
ros_tutorial Documentation

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skconan

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Contents:

Install ROS in Ubuntu

1.1 1.

1.1. sources.list

deb <http://packages.ros.org/ros/ubuntu> \$(lsb_release -sc) main /etc/apt/sources.list.d/ros-latest.list 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'
```

1.2. Key

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

1.3. Debian package

```
$ sudo apt-get update
```

1.4. ROS-Kinetic package

```
$ sudo apt-get install ros-kinetic-<package >
```

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

Reference: <http://wiki.ros.org/kinetic/Installation/Ubuntu>

1.2 2. rosdep

rosdep dependencies

```
$ sudo rosdep init
$ rosdep update
```


2.1 1. ROS environment Bash session

```
source /opt/ros/kinetic/setup.bash .bashrc .bash_aliases (: .bash_aliases)
```

ROS environment Bash session Terminal

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

```
echo show double quote (" ")
```

```
>>
```



```
skconan@skconan: ~/catkin_ws
skconan@skconan:~/catkin_ws$ tree -L 2
.
├── build
│   ├── catkin
│   ├── catkin_generated
│   ├── CATKIN_IGNORE
│   ├── catkin_make.cache
│   ├── CMakeCache.txt
│   ├── CMakeFiles
│   ├── cmake_install.cmake
│   ├── CTestTestfile.cmake
│   ├── gtest
│   ├── hello_pkg
│   ├── helloPkg
│   ├── Makefile
│   ├── test_results
│   └── ttt
├── devel
│   ├── env.sh
│   ├── lib
│   ├── setup.bash
│   ├── setup.sh
│   ├── _setup_util.py
│   ├── setup.zsh
│   └── share
└── src
    ├── CMakeLists.txt -> /opt/ros/kinetic/share/catkin/cmake/toplevel.cmake
    └── hello_pkg

14 directories, 12 files
skconan@skconan:~/catkin_ws$
```

3.1 1. directory workspace

directory catkin_ws directory home directory src catkin_ws

```
$ cd ~/
$ mkdir catkin_ws
$ cd ~/catkin_ws
$ mkdir src
```

3.2 2. catkin_init_workspace

catkin_init_workspace directory **catkin_ws/src**

workspace CMakeList.txt

```
$ cd ~/catkin_ws/src
$ catkin_init_workspace
```

3.3 3. catkin_make

catkain_ws catkin_make run

```
$ cd src
$ catkin_init_workspace
$ cd ..
$ mkdir build
$ cd build
$ cmake ../src -DCMAKE_INSTALL_PREFIX=../install -DCATKIN_DEVEL_PREFIX=../
↪devel
$ make
```

