

## GROUP WORK

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❖ Installing ROS:

❖ Set up sources.list

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

```
peter@peter-VirtualBox:~$ rosversion -d
Debian
peter@peter-VirtualBox:~$
peter@peter-VirtualBox:~$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
[sudo] password for peter:
peter@peter-VirtualBox:~$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
Executing: /tmp/tmp.3l0DSQCi6a/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)
```

❖ Set up keys

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

```
peter@peter-VirtualBox:~$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
Executing: /tmp/tmp.44uPZVoZrI/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: "Open Robotics <info@osrfoundation.org>" not changed
```

❖ Update your Ubuntu package index

Command: `sudo apt-get update`

```

peter@peter-VirtualBox:~$ sudo apt-get update
Hit:1 http://ke.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://ke.archive.ubuntu.com/ubuntu xenial-updates InRelease [99.8 kB]
Get:3 http://ke.archive.ubuntu.com/ubuntu xenial-backports InRelease [97.4 kB]
Get:4 http://security.ubuntu.com/ubuntu xenial-security InRelease [99.8 kB]
Get:5 http://ke.archive.ubuntu.com/ubuntu xenial-updates/main amd64 DEP-11 Metad
ata [326 kB]
Get:6 http://ke.archive.ubuntu.com/ubuntu xenial-updates/universe amd64 DEP-11 M
etaddata [281 kB]
Get:7 http://packages.ros.org/ros/ubuntu xenial InRelease [4,692 B]
Get:8 http://ke.archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 DEP-11
Metadata [5,956 B]
Get:9 http://ke.archive.ubuntu.com/ubuntu xenial-backports/main amd64 DEP-11 Met

```

- ❖ Update your Ubuntu package index

Command: `sudo apt-get update`

```

peter@peter-VirtualBox:~$ sudo apt-get update
Hit:1 http://ke.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://ke.archive.ubuntu.com/ubuntu xenial-updates InRelease [99.8 kB]
Get:3 http://ke.archive.ubuntu.com/ubuntu xenial-backports InRelease [97.4 kB]
Get:4 http://security.ubuntu.com/ubuntu xenial-security InRelease [99.8 kB]
Get:5 http://ke.archive.ubuntu.com/ubuntu xenial-updates/main amd64 DEP-11 Metad
ata [326 kB]
Get:6 http://ke.archive.ubuntu.com/ubuntu xenial-updates/universe amd64 DEP-11 M
etaddata [281 kB]
Get:7 http://packages.ros.org/ros/ubuntu xenial InRelease [4,692 B]
Get:8 http://ke.archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 DEP-11
Metadata [5,956 B]
Get:9 http://ke.archive.ubuntu.com/ubuntu xenial-backports/main amd64 DEP-11 Met

```

- ❖ Install ROS Kinetic Desktop Full

- ❖ Command: `sudo apt-get install ros-kinetic-desktop-full`

```

peter@peter-VirtualBox:~$ sudo apt-get install ros-kinetic-desktop-full
Reading package lists... Done
Building dependency tree
Reading state information... Done
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 icu-devtools javascript-common
  krb5-multidev libaec-dev libaec0 libapr1 libapr1-dev
  libaprutil1 libaprutil1-dev libarmadillo6 libarpack2
  libassimp-dev libassimp3v5 libatk1.0-dev libavcodec-dev
  libavformat-dev libavutil-dev libblas-common libblas-dev
  libblas3 libboost-all-dev libboost-atomic-dev
  libboost-atomic1.58-dev libboost-atomic1.58.0
  libboost-chrono-dev libboost-chrono1.58-dev
  libboost-chrono1.58.0 libboost-context-dev
  libboost-context1.58-dev libboost-context1.58.0
  libboost-coroutine-dev libboost-coroutine1.58-dev

```



Confirming kinetic ROS successfully installed

```
peter@peter-VirtualBox:~$ rosversion -d  
kinetic  
peter@peter-VirtualBox:~$
```

- ❖ Create a package

Command:

`mkdir -p ~/catkin_ws/src`

`cd ~/catkin_ws/src`

`catkin_init_workspace`

```
peter@peter-VirtualBox:~$ mkdir -p ~/catkin_ws/src  
peter@peter-VirtualBox:~$ cd ~/catkin_ws/src  
peter@peter-VirtualBox:~/catkin_ws/src$ catkin_init_workspace  
Creating symlink "/home/peter/catkin_ws/src/CMakeLists.txt" pointing to "  
opt/ros/kinetic/share/catkin/cmake/toplevel.cmake"  
peter@peter-VirtualBox:~/catkin_ws/src$
```

- ❖ Creating a new package:

Command: `cd ~/catkin_ws/src`

`catkin_create_pkg kca_robot_project [depend1] [depend2] [depend3]`

```
VirtualBox:~/catkin_ws/src$ cd ~/catkin_ws/src  
peter@peter-VirtualBox:~/catkin_ws/src$ catkin_create_pkg kca_robot_projec  
t [depend1] [depend2] [depend3]  
Created file kca_robot_project/CMakeLists.txt  
Created file kca_robot_project/package.xml  
Successfully created files in /home/peter/catkin_ws/src/kca_robot_project.  
Please adjust the values in package.xml.  
peter@peter-VirtualBox:~/catkin_ws/src$
```

- ❖ Adding code and files to the package:

Command: `file => group_first_package`

```
peter@peter-VirtualBox:~/catkin_ws/src$ cd ~/catkin_ws/src  
peter@peter-VirtualBox:~/catkin_ws/src$ catkin_create_pkg group_first_pack  
age roscpp std_msgs  
Created file group_first_package/CMakeLists.txt  
Created file group_first_package/package.xml  
Created folder group_first_package/include/group_first_package  
Created folder group_first_package/src  
Successfully created files in /home/peter/catkin_ws/src/group_first_packag  
e. Please adjust the values in package.xml.  
peter@peter-VirtualBox:~/catkin_ws/src$
```

- ❖ A simple `c++` code that was added to the package

```
GNU nano 2.5.3      File: group_first_package.txt      Modified
#include <iostream>

using namespace std;

int main() {
    cout << "Hello everyone.This is a simple c++ program to say 'HELLO'
    return 0;
}
```

- ❖ Confirming the code an files were added in the package

```
GNU nano 2.5.3 DIR: ...e/peter/catkin_ws/src/group_first_package/src/
..                                (parent dir)
.group_first_package.txt.swp      1 KB
my_node.cpp                      0 B
```