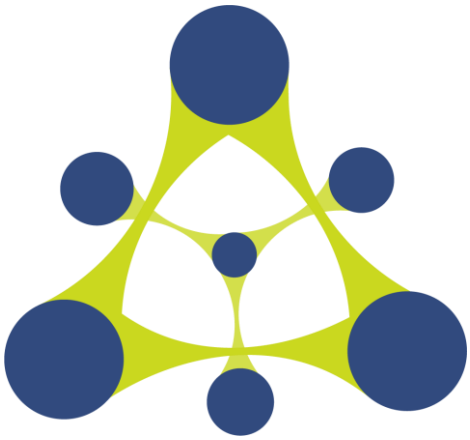


RoboWare Studio Manual

Version：1.0.2

Date：2017-11-30

CONTENTS

1 Introduction

1.1 Purpose

The purpose of this manual is to fully describe the function of RoboWare Studio and its operating environment. It helps users understand the scope of RoboWare Studio and how to use it, and provides the necessary information for the maintenance and updating of RoboWare Studio software.

1.2 Features

RoboWare is an IDE environment for ROS development. It makes the ROS development visual, simple and manageable. It provides ROS workspace management, code editing, building and debugging. It is an IDE, but it will not be an IDE only!

The main features of RoboWare Studio are:

(1) Easy installation and configuration

With a double-click installation, RoboWare Studio can automatically detect and load ROS environment without any additional configuration. This “out-of-the-box” feature helps developers pick it up and figure it out quickly.

(2) ROS-specific assistance, compatible with ROS indigo/jade/kinetic

RoboWare Studio is specially designed for ROS (indigo/jade/kinetic), it provides an intuitive graphical interface for developers to create ROS workspaces/packages, add source files, create messages/services/actions, list generated packages/nodes, etc. It can update CMakelists.txt and package.xml automatically.

(3) Perfect source-coding experience

RoboWare Studio provides important features of a modern IDE, such as syntax highlighting, code completion, go to definition, peek definition, diagnostic display, etc. It supports integrated terminal, you can open multiple terminals simultaneously. It also supports Vim mode.

(4) C++ and Python debugger

RoboWare Studio support “Release”, “Debug” and “Isolated” build options. It debugs C++ and Python codes right from the editor, with break points, call stacks and an interactive console. It displays ROS packages and nodes in the interface.

(5) Remote deploy and debug

RoboWare Studio can deploy local codes to remote computers, which can be X86 or ARM architecture, which makes users connect to remote computes, build and debug remote codes.

(6) Git built-in

RoboWare Studio working with Git has never been easier. It reviews diffs, stage files, and make commits right from the editor, and push and pull from any hosted Git service.

(7) Follow ROS conventions

RoboWare Studio provides an assistant guide to standardized operation for ROS developers, from creating nodes, defining messages, to putting files in a specific path, etc. RoboWare Studio can help to develop high quality, well organized ROS packages.

1.3 Updates

Version 1.0.2

1.In order to guarantee a compile error positioning function, for the previous version of the ROS workspace, you must first remove the tasks.json file in .vscode folder of workspace root, then close and reopen the workspace;

2.Optimize remote deploy speed;

3.Add cmakelists.txt error positioning function;

4.Fix package depends automatic modification problem in package.xml;

Version 1.0.1

1.Add dependencies when creating package;

2.Fix catkin package editing problem;

Version 1.0.0

1.Integrate with RoboWare Designer;

2.Add code format function using clang-format;

3.Add catkin dependencies edit function for packages;

Version 0.7.2

1.Add rosbag loop play function;

2.Fix remote debugging abnormal exit problem;

3.Fix compile error problem under Kinetic;

Version 0.7.1

1.Use non-Vim edit mode by default;

2.Add remote .bashrc editing function;

3.Add rqt command to the menu;

4.Update Python syntax plugin;

5.Update debug plugin;

6.Automatically switch debug mode based on build options;

Version 0.7.0

1.Adopt a brand new scheme for C++ code completion;

2.Add remote roscore command to the menu;

3.Fixed some bugs;

Version 0.6.0

1.Add rosbag tool: record and play function;

2.Using VS Code v1.12.2;

3.Improved C++ code completion experience;

4.Fixed some bugs;

Version 0.5.1

1.Provides Vim edit mode;

2.Add ROS node and C++ class wizard;

3.Synchronization of remote and local build directory;

4.Clean up build results remotely;

5.Fixed some bugs;

Version 0.5.0

1.optimize structure, decrease the size of installation package;

2.Using VS Code v1.10.1;
3.Move ROS package tools to left Activity Bar;
4.Can mark un-active ROS package in Explorer;
5.Add C++ and Python snippets;
6.Fixed some bugs;

Version 0.4.2

1.Automatically update CMakeLists.txt when add/remove source files;
2.Specify one or more packages to build;
3.Specify one or more packages to remote deploy, build;
4.Start .launch file remotely;
5.Add .bashrc menu, support one-key openning of .bashrc file ;
6.Clean up build results;
7.Fixed some bugs;

Version 0.4.1

1.Add 32-bit version of RoboWare Studio;
2.Add package installation function in ROS package manager;
3.Add code completion function with Clang;
4.Using VS Code v1.8.1;
5.Fixed some bugs;

Version 0.4.0

1.add ROS commands viewer;
2.add ROS package manager;
3.add language settings menu;
4.Fixed some bugs;

Version 0.3.1

1.Using VS Code v1.7.2;
2.Add build options list in the Explorer;
3.Add "isolated" build mode;
4.Achieve remote deployment, build and debug;
5.Increased CMakeLists.txt syntax support;
6.Run ROS commands in the integrated terminal;
7.Add rqt_reconfigure and rqt_graph commands to the menu;
8.Graphical user configuration interface;
9.Fixed some bugs;

2 Installation

2.1 Preparation

Prior to installing, take note of the details of your platform and make sure that:

1. Your operating system is Ubuntu.
2. ROS is configured appropriately (Please refer to ROS official instructions here[http://wiki.ros.org/kinetic/Installation/Ubuntu]).
3. You can build ROS packages using catkin_make. (You may need to run

   $ sudo apt-get install build-essential

to install build tools.)

4. Install “pylint” to support Python debugging.

   $ sudo apt-get install python-pip

   $ sudo python -m pip install pylint

5. Install clang-format-3.8 or higher version to support code format function.

   $ sudo apt-get install clang-format-3.8

2.2 Installation

Download the latest version of RoboWare Studio and install it easily by double click the deb file or by the following commands in a terminal:

$ cd /path/to/deb/file/

$ sudo dpkg -i roboware-studio_<version>_<architecture>.deb

Replace <version> and <architecture> with the file information (Tips: after typing “sudo dpkg -i ”, press Tab to automatically complete the file name). After installation, RoboWare Studio automatically detects and loads ROS environment without additional configuration.

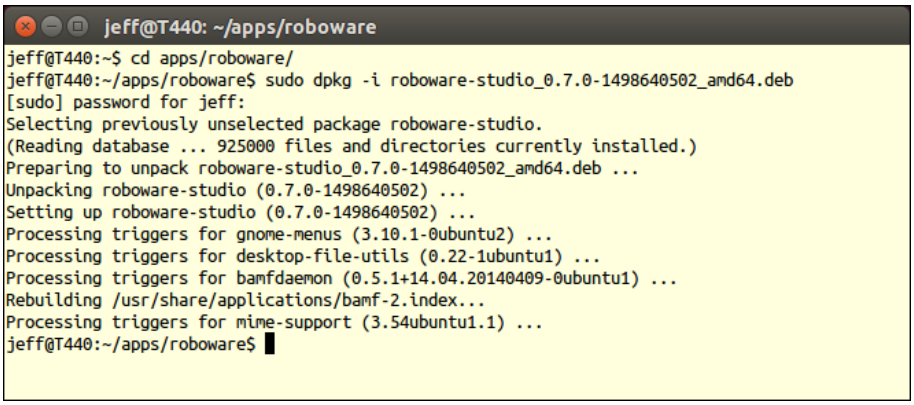


Figure 2-1 Installation in terminal

2.3 Upgrade

Download the latest version of RoboWare Studio installation file and install, the previous version will be replaced automatically.

2.4 Uninstallation

Use the following commands to uninstall RoboWare Studio:

$ sudo apt-get remove roboware-studio

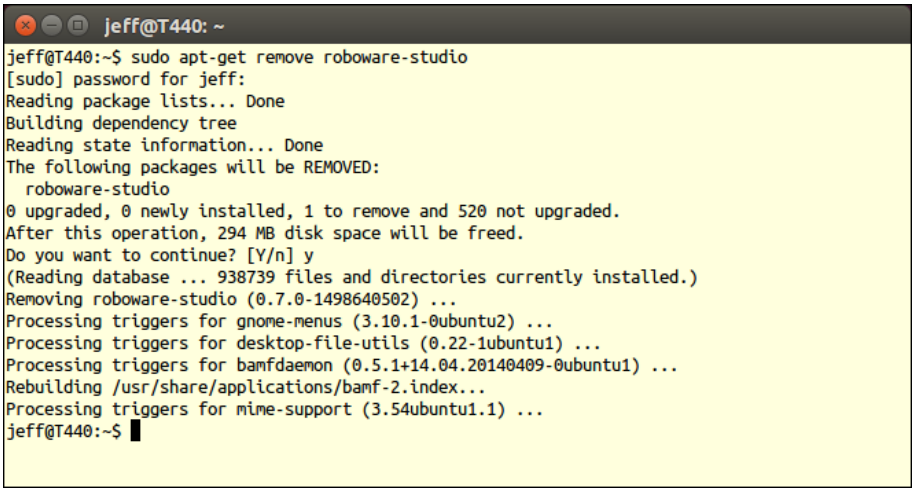


Figure 2-2 Uninstallation

2.5 Lanuch

Way #1 (recommended): Click the Ubuntu logo in the upper-left corner of the screen to activate Dash, search for “roboware studio”, click and launch.

Way #2: Start the application from terminal by executing:

```
$ roboware-studio
```

3 Tutorial

3.1 Local development mode

3.1.1 Create a workspace

In welcome panel, click “New Workspace” button (or select “File” - “New Workspace”), select a directory and type workspace name, for example “catkin_ws”, a catkin workspace named “catkin_ws” will be created and displayed in the explorer window.

