

# ***Smart Mobility Engineering Lab*** ***(IGS3231)***

**Jump Together, Fly Farther!**



인하대학교 국제학부


***Week 3***

**ISE Department**  
**Prof. Mehdi Pirahandeh**

- **ROS2 VMWare Workstation Player Setup**
- **Configuring Ubuntu Virtual Machine**
- **ROS 2 Installation**
- **Activity Session ( OS & ROS 2 Test)**

# Introduction to Course

🏠 ROS 2 Documentation: Foxy



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🏠 » ROS 2 Documentation

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You're reading the documentation for an older, but still supported, version of ROS 2. For information on the latest version, please have a look at [Humble](#).

## ROS 2 Documentation

The Robot Operating System (ROS) is a set of software libraries and tools for building robot applications. From drivers and state-of-the-art algorithms to powerful developer tools, ROS has the open source tools you need for your next robotics project.

Since ROS was started in 2007, a lot has changed in the robotics and ROS community. The goal of the ROS 2 project is to adapt to these changes, leveraging what is great about ROS 1 and improving what isn't.

This site contains the documentation for ROS 2. If you are looking for ROS 1 documentation, check out the [ROS wiki](#).

If you use ROS 2 in your work, please see [Citations](#) to cite ROS 2.

## Getting started

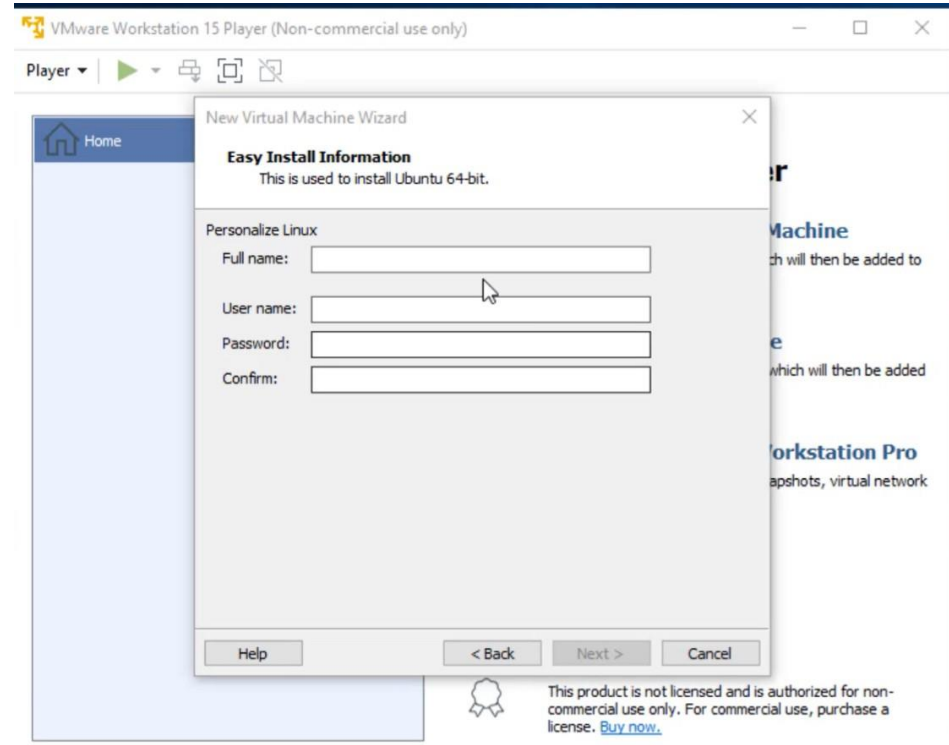
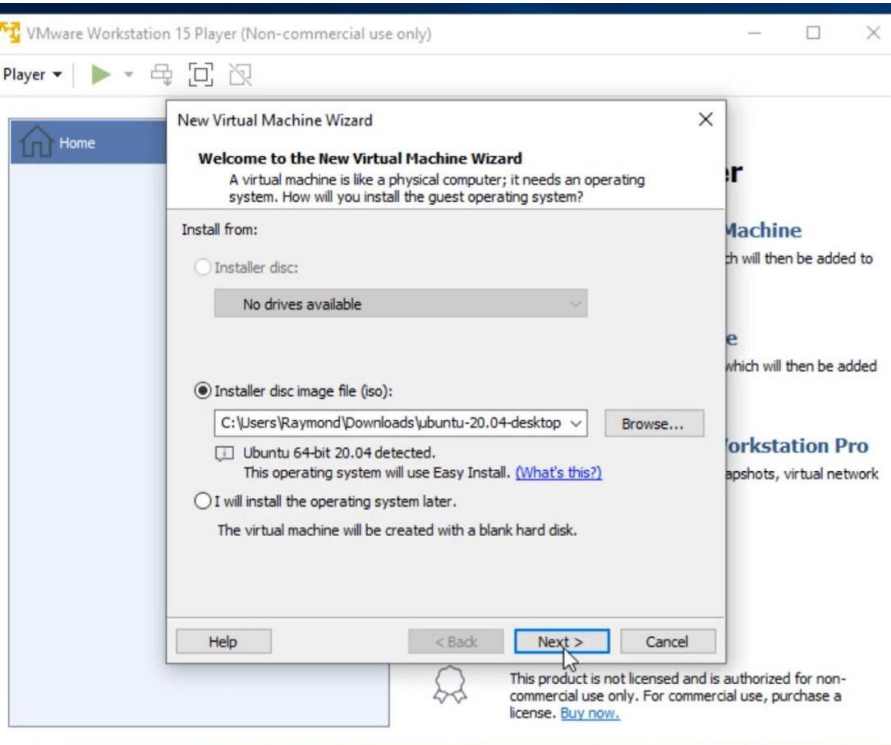
- [Installation](#)
  - Instructions to set up ROS 2 for the first time
- [Tutorials](#)
  - The best place to start for new users!
  - Hands-on sample projects that help you build a progression of necessary skills
- [How-to Guides](#)

