Micro-ROS Installation Steps (ROS 2)

1. Source ROS 2

Before using any ROS 2 tools or packages, source your ROS 2 installation environment by running:

source /opt/ros/$ROS_DISTRO/setup.bash

Replace $ROS_DISTRO with your installed ROS 2 distribution (e.g., humble, foxy).

2. Create a Workspace and Clone micro-ROS Setup Repository

Create a dedicated workspace directory and download the micro-ROS setup tools:

mkdir microros_ws

cd microros_ws

git clone -b $ROS_DISTRO https://github.com/micro-ROS/micro_ros_setup.git src/micro_ros_setup

This command ensures you clone the branch matching your ROS 2 distribution.

3. Install Required Dependencies Using rosdep

Update the package index and install dependencies for the micro-ROS setup:

sudo apt update && rosdep update

rosdep install --from-path src --ignore-src -y

rosdep resolves and installs system dependencies defined in package.xml files.

4. Install pip (if not already installed)

Install the Python package manager (pip), required for some Python dependencies:

sudo apt-get install python3-pip

5. Build micro-ROS Setup Tools

Use colcon to build the micro-ROS setup workspace:

colcon build

Once built, source the generated setup file:

source install/local_setup.bash

6. Create and build the micro-ROS Firmware (for ESP32, STM32, etc.)

Run the following command to create a freertos based firmware for esp32.
ros2 run micro_ros_setup create_firmware_ws.sh freertos esp32
Run the following to build the firmware for your target embedded board:
ros2 run micro_ros_setup build_firmware.sh
Then source the environment again:
source install/local_setup.bash

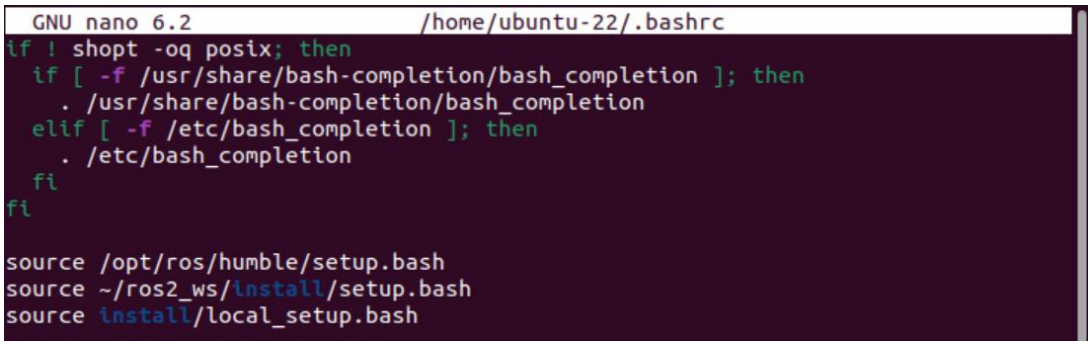
7. Download micro-ROS Agent Packages

The agent is the bridge between the embedded device and ROS 2.
Download the agent source code:
ros2 run micro_ros_setup create_agent_ws.sh

8. Build the micro-ROS Agent

Compile the downloaded agent workspace using the following command:
ros2 run micro_ros_setup build_agent.sh
Then source the built workspace:
source install/local_setup.bash

9. Add path in bashrc files as below shown



10. Run the micro-ROS Agent (Choose Serial or UDP Based on Your Setup)

To launch the agent and establish communication with your microcontroller:
ros2 run micro_ros_agent micro_ros_agent serial --dev /dev/ttyUSB0
Replace `/dev/ttyUSB0` with the actual serial port your device is connected to.
Other transport options include UDP, TCP, or custom transports, such as following.
ros2 run micro_ros_agent micro_ros_agent udp4 -i 192.168.1.100 -p 8888