

Lab – Install Linux in a Virtual Machine and Explore the GUI

Group 5 – CSAT Instructor: Engr. Jimlord Quejado

Objectives

Part 1: Prepare a Computer for Virtualization

Part 2: Install a Linux OS on the Virtual Machine Part

3: Explore the GUI

Background / Scenario

Computing power and resources have increased tremendously over the last 10 years. A benefit of multi-core processors and large amounts of RAM is the ability to install multiple operating systems through the use of virtualization on a computer.

With virtualization, one or more virtual computers can operate inside one physical computer. Virtual computers that run within physical computers are called virtual machines. Virtual machines are often called guests, and physical computers are often called hosts. Anyone with a modern computer and operating system can run virtual machines.

In this lab, you will install a Linux OS in a virtual machine using a desktop virtualization application, such as VirtualBox. After completing the installation, you will explore the GUI interface. You will also explore the command line interface using this virtual machine in a lab later in this course.

Required Resources

- Computer with a minimum of 2 GB of RAM and 10 GB of free disk space
- High-speed Internet access to download Oracle VirtualBox and Linux OS image, such as Ubuntu Desktop

Instructions

Part 1: Prepare a Computer for Virtualization

In Part 1, you will download and install desktop virtualization software and a Linux OS image. Your instructor may provide you with a Linux OS image.

Step 1: Download and install VirtualBox.

VMware Player and Oracle VirtualBox are two virtualization programs that you can download and install to support the OS image file. In this lab, you will use the VirtualBox application.

- Navigate to <https://www.virtualbox.org/>. Click the download link on this page.
- Choose and download the appropriate installation file based on your operating system.

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- c. After the VirtualBox installation file is downloaded, run the installer and accept the default installation settings. When prompted regarding missing dependencies python code / win32 api, click **Yes** to proceed.

Step 2: Download a Linux Image.

- a. Navigate to the Ubuntu website at <http://www.ubuntu.com>. Click the **Download** menu.
- b. Click the Download link on this page to download and save an Ubuntu Desktop image.

Step 3: Create a New Virtual Machine.

- a. If you did not choose to open VirtualBox after your installation, click **Start** and search for **VirtualBox**. Click **Oracle VM VirtualBox** to open the manager. When the manager opens, click **New** to start the Ubuntu installation.
- b. In the **Virtual machine Name and Operating System** screen, type **Ubuntu** in the **Name** field.
Review the location of the **Folder** field. This will be the location of the virtual hard drive for this virtual machine.
In the **ISO Image** field, click the dropdown and locate the downloaded Ubuntu Desktop image. Notice that the Type and Version fields are automatically filled in and grey out.
Click the checkbox **Skip Unattended Installation** to install the guest OS manually.
Click **Next** to continue.
- c. In the **Hardware** screen, increase the amount of RAM or number of CPUs as desired. Make sure the selection stays in the green area so it does not adversely affect the performance of the host. You should not need more than 4096 MB of RAM or more than 1 CPU for this lab. You can always adjust it later. Click **Next** to continue.
- d. In the **Virtual Hard disk** screen, click **Next** to accept the option to create a virtual hard disk now with the suggested size. Change as desired. The default storage settings for the hard drive is dynamically allocated. Click **Next** to continue.
- e. Review the setting in the summary page. Click **Finish** when done.
- f. When the hard drive creation is done, the new virtual machine is listed in the **Oracle VM VirtualBox Manager** window. Select **Ubuntu** and click **Start** in the top menu.

Part 2: Install Ubuntu on the Virtual Machine

- a. In the GNU GRUB screen, press **Enter** on the highlighted **Try or Install Ubuntu** to start the loading process. This can take several minutes.
- b. In the **Welcome** screen, you are prompted to try or install Ubuntu. The try option does not install the OS, it runs the OS straight from the image. In this lab, you will install the Ubuntu OS in this virtual machine. Click **Install Ubuntu**.
- c. Follow the on-screen instructions and provide the necessary information when prompted.
Note: If you are not connected to the internet, you can continue to install and enable the network later.
 - 1) Accept the defaults on the **Updates and other software** screen. You can also check **Install thirdparty software...** if you wish.
 - 2) Because this Ubuntu installation is in a virtual machine, it is safe to erase the disk and install Ubuntu without affecting the host computer. In the **Installation type** screen, select **Erase disk and install Ubuntu**. Otherwise installing Ubuntu on a physical computer would erase all data on the disk and replace the existing operating system with Ubuntu. Click **Install Now** to start the installation.
 - 3) In the **Write the changes to disks?** screen, click **Continue** to erase the disk and install Ubuntu.

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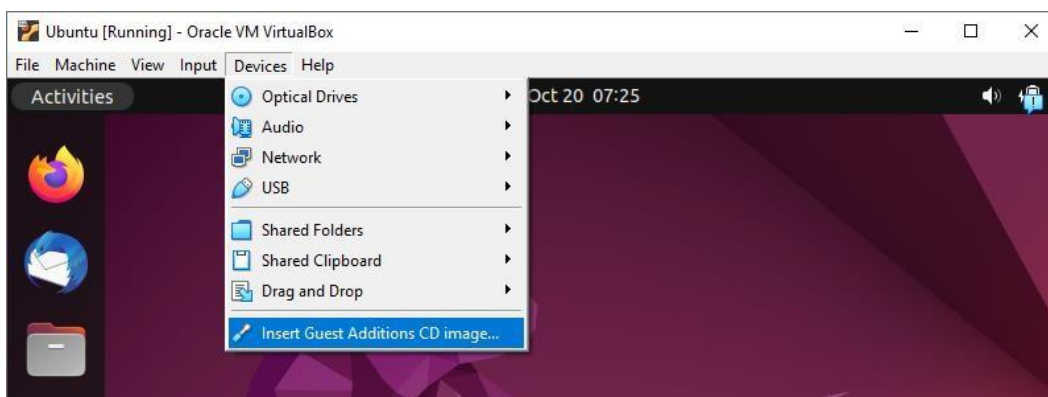
- 4) In the **Who are you?** screen, provide your name and choose a password. Use **iteuser** for **Your Name** and **ITEpass!** for the password. You can use the username generated or enter a different username. If desired, you can change the other settings. Click **Continue**.
- d. The Ubuntu OS is now installing in the virtual machine. This will take several minutes. When the **Installation is complete** message displays in Ubuntu, click **Restart Now** to restart the virtual machine. When prompted to remove the installation medium, press **Enter** to continue the booting process.

Part 3: Explore the GUI

In this part, you will install the VirtualBox guest additions and explore the Ubuntu GUI.

Step 1: Install Guest Additions.