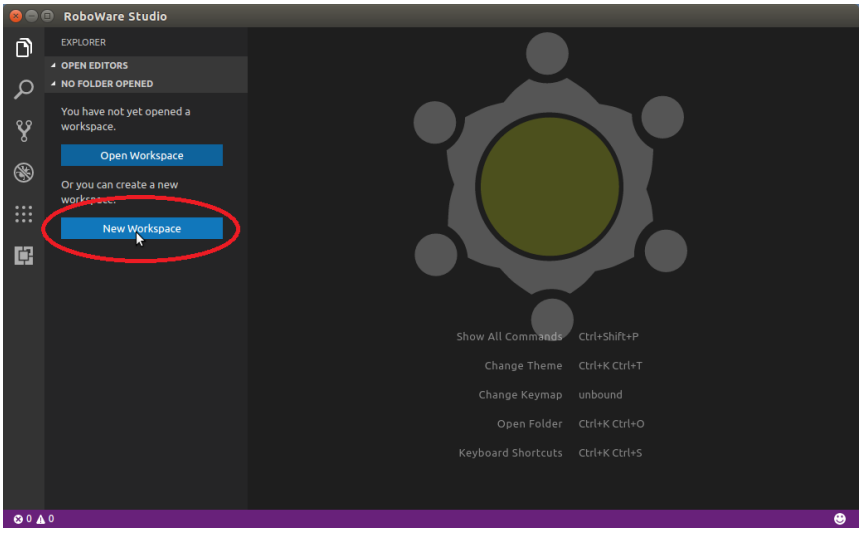


Figure 3-1 RoboWare Studio welcome panel

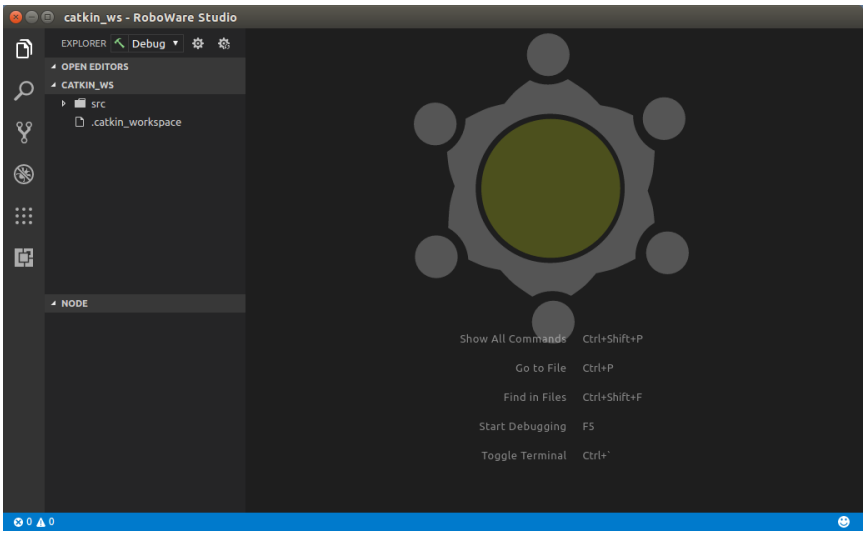


Figure 3-2 catkin_ws workspace

3.1.2 Open/close a workspace

In welcome panel, click the “Open Workspace” button (or select “File” - “Open Workspace”), choose the workspace directory and it will be opened and displayed in the explorer window.

Select “File” - “Close Workspace”, RoboWare Studio will close the current workspace and return back to welcome panel.

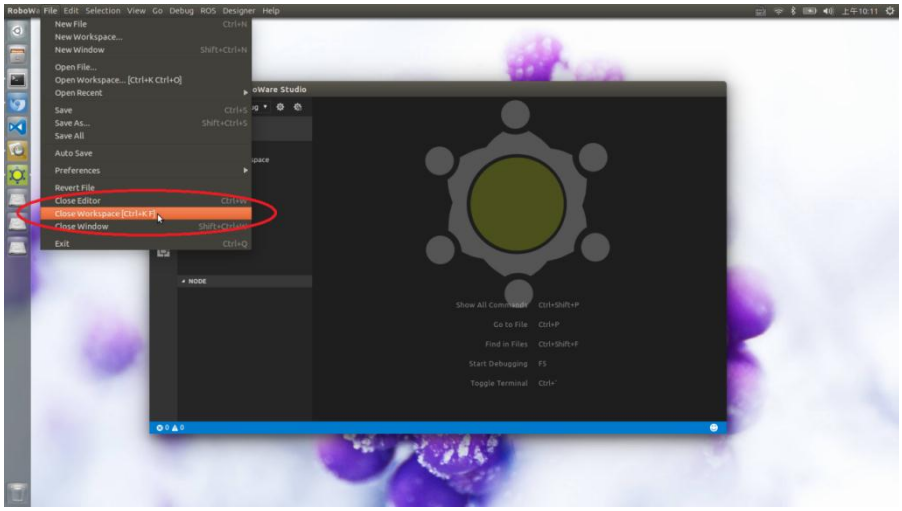


Figure 3-3 Close workspace

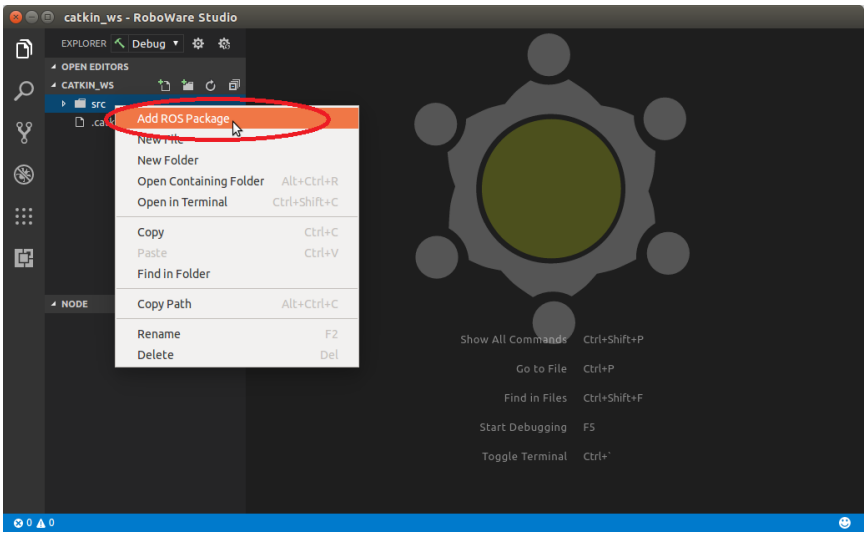
3.1.3 Create a ROS package

Right click on “src” folder of ROS workspace.

Select “Add ROS Package”, type package name, for example:

“my_package”

A ROS package named “my_package” will be created.



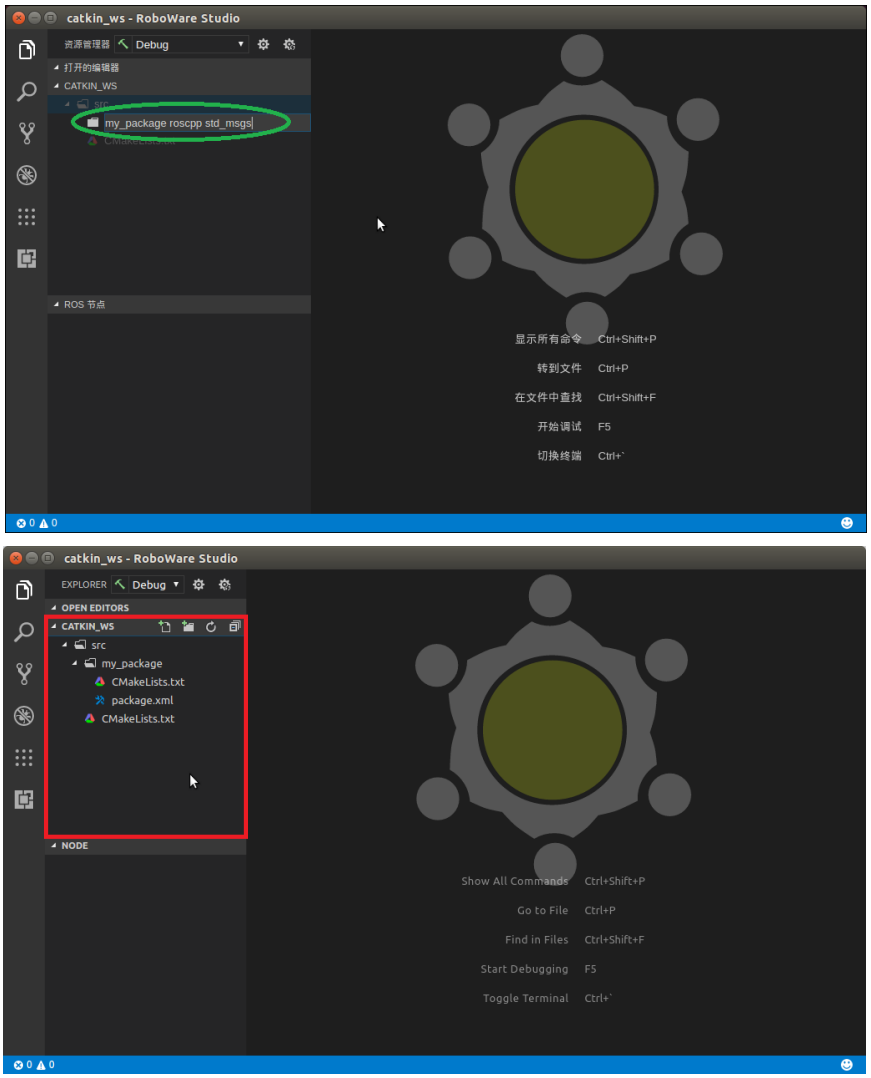


Figure 3-4 Create a package named “my_package” with dependencies “roscpp” and “std_msgs”

3.1.4 Add a new library or executable(Node)

Right click on package name (“my_package” here), choose “Add Src Folder” to create an empty “src” directory.

Right click on “src” to add a cpp file, or right click on “include/my_package/” to add a header file. After typing the file name, select an item from the list as follows:

- Add to New Library
- Add to New Executable

A library or an executable with the same name of the source file will be created.

