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 Kilted.

Ubuntu (deb packages)

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Deb packages for ROS 2 Humble Hawksbill are currently available for Ubuntu Jammy (22.04). The target platforms are defined in REP 2000.

Resources

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Set locale

Make sure you have a locale which supports `UTF-8`. If you are in a minimal environment (such as a docker container), the locale may be something minimal like `POSIX`. We test with the following settings. However, it should be fine if you're using a different UTF-8 supported locale.

```
$ 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
```

Setup Sources

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

First ensure that the Ubuntu Universe repository is enabled.

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

The ros-apt-source packages provide keys and apt source configuration for the various ROS repositories.

Installing the ros2-apt-source package will configure ROS 2 repositories for your system. Updates to repository configuration will occur automatically when new versions of this package are released to the ROS repositories.

```
$ sudo apt update && sudo apt install curl -y
$ export ROS_APT_SOURCE_VERSION=$(curl -s https://api.github.com/repos/ros-infrastructure/ros-apt-source/releases/latest | grep -F "tag_name" | awk -F\" '{print $4}')
$ curl -L -o /tmp/ros2-apt-source.deb "https://github.com/ros-infrastructure/ros-apt-source/releases/download/${ROS_APT_SOURCE_VERSION}/ros2-apt-source_${ROS_APT_SOURCE_VERSION}.$(. /etc/os-release && echo ${UBUNTU_CODENAME:-${VERSION_CODENAME}})_all.deb"
$ sudo dpkg -i /tmp/ros2-apt-source.deb
```

Install ROS 2 packages

Update your apt repository caches after setting up the repositories.

```
$ sudo apt update
```

ROS 2 packages are built on frequently updated Ubuntu systems. It is always recommended that you ensure your system is up to date before installing new packages.

```
$ sudo apt upgrade
```

Warning

Due to early updates in Ubuntu 22.04 it is important that `systemd` and `udev`-related packages are updated before installing ROS 2. The installation of ROS 2's dependencies on a freshly installed system without upgrading can trigger the **removal of critical system packages**.

Please refer to ros2/ros2#1272 and Launchpad #1974196 for more information.

Desktop Install (Recommended): ROS, RViz, demos, tutorials.

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

ROS-Base Install (Bare Bones): Communication libraries, message packages, command line tools. No GUI tools.

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

Development tools: Compilers and other tools to build ROS packages

```
$ sudo apt install ros-dev-tools
```

Environment setup

Sourcing the setup script

Set up your environment by sourcing the following file.

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

Note

Replace `.bash` with your shell if you're not using bash. Possible values are: `setup.bash`, `setup.sh`, `setup.zsh`.

Try some examples

Talker-listener

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
```

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
```

You should see the `talker` saying that it's `Publishing` messages and the `listener` saying `I heard` those messages. This verifies both the C++ and Python APIs are working properly. Hooray!

If you want to use other RMW implementations, you can check the guide.

Next steps after installing

Continue with the tutorials and demos to configure your environment, create your own workspace and packages, and learn ROS 2 core concepts.

Using the ROS 1 bridge

The ROS 1 bridge can connect topics from ROS 1 to ROS 2 and vice-versa. See the dedicated documentation on how to build and use the ROS 1 bridge.

Additional RMW implementations (optional)

The default middleware that ROS 2 uses is `Fast DDS`, but the middleware (RMW) can be replaced at runtime. See the guide on how to work with multiple RMWs.

Troubleshooting

Troubleshooting techniques can be found here.

Uninstall

If you need to uninstall ROS 2 or switch to a source-based install once you have already installed from binaries, run the following command:

```
$ sudo apt remove ~nros-humble-* && sudo apt autoremove
```

You may also want to remove the repository:

```
$ sudo apt remove ros2-apt-source
$ sudo apt update
$ sudo apt autoremove
$ sudo apt upgrade # Consider upgrading for packages previously shadowed.
```