GCPS Bus Capstone

Virtual Machine Setup

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I. SERVER LOGIN

How to login to the project server:

1. If Kennesaw State's VPN is not installed follow these instructions:

    a. Instructions can be found here: https://uits.kennesaw.edu/vpn/index.php

2. If windows Linux subsystem(WSL) is not installed follow these instructions:

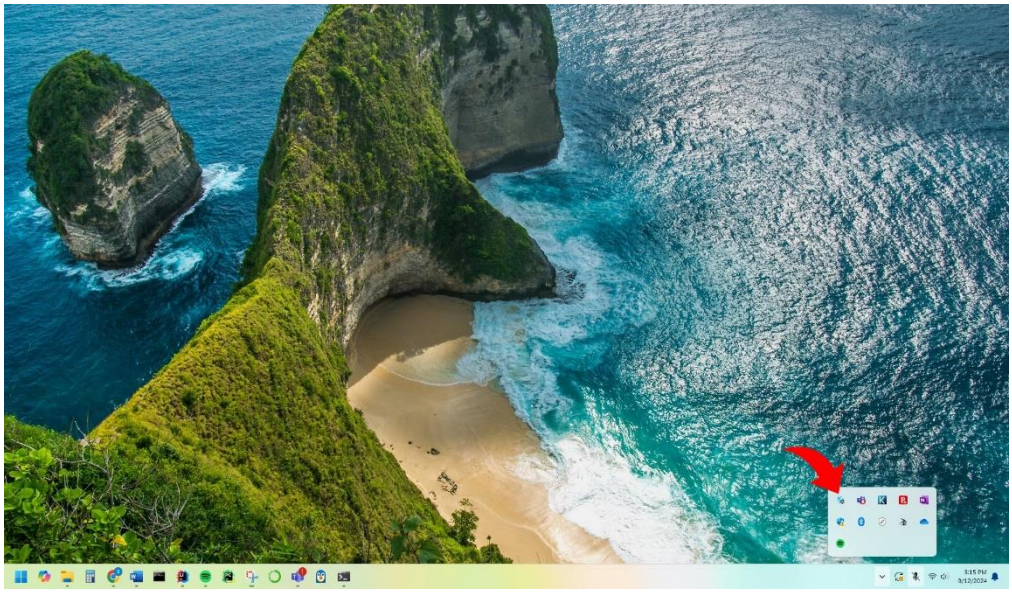
    a. Instructions can be found here: https://techcommunity.microsoft.com/t5/windows-11/how-to-install-the-linux-windows-subsystem-in-windows-11/m-p/2701207/page/3

    b. It is suggested to upgrade to WSL2 using the following instructions: https://learn.microsoft.com/en-us/windows/wsl/install

        i. Scroll down to the section titled Upgraded version from WSL 1 to WSL 2: https://learn.microsoft.com/en-us/windows/wsl/install#upgrade-version-from-wsl-1-to-wsl-2

        ii. It is recommended to pin the WSL to the start or task bar.

3. You must be logged into the KSU VPN and in the Portal: vpn.kennesaw.edu to successful execute the following steps (the world must be colored and not in grayscale):



a. Open the WSL and type the following command lines to access the server provided by the school:

ssh *[username]@[ip address]*

b. The user will be prompted to enter a password.

c. Congratulations, you are logged in.

II. LINUX GROUPS AND USERS

In Linux a group is an assembly of users. An administrator might want to create a group in Linux to simplify what users have access to specific files. Groups can be created from the root folder or users that have superuser do (**sudo**) access.

A. How to Create a Group

*$ **sudo** groupadd [group name]*

-- Or for more control to set the group ID(GID)--

*$ **sudo** groupadd -g [GID 1000-60000] [group name]*

B. How to Create a User

*$ **sudo** useradd {options} [username]*

--Example of an {option}: adding a custom user ID(UID)--

*$ **sudo** useradd -u [UID 1000-60000] [username]*

--Or to add a String to identify the user like their name--

*$ **sudo** useradd -c "[String]" [username]*

C. How to Add a Password to a User

*$ **sudo** passwd [username]*

D. How to Add a User a Group

*$ **sudo** usermod --append --groups [group name] [username]*

To find additional information and documentation you can follow the following links:

- Red Hat Documentation: Chapter 9 – Managing users and groups
- Users, Groups, UIDs and GIDs on systemd Systems
- How to create, delete, and modify groups in Linux
- Exploring the differences between sudo and su commands in Linux

III. SOFTWARE PACKAGE INSTALLATIONS

A. How to Upgrade Packages

--Upgrade All packages--

*$ **sudo** dnf upgrade*

--Upgrade a Single Package--

*$ **sudo** dnf upgrade [package name]*

--Upgrade a Specific Package Group--

*$ **sudo** dnf upgrade [group name]*

B. How to Install Python 3

Select one of the following Python versions:

--Install Python 3.9--

*$ **sudo** dnf install python3*

--Install Python 3.11--

*$ **sudo** dnf install python3.11*

--Install Python 3.12--

*$ **sudo** dnf install python3.12*

1. Python Packages to Install

--Install Python Request Modules--

*$ **sudo** dnf install python3-requests*

--Install Python3 package manager(pip)--

*$ **sudo** dnf install python3-pip*

--Install Python3.11 package manager(pip)--

*$ **sudo** dnf install python3.11-pip*

--Install Python3.12 package manager(pip)--

*$ **sudo** dnf install python3.12-pip*

--Install Additional Python3Developer tools—

Enable the following subscription manager code before the following code

*$ **sudo** subscription-manager repos --enable codeready-builder-for-rhel-9-x86_64-rpms*

Then install the following development tools for python:

- ☐ *$ **sudo** dnf install python3*-idle*
- ☐ *$ **sudo** dnf install python3*-debug*
- ☐ *$ **sudo** dnf install python3*-Cython*
- ☐ *$ **sudo** dnf install python3.11-pytest*
- ☐ *$ **sudo** dnf install python3.12-pytest*
- ☐ *$ **sudo** dnf install python3.12-pytest*
- ☐ *$ **sudo** pip3 install Flask*

C. How to Install Java

Select one of the following OpenJDKs versions:

--Install OpenJDK11--

*$ **sudo** dnf install java-11-openjdk*

--Install OpenJDK17--

*$ **sudo** dnf install java-17-openjdk*

--Install OpenJDK8--

*$ **sudo** dnf install java-1.8.0-openjdk*

D. How to Install Podman

*$ **sudo** dnf install podman*

E. How to Install Zookeeper

Complete the following steps in order to install zookeeper

(1) Install the Extra Packages for Enterprise Linux (EPEL) repository onto the system

*$ **sudo** dnf install https://dl.fedoraproject.org/pub/epel/epel-release-latest-9.noarch.rpm*
*$ **sudo** dnf upgrade*

(2) Add the following extra repositories

*$ **sudo** subscription-manager repos --enable "rhel-*-optional-rpms" --enable "rhel-*-extras-rpms"*
*$ **sudo** dnf update*

(3) Install Snap

*$ **sudo** dnf install snapd*

(4) Enable the systemd unit that manages the main snap communication socket

*$ **sudo** dnf systemctl enable --now snapd.socket*

(5) Enable the classic Snap support

*$ **sudo** ln -s /var/lib/snapd/snap /snap*

(6) Install Zookeeper

*$ **sudo** snap install zookeeper*

F. How to install Apache Kafka

Complete the following steps in order to install Apache Kafka

(1) Download the file

*$ **sudo** wget https://dlcdn.apache.org/kafka/3.8.0/kafka_2.13-3.8.0.tgz*

Back site to download from if the above does not work:

*$ **sudo** wget https://dlcdn.apache.org/kafka/3.8.0/kafka_2.13-3.8.0.tgz*

(2) Extract the file

$ tar -xzf kafka_2.13-3.8.0.tgz

(3) Kafka can now be found in the following directory kafka_2.13-3.8.0
To get to the directory type:

$ cd kafka_2.13-3.8.0

G. How to Install MySQL

Complete the following steps in order to install MySQL

(1) Install MySQL
(2) Start the MySQL service
(3) Enable the MySQL service to start at boot
(4) Improve Security of your MySQL server

The Following Settings:

- Would you like to setup VALIDATE PASSWORD component? **NO**
- New password: **[choose a password]**
- Remove anonymous users : **YES**
- Disallow root login remotely : **NO**
- Remove test database and access to it : **NO**
- Reload privilege tables now? **Yes**

H. How to Install Lynx web browser

Lynx is a text web browser. The contents will be shown on the terminal.

--Install Lynx--

*$ **sudo** dnf install lynx*

--Run Lynx--

lynx [desired url]

To find additional information and documentation you can follow the following links:

- Red Hat Documentation: Chapter 2 – Installing and using Python
- Red Hat Documentation: Installing and using Red Hat build of OpenJDK11 on RHEL
- Red Hat Customer Portal: How do I install podman in RHEL 8 or 9
- Canonical Snapcraft: Install Zookeeper on Red Hat Enterprise Linux
- Apache Software Foundation: Apache Kafka Download Link and Integrity Verification
- Apache Software Foundation: Apache Kafka QuickStart
- Red Hat Documentation: Chapter 3.2 – Installing MySQL
- Lynx: User Guide