- a. Log on to your Ubuntu virtual machine using the user credentials created in the previous part.
- b. Your Ubuntu Desktop window may be smaller than expected. This is especially true on high-resolution displays. Click **Device > Insert Guest Additions CD image...** to install the Guest Additions. This allows more functions, such as changing the screen resolution in the virtual machine.



- c. Click **Run** to install the additions. When prompted for a password, use the same password that you used to log on. Click **Authenticate** to continue.
- Note:** If you were not prompted to install the additions, you can access the Guest Additions CD image to install the guest additions.
- 1) In the list of **Activities** on the left, scroll down until you see the disk labeled **VBox_GAs_x** where **x** is the version number (e.g. **7.0.2**). Click the CD icon to open it.
 - 2) Right click **autorun.sh** and choose **Run as a Program**.
 - 3) When prompted for a password, use the same password that you used to log on. Click **Authenticate** to continue. Following the instructions on the screen to complete the installation.
- d. When the installation of the additions is done, restart the virtual machine again. Click the menu in the upper-right corner and click **Power Off / Log Out**. Click **Restart** to restart Ubuntu.

Step 2: Run applications.

In this step, you will open a couple of applications in the virtual machine.

Note: If the host computer is not connected to the internet, re-connect to the internet and verify that the virtual machine has access to the internet. If the network connection settings need to be changed, power off the virtual machine and click **Settings** in Oracle VM VirtualBox Manager > click **Network** to change the network settings.

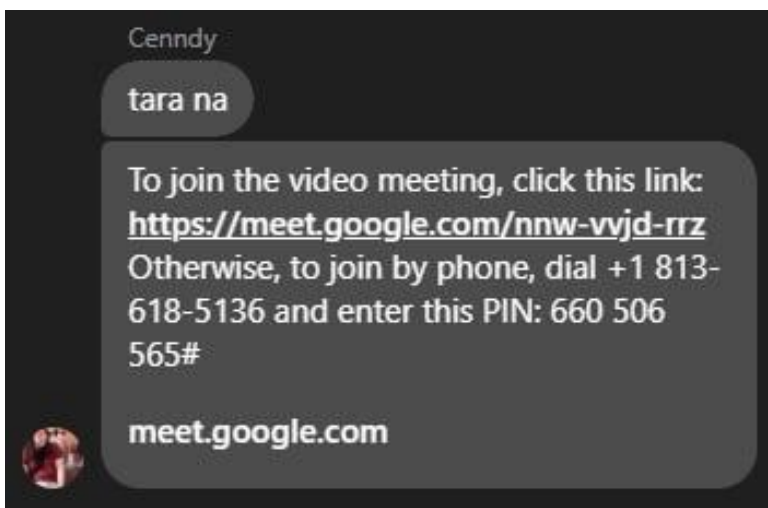
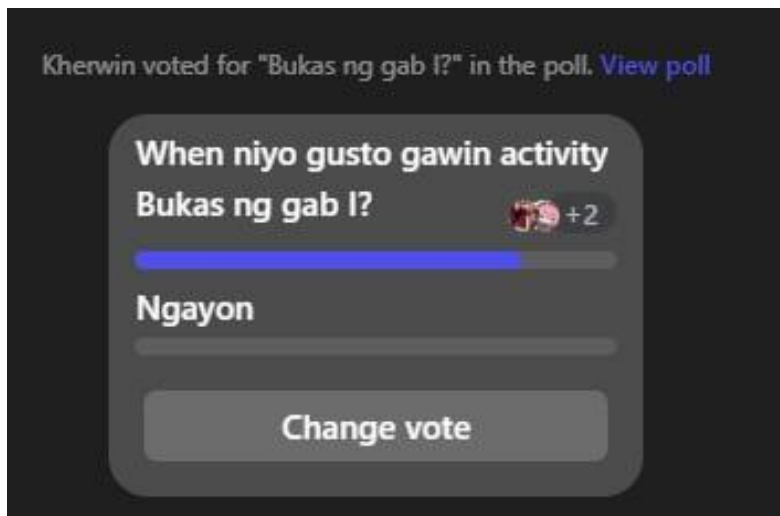
- a. Power on virtual machine as needed and log into Ubuntu again. After you are logged in again, you can resize the virtual machine window.

