

## Installing ROS Kinetic on Ubuntu 16.04 LTS

This file will help you to install ROS (Robotics Operating System) on your Linux Ubuntu (16.04 LTS) machine.

### What is ROS?

Robot Operating System (ROS) is a framework which provides tools and libraries to help software developers to create robot applications. The primary goal of ROS is to support code reuse in robotics research and development. Testing of robot code can be time-consuming and error-prone and sometimes physical robot might not be present. ROS provides a solution to this problem as it separates the hardware part and decision making (coding) part. Because of this separation, we can replace hardware part with a model in the simulator and test the behavior of decision-making part. It is an **open-source** software. It also provides a simple way to record and play data.

To know more about ROS you can visit [here](#).

The main ROS client libraries (C++ and Python) are geared toward a Unix-like system, primarily because of their dependence on large collections of open-source software. Hence these client libraries require Linux operating system.

You must install the **ROS-Kinetic** in **Ubuntu 16.04** on your PC/Laptop.

You can download the **Ubuntu 16.04 desktop image** here: ([64-bit](#)) / ([32-bit](#)) [Direct Download].

**NOTE: ROS must be installed on Ubuntu 16.04 LTS only.**

### Installing Instructions for ROS-Kinetic on Ubuntu 16.04:

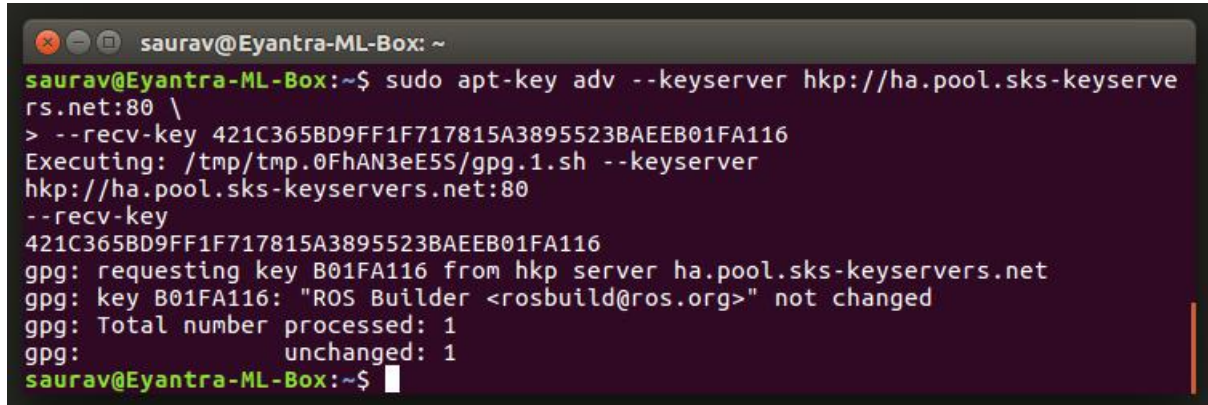
This document assumes that the host OS on which ROS Kinetic is to be installed is Ubuntu 16.04 LTS. This document offers a very concise walk-through of the ROS Installation.

- Execute the following commands/steps in the terminal one after the other.
- Do not copy the following two commands from this PDF, they may throw an error due to formatting differences. Copy them from section 1.2 and 1.3 of this link: [ROS Kinetic Installation page](#).

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

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

The output for this command should look like Figure 1, below:



```
saurov@Eyantra-ML-Box: ~  
saurov@Eyantra-ML-Box:~$ sudo apt-key adv --keyserver hkp://ha.pool.sks-keyserve  
rs.net:80 \  
> --recv-key 421C365BD9FF1F717815A3895523BAEEB01FA116  
Executing: /tmp/tmp.0FhAN3eE5S/gpg.1.sh --keyserver  
hkp://ha.pool.sks-keyservers.net:80  
--recv-key  
421C365BD9FF1F717815A3895523BAEEB01FA116  
gpg: requesting key B01FA116 from hkp server ha.pool.sks-keyservers.net  
gpg: key B01FA116: "ROS Builder <rosbuild@ros.org>" not changed  
gpg: Total number processed: 1  
gpg: unchanged: 1  
saurov@Eyantra-ML-Box:~$
```

Figure 1: Output of Add Key Command

```
>> sudo apt-get update  
>> sudo apt-get install ros-kinetic-desktop-full  
>> sudo rosdep init  
>> rosdep update  
>> printf "\nsourcing /opt/ros/kinetic/setup.bash" >> ~/.bashrc  
>> source ~/.bashrc  
>> sudo apt-get install python-rosinstall
```

After this we will create a catkin workspace, follow the commands below to do so:

```
>> mkdir -p ~/catkin_ws/src  
>> cd ~/catkin_ws/src  
>> catkin_init_workspace  
>> cd ~/catkin_ws  
>> catkin_make  
>> printf "\nsourcing ~/catkin_ws/devel/setup.bash" >> ~/.bashrc  
>> source ~/.bashrc
```