list you have executed with proper name. For example, postgres installation command list screenshot name like* ***postgres.png.***  ***Share SonarQube URL*** | Postgres = 10  SonarQube Server = 20  **Only AWS EC2 instance=05** |

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**\*\*\*\*\*\*\*\*\*\* Creating to AWS EC2 \*\*\*\*\*\*\*\***

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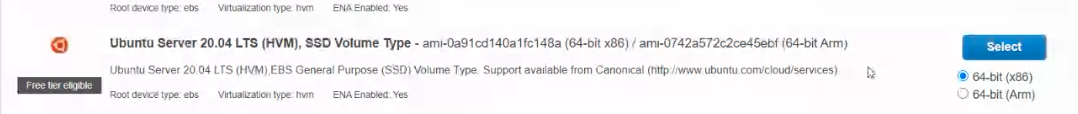
**NOTE: Students are free to use nay cloud services (AWS, GCS, MS Azure, etc.) to complete the assignment. Please submitted relevant screens shots to validate your work. Below steps are only to create AWS EC2 instances. All other steps remains same for Ubuntu OS.**

Login to AWS Console <https://aws.amazon.com/console/>

Student Account: <https://www.awseducate.com/student/s/classrooms>

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html>

Select Ubuntu server on EC2 as below



Graphical user interface, text, application

Description automatically generated

**Add Custom TCP having port 8080 for Jenkins**

Graphical user interface, text, application, email

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**Add Custom TCP having port 9000 for SonarQube Server**

**\*\*\*\*\*\*\*\*\* Connecting to AWS EC2 \*\*\*\*\*\*\***

**To access your instance:**

Open an SSH client. (Find out how to connect using PuTTY on windows)

Locate your private key file (pritesh\_keypair.pem). The wizard automatically detects the key you used to launch the instance.

Your key must not be publicly viewable for SSH to work. Use this command if needed:

**$ chmod 400 pritesh\_keypair.pem**

Connect to your instance using its Public DNS: ec2-100-25-191-138.compute-1.amazonaws.com

**Example**:

**$ ssh -i "pritesh\_keypair.pem" ubuntu@ec2-100-25-191-138.compute-1.amazonaws.com**

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our connection documentation.

**Reference**: <https://www.youtube.com/watch?v=hHZoV3LBIwE&t=5121s>

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**\*\*\*\*\*\*\*\* Installing Java \*\*\*\*\*\*\*\***

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<https://www.digitalocean.com/community/tutorials/how-to-install-jenkins-on-ubuntu-18-04>

**$ java -version**

Perform a system update

**$ sudo apt-get update**

**$ sudo apt-get -y upgrade**

Installing JAVA

**$ sudo apt install openjdk-8-jdk -y**

**$ java -version**

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**\*\*\*\*\*\*\*\* Installing Jenkins \*\*\*\*\*\*\*\***

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Downloading and Installing Jenkins (**Research if these URL not working**)

**$ sudo wget -q -O - https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo apt-key add -**

**$ sudo sh -c 'echo deb https://pkg.jenkins.io/debian-stable binary/ > \**

**/etc/apt/sources.list.d/jenkins.list'**

Text

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**$ sudo apt-get update**

**$ sudo apt-get install jenkins -y**

Start Jenkins Services

**$ sudo systemctl start jenkins**

**$ sudo systemctl status jenkins**

Open web browser and enter **http://<ip address>:8080/**

Install on browser and fetch initial password from below given location

**$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword**

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**\*\*\*\*\*\*\*\* Installing Docker \*\*\*\*\*\*\*\*\***

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<https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04>

Perform a system update

**$ sudo apt-get update**

**$ sudo apt-get -y upgrade**

Install Docker

**$ sudo apt install docker.io -y**

Add Jenkins user to docker

**$ sudo usermod -aG docker jenkins**

Restart Jenkins

**$ sudo systemctl restart jenkins**

Check that it’s running:

**$ sudo systemctl status docker**

Working with Docker Images

**$ sudo docker --version**

**$ sudo docker run hello-world**

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**\*\*\*\*\*\*\*\* Installing Git \*\*\*\*\*\*\*\*\***

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<https://www.digitalocean.com/community/tutorials/how-to-install-git-on-ubuntu-20-04>

Perform a system update

**$ sudo apt-get update**

**$ sudo apt-get -y upgrade**

Install Git

**$ sudo apt install git**

Version Check

**$ sudo git –version or git --version**

Git user setup

**$ git config --global user.name "Your Name"**

**$ git config --global user.email "youremail@domain.com"**

Verify Git user setup

**$ git config --list**

Create Git repository name studentID\_**COMP\_3104\_assignment2** and commit hello.txt file with your name, student ID and “Git repository created from AWS EC2 instance”. *Don’t forget to* ***submit GitHub repo link***

***Refer previous weeks exercise to work with GitHub repositories using CLI commands***

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**\*\*\*\* Installing Postgres \*\*\*\*\*\***

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<https://www.fosstechnix.com/how-to-install-sonarqube-on-ubuntu-20-04/>

<https://www.vultr.com/docs/how-to-install-sonarqube-on-ubuntu-16-04>

Perform a system update

**$ sudo apt-get update**

**$ sudo apt-get -y upgrade**

Install and configure PostgreSQL

Install the PostgreSQL repository (**Research if these URL not working**)

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

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

Install the PostgreSQL database server by running:

**$ sudo apt-get -y install postgresql postgresql-contrib**

Start PostgreSQL server and enable it to start automatically at boot time by running:

**$ sudo systemctl start postgresql**

**$ sudo systemctl enable postgresql**

Change the password for the default PostgreSQL user

**$ sudo passwd postgres**

Set password of postgres as **gbcdevops**

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 'DevOps@gbc.ca';**

Create a new database for PostgreSQL database by running:

**$ CREATE DATABASE sonar OWNER sonar;**

Exit from the psql shell:

**\q**

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

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**\*\*\*\* Installing SonarQube \*\*\*\*\*\***

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**Download and configure SonarQube**

Download the SonarQube installer files archive. (**Research if these URL not working**)

**$ sudo wget https://binaries.sonarsource.com/Distribution/sonarqube/sonarqube-6.4.zip**

You can always look for the link to the latest version of the application on the SonarQube download page

Install unzip by running:

**$ sudo apt-get -y install unzip**

Unzip the archive using the following command

**$ sudo unzip sonarqube-6.4.zip -d /opt**

Rename the directory:

**$ sudo mv /opt/sonarqube-6.4 /opt/sonarqube**

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 provide the PostgreSQL username and password of the database that we have created earlier. It should look like:**

*sonar.jdbc.username=****sonar***

*sonar.jdbc.password=***DevOps@gbc.ca**

**Next, find:**

*#sonar.jdbc.url=jdbc:postgresql://localhost/sonar*

Uncomment the line, save the file and exit from the editor.

**Configure Systemd service**

SonarQube can be started directly using the startup script provided in the installer package. As a matter of convenience, you should setup a Systemd unit file for SonarQube.

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

Populate the file with:

*[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=root*

*Group=root*

*Restart=always*

*[Install]*

*WantedBy=multi-user.target*

Text

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Start the application by running:

**$ sudo systemctl start sonar**

Enable the SonarQube service to automatically start at boot time.

**$ sudo systemctl enable sonar**

To check if the service is running, run:

**$ sudo systemctl status sonar**

SonarQube is installed on your server, access the dashboard at the following address

**http://<ip address>:9000**

Log in using the initial administrator account, **admin** and **admin**. You can now use SonarQube to continuously analyze the code you have written.

**Submission**

* Upload Doc file containing URL of your SonarQube and Jenkins server which you installed on EC2 Ubuntu instance.
* Also put all your screenshots of commands on terminal as a proof of your work.