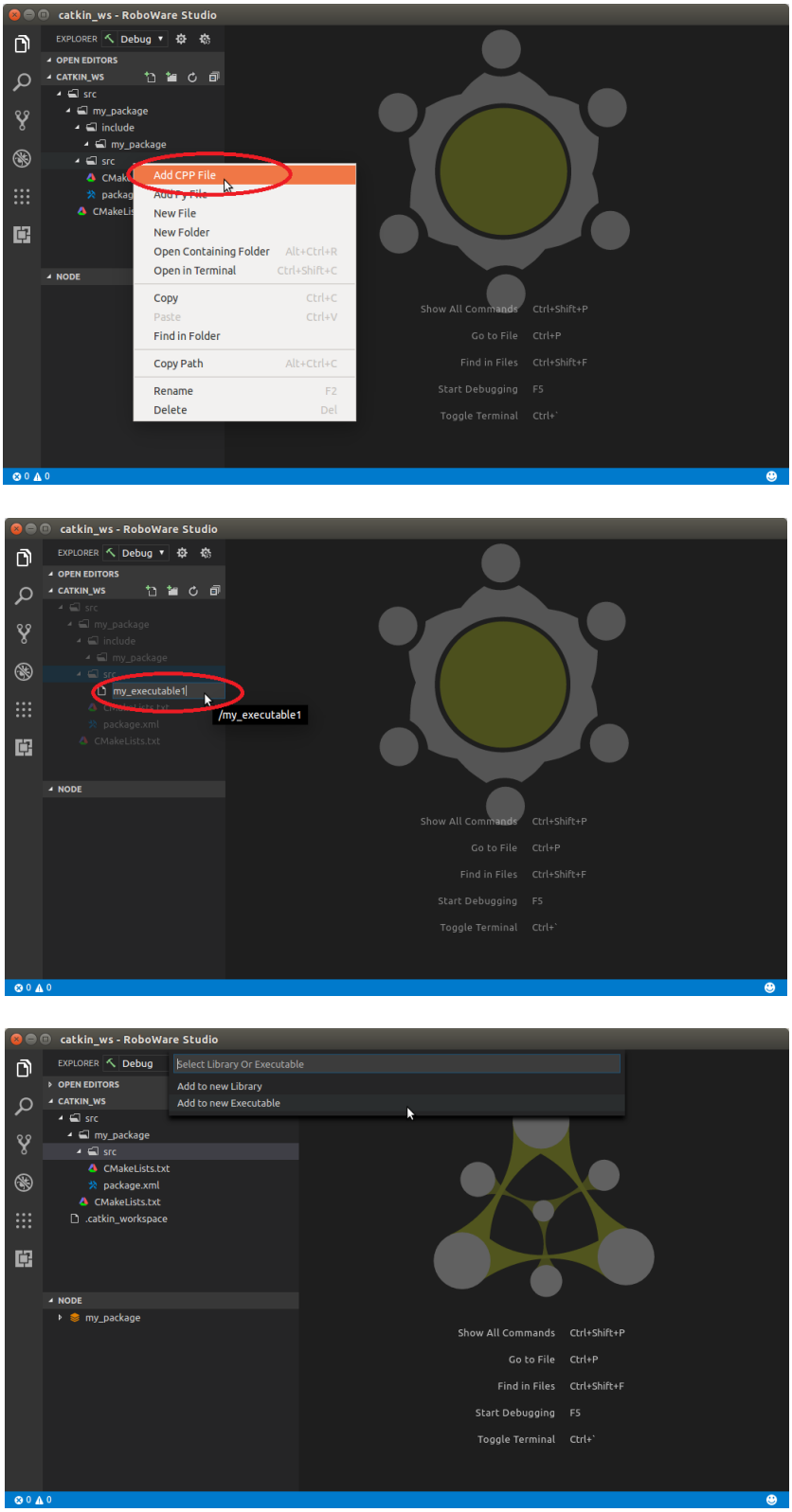


Figure 3-5 Create new CPP source file and add it to an executable(Node)

3.1.5 Add C++ source code to library or executable(Node)

Right click on “src” or “include/my_package/”. After typing the file name, select an item from the list as follows:

- your_library_name1

- your_library_name2
- your_executable_name1
- Add to New Library
- Add to New Executable

The source code will be added to corresponding library or executable. CMakeLists.txt will be updated automatically.

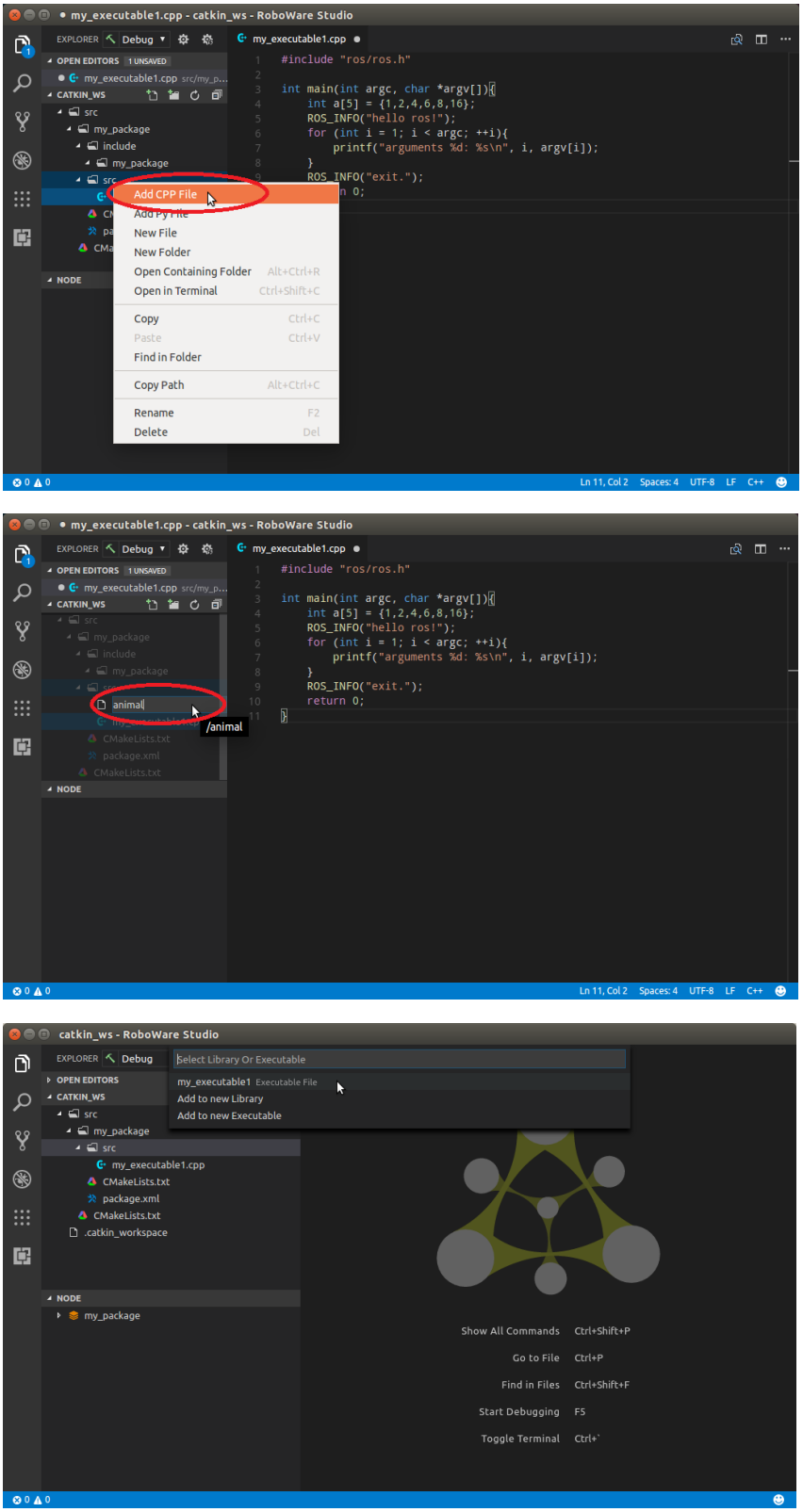


Figure 3-6 Create a CPP file and add it to “my_executable1”

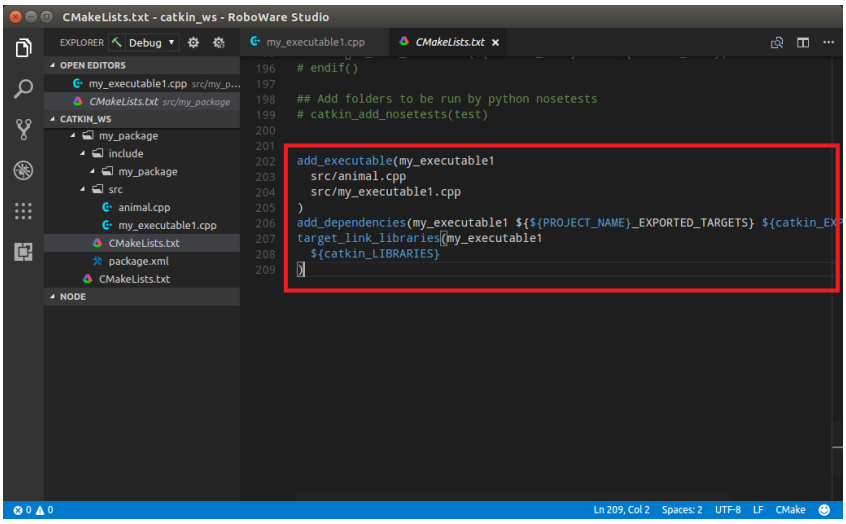


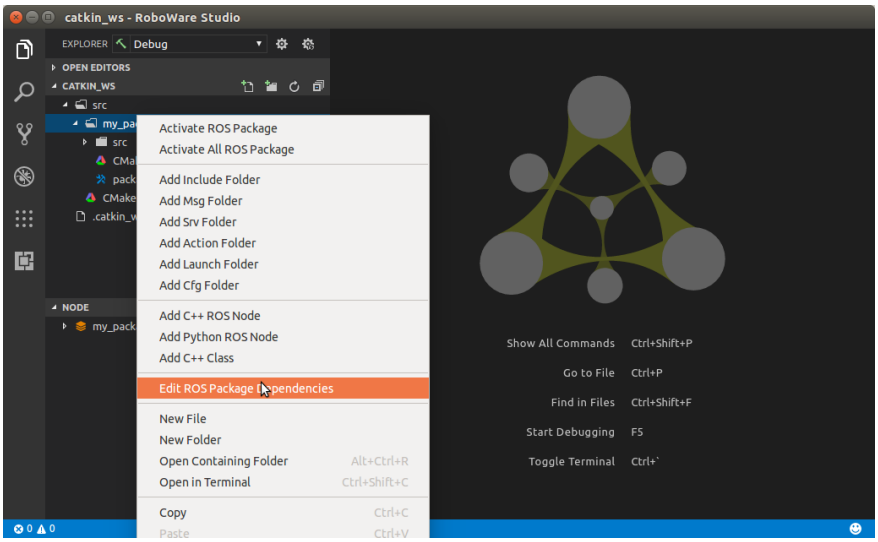
Figure 3-7 CMakeLists.txt is updated automatically

3.1.6 Edit ROS package dependencies

Right click on package name (“my_package” here), choose “Edit ROS Package Dependencies”, and type the dependencies of this package, for example:

“roscpp std_msgs”

Press “Enter”, then “roscpp” and “std_msgs” will be added as dependencies of “my_package”. For more dependencies, just use space to separate them.



