Manual for Installation of ROS Kinetic on Ubuntu Linux

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"The Robot Operating System (ROS) is a flexible framework for writing robot software. It is a collection of tools, libraries, and conventions that aim to simplify the task of creating complex and robust robot behavior across a wide variety of robotic platforms."

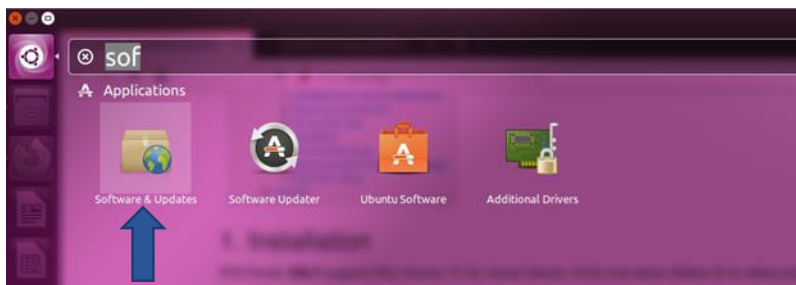> *For more information about ROS click here.*

Configure your Ubuntu repositories

Hint: ROS Kinetic **ONLY** supports Wily (Ubuntu 15.10), Xenial (Ubuntu 16.04) and Jessie (Debian 8) for debian packages. For me, I use Ubuntu 16.04.
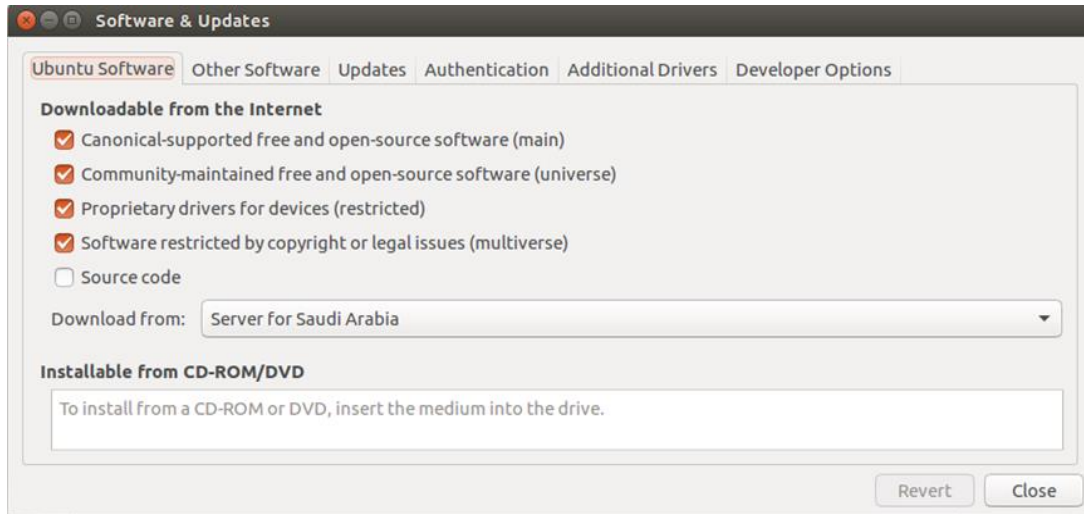
1. Click on the first icon.
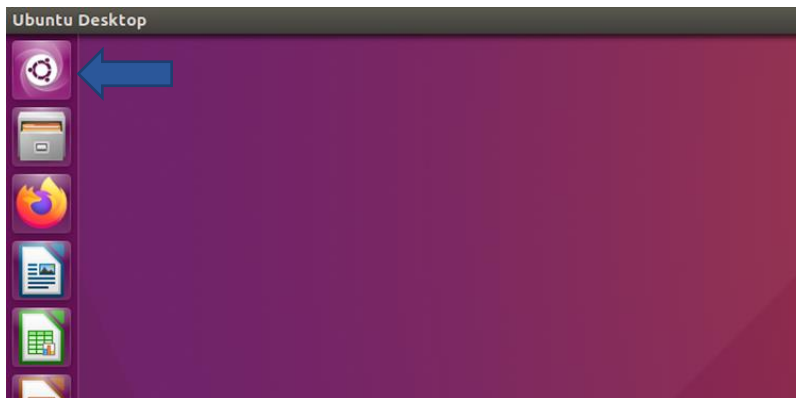
2. Search for **Software & Updates**, and click on it.

3. Make sure **universe, restricted and multiverse** are all checked. Then click close.

Now open a new terminal window to type the commands.

Setup your sources.list

1. Type (or copy and paste) the following command then click enter.

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

2. After that, will ask you to enter the password. Type your password and click enter.

Set up your keys

Type (or copy and paste) the following command then click enter.

