**GCPS Bus Capstone**

**Virtual Machine Setup**

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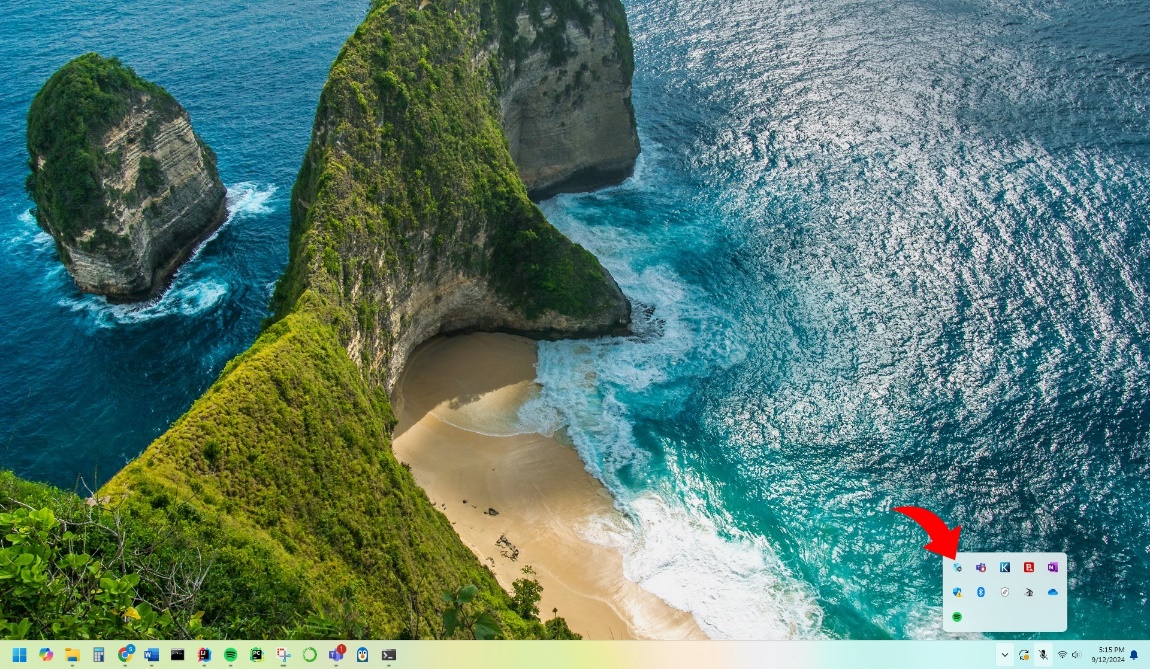
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# **Server Login**

## How to login to the project server:

1. If Kennesaw State’s VPN is not installed follow these instructions:
   1. Instructions can be found here: [**https://uits.kennesaw.edu/vpn/index.php**](https://uits.kennesaw.edu/vpn/index.php)
2. If *Windows Linux subsystem* (WSL) is not installed follow these instructions:
   1. 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>**
   2. It is suggested to upgrade to WSL2 using the following instructions (This should be set as default when installing for the first time): [**https://learn.microsoft.com/en-us/windows/wsl/install**](https://learn.microsoft.com/en-us/windows/wsl/install)
      1. 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**](https://learn.microsoft.com/en-us/windows/wsl/install%23upgrade-version-from-wsl-1-to-wsl-2)
      2. Note: 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):**



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

ssh *[username]*@*[ip address]*

* 1. The user will be prompted to enter a password.
  2. **Congratulations!** You are logged in.

# **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.*

## 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]*

## 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]*

## How to Add a Password to a User

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

## 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](https://docs.redhat.com/en/documentation/red_hat_enterprise_linux/9/html/configuring_basic_system_settings/managing-users-and-groups_configuring-basic-system-settings#resetting-the-forgotten-root-password-on-boot_changing-and-resetting-the-root-password-from-the-command-line)
* [Users, Groups, UIDs and GIDs on systemd Systems](https://systemd.io/UIDS-GIDS/)
* [How to create, delete, and modify groups in Linux](https://www.redhat.com/sysadmin/linux-groups#:~:text=Groups%20are%20an%20essential%20part,file%20access%20on%20your%20system.&text=In%20Linux%2C%20groups%20are%20collections,is%20the%20user's%20primary%20group.)
* [Exploring the differences between sudo and su commands in Linux](https://www.redhat.com/sysadmin/difference-between-sudo-su#:~:text=sudo%20%2C%20which%20is%20an%20acronym,root%20or%20as%20another%20user.)

# **Software Package Installations**

## 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]*

## 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*

## 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*** *pip3 install Flask*

## 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*

## How to Install Podman

*$* ***sudo*** *dnf install podman*

## How to Install Zookeeper

**Complete the following steps 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*](https://dl.fedoraproject.org/pub/epel/epel-release-latest-9.noarch.rpm)

*$* ***sudo*** *dnf upgrade*

* + 1. Add the following extra repositories

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

*$* ***sudo*** *dnf update*

* + 1. Install **Snap**

*$* ***sudo*** *dnf install snapd*

* + 1. Enable the systemd unit that manages the main snap communication socket

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

* + 1. Enable the classic Snap support

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

* + 1. Install **Zookeeper**

*$* ***sudo*** *snap install zookeeper*

## 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*](https://dlcdn.apache.org/kafka/3.8.0/kafka_2.13-3.8.0.tgz)

1. Extract the file

*$ tar -xzf kafka\_2.13-3.8.0.tgz*

1. Kafka can now be found in the following directory kafka\_2.13-3.8.0
   1. To get to the directory type:

*$ cd kafka\_2.13-3.8.0*

## 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**

## 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]*

# Additional Resources

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

* + [Red Hat Documentation: Chapter 2 – Installing and using Python](https://docs.redhat.com/en/documentation/red_hat_enterprise_linux/9/html/installing_and_using_dynamic_programming_languages/assembly_installing-and-using-python_installing-and-using-dynamic-programming-languages#assembly_installing-and-using-python_installing-and-using-dynamic-programming-languages)
  + [Red Hat Documentation: Installing and using Red Hat build of OpenJDK11 on RHEL](https://docs.redhat.com/en/documentation/red_hat_build_of_openjdk/11/html-single/installing_and_using_red_hat_build_of_openjdk_11_on_rhel/index#installing-openjdk11-on-rhel8)
  + [Red Hat Customer Portal: How do I install podman in RHEL 8 or 9](https://access.redhat.com/solutions/3650231)
  + [Canonical Snapcraft: Install Zookeeper on Red Hat Enterprise Linux](https://snapcraft.io/install/zookeeper/rhel)
  + [Apache Software Foundation: Apache Kafka Download Link and Integrity Verification](https://www.apache.org/dyn/closer.cgi?path=/kafka/3.8.0/kafka_2.13-3.8.0.tgz)
  + [Apache Software Foundation: Apache Kafka QuickStart](https://kafka.apache.org/quickstart)
  + [Red Hat Documentation: Chapter 3.2 – Installing MySQL](https://docs.redhat.com/fr/documentation/red_hat_enterprise_linux/9/html/configuring_and_using_database_servers/installing-mysql_assembly_using-mysql)
  + [Lynx: User Guide](https://lynx.invisible-island.net/lynx_help/Lynx_users_guide.html)