

Ubuntu install of ROS Kinetic



We are building Debian packages for several Ubuntu platforms, listed below. These packages are more efficient than source-based builds and are our preferred installation method for Ubuntu. Note that there are also packages available from Ubuntu upstream. Please see UpstreamPackages (/UpstreamPackages) to understand the difference.

Ubuntu packages are built for the following distros and architectures.

Distro	amd64	i386	armhf
Wily	X	X	
Xenial	X	X	X

If you need to install from source (**not recommended**), please see source (download-and-compile) installation instructions (/kinetic/Installation/Source).

If you rely on these packages, please support OSRF.

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1. Installation

ROS Kinetic **ONLY** supports Wily (Ubuntu 15.10), Xenial (Ubuntu 16.04) and Jessie (Debian 8) for debian packages.

1.1 Configure your Ubuntu repositories

Configure your Ubuntu repositories to allow "restricted," "universe," and "multiverse." You can  follow the Ubuntu guide (<https://help.ubuntu.com/community/Repositories/Ubuntu>) for instructions on doing this.

1.2 Setup your sources.list

Setup your computer to accept software from packages.ros.org.

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

Mirrors (/ROS/Installation/UbuntuMirrors) Source Debs (/DebianPackageSources) are also available

1.3 Set up your keys

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

If you experience issues connecting to the keyserver, you can try substituting hkp://pgp.mit.edu:80 or hkp://keyserver.ubuntu.com:80 in the previous command.

Alternatively, you can use curl instead of the apt-key command, which can be helpful if you are behind a proxy server:


```
curl -sSL 'http://keyserver.ubuntu.com/pks/lookup?op=get&search=0xC1CF6E31E6BADE8868B172B4F42ED6FBAB17C654' | sudo apt-key add -
```

1.4 Installation

First, make sure your Debian package index is up-to-date:

```
sudo apt-get update
```

There are many different libraries and tools in ROS. We provided four default configurations to get you started. You can also install ROS packages individually.

In case of problems with the next step, you can use following repositories instead of the ones mentioned above  [ros-shadow-fixed](http://wiki.ros.org/ShadowRepository) (<http://wiki.ros.org/ShadowRepository>)

Desktop-Full Install: (Recommended) : ROS, rqt (/rqt), rviz (/rviz), robot-generic libraries, 2D/3D simulators, navigation and 2D/3D perception

```
sudo apt-get install ros-kinetic-desktop-full
```

or click here ([apt:ros-kinetic-desktop-full?refresh=yes](http://apt.ros-kinetic-desktop-full?refresh=yes))

Desktop Install: ROS, rqt (/rqt), rviz (/rviz), and robot-generic libraries

```
sudo apt-get install ros-kinetic-desktop
```

or click here ([apt:ros-kinetic-desktop?refresh=yes](http://apt.ros-kinetic-desktop?refresh=yes))

ROS-Base: (Bare Bones) ROS package, build, and communication libraries. No GUI tools.

```
sudo apt-get install ros-kinetic-ros-base
```

or click here ([apt:ros-kinetic-ros-base?refresh=yes](http://apt.ros-kinetic-ros-base?refresh=yes))

Individual Package: You can also install a specific ROS package (replace underscores with dashes of the package name):

```
sudo apt-get install ros-kinetic-PACKAGE
```

e.g.

```
sudo apt-get install ros-kinetic-slam-gmapping
```

To find available packages, use:

```
apt-cache search ros-kinetic
```

1.5 Environment setup

It's convenient if the ROS environment variables are automatically added to your bash session every time a new shell is launched:

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

If you have more than one ROS distribution installed, ~/.bashrc must only source the setup.bash for the version you are currently using.

If you just want to change the environment of your current shell, instead of the above you can type:

```
source /opt/ros/kinetic/setup.bash
```

If you use zsh instead of bash you need to run the following commands to set up your shell:

```
echo "source /opt/ros/kinetic/setup.zsh" >> ~/.zshrc
source ~/.zshrc
```

1.6 Dependencies for building packages

Up to now you have installed what you need to run the core ROS packages. To create and manage your own ROS workspaces, there are various tools and requirements that are distributed separately. For example, `rosinstall` (/rosinstall) is a frequently used command-line tool that enables you to easily download many source trees for ROS packages with one command.

To install this tool and other dependencies for building ROS packages, run:

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

1.6.1 Initialize rosdep



Before you can use many ROS tools, you will need to initialize rosdep. rosdep enables you to easily install system dependencies for source you want to compile and is required to run some core components in ROS. If you have not yet installed rosdep, do so as follows.

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

With the following, you can initialize rosdep.

```
sudo rosdep init
rosdep update
```

1.7 Build farm status

The packages that you installed were built by the  ROS build farm (<http://build.ros.org>). You can check the status of individual packages  here (http://repositories.ros.org/status_page/ros_kinetic_default.html).

2. Tutorials

Now, to test your installation, please proceed to the ROS Tutorials ([/ROS/Tutorials](#)).

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Wiki: kinetic/Installation/Ubuntu (last edited 2020-03-25 20:13:00 by TullyFoote (/TullyFoote))

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