<http://docs.ros.org/en/foxy/index.html>

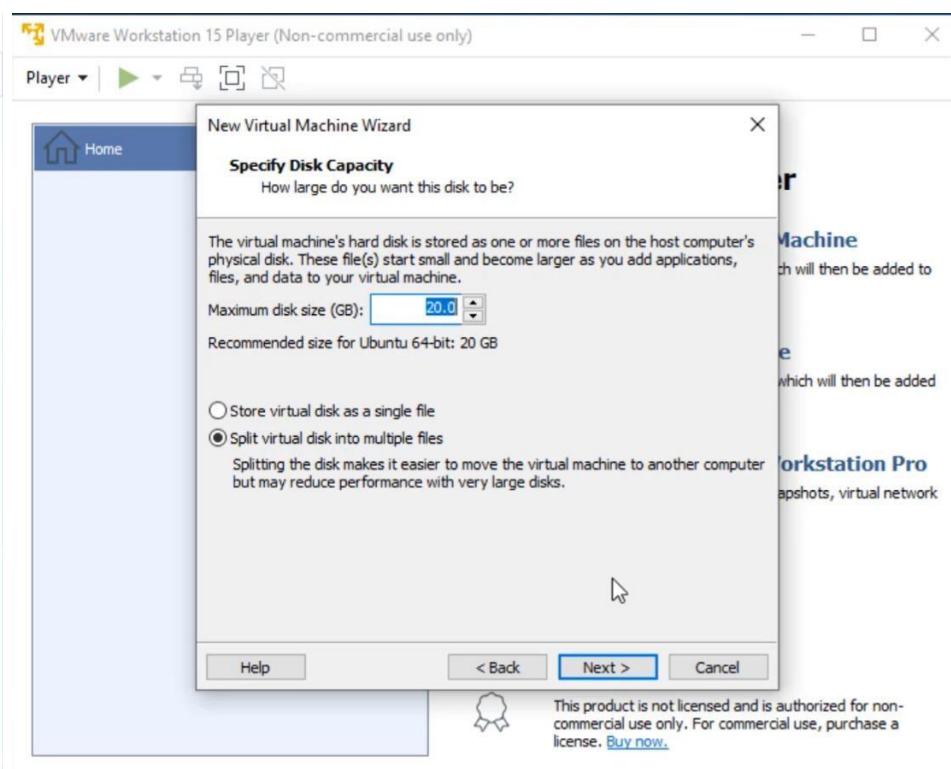
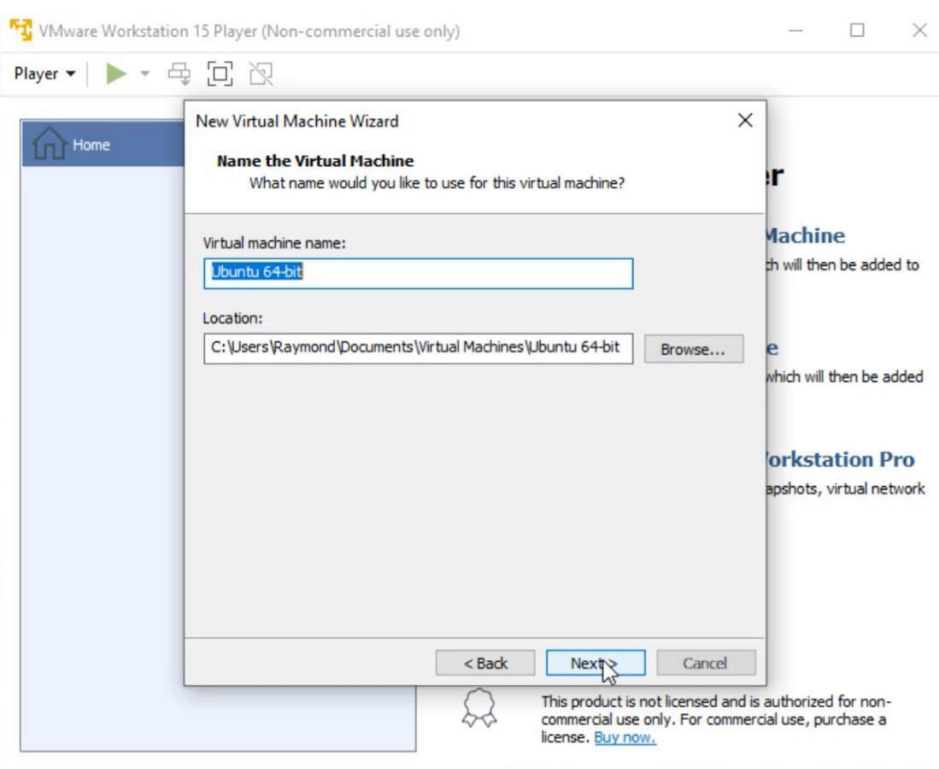
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# Configuring Ubuntu Virtual Machine