```
skconan@skconan: ~/catkin_ws
Source space: /home/skconan/catkin_ws/src
Build space: /home/skconan/catkin_ws/build
Devel space: /home/skconan/catkin_ws/devel
Install space: /home/skconan/catkin_ws/install
####
#### Running command: "cmake /home/skconan/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/
/home/skconan/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/home/skconan/catkin_ws/inst
all -G Unix Makefiles" in "/home/skconan/catkin_ws/build"
####
-- Using CATKIN_DEVEL_PREFIX: /home/skconan/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/kinetic
-- This workspace overlays: /opt/ros/kinetic
-- Using PYTHON_EXECUTABLE: /usr/bin/python2
-- Using Debian Python package layout
-- Using empy: /usr/bin/empy
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/skconan/catkin_ws/build/test_results
-- Found gtest sources under '/usr/src/gtest': gtests will be built
-- Using Python nosetests: /usr/bin/python2/nosetests
-- catkin 0.7.6
-- BUILD_SHARED_LIBS is on
-- Configuring done
-- Generating done
-- Build files have been written to: /home/skconan/catkin_ws/build
####
#### Running command: "make -j4 -l4" in "/home/skconan/catkin_ws/build"
####
skconan@skconan:~/catkin_ws$
```

reference: http://wiki.ros.org/catkin/commands/catkin_make

3.4 4. NOTE

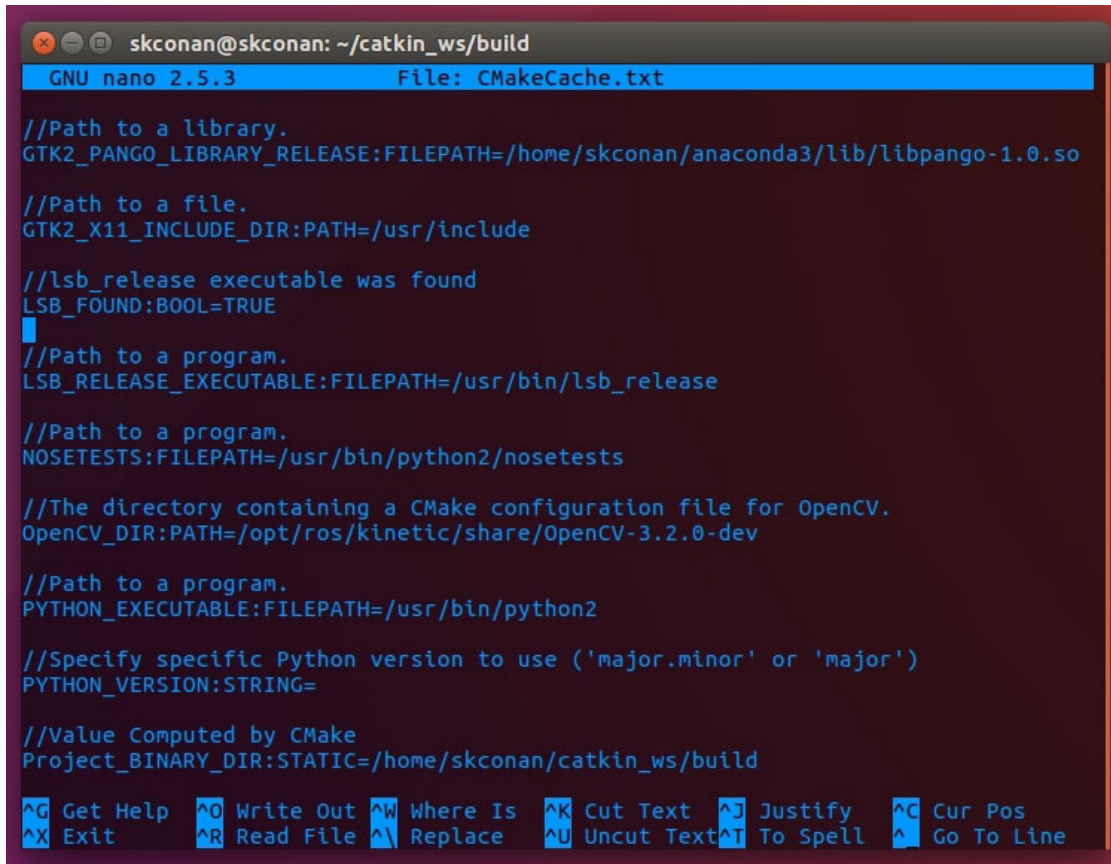
```
skconan@skconan: ~/catkin_ws
####
-- Using CATKIN_DEVEL_PREFIX: /home/skconan/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/kinetic
-- This workspace overlays: /opt/ros/kinetic
-- Using PYTHON_EXECUTABLE: /home/skconan/anaconda3/bin/python
-- Using Debian Python package layout
-- Using empy: /usr/bin/empy
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/skconan/catkin_ws/build/test_results
-- Found gtest sources under '/usr/src/gtest': gtests will be built
-- Using Python nosetests: /home/skconan/anaconda3/bin/nosetests
ImportError: "from catkin_pkg.package import parse_package" failed: No module named 'catkin_pkg'
Make sure that you have installed "catkin_pkg", it is up to date and on the PYTHONPATH.
CMake Error at /opt/ros/kinetic/share/catkin/cmake/safe_execute_process.cmake:11 (message):
  execute_process(/home/skconan/anaconda3/bin/python
"/opt/ros/kinetic/share/catkin/cmake/parse_package_xml.py"
"/opt/ros/kinetic/share/catkin/cmake/./package.xml"
"/home/skconan/catkin_ws/build/catkin/catkin_generated/version/package.cmake")
returned error code 1
Call Stack (most recent call first):
/opt/ros/kinetic/share/catkin/cmake/catkin_package_xml.cmake:63 (safe_execute_process)
/opt/ros/kinetic/share/catkin/cmake/all.cmake:151 (_catkin_package_xml)
/opt/ros/kinetic/share/catkin/cmake/catkinConfig.cmake:20 (include)
CMakeLists.txt:52 (find_package)

-- Configuring incomplete, errors occurred!
See also "/home/skconan/catkin_ws/build/CMakeFiles/CMakeOutput.log".
See also "/home/skconan/catkin_ws/build/CMakeFiles/CMakeError.log".
Invoking "cmake" failed
```

error version Python default python version Python2 anaconda3

catkin_ws/build/CMakeCache.txt path python2

```
...
//Path to a program.
NOSETESTS:FILEPATH=/usr/bin/python2/nosetests
...
//Path to a program.
PYTHON_EXECUTABLE:FILEPATH=/usr/bin/python2
...
```



```
skconan@skconan: ~/catkin_ws/build
GNU nano 2.5.3      File: CMakeCache.txt

//Path to a library.
GTK2_PANGO_LIBRARY_RELEASE:FILEPATH=/home/skconan/anaconda3/lib/libpango-1.0.so

//Path to a file.
GTK2_X11_INCLUDE_DIR:PATH=/usr/include

//lsb_release executable was found
LSB_FOUND:BOOL=TRUE

//Path to a program.
LSB_RELEASE_EXECUTABLE:FILEPATH=/usr/bin/lsb_release

//Path to a program.
NOSETTESTS:FILEPATH=/usr/bin/python2/nosetests

//The directory containing a CMake configuration file for OpenCV.
OpenCV_DIR:PATH=/opt/ros/kinetic/share/OpenCV-3.2.0-dev

//Path to a program.
PYTHON_EXECUTABLE:FILEPATH=/usr/bin/python2

//Specify specific Python version to use ('major.minor' or 'major')
PYTHON_VERSION:STRING=

//Value Computed by CMake
Project_BINARY_DIR:STATIC=/home/skconan/catkin_ws/build

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File  ^\ Replace   ^U Uncut Text ^T To Spell  ^_ Go To Line
```


CHAPTER 4

Indices and tables

- `genindex`
- `modindex`
- `search`