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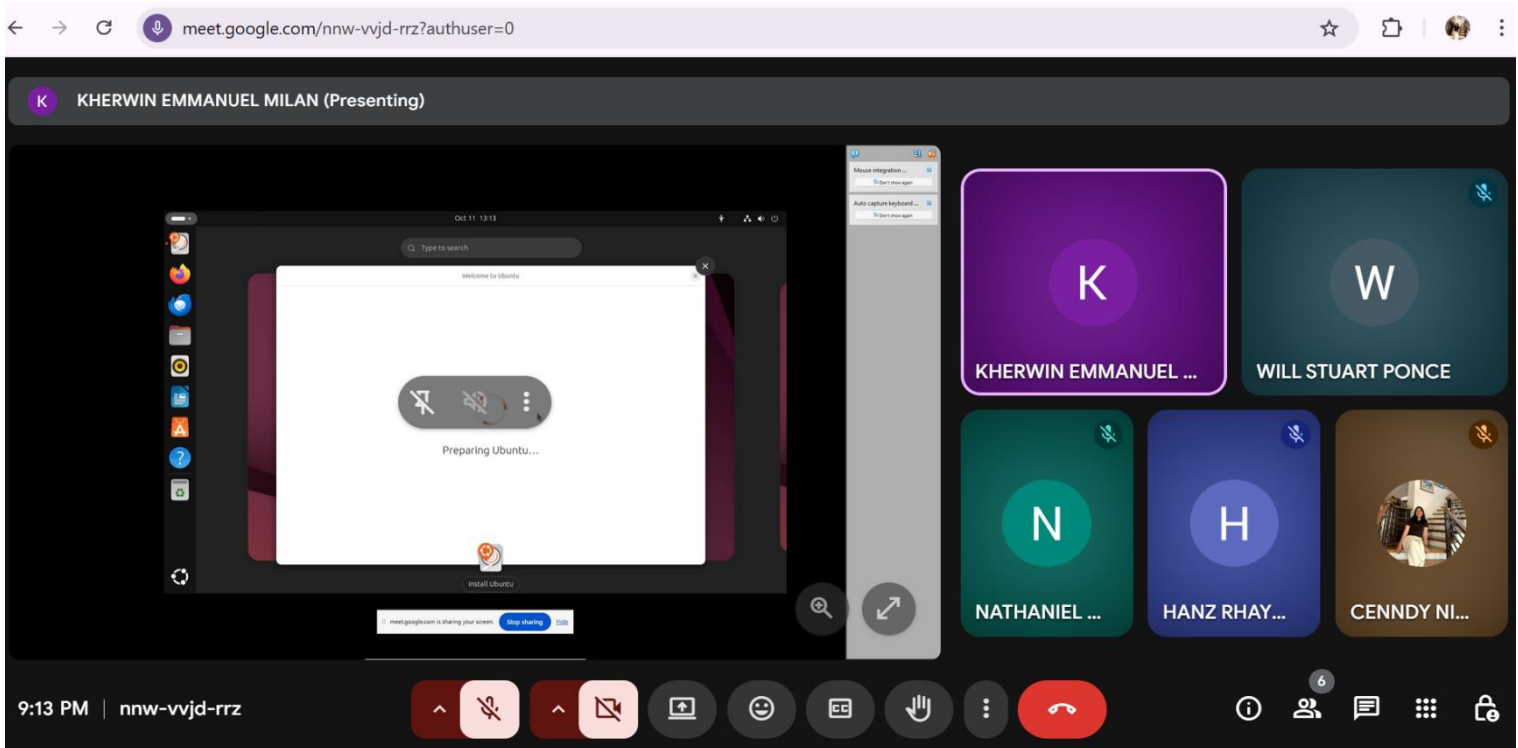
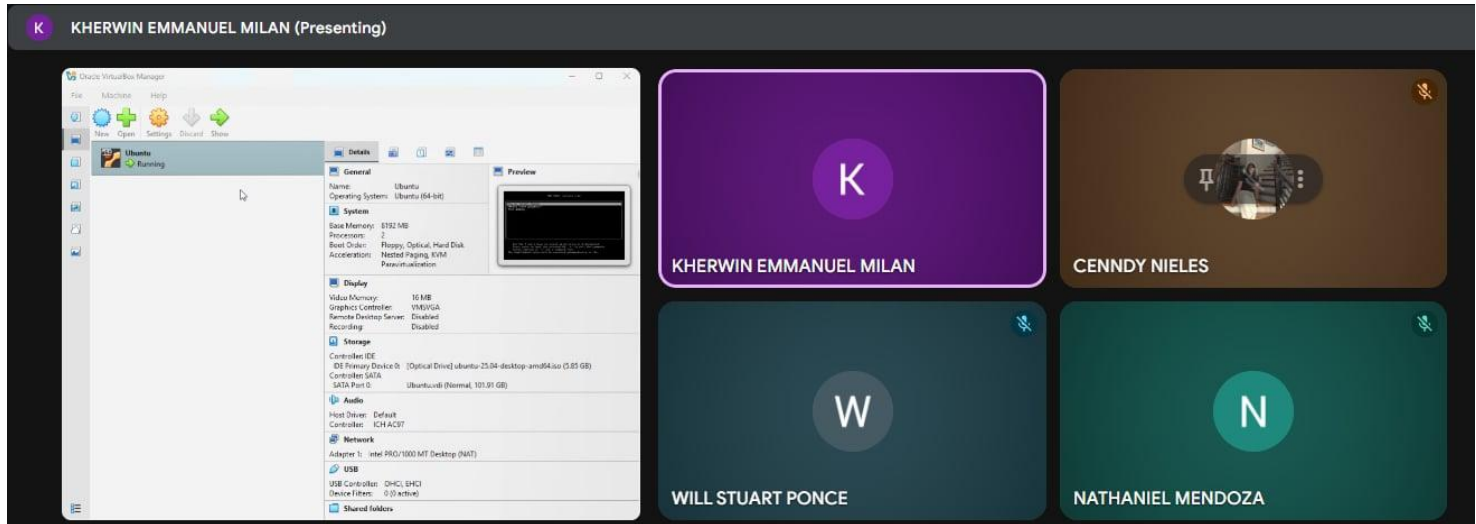
- b. Open a web browser. Depending on the Linux distribution, you may need to search for a web browser or there is a link to a web browser already on the Desktop. Navigate to a few websites if desired.
- c. Right click the Desktop and choose **Open in Terminal**. You will be using a terminal emulator in later labs.
- d. Explore the installed Linux distribution and locate a few applications that you may use.

Reflection Question

What are the advantages and disadvantages of using a virtual machine?