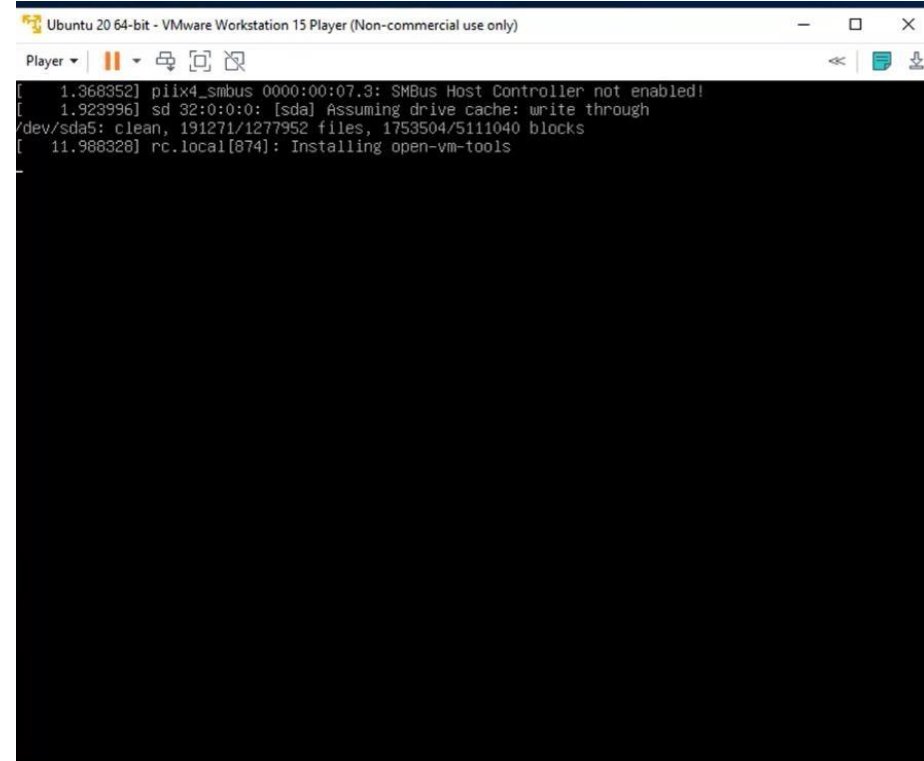
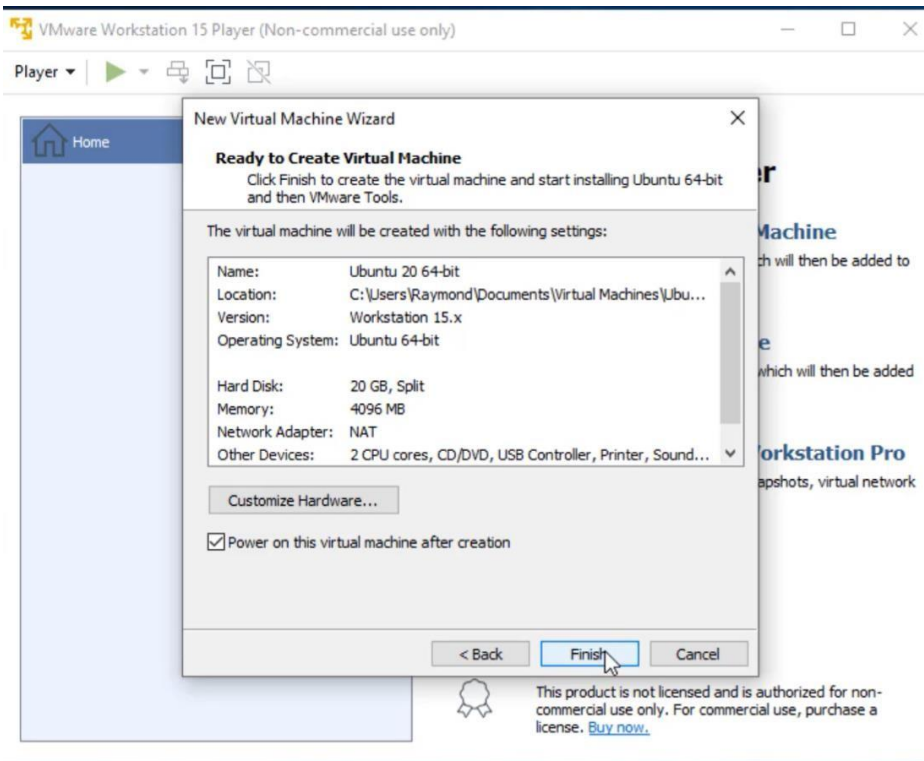
# Configuring Ubuntu Virtual Machine



