

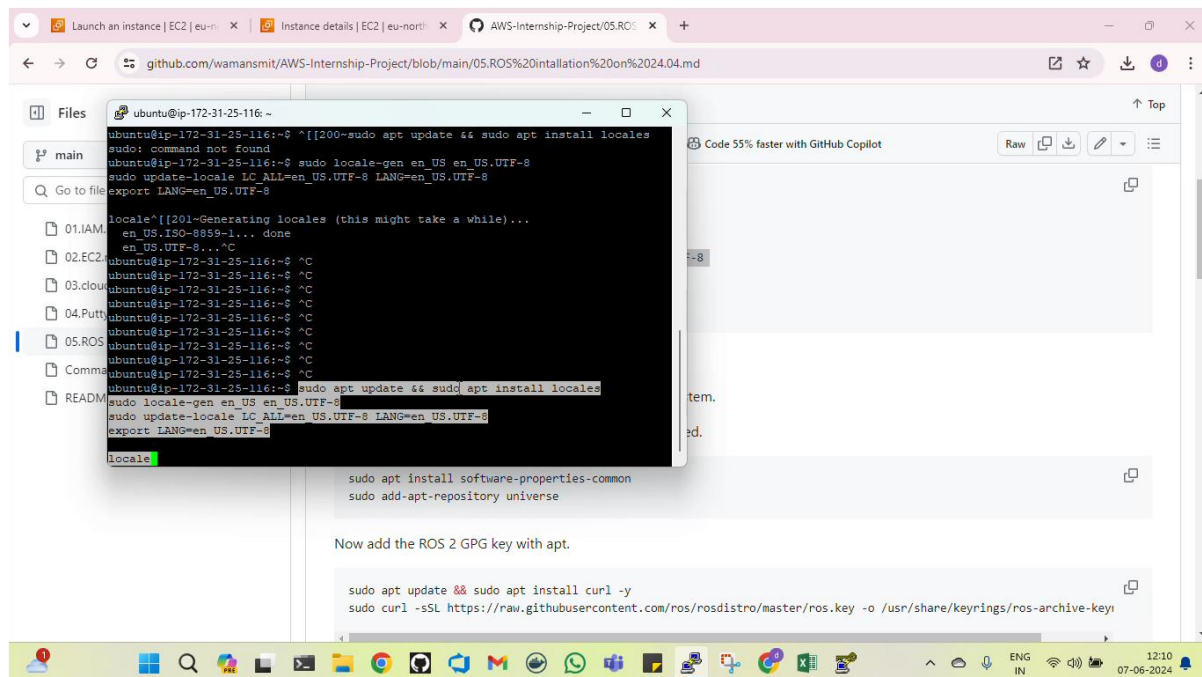
## Step 4: Install ROS2 on EC2:

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
```



```
ubuntu@ip-172-31-25-116:~$ sudo apt update
Building dependency tree... Done
Reading state information... Done
75 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libc-bin libc-dev-bin libc-devtools libc6 libc6-dev
Suggested packages:
  glibc-doc libnss-nis libnss-nisplus
The following packages will be upgraded:
  libc-bin libc-dev-bin libc-devtools libc6 libc6-dev locales
6 upgraded, 0 newly installed, 0 to remove and 69 not upgraded.
Need to get 10.4 MB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libc-devtools amd64 2.39-0ubuntu8.2 [25.3 kB]
Get:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libc6-dev amd64 2.39-0ubuntu8.2 [2124 kB]
Get:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libc-dev-bin amd64 2.39-0ubuntu8.2 [20.4 kB]
Get:4 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libc6 amd64 2.39-0ubuntu8.2 [3263 kB]
Get:5 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libc-bin amd64 2.39-0ubuntu8.2 [682 kB]
Get:6 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 locales all 2.39-0ubuntu8.2 [4235 kB]
Fetched 10.4 MB in 0s (43.0 MB/s)
Preconfiguring packages ...
(Reading database ... 71839 files and directories currently installed.)
Preparing to unpack .../libc-devtools_2.39-0ubuntu8.2_amd64.deb ...
Unpacking libc-devtools (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Preparing to unpack .../libc6-dev_2.39-0ubuntu8.2_amd64.deb ...
Unpacking libc6-dev:amd64 (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Preparing to unpack .../libc-dev-bin_2.39-0ubuntu8.2_amd64.deb ...
Unpacking libc-dev-bin (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Preparing to unpack .../libc6_2.39-0ubuntu8.2_amd64.deb ...
Unpacking libc6:amd64 (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Setting up libc6:amd64 (2.39-0ubuntu8.2) ...
(Reading database ... 71839 files and directories currently installed.)
Preparing to unpack .../libc-bin_2.39-0ubuntu8.2_amd64.deb ...
Unpacking libc-bin (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Setting up libc-bin (2.39-0ubuntu8.2) ...
(Reading database ... 71839 files and directories currently installed.)
Preparing to unpack .../locales_2.39-0ubuntu8.2_all.deb ...
Unpacking locales (2.39-0ubuntu8.2) over (2.39-0ubuntu8) ...
Setting up locales (2.39-0ubuntu8.2) ...
Generating locales (this might take a while)...
```

## Enable required repositories

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
```

```
ubuntu@ip-172-31-25-116:~$ sudo apt install software-properties-common
No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: apt[1558], sshd[1057,1167]
ubuntu @ user manager service: systemd[1062]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
Generating locales (this might take a while)...
  en_US.ISO-8859-1... done
  en_US.UTF-8... done
Generation complete.
LANG=en_US.UTF-8
LANGUAGE=
LC_CTYPE="en_US.UTF-8"
LC_NUMERIC="en_US.UTF-8"
LC_TIME="en_US.UTF-8"
LC_COLLATE="en_US.UTF-8"
LC_MONETARY="en_US.UTF-8"
LC_MESSAGES="en_US.UTF-8"
LC_PAPER="en_US.UTF-8"
LC_NAME="en_US.UTF-8"
LC_ADDRESS="en_US.UTF-8"
LC_TELEPHONE="en_US.UTF-8"
LC_MEASUREMENT="en_US.UTF-8"
LC_IDENTIFICATION="en_US.UTF-8"
LC_ALL=
ubuntu@ip-172-31-25-116:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.48).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 69 not upgraded.
Adding component(s) 'universe' to all repositories.
Press [ENTER] to continue or Ctrl-C to cancel.
Hit:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
ubuntu@ip-172-31-25-116:~$
```

Now add the ROS 2 GPG key with apt.

