ROS 2 Jazzy – Linux Complete Setup & Run Guide

This document explains how to install, verify, and run the ROS 2 Jazzy Image Publisher–Subscriber pipeline on Linux systems. It is designed to work on native Linux and Linux virtual machines (VirtualBox, VMware).

1. Prerequisites

• Linux (Ubuntu/Debian-based recommended)
• Internet connection
• Webcam or USB camera
• Python 3 (system default)
• VirtualBox users: Guest Additions installed

2. Install ROS 2 Jazzy

Official documentation:
https://docs.ros.org/en/jazzy/Installation/Linux-Install-Debians.html

Basic commands:
sudo apt update
sudo apt install -y ros-jazzy-desktop

3. Source ROS Environment

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

4. Verify ROS Installation

ros2 --help

If help text appears, ROS is installed correctly.

5. Camera Verification

Check camera devices:
ls /dev/video*

Install camera tools:
sudo apt install -y v4l-utils ffmpeg
v4l2-ctl --list-devices
ffplay /dev/video0

Virtual Machine Notes

• VM Menu → Devices → Webcams → Select your camera
• No USB filter needed for webcams
• Restart publisher if camera was attached after VM start

6. Run the Image Pipeline

Terminal 1 – Publisher

source /opt/ros/jazzy/setup.bash
cd ~/work/ros2_image_pipeline
python3 publisher/image_publisher.py

Terminal 2 – Subscriber

source /opt/ros/jazzy/setup.bash
cd ~/work/ros2_image_pipeline
python3 subscriber/image_subscriber.py

Expected result:
• Live camera feed displayed
• Timestamp overlay updates continuously

7. Troubleshooting

• Synthetic image → Camera not detected
• Fix: Attach webcam via VM menu
• No ros2 command → Forgot to source setup.bash
• Do NOT use pip install rclpy

8. Clean Environment Rules

• Use system Python only
• No virtualenv or pip installs
• One ROS distribution per system
• Always source ROS before running nodes