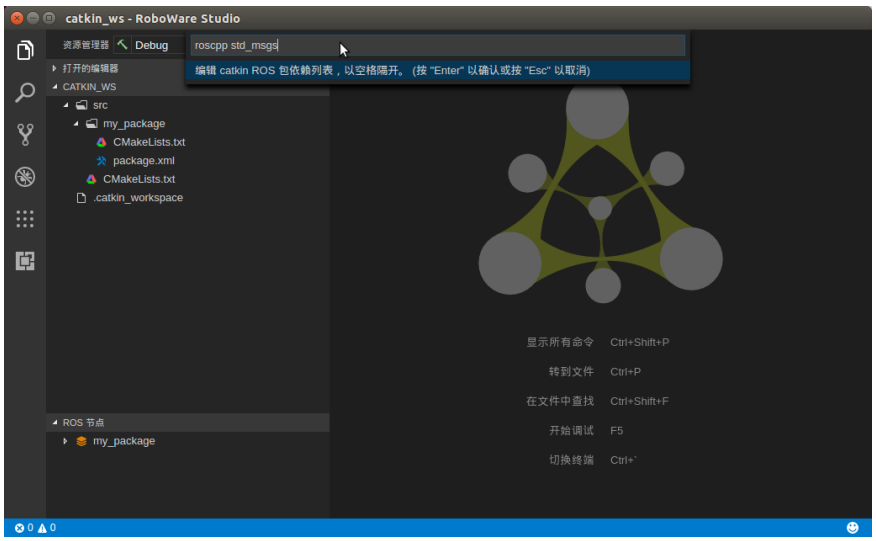


Figure 3-8 Edit ROS package dependencies

3.1.7 Add message/service/action

Right click on “my_package” to create msg/srv/action folder.

Right click on corresponding folder and add message/service/action file respectively. CMakeLists.txt and package.xml file will be updated automatically.

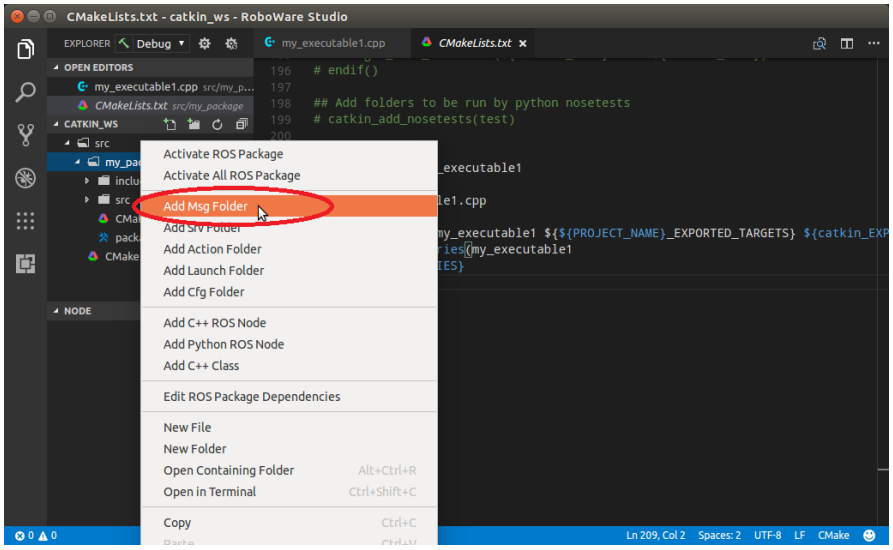


Figure 3-9 Create “msg” folder

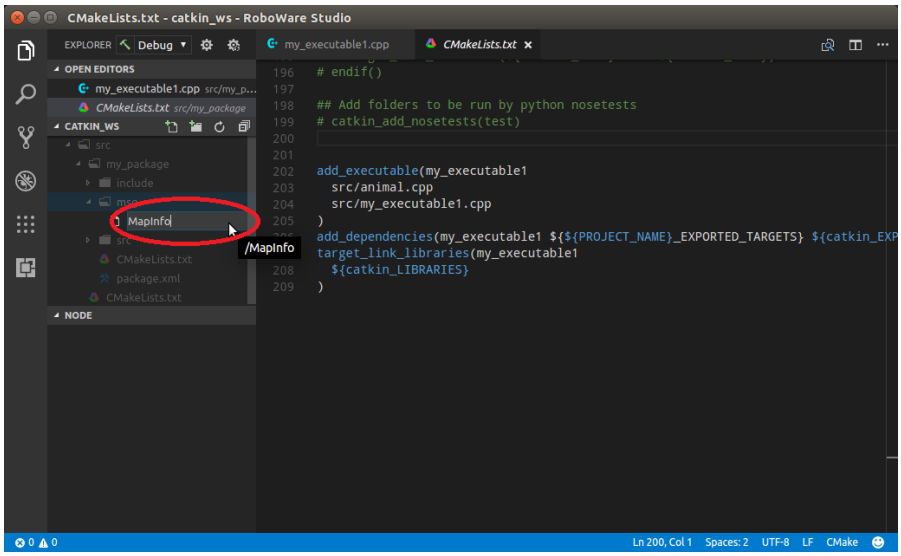


Figure 3-10 Create a message file named “MapInfo”

3.1.8 Build workspace

Choose a local build option from the build options list as follows:

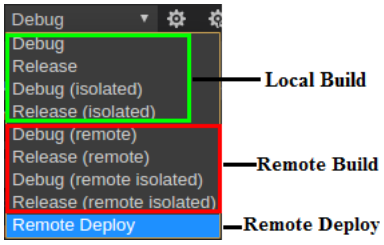
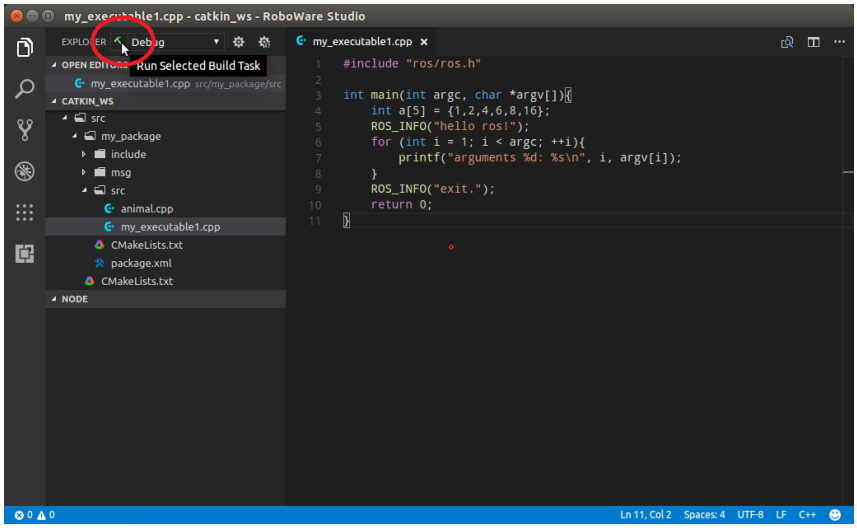


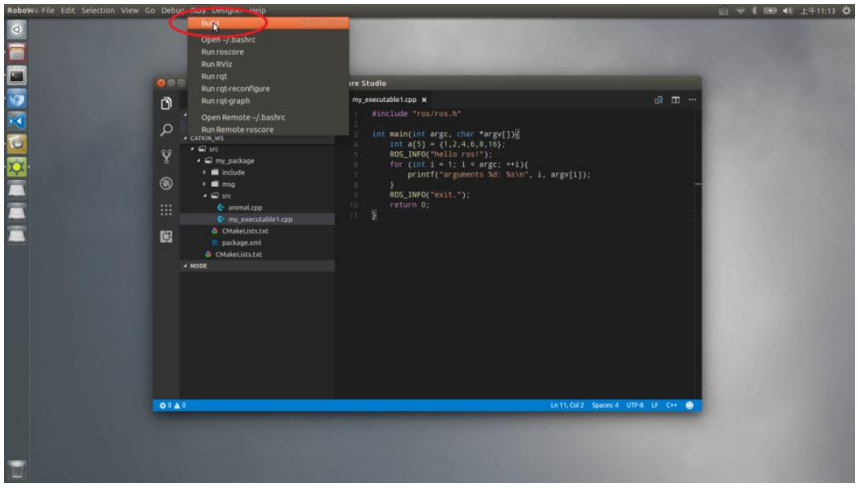
Figure 3-11 Build options

Click the “Run” icon in the left (or select “ROS” - “Build” in the menu) to build the workspace. Select “View” - “Output” to see build outputs. In output window, “ctrl + click” to track source code errors.

Once the workspace is built, the “Node” section at the lower part of Explorer window will display all packages/nodes in the current workspace.