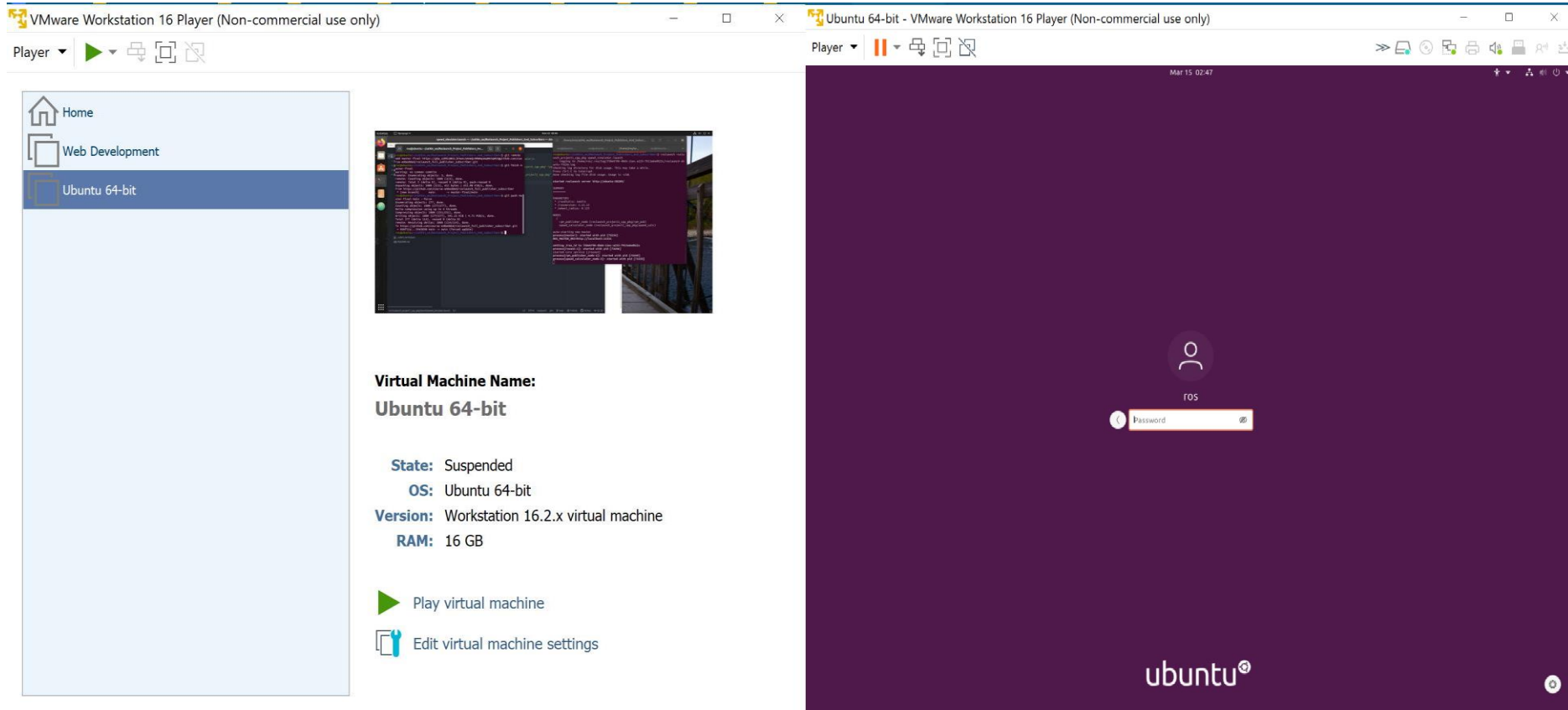
# Configuring Ubuntu Virtual Machine



# Configuring Ubuntu Virtual Machine

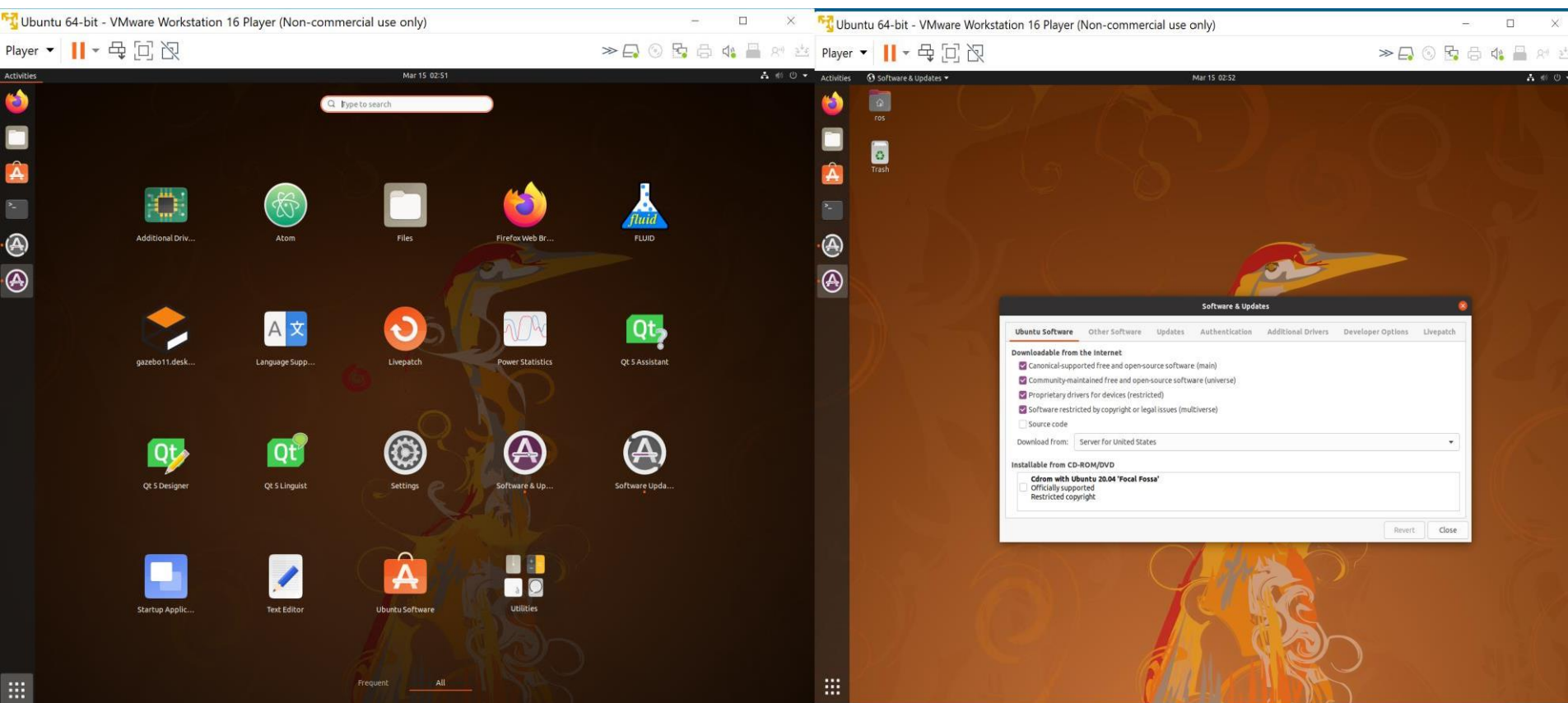


# Configuring Ubuntu Virtual Machine





# Configuring Ubuntu Virtual Machine



# Activity Session

( OS & ROS 2 Test)

# ROS 2 Installation

## 1. Set Locale

Make sure you have a locale which supports UTF-8.

```
locale # check for UTF-8
sudo apt update && sudo apt install locales
sudo locale-gen en_US en_US.UTF-8
sudo update-locale LC_ALL=en_US.UTF-8 LANG=en_US.UTF-8
export LANG=en_US.UTF-8
locale # verify settings
```

## 2. Setup Sources

You will need to add the ROS 2 apt repository to your system.

- First, make sure that the Ubuntu Universe repository is enabled by checking the output of this command.

```
apt-cache policy | grep universe
```

- This should output a line like the one below:

```
500 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages  
   release v=22.04,o=Ubuntu,a=jammy,n=jammy,l=Ubuntu,c=universe,b=amd64
```

## 2. Setup Sources

You will need to add the ROS 2 apt repository to your system.

- First, make sure that the Ubuntu Universe repository is enabled by checking the output of this command.