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

```
hind@hind-virtual-machine:~$ sudo apt-key adv --keyserver 'hkp://keyserver.ubunt
u.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
Executing: /tmp/tmp.1hO7w8McheR/gpg.1.sh --keyserver
hkp://keyserver.ubuntu.com:80
--recv-key
C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
gpg: requesting key AB17C654 from hkp server keyserver.ubuntu.com
gpg: key AB17C654: public key "Open Robotics <info@osrfoundation.org>" imported
gpg: Total number processed: 1
gpg:               imported: 1  (RSA: 1)
hind@hind-virtual-machine:~$
```

Installation

1. First, type (or copy and paste) the following command then click enter.

```
sudo apt-get update
```

```
hind@hind-virtual-machine:~$ sudo apt-get update
Get:1 http://security.ubuntu.com/ubuntu xenial-security InRelease [109 kB]
Hit:2 http://sa.archive.ubuntu.com/ubuntu xenial InRelease
Get:3 http://sa.archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]
Get:4 http://packages.ros.org/ros/ubuntu xenial InRelease [4678 B]
Get:5 http://sa.archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]
Fetched 330 kB in 0s (348 kB/s)
Reading package lists... Done
hind@hind-virtual-machine:~$ ▮
```

2. Now type the following command then click enter.

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

```
hind@hind-virtual-machine:~$ sudo apt-get install ros-kinetic-desktop-full
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  snapd-login-service
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  autotools-dev binfmt-support blt bzip2-doc cmake cmake-data comerr-dev curl
  debhelper dh-strip-nondeterminism docutils-common docutils-doc fltk1.3-doc
  fluid fonts-lato fonts-lyx freeglut3 freeglut3-dev gazebo7 gazebo7-common
  gazebo7-plugin-base gfortran gfortran-5 gir1.2-gtk-2.0 google-mock graphviz
  hddtemp hdf5-helpers i965-va-driver icu-devtools javascript-common
```

3. Then, will ask you to continue. Type y and click enter. This command will take some time.

```
  x11proto-gl-dev x11proto-input-dev x11proto-kb-dev x11proto-randr-dev
  x11proto-render-dev x11proto-scrnsaver-dev x11proto-xext-dev
  x11proto-xf86vidmode-dev x11proto-xinerama-dev xorg-sgml-doctools xtrans-dev
  zlib1g-dev
0 upgraded, 868 newly installed, 0 to remove and 0 not upgraded.
Need to get 494 MB of archives.
After this operation, 2507 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Environment setup

1. First, type (or copy and paste) the following command then click enter.

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

```
hind@hind-virtual-machine:~$ echo "source /opt/ros/kinetic/setup.bash" >> ~/.bashrc
hind@hind-virtual-machine:~$
```

2. Now type the following command then click enter.

```
source ~/.bashrc
```

```
hind@hind-virtual-machine:~$ source ~/.bashrc
hind@hind-virtual-machine:~$
```

Dependencies for building packages

1. First, type (or copy and paste) the following command then click enter.

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

```
hind@hind-virtual-machine:~$ sudo apt install python-rosdep python-rosinstall python-ros
install-generator python-wstool build-essential
[sudo] password for hind:
Reading package lists... Done
Building dependency tree
Reading state information... Done
build-essential is already the newest version (12.1ubuntu2).
python-rosdep is already the newest version (0.19.0-1).
python-rosdep set to manually installed.
The following package was automatically installed and is no longer required:
  snapd-login-service
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  bzr git git-core git-man liberror-perl libjs-excanvas libserf-1-1 libsvn1 mercurial
  mercurial-common python-bzrlib python-configobj python-dbus python-gi python-gpgme
```

2. After that, will ask you to enter the password. Type your password and click enter.

3. Then, will ask you to continue. Type y and click enter. This command will take some time.

```
python-httplib2 python-keyring python-launchpadlib python-lazr.restfulclient
  python-lazr.uri python-oauth python-rosinstall python-rosinstall-generator
  python-secretstorage python-simplejson python-vcstools python-wadllib python-wstool
  subversion
0 upgraded, 29 newly installed, 0 to remove and 0 not upgraded.
Need to get 9555 kB of archives.
After this operation, 54.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

4. Now type the following command then click enter.

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

```
hind@hind-virtual-machine:~$ sudo apt install python-rosdep
Reading package lists... Done
Building dependency tree
Reading state information... Done
python-rosdep is already the newest version (0.19.0-1).
The following package was automatically installed and is no longer required:
  snapd-login-service
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
hind@hind-virtual-machine:~$
```

5. Next, type the following command then click enter.

```
sudo rosdep init
```

```
hind@hind-virtual-machine:~$ sudo rosdep init
Wrote /etc/ros/rosdep/sources.list.d/20-default.list
Recommended: please run

        rosdep update

hind@hind-virtual-machine:~$
```

6. Finally, type the following command then click enter.

```
rosdep update
```

```
hind@hind-virtual-machine:~$ rosdep update
reading in sources list data from /etc/ros/rosdep/sources.list.d
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/osx-homebrew.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/base.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/python.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/ruby.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/releases/fuerte.yaml
Query rosdistro index https://raw.githubusercontent.com/ros/rosdistro/master/index-v4.ya
ml
Skip end-of-life distro "ardent"
Skip end-of-life distro "bouncy"
Skip end-of-life distro "crystal"
Add distro "dashing"
Add distro "eloquent"
Add distro "foxy"
Skip end-of-life distro "groovy"
Skip end-of-life distro "hydro"
Skip end-of-life distro "indigo"
Skip end-of-life distro "jade"
Add distro "kinetic"
Skip end-of-life distro "lunar"
Add distro "melodic"
Add distro "noetic"
Add distro "rolling"
updated cache in /home/hind/.ros/rosdep/sources.cache
hind@hind-virtual-machine:~$
```

Checking for ROS installation

In the last step of the installation process, type the following command to check if ROS is installed properly or not.

```
roscore
```


References

http://wiki.ros.org/kinetic/Installation/Ubuntu

https://www.youtube.com/watch?v=hmej7Wkj0OA