Way #1: Click “Run” icon



Way #2: Select “ROS” - “Build” in the menu

Figure 3-12 Build ROS package

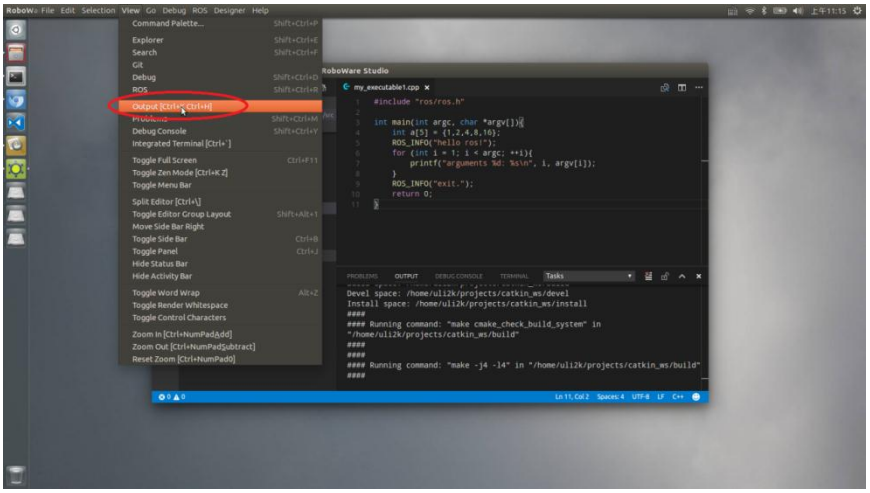
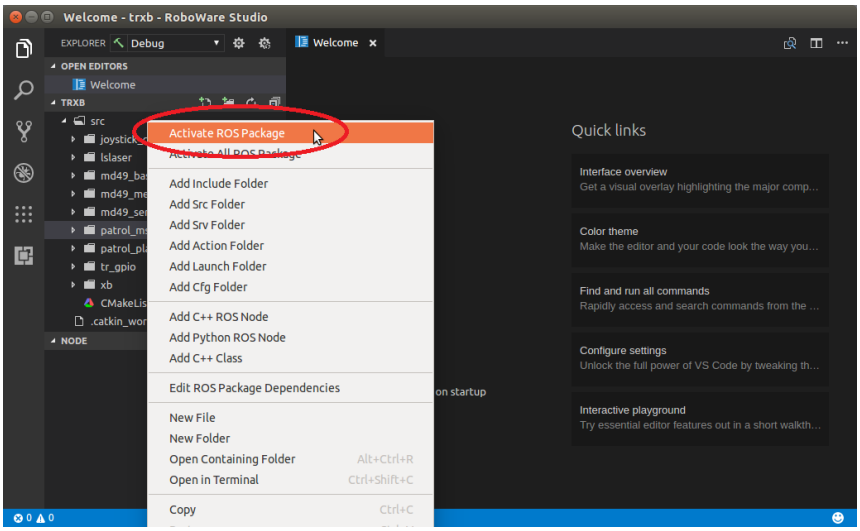
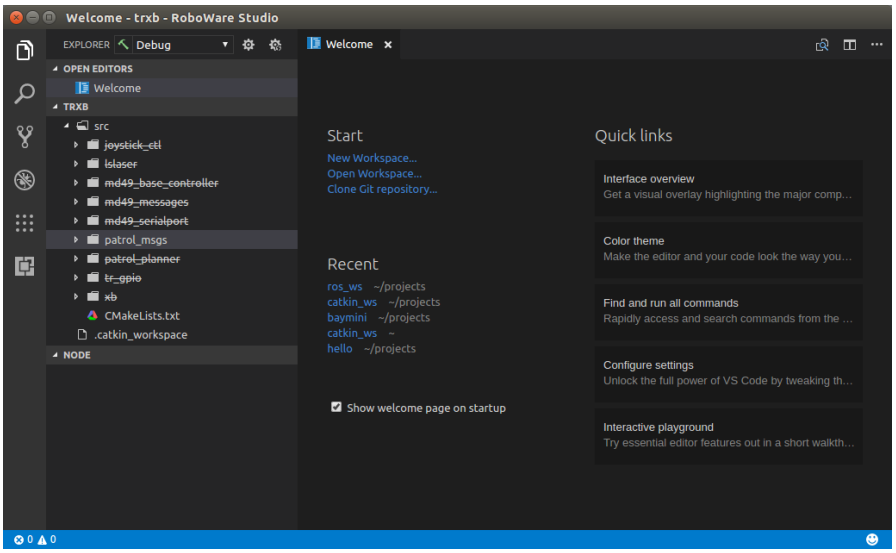


Figure 3-13 View build outputs

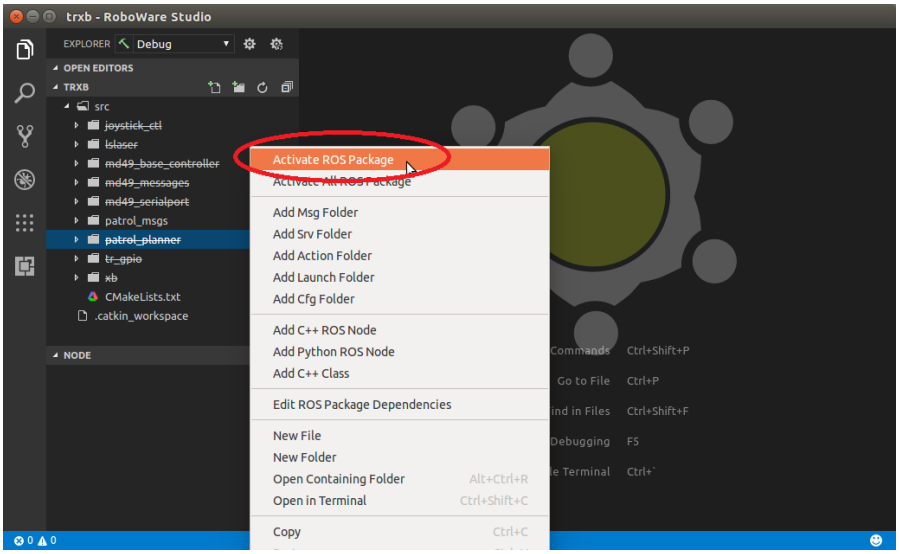
3.1.9 Build multiple packages

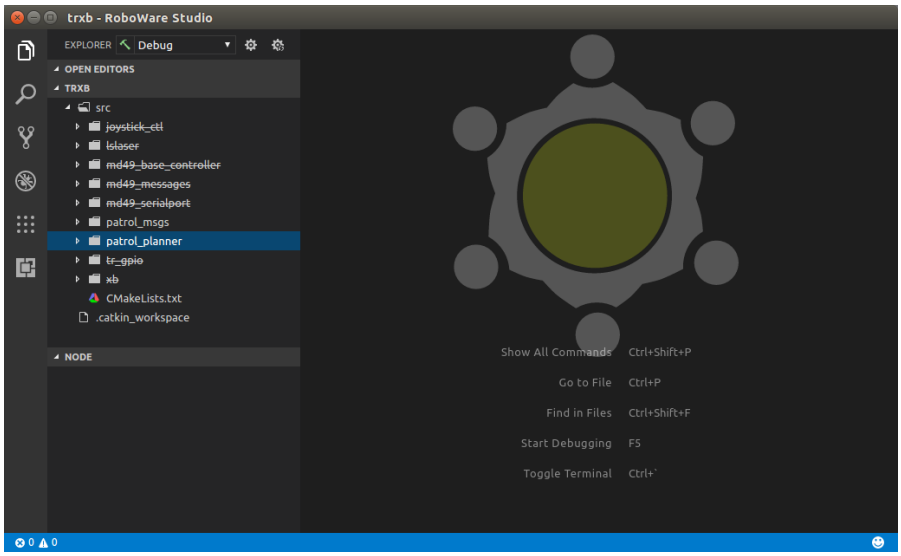
By default, clicking “Build” button will build all packages in current workspace. If we want to build multiple packages, we can right-click package name, select “Activate ROS Package” to set it to activate it. One or more packages can be activated in this way. Now, the inactive packages will be shown as strikethrough, they will not be built when wen click “Build” button.





Activate “patrol_msgs” package





Activate “patrol_planner” package

Figure 3-14 Activate ROS packages

After activating “patrol_msgs” and “patrol_planner”, click “Build” button to build these two packages.

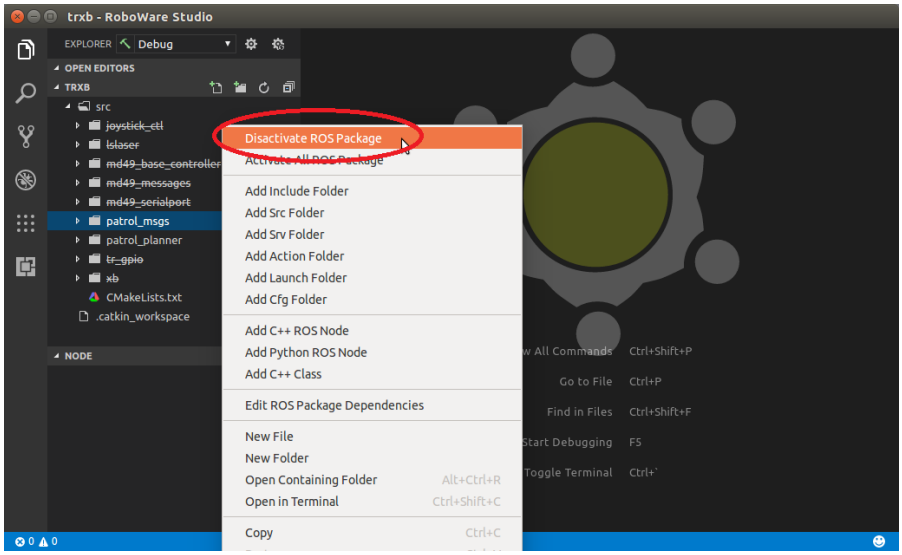


Figure 3-15 Deactivate “patrol_msgs” package

After deactivating “patrol_msgs” package, then click “Build” button, only “patrol_planner” will be built this time.

Right-click any package name, select “Activate All ROS Package”, then all packages will be activated, click “Build” button to build all packages in current workspace.

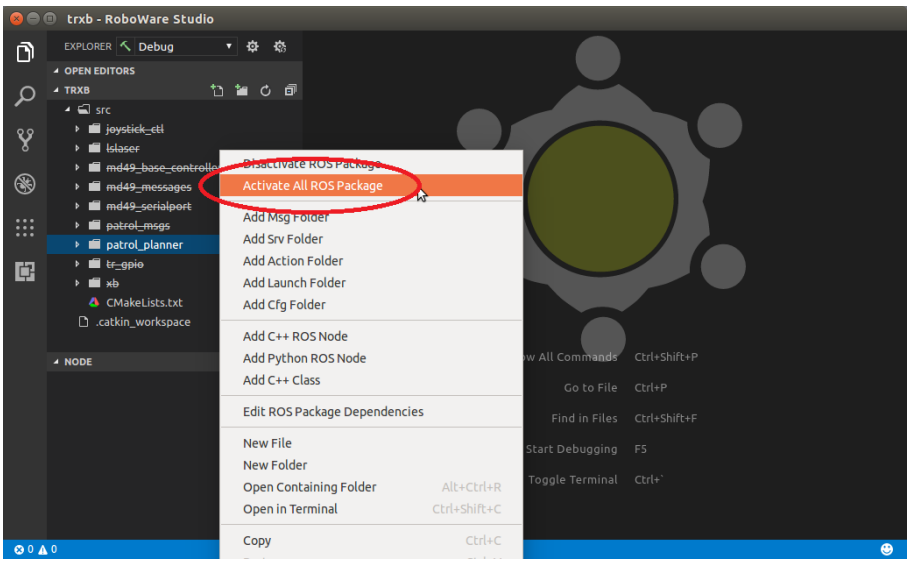


Figure 3-16 Activate all packages

3.1.10 Clean build outputs

The “Node” section at the lower part of Explorer window will display all nodes, click “Clean ROS Node” icon to clean them.