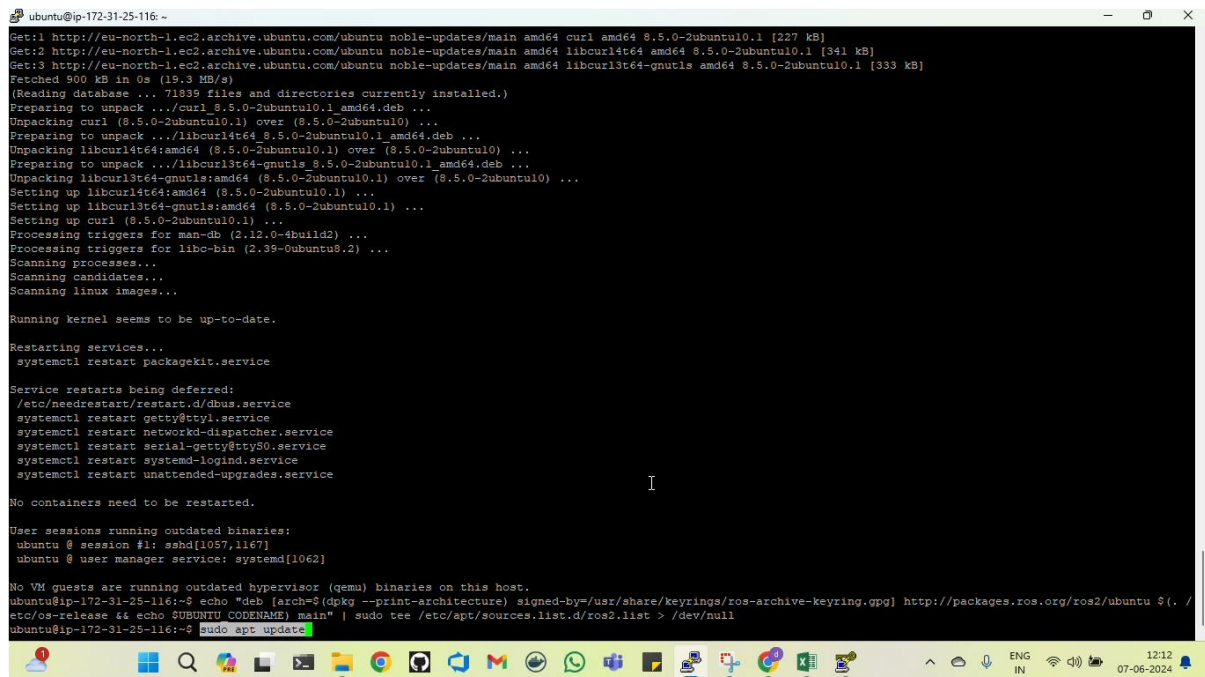
```
sudo apt update && sudo apt install curl -y
```

```
sudo curl -sSL https://raw.githubusercontent.com/ros/rosdistro/master/ros.key  
-o /usr/share/keyrings/ros-archive-keyring.gpg
```

```
ubuntu@ip-172-31-25-116: ~  
Get:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu0.1 [227 kB]  
Get:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu0.1 [341 kB]  
Get:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu0.1 [333 kB]  
Fetched 900 kB in 0s (19.3 MB/s)  
(Reading database ... 71839 files and directories currently installed.)  
Preparing to unpack .../curl 8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking curl (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Preparing to unpack .../libcurl4t64 8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking libcurl4t64:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Preparing to unpack .../libcurl3t64-gnutls 8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Setting up libcurl4t64:amd64 (8.5.0-2ubuntu0.1) ...  
Setting up libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) ...  
Setting up curl (8.5.0-2ubuntu0.1) ...  
Processing triggers for man-db (2.12.0-4build2) ...  
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...  
Scanning processes...  
Scanning candidates...  
Scanning linux images...  
  
Running kernel seems to be up-to-date.  
  
Restarting services...  
systemctl restart packagekit.service  
  
Service restarts being deferred:  
/etc/needrestart/restart.d/dbus.service  
systemctl restart getty@tty1.service  
systemctl restart networkd-dispatcher.service  
systemctl restart serial-getty@ttyS0.service  
systemctl restart systemd-logind.service  
systemctl restart unattended-upgrades.service  
  
No containers need to be restarted.  
  
User sessions running outdated binaries:  
ubuntu @ session #1: sshd[1057,1167]  
ubuntu @ user manager service: systemd[1062]  
  
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
ubuntu@ip-172-31-25-116:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/ros-archive-keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /  
etc/os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null  
ubuntu@ip-172-31-25-116:~$
```

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 $(. /etc/os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null
```



```
ubuntu@ip-172-31-25-116: ~  
Get:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu0.1 [227 kB]  
Get:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu0.1 [341 kB]  
Get:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu0.1 [333 kB]  
Fetched 900 kB in 0s (19.3 MB/s)  
(Reading database ... 71839 files and directories currently installed.)  
Preparing to unpack .../curl_8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking curl (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Preparing to unpack .../libcurl4t64_8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking libcurl4t64:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Preparing to unpack .../libcurl3t64-gnutls_8.5.0-2ubuntu0.1_amd64.deb ...  
Unpacking libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...  
Setting up libcurl4t64:amd64 (8.5.0-2ubuntu0.1) ...  
Setting up libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) ...  
Setting up curl (8.5.0-2ubuntu0.1) ...  
Processing triggers for man-db (2.12.0-4build2) ...  
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...  
Scanning processes...  
Scanning candidates...  
Scanning linux images...  
  
Running kernel seems to be up-to-date.  
  
Restarting services...  
systemctl restart packagekit.service  
  
Service restarts being deferred:  
/etc/needrestart/restart.d/dbus.service  
systemctl restart getty@tty1.service  
systemctl restart networkd-dispatcher.service  
systemctl restart serial-getty@ttyS0.service  
systemctl restart systemd-logind.service  
systemctl restart unattended-upgrades.service  
  
No containers need to be restarted.  
  
User sessions running outdated binaries:  
ubuntu @ session #1: sshd[1057,1167]  
ubuntu @ user manager service: systemd[1062]  
  
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
ubuntu@ip-172-31-25-116:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/ros-archive-keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /  
etc/os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null  
ubuntu@ip-172-31-25-116:~$ sudo apt update
```

### *Install development tools (optional)*

If you are going to build ROS packages or otherwise do development, you can also install the development tools:

```
sudo apt update && sudo apt install ros-dev-tools
```

## Install ROS 2

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
```

```
ubuntu@ip-172-31-25-116:~$ sudo apt update
Get:1 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu0.1 [227 kB]
Get:2 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu0.1 [341 kB]
Get:3 http://eu-north-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu0.1 [333 kB]
Fetched 900 kB in 0s (19.3 MB/s)
(Reading database ... 71839 files and directories currently installed.)
Preparing to unpack .../curl.8.5.0-2ubuntu0.1.amd64.deb ...
Unpacking curl (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...
Preparing to unpack .../libcurl4t64.8.5.0-2ubuntu0.1.amd64.deb ...
Unpacking libcurl4t64:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...
Preparing to unpack .../libcurl3t64-gnutls.8.5.0-2ubuntu0.1.amd64.deb ...
Unpacking libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) over (8.5.0-2ubuntu0) ...
Setting up libcurl4t64:amd64 (8.5.0-2ubuntu0.1) ...
Setting up libcurl3t64-gnutls:amd64 (8.5.0-2ubuntu0.1) ...
Setting up curl (8.5.0-2ubuntu0.1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
systemctl restart packagekit.service

Service restarts being deferred:
/etc/passwdrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@ttyS0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: sshd[1057,1167]
ubuntu @ user manager service: systemd[1062]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-25-116:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/ros-archive-keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /
etc/os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null
ubuntu@ip-172-31-25-116:~$ sudo apt update
```

## Desktop Install (Recommended):

```
sudo apt install ros-rolling-desktop
```

```
ubuntu@ip-172-31-25-116:~$ sudo apt install ros-rolling-desktop
Unpacking poppler-data (0.4.12-1) ...
Selecting previously unselected package libltdng-ctl0t64:amd64.
Preparing to unpack .../001-libltdng-ctl0t64_2.13.11-2.1build4_amd64.deb ...
Unpacking libltdng-ctl0t64:amd64 (2.13.11-2.1build4) ...
Selecting previously unselected package libltdng-ust-common1t64:amd64.
Preparing to unpack .../002-libltdng-ust-common1t64_2.13.7-1.lubuntu2_amd64.deb ...
Unpacking libltdng-ust-common1t64:amd64 (2.13.7-1.lubuntu2) ...
Selecting previously unselected package libltdng-ust-ctl15t64:amd64.
Preparing to unpack .../003-libltdng-ust-ctl15t64_2.13.7-1.lubuntu2_amd64.deb ...
Unpacking libltdng-ust-ctl15t64:amd64 (2.13.7-1.lubuntu2) ...
Selecting previously unselected package ltdng-tools.
Preparing to unpack .../004-ltdng-tools_2.13.11-2.1build4_amd64.deb ...
Unpacking ltdng-tools (2.13.11-2.1build4) ...
Selecting previously unselected package libgdk-pixbuf2.0-common.
Preparing to unpack .../005-libgdk-pixbuf2.0-common_2.42.10+dfsg-3ubuntu3.1_all.deb ...
Unpacking libgdk-pixbuf2.0-common (2.42.10+dfsg-3ubuntu3.1) ...
Selecting previously unselected package libgdk-pixbuf-2.0-0:amd64.
Preparing to unpack .../006-libgdk-pixbuf-2.0-0_2.42.10+dfsg-3ubuntu3.1_amd64.deb ...
Unpacking libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
Selecting previously unselected package gtk-update-icon-cache.
Preparing to unpack .../007-gtk-update-icon-cache_3.24.41-4ubuntu1_amd64.deb ...
Unpacking gtk-update-icon-cache (3.24.41-4ubuntu1) ...
Selecting previously unselected package hicolor-icon-theme.
Preparing to unpack .../008-hicolor-icon-theme_0.17-2_all.deb ...
Unpacking hicolor-icon-theme (0.17-2) ...
Selecting previously unselected package humanity-icon-theme.
Preparing to unpack .../009-humanity-icon-theme_0.6.16_all.deb ...
Unpacking humanity-icon-theme (0.6.16) ...
Selecting previously unselected package ubuntu-mono.
Preparing to unpack .../010-ubuntu-mono_24.04-0ubuntu1_all.deb ...
Unpacking ubuntu-mono (24.04-0ubuntu1) ...
Selecting previously unselected package adwaita-icon-theme.
Preparing to unpack .../011-adwaita-icon-theme_46.0-1_all.deb ...
Unpacking adwaita-icon-theme (46.0-1) ...
Selecting previously unselected package alsa-topology-conf.
Preparing to unpack .../012-alsa-topology-conf_1.2.5.1-2_all.deb ...
Unpacking alsa-topology-conf (1.2.5.1-2) ...
Selecting previously unselected package libasound2-data.
Preparing to unpack .../013-libasound2-data_1.2.11-1build2_all.deb ...
Unpacking libasound2-data (1.2.11-1build2) ...
Selecting previously unselected package libasound2t64:amd64.
Unpacking libasound2t64:amd64 (1.2.11-1build2) ...
Progress: [ 0%] [.....]
```



