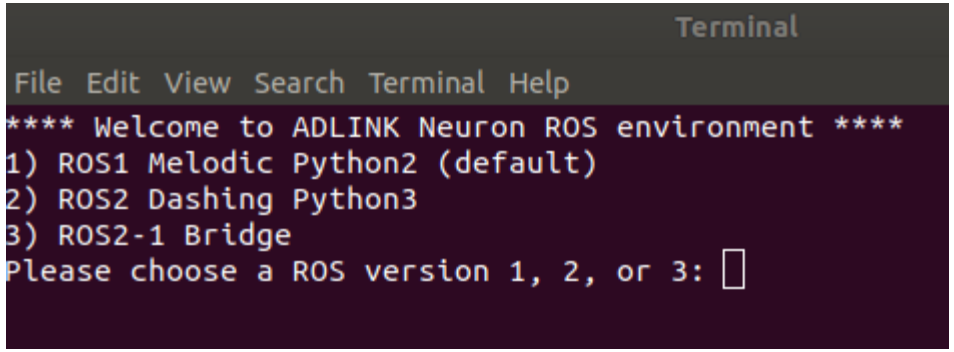
ADLINK
Leading EDGE COMPUTING

ROS 1 AND ROS 2 INSTALLATION GUIDE

ROS 1 Melodic + ROS 2 Dashing

ROS Installation and Environment

Goal: ROS 1 + ROS 2 + Bridge all in one PC



Prerequisite: Ubuntu 18.04

- The binary packages for ROS 1 Melodic and ROS 2 Dashing can be found in Ubuntu 18.04

Install ROS 1 Melodic

Setup your sources.list

```
$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) \
 main" > /etc/apt/sources.list.d/ros-latest.list'
```

Set up keys

```
$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key \
C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

Install ROS Melodic

```
$ sudo apt update
```

```
$ sudo apt install ros-melodic-desktop-full
```

Install dependencies

```
$ sudo apt install python-rosdep python-rosinstall python-rosinstall-generator
python-wstool build-essential
```

```
$ sudo apt install python-rosdep
```

Install ROS 1 Melodic (cont'd)

Initialize rosdep

```
$ sudo rosdep init
$ rosdep update
```

Verify

Terminal 1:

```
$ source /opt/ros/melodic/setup.bash
$ roscore
```

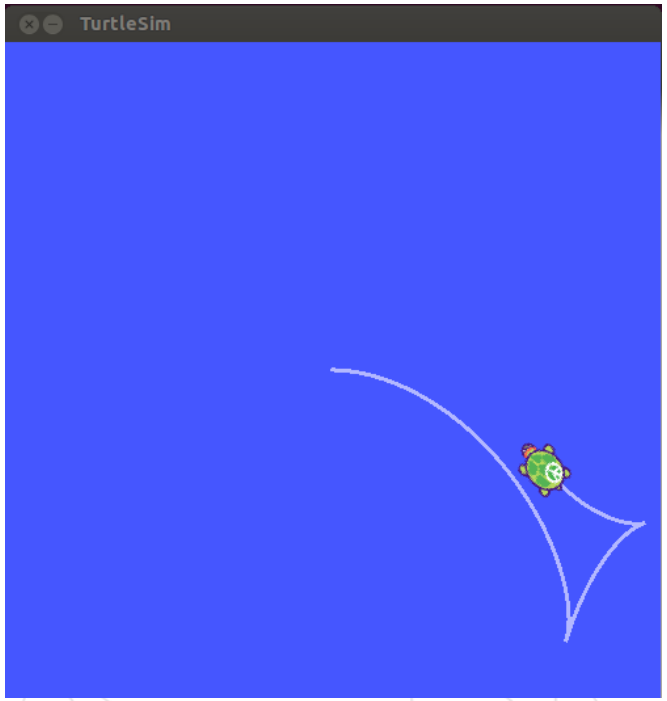
Terminal 2:

```
$ source /opt/ros/melodic/setup.bash
$ rosrun turtlesim turtlesim_node
```

Terminal 3:

```
$ source /opt/ros/melodic/setup.bash
$ rosrun turtlesim turtle_teleop_key
```

Hint:
Ctrl+Alt+T for new terminal window
Ctrl+Shift+T for new terminal tab



Install ROS 2 Dashing

Setup Locale

```
$ 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
```

Setup Sources

```
$ sudo apt update && sudo apt install curl gnupg2 lsb-release
```

```
$ curl -s https://raw.githubusercontent.com/ros/rosdistro/master/ros.asc \
 | sudo apt-key add -
```