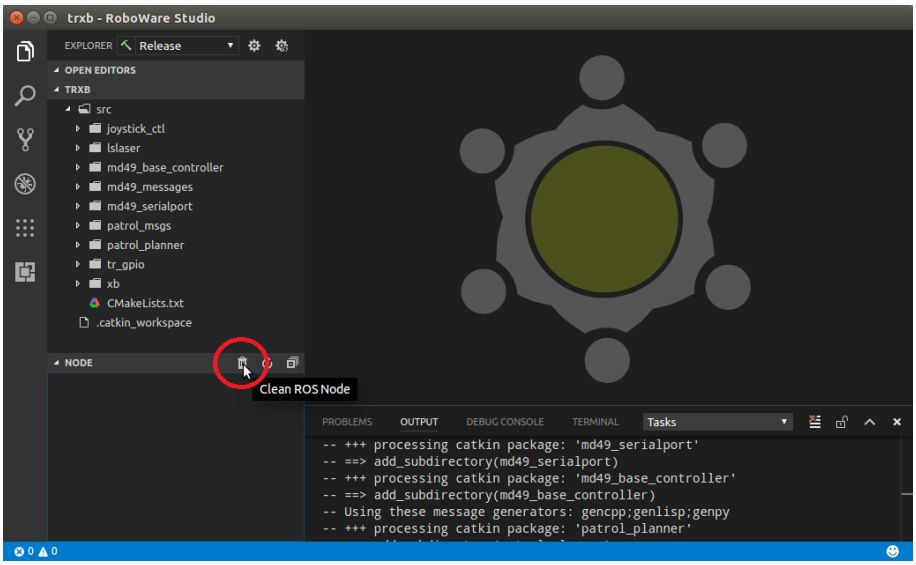
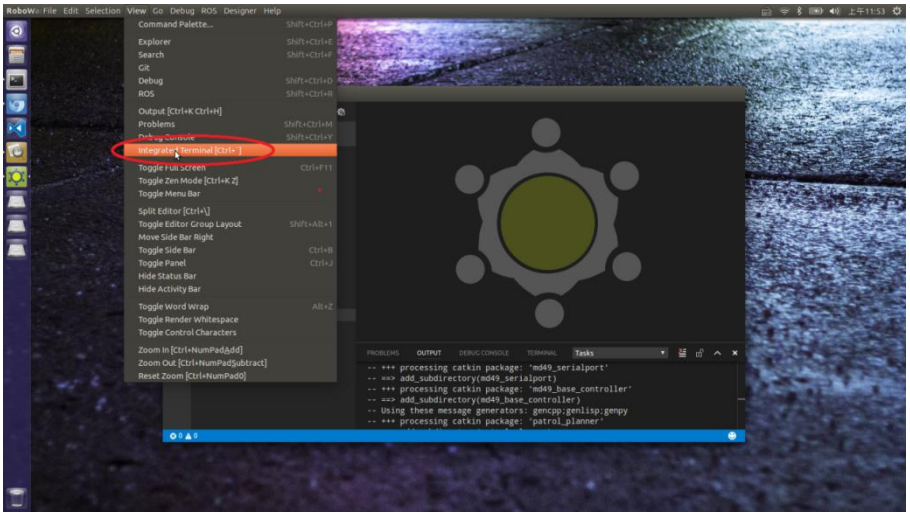


Figure 3-17 Clean ROS nodes

3.1.11 Integrated terminal

Select “View – Integrated Terminal” to open it and run your command in it. You can click “+” icon to open new terminal, and choose terminal from the drop-down menu.



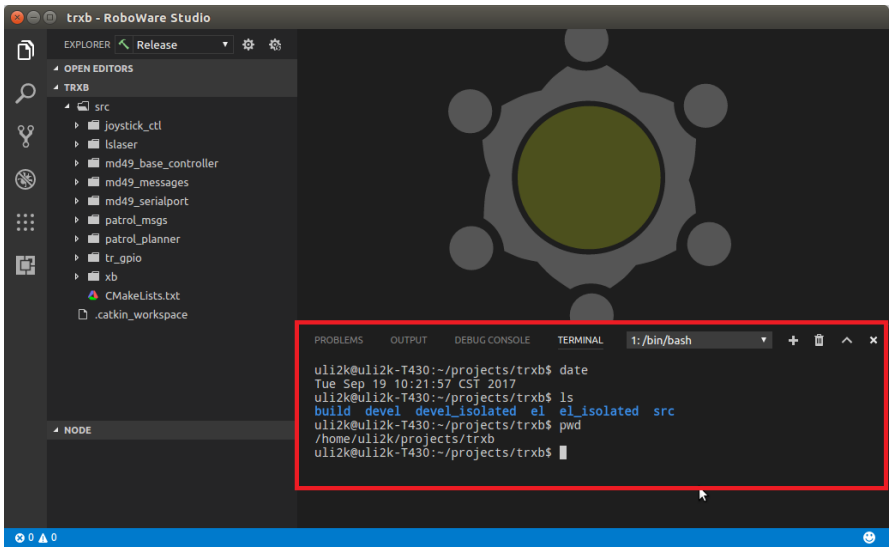


Figure 3-18 Integrated terminal

3.1.12 Debug C++ source code

In “Explorer” view, choose “Debug” option, click “Build” button to build. (or select “ROS - Build” in the menu.)

Then, in “Debug” view, the debugger is set to “C++” automatically.

In “Explorer” view, choose a node in “Node” section, a debug panel will be displayed in the right. After setting breakpoint in the source code, select “Debug this file” to debug.

You can also configure input arguments by clicking “Configure Args”, and select history arguments by clicking “Select Args”.