```
apt-cache policy | grep universe
```

- If you don't see an output line like the one above, then enable the Universe repository with these instructions.

```
sudo apt install software-properties-common  
sudo add-apt-repository universe
```

---

## 2. Setup Sources

Now add the ROS 2 apt repository to your system.

- First authorize our GPG key with apt.

```
sudo apt update && sudo apt install curl gnupg lsb-release  
sudo curl -sSL https://raw.githubusercontent.com/ros/rosdistro/master/ros.key  
-o /usr/share/keyrings/ros-archive-keyring.gpg
```

## 2. Setup Sources

Now add the ROS 2 apt repository to your system.

- Then add the repository to your sources list.

```
echo "deb [arch=$(dpkg --print-architecture) signed-  
by=/usr/share/keyrings/ros-archive-keyring.gpg]  
http://packages.ros.org/ros2/ubuntu $(source /etc/os-release && echo  
$UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list >  
/dev/null
```



## 3. Update your apt repository

Update your apt repository caches after setting up the repositories.

```
sudo apt update -y  
sudo apt upgrade
```

## 4. Desktop-Full Install: (Recommended) :

Everything in Desktop plus 2D/3D simulators and 2D/3D perception packages

```
sudo apt install ros-humble-desktop  
sudo apt install ros-humble-ros-base
```

## 5. Ubuntu Environment Setup

You must source this script in every bash terminal you use ROS in.

```
source /opt/ros/humble/setup.bash
```

- It can be convenient to automatically source this script every time a new shell is launched.
- These commands will do that for you.

```
echo "source /opt/ros/humble/setup.bash" >> ~/.bashrc  
source ~/.bashrc
```

## 6. Testing ROS 2 Installation (C++ )

If you installed ros-humble-desktop above, you can try some examples.

- In one terminal, source the setup file and then run a C++ talker:

```
source /opt/ros/humble/setup.bash  
ros2 run demo_nodes_cpp talker
```

## 6. Testing ROS 2 Installation (Python)

If you installed ros-humble-desktop above, you can try some examples.

- In another terminal source the setup file and then run a Python listener:

```
source /opt/ros/humble/setup.bash  
ros2 run demo_nodes_py listener
```

# Brief break (if on schedule)

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