kinetic/ Installation/ Ubuntu

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 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.

If you rely on these packages, please support OSRF.

These packages are built and hosted on infrastructure maintained and paid for by the Open Source Robotics Foundation, a 501(c)(3) non-profit organization. If OSRF were to receive one penny for each downloaded package for just two months, we could cover our annual costs to manage, update, and host all of our online services. Please consider donating to OSRF today.

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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 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 Source Debs are also available

1.3 Set up your keys

```
sudo apt-key adv --keyserver hkp://ha.pool.sks-keyservers.net:80 --recv-key 421C365BD9FF1F717815A3895523BAEEB01FA116
```

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.

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

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

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

or click here

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

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

or click here

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

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

or click here

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 Initialize rosdep

Before you can use ROS, 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.

```
sudo rosdep init
rosdep update
```

1.6 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
```

1.7 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 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-rosinstall python-rosinstall-generator python-wstool build-essential
```

1.8 Build farm status

The packages that you installed were built by the ROS build farm. You can check the status of individual packages here.

2. Tutorials

Now, to test your installation, please proceed to the ROS Tutorials.

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