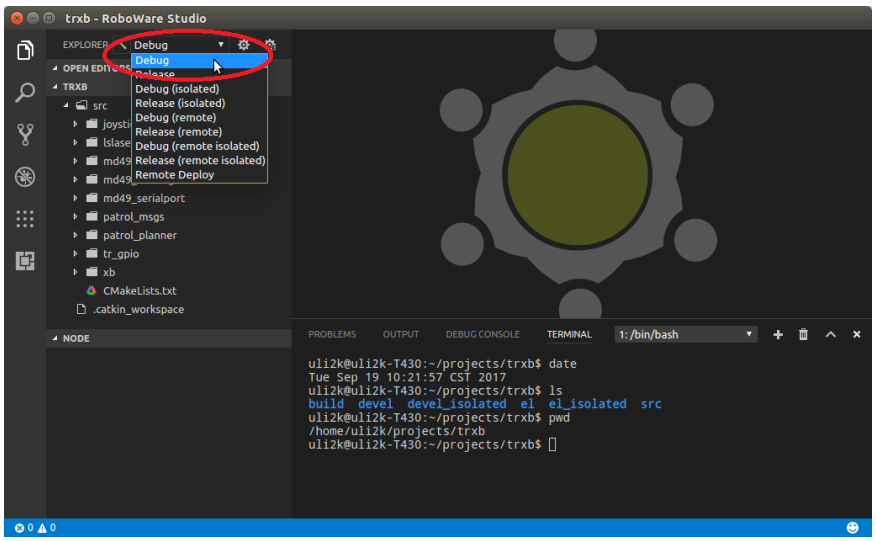


Figure 3-19 Choose “debug” option and build

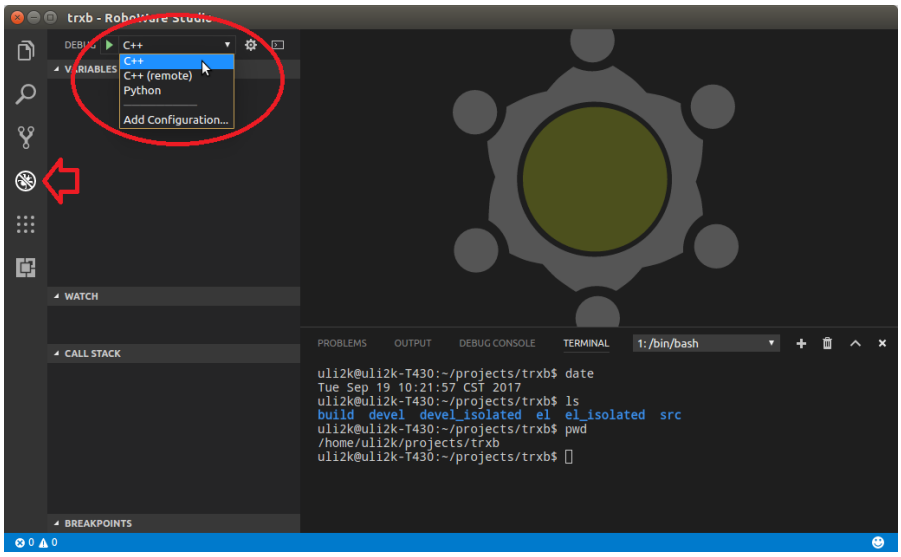


Figure 3-20 Debugger is set to “C++” automatically

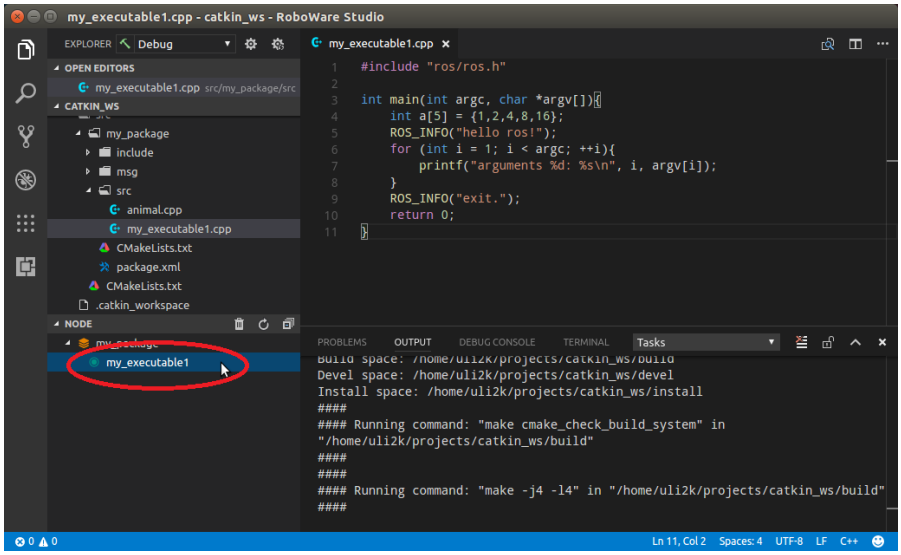


Figure 3-21 Choose a node

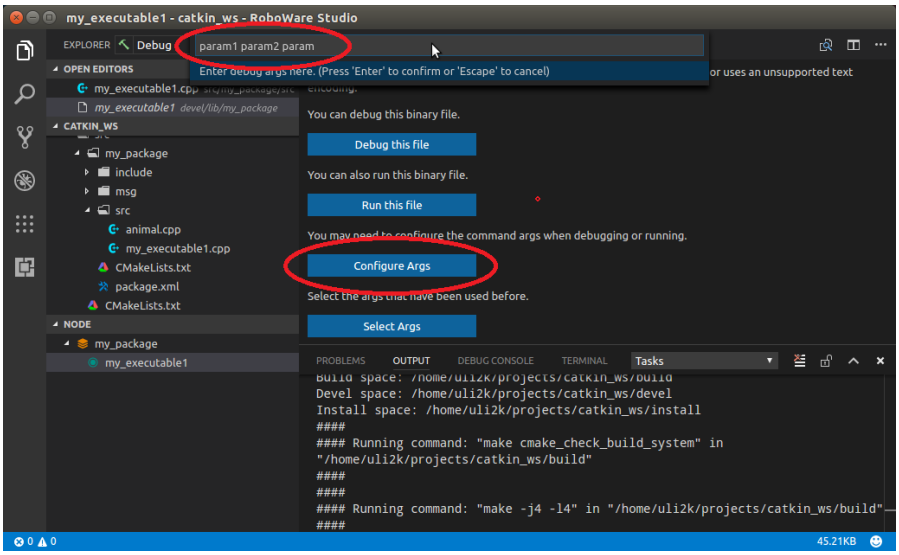
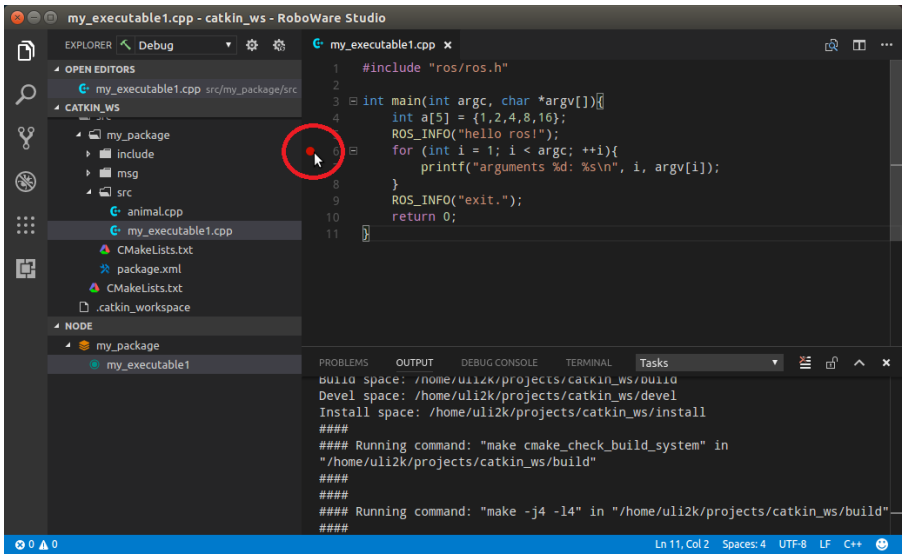
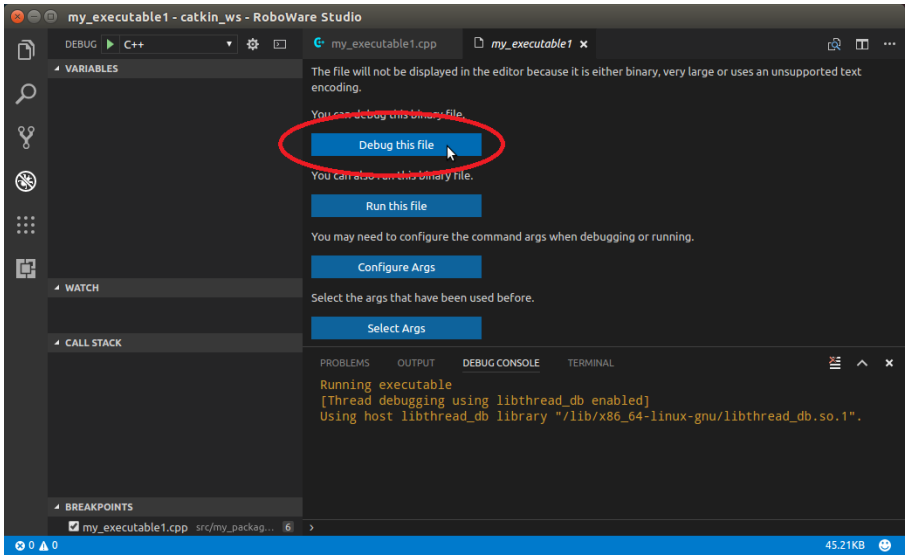


Figure 3-22 Configure input arguments





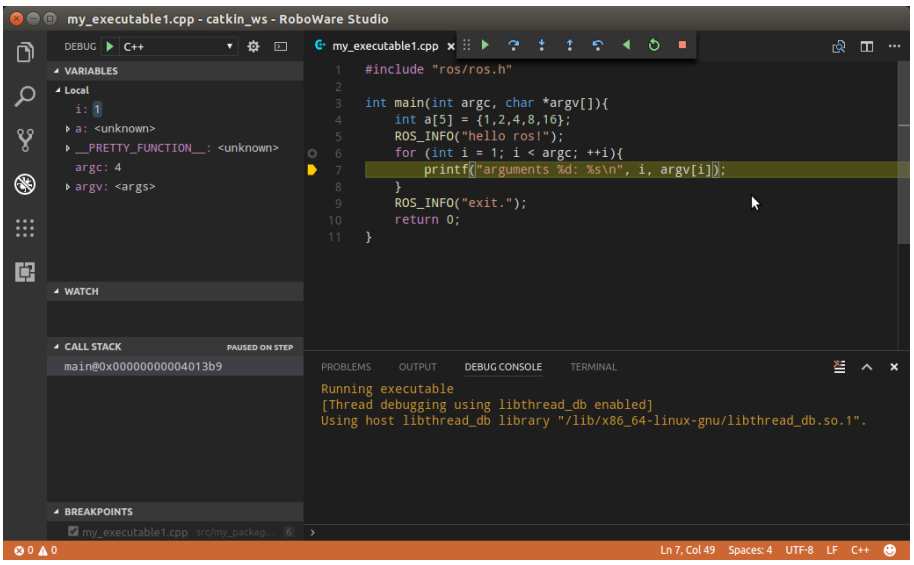


Figure 3-23 Set breakpoint and debug

3.1.13 Debug Python source code

Go into “Debug” view by clicking “Debug” icon in the left sidebar, select “Python” debugger.

Go into “Explorer” view by clicking “Explorer” icon in the left sidebar, open python source code, set a breakpoint.

In “Debug” view, click “Start Debugging” icon or press F5 to debug the source code.

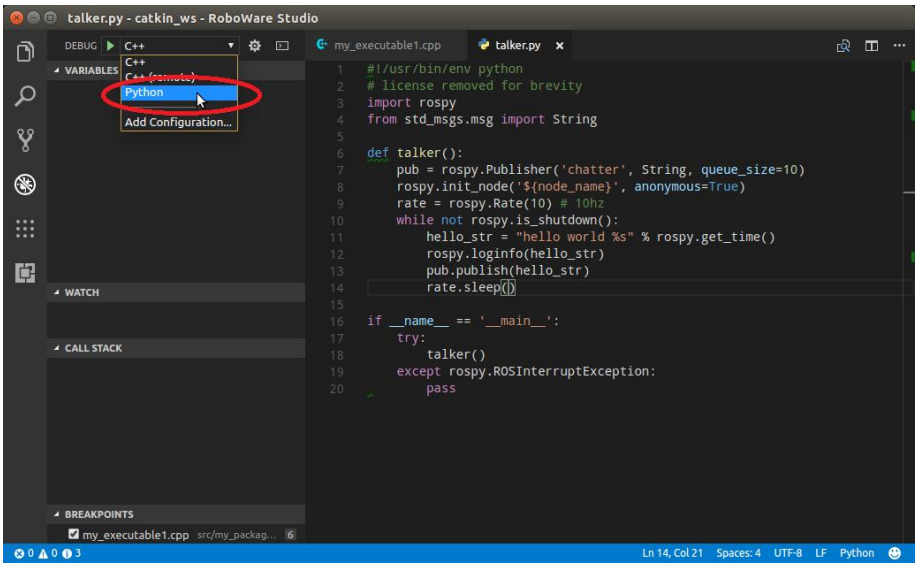


Figure 3-24 In debug view, select “Python” debugger

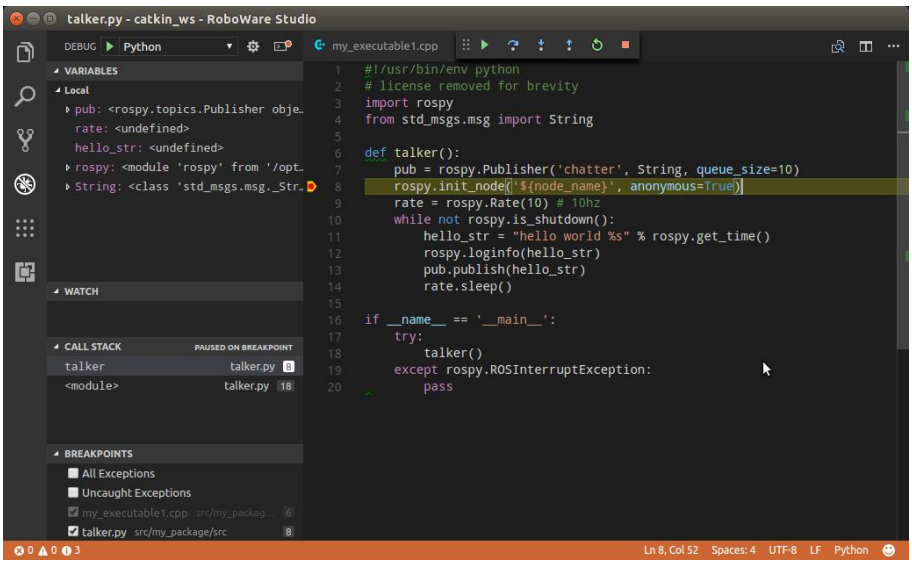


Figure 3-25 Set breakpoint and debug

3.1.14 Add launch file

Right click on package name, select “Add Launch Folder” to create a folder named “launch”. Then right click on “launch” folder, select “Add Launch File” to add a new file.

Right click on launch file name, select “Run Launch File”, RoboWare Studio will launch it in an integrated terminal. Use “Ctrl+C” to abort.