## Setup environment

Set up your environment by sourcing the following file.

```
# Replace ".bash" with your shell if you're not using bash
# Possible values are: setup.bash, setup.sh, setup.zsh
source /opt/ros/rolling/setup.bash
```

```
ubuntu@ip-172-31-23-110:~$ source /opt/ros/rolling/setup.bash
Setting up ros-rolling-ros2bag (0.27.0-1noble.20240430.181909) ...
Setting up ros-rolling-ros2cli-common-extensions (0.4.0-1noble.20240430.193804) ...
Setting up ros-rolling-dummy-robot-bringup (0.34.0-1noble.20240430.185527) ...
Setting up ros-rolling-ros-core (0.11.0-1noble.20240430.193836) ...
Setting up ros-rolling-rviz2 (14.2.0-1noble.20240514.130847) ...
Setting up ros-rolling-rosbag2 (0.27.0-1noble.20240430.181946) ...
Setting up ros-rolling-rqt-bag-plugins (1.6.0-1noble.20240430.191555) ...
Setting up ros-rolling-rqt-common-plugins (1.2.0-3noble.20240430.191717) ...
Setting up ros-rolling-ros-base (0.11.0-1noble.20240430.193907) ...
Setting up ros-rolling-desktop (0.11.0-1noble.20240514.131108) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1008-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1009-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@ttyS0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: sshd[1057,1167]
ubuntu @ user manager service: systemd[1062]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-25-116:~$ source /opt/ros/rolling/setup.bash
```

Next, check ROS version with command "rosversion -d". It will prompt you to python library. Install it.

```
ubuntu@ip-172-31-25-116:~$ sudo apt install python3-rosdep
Setting up ros-rolling-ros-core (0.11.0-inoble.20240430.193836) ...
Setting up ros-rolling-rviz2 (14.2.0-inoble.20240514.130847) ...
Setting up ros-rolling-rosbag2 (0.27.0-inoble.20240430.181946) ...
Setting up ros-rolling-rqt-bag-plugins (1.6.0-inoble.20240430.191555) ...
Setting up ros-rolling-rqt-common-plugins (1.2.0-3noble.20240430.191717) ...
Setting up ros-rolling-ros-base (0.11.0-inoble.20240430.193907) ...
Setting up ros-rolling-desktop (0.11.0-inoble.20240514.131108) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
Processing triggers for libc-bin (2.39-0ubuntu8.2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1008-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1009-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@ttyS0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: sshd[1057,1167]
ubuntu @ user manager service: systemd[1062]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-25-116:~$ source /opt/ros/rolling/setup.bash
ubuntu@ip-172-31-25-116:~$ rosversion -d
Command 'rosversion' not found, but can be installed with:
sudo apt install python3-rosdep
ubuntu@ip-172-31-25-116:~$
```

Once command again run "rosversion -d" command. You will find rolling in output window.

```
ubuntu@ip-172-31-25-116:~$ sudo apt install python3-rosdep
Need to get 2,524 B of archives.
After this operation, 18.4 kB of additional disk space will be used.
Get:1 http://packages.ros.org/ros/ubuntu noble/main amd64 python3-rosdep all 1.5.1-100 [2,524 B]
Fetched 2,524 B in 1s (3,608 B/s)
Selecting previously unselected package python3-rosdep.
(Reading database ... 171078 files and directories currently installed.)
Preparing to unpack .../python3-rosdep_1.5.1-100_all.deb ...
Unpacking python3-rosdep (1.5.1-100) ...
Setting up python3-rosdep (1.5.1-100) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1008-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1009-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service
systemctl restart getty@tty1.service
systemctl restart networkd-dispatcher.service
systemctl restart serial-getty@ttyS0.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
ubuntu @ session #1: sshd[1057,1167]
ubuntu @ user manager service: systemd[1062]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-25-116:~$ rosversion -d
rolling
ubuntu@ip-172-31-25-116:~$ echo "here we have successfully created ros server"
here we have successfully created ros server
ubuntu@ip-172-31-25-116:~$
```