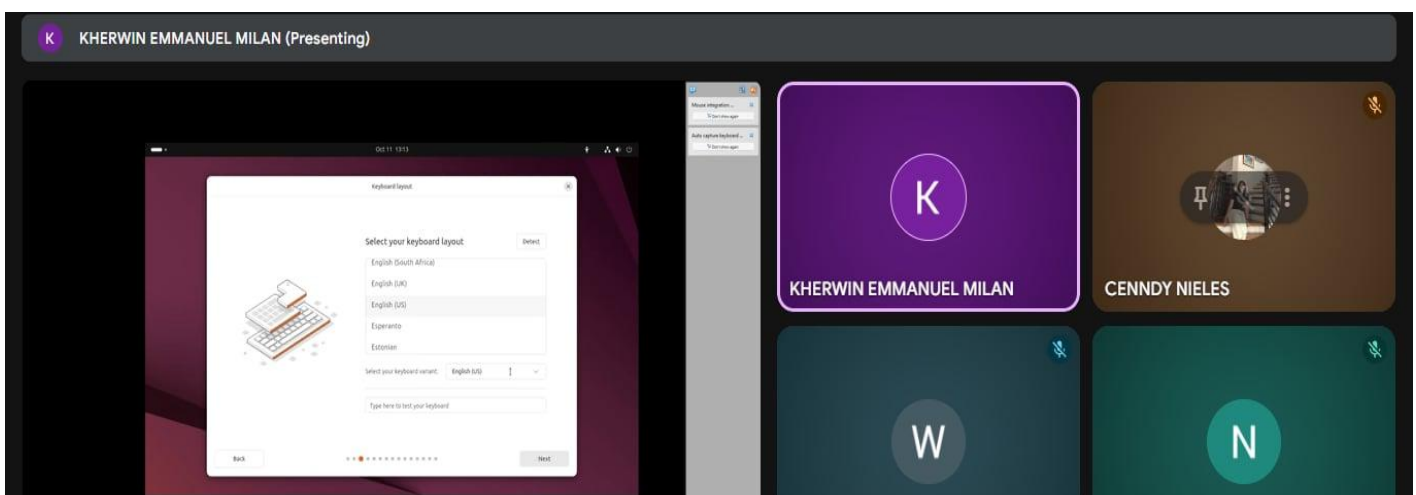
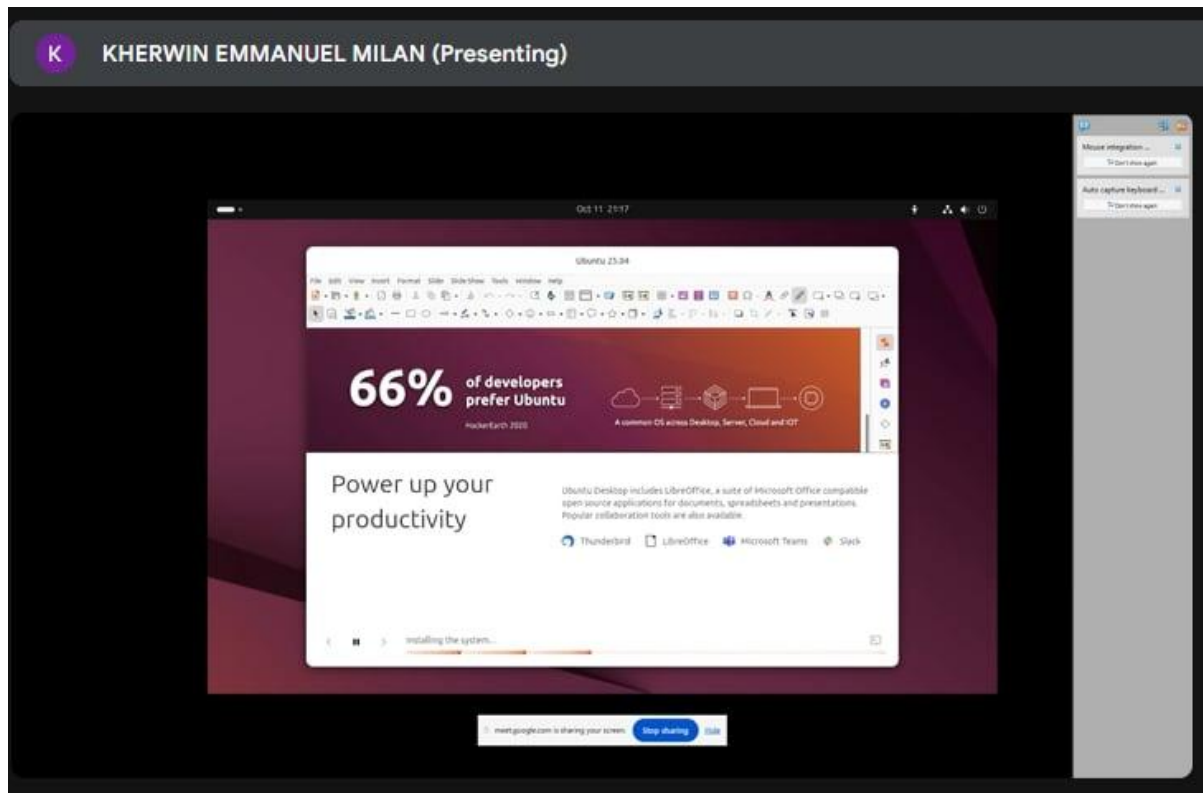
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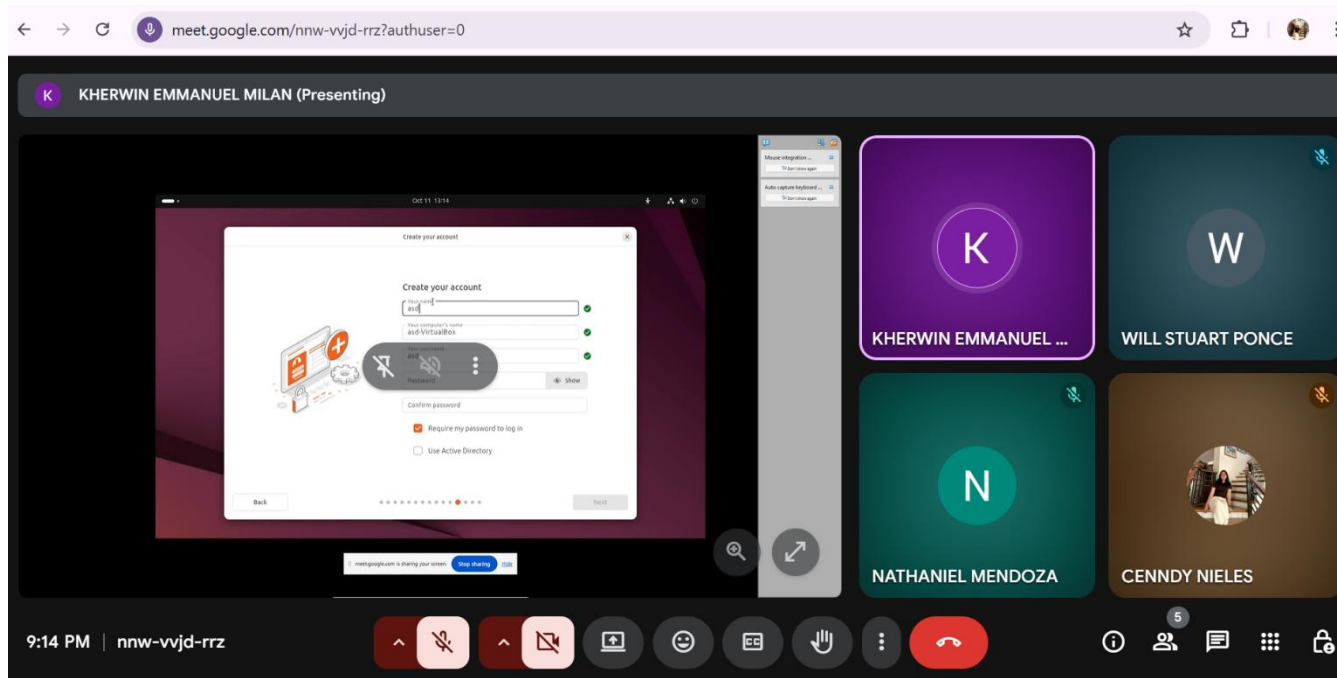