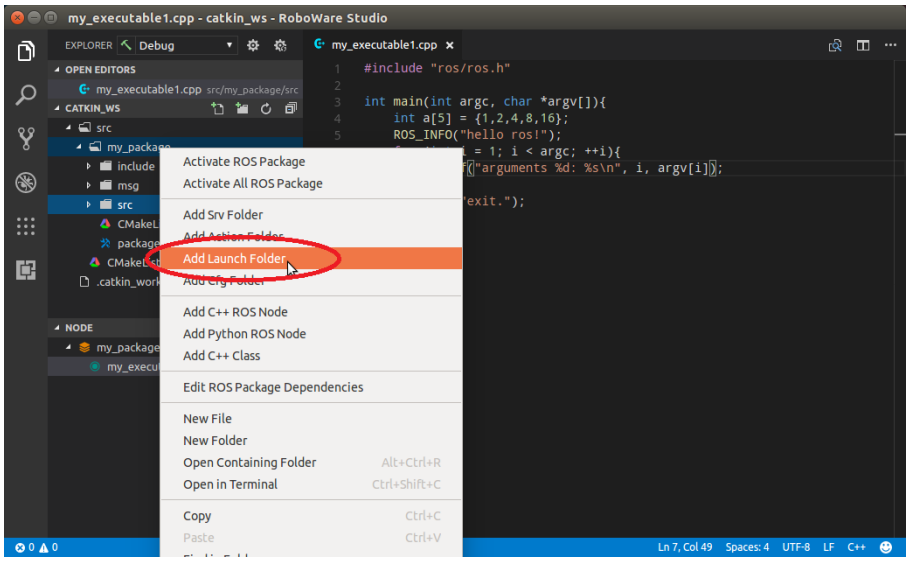


Figure 3-26 Add launch folder

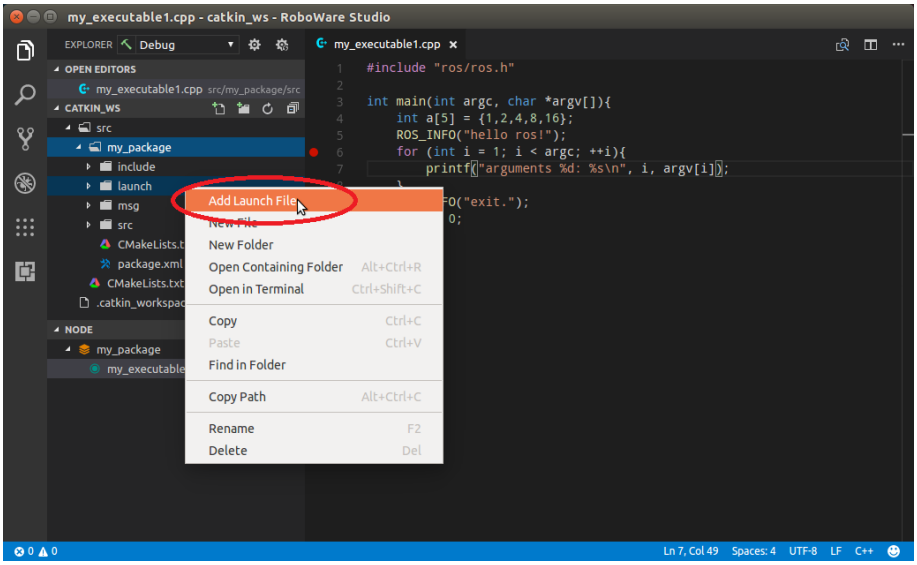


Figure 3-27 Add launch file

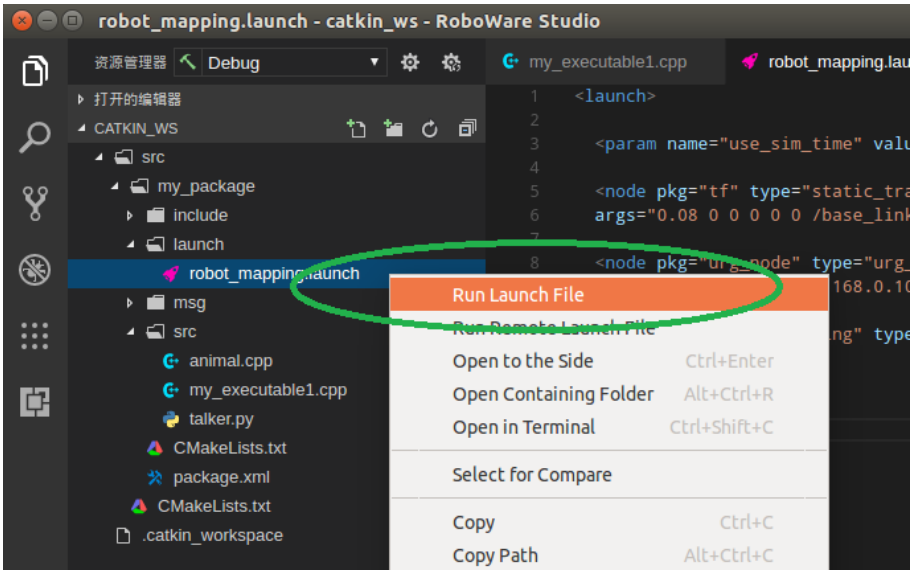


Figure 3-28 Launch the file

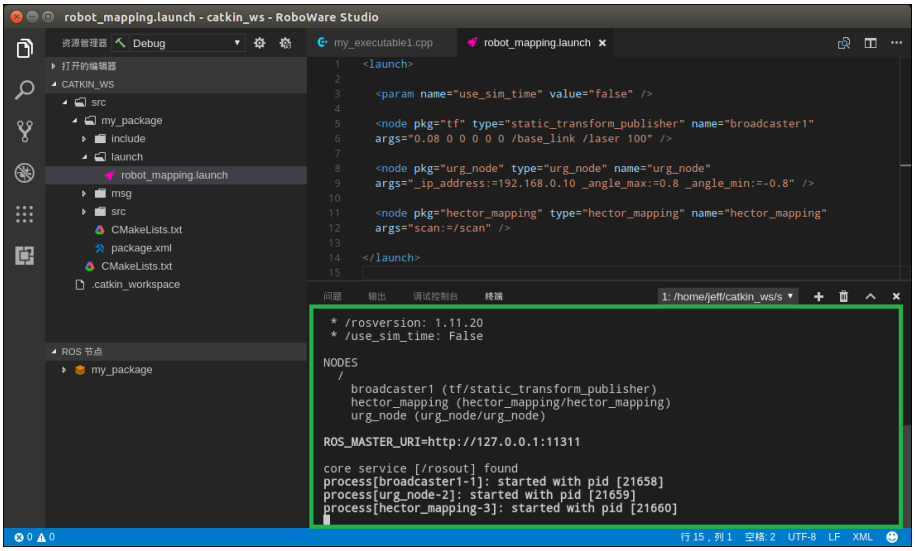
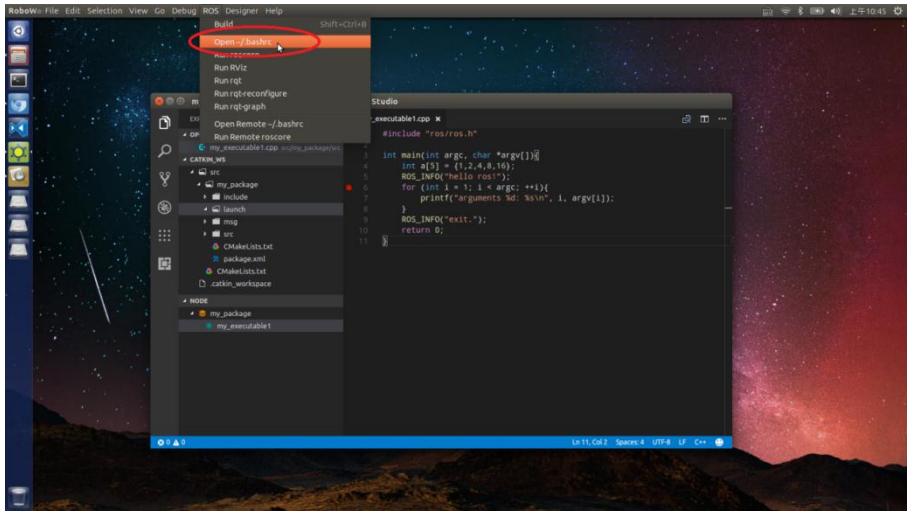


Figure 3-29 Launch file is running in an integrated terminal

3.1.15 Edit ~/.bashrc

Select “ROS – Open ~/.bashrc” to open and edit the ~/.bashrc file.



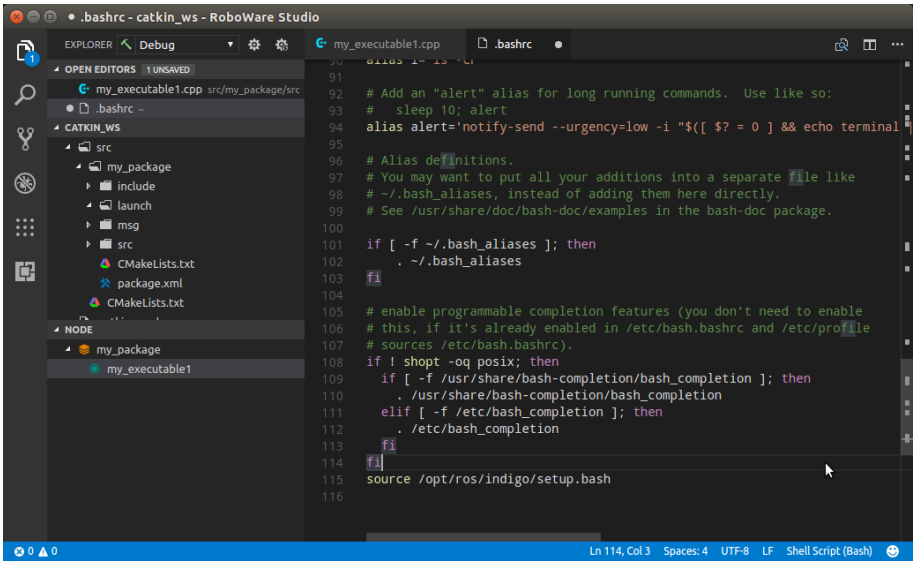


Figure 3-30 Open and edit ~/.bashrc

There is also a “ROS – Open Remote ~/.bashrc” option to edit the .bashrc file on remote computer, use “Ctrl+S” or select “File – Save” to save it remotely.

3.2 Remote Development

3.2.1 Configuration of SSH login

First, generate public key and private key on local PC. Open a terminal and execute:

```
$ ssh-keygen
```

Press “