```
$ sudo sh -c 'echo "deb [arch=amd64,arm64] \
 http://packages.ros.org/ros2/ubuntu `lsb_release -cs` main" > \
/etc/apt/sources.list.d/ros2-latest.list'
```

Install ROS 2 Dashing (cont'd)

Install ROS 2 packages

```
$ sudo apt update
$ sudo apt install ros-dashing-desktop
```

Install argcomplete

```
$ sudo apt install python3-argcomplete
```

Install RMW_OpenSplice

```
$ sudo apt install ros-dashing-rmw-opensplice-cpp
```

Install RMW_CycloneDDS

```
$ sudo apt install ros-dashing-rmw-cyclonedds-cpp
```

Install colcon

```
$ sudo apt install python3-colcon-common-extensions
```

Install ROS 2 Dashing (cont'd)

Install RQT and all the plugins in ROS 2

```
$ sudo apt install ros-dashing-rqt
```

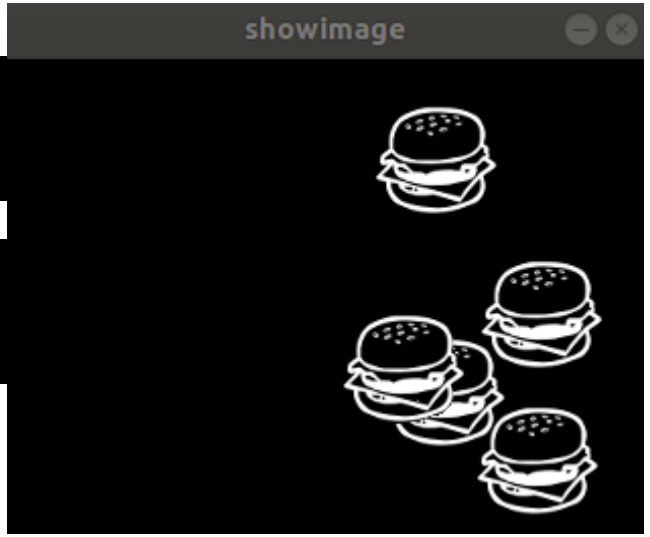
Verify ROS 2

Terminal 1:

```
$ source /opt/ros/dashing/setup.bash
$ ros2 run image_tools showimage -r 0 -d 1
```

Terminal 2:

```
$ source /opt/ros/dashing/setup.bash
$ ros2 run image_tools cam2image -r 0 -d 1 -b
```



Install ROS 1 Bridge for ROS 2

Install ROS1-bridge

```
$ sudo apt install ros-dashing-ros1-bridge
```

Verify

Terminal 1:

```
$ source /opt/ros/melodic/setup.bash
$ roscore
```

Terminal 2:

```
$ source /opt/ros/melodic/setup.bash
$ rosrun rospy_tutorials listener
```

Terminal 3:

```
$ source /opt/ros/dashing/setup.bash
$ ros2 run demo_nodes_py talker
```

Terminal 4:

```
$ source /opt/ros/melodic/setup.bash
$ source /opt/ros/dashing/setup.bash
$ ros2 run ros1_bridge dynamic_bridge
```

Question

Source ROS environment for each terminals?

Why so bothered?

Better way ➔ Add it into your .bashrc

ROS Environment

You can clone the below GIT repo to install ROS development environment:

https://github.com/Adlink-ROS/ros_dotfiles

ROS Environment (cont'd)

Example in .ros_bashrc

```
# clear ROS env var for resolving warning #
unset ros_version
unset ROS_DISTRO

# If the ros version is not assigned, #
# prompt user which version should be loaded. #
if [ -z $ros_version ]; then
    echo "**** Welcome to ADLINK Neuron ROS environment ****"
    echo "1) ROS1 Melodic Python2 (default)"
    echo "2) ROS2 Dashing Python3"
    echo "3) ROS2-1 Bridge"
    echo -n "Please choose a ROS version 1, 2, or 3: "
    read ros_version
fi
```

ROS Environment (cont'd)

```
if [ "$ros_version" == "2" ];
then
    # for ROS2 #
    source /usr/share/colcon_argcomplete/hook/colcon-argcomplete.bash
    echo "Loading ROS2 Dashing Python3 ..."
    source /opt/ros/dashing/setup.bash

elif [ "$ros_version" == "3" ];
then
    # ROS1 #
    source /opt/ros/melodic/setup.bash

    # ROS2 #
    echo "Loading ROS2 Dashing Python3 ..."
    source /usr/share/colcon_argcomplete/hook/colcon-argcomplete.bash
    source /opt/ros/dashing/setup.bash
else
    # for ROS1 #
    echo "Loading ROS1 Melodic Python2 ..."
    source /opt/ros/melodic/setup.bash
fi
```

THANK YOU

ADLINK

Leading EDGE COMPUTING