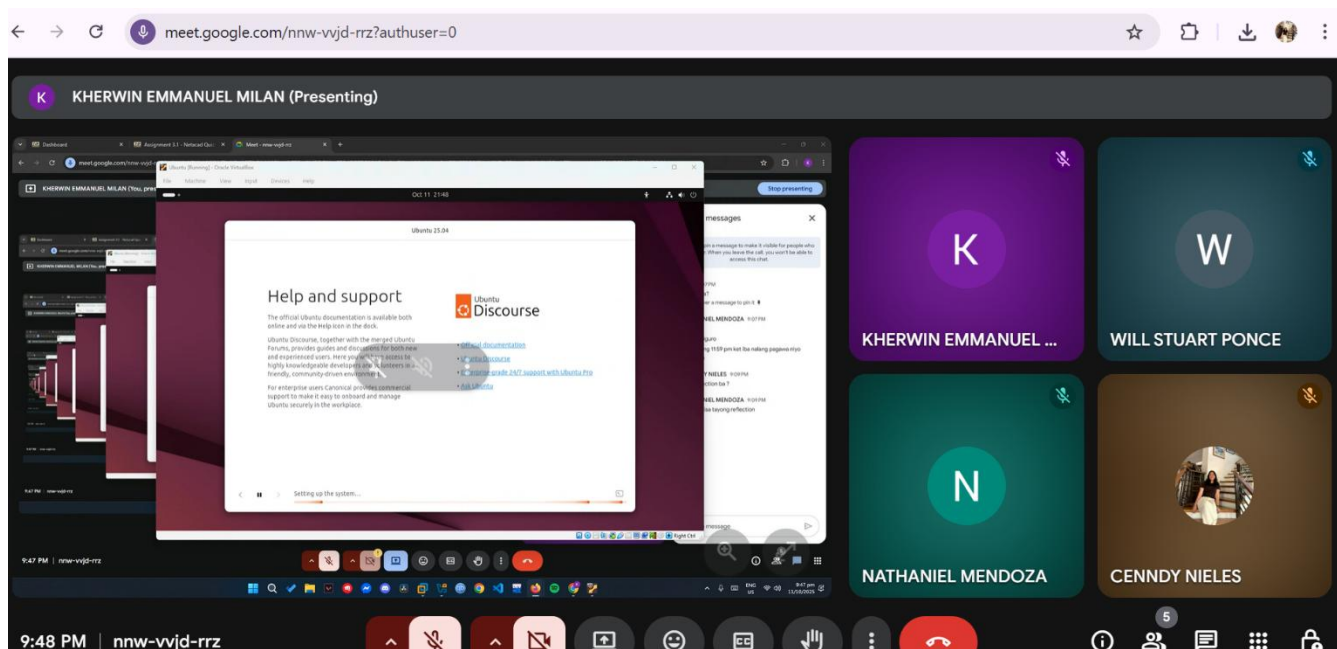
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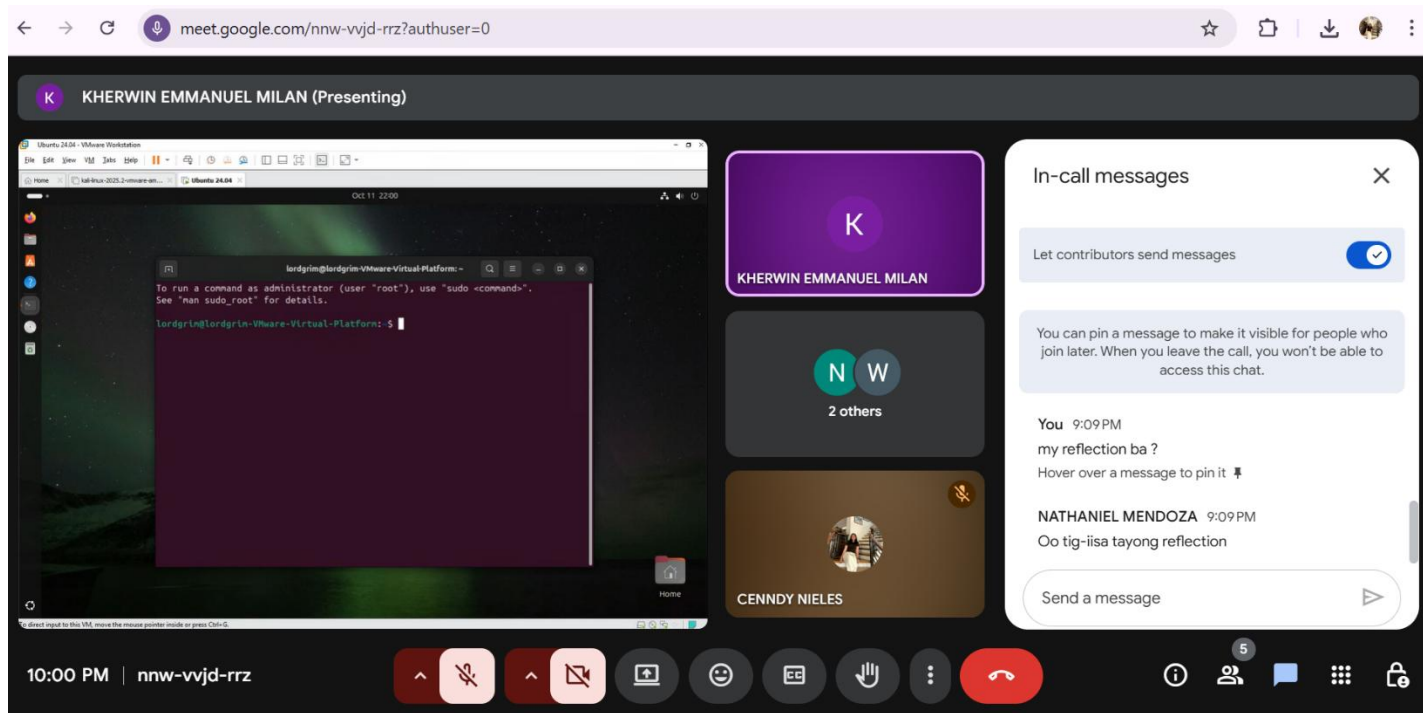
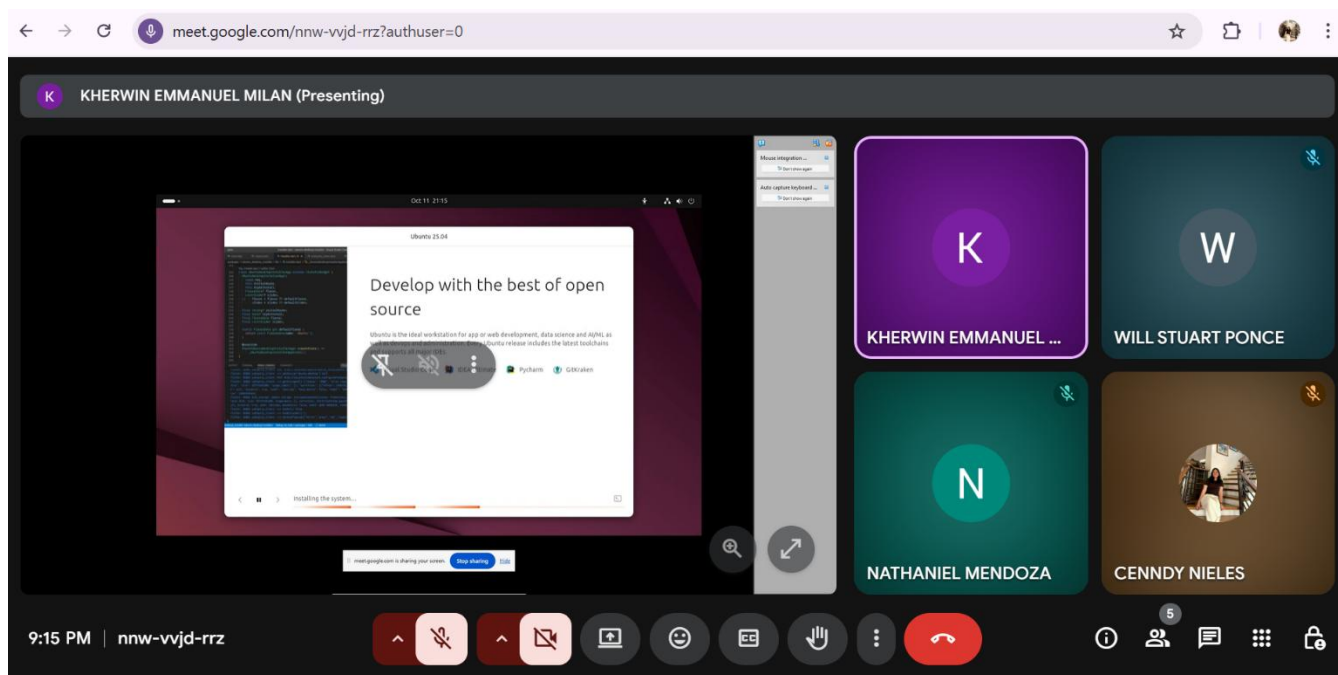
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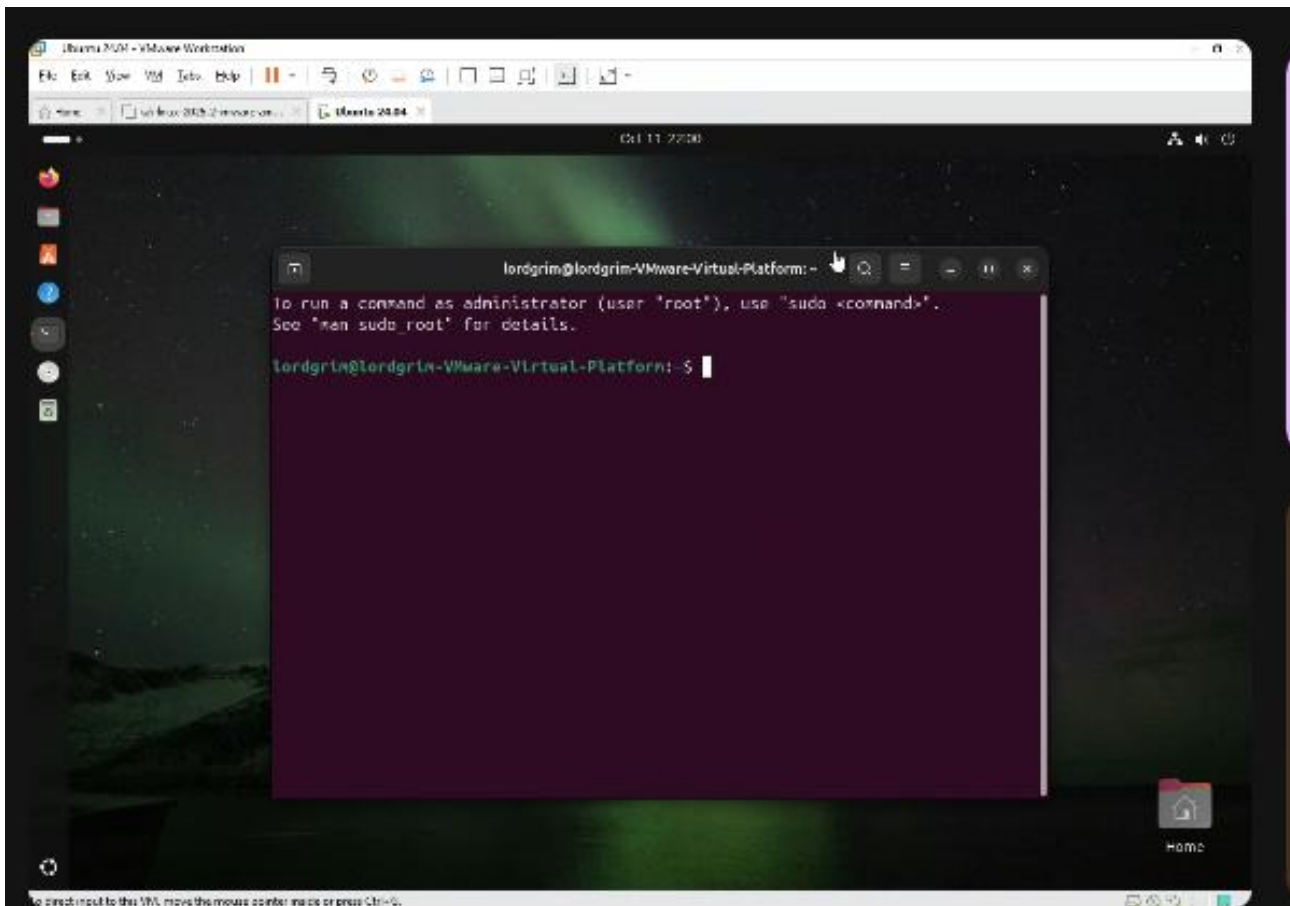
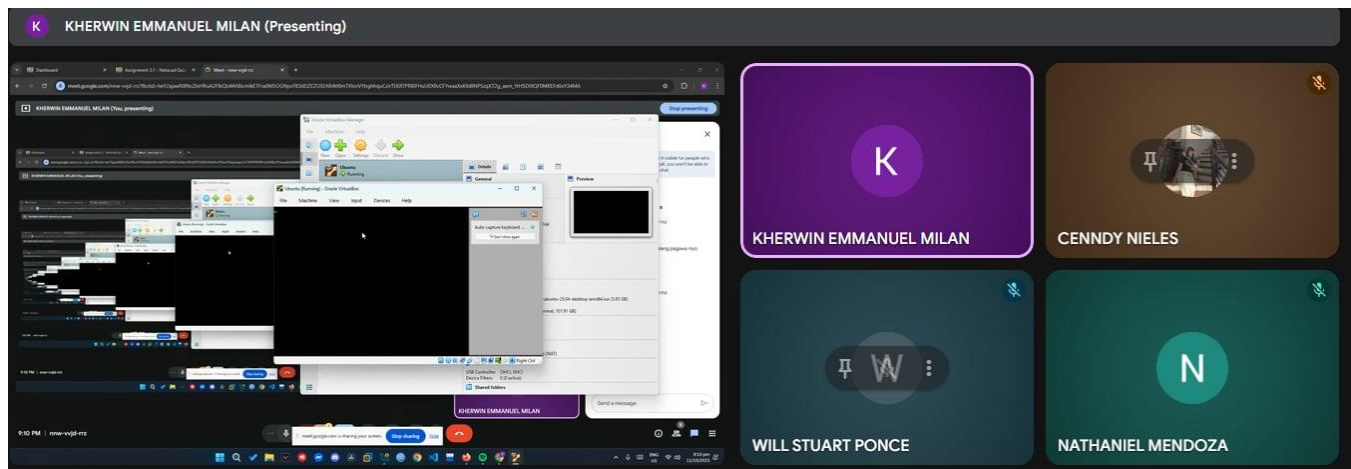
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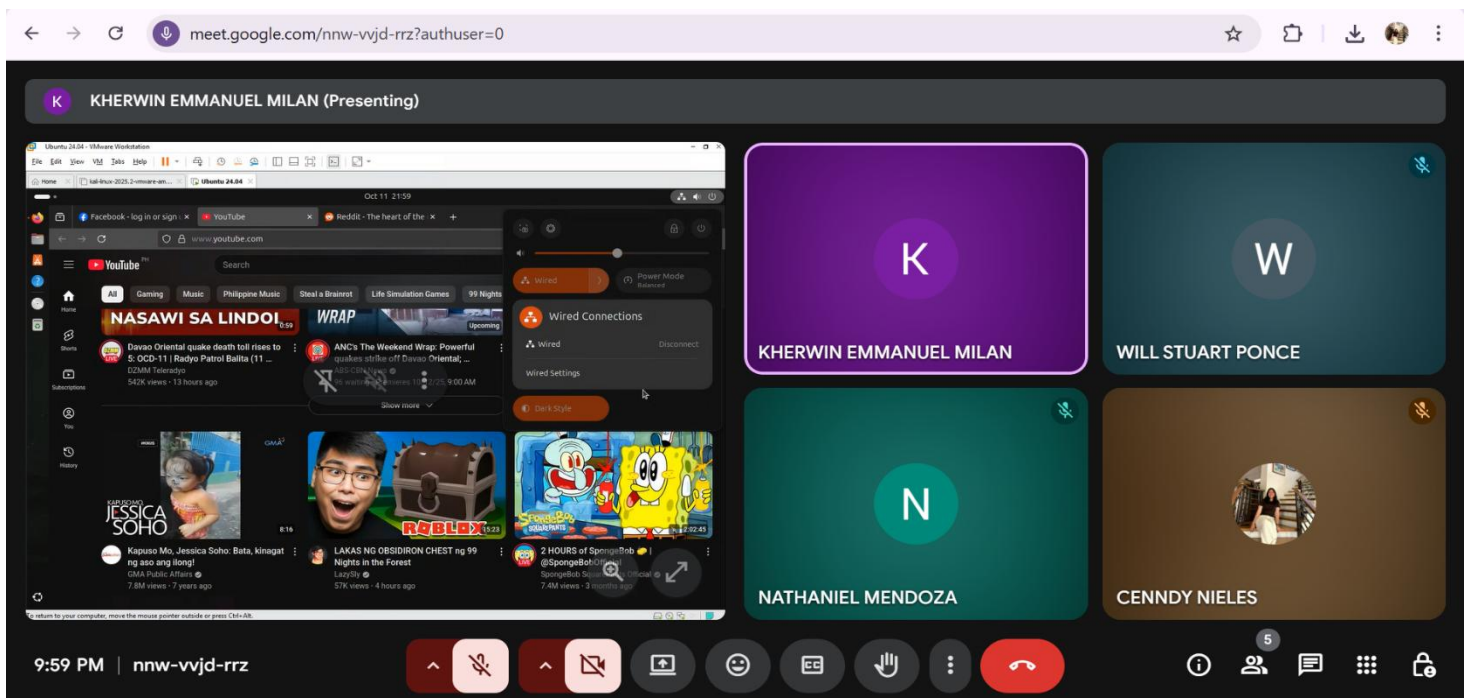
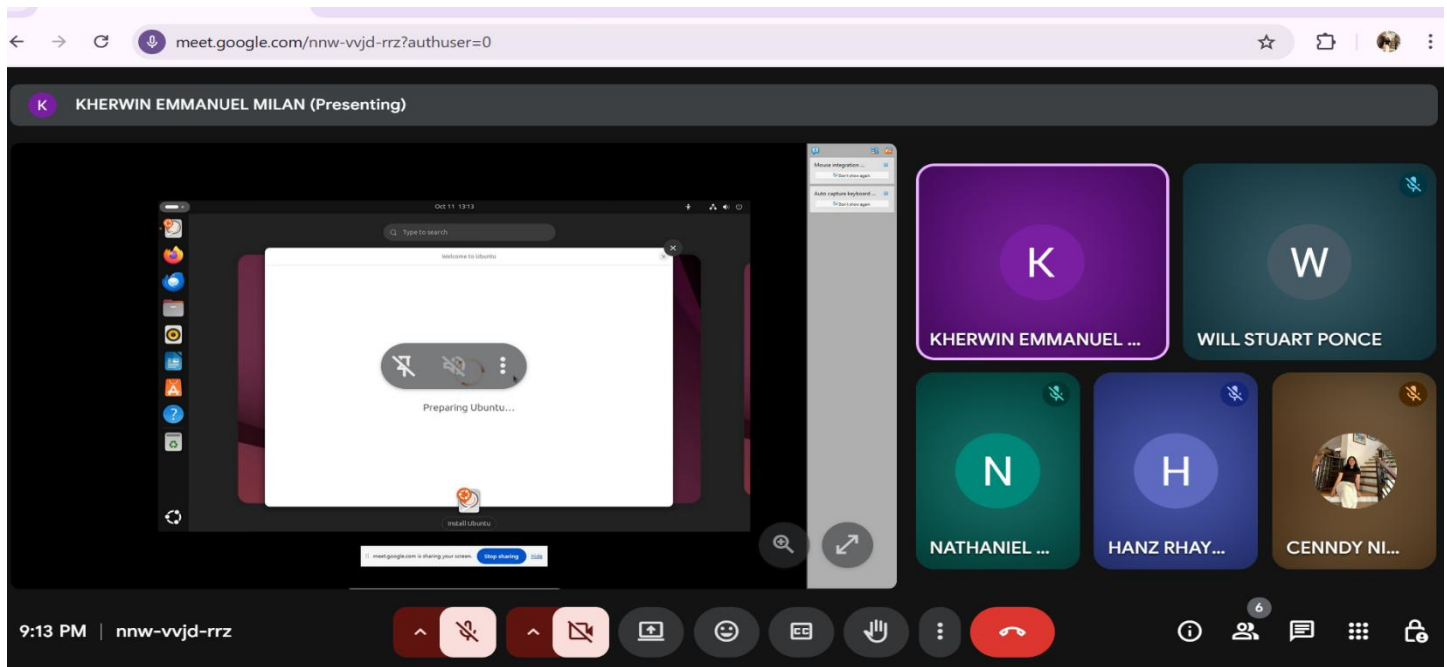
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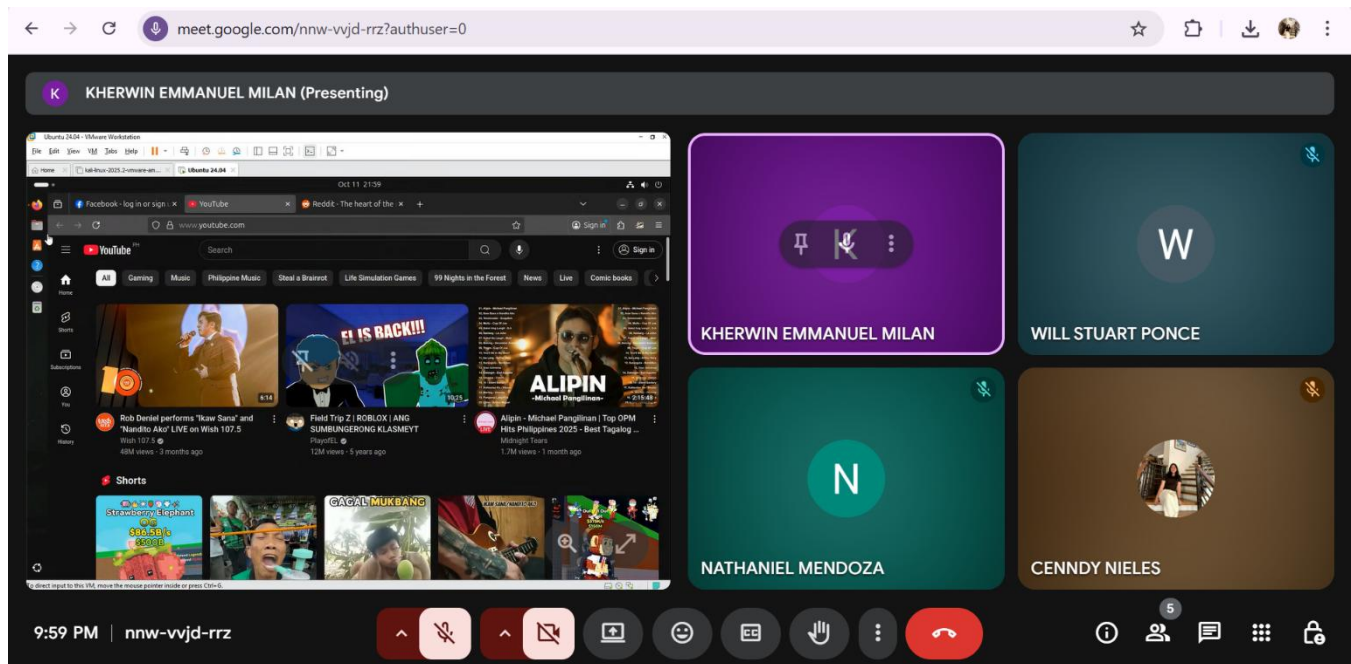
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Reflection:

Nat

After performing this activity, with the usage of Virtual Machines offers cost savings as it doesn't require the user to purchase such equipment to need to be utilized on performing the usage of hardware. Therefore these make thing such easier as it is more accessible and can has an ability to run on a single physical server, which is often underutilized in a traditional setup, leading to better use of hardware. Additionally for me as a Computer Engineering Student, I see as an opportunity to explore Virtual Machines to know them better as I can easily perform such creations where I can clone, move, and delete Virtual Machines, and quickly adjust some resources such as RAM and CPU power as needed without purchasing new hardware for testing and promoting improvements. But, the disadvantage of the usage of these Machines is that there is going to be less Hand-on activities or performance as you perform this on software in which you may lose some experiences specially in gaining knowledge and improving ones skills. And, what I found is that there are may be some older applications in which it is not really compatible to its environments.



Kherwin

There are pros and cons to using a virtual machine. I think one of the main advantages is the ability to run different operating systems on one computer. This is useful if you want to test, learn, or experiment on your own, without committing changes to your real machine. It's also safe, as any problems occurring inside the virtual machine will not affect your real machine. One of the downsides is that virtual machines are pretty slow, especially if your own computer does not have enough memory or power to run a virtual machine. They also take up a significant amount of the memory of your computer. Virtual machines are a great learning and practice tool, but you often need a powerful computer to successfully run them.

Using a Virtual Machine (VM) offers a powerful combination of advantages and disadvantages. On the positive side, VMs provide excellent resource efficiency and cost savings because they allow you to run multiple operating systems and applications on a single physical server, maximizing hardware utilization and reducing the need for numerous physical machines, which lowers energy and maintenance costs. They are highly beneficial for security and isolation, as each VM is isolated, creating a "sandbox" environment perfect for safely testing new or suspicious software without risking the host system. VMs do have some serious disadvantages, though. Performance overhead is the primary issue because the virtualization layer (hypervisor) introduces complexity, making the virtual machine (VM) less suitable for demanding tasks like high-end gaming. They also have a higher resource consumption rate; resource contention can occur when too many virtual machines are running, rapidly taxing the host computer's available CPU, RAM, and storage.

Will Stuart

Virtual machines have various good effects. Different operating systems can be run on one physical server, which results in cutting down hardware costs and increasing the efficiency of resources. Besides, such an architecture ensures safety because of separation and thus, VMs can be used for software testing or different services running in isolated environments. Nevertheless, due to the fact that the hypervisor layer takes up system resources, there is a certain performance overhead which means that application execution speed may be lower than that of a dedicated hardware one



Hanz

Using a virtual machine has its own set of pros and cons. One main advantage is that it allows me to run Linux or other operating systems without affecting my main computer. It provides a secure and easy way to explore and experiment with different systems, which is especially helpful for learning and practice. I can install, test, or even make mistakes without worrying about damaging my actual device. However, virtual machines can sometimes be slow, particularly when my computer doesn't have enough RAM or storage. They also use a lot of system resources, which can make multitasking difficult. In the end, even though a virtual machine requires patience and good hardware to run smoothly, it helped me better understand how operating systems work.



Mendoza, Nathaniel

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Milan, Kherwin

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Pabalan, Hanz

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Ponce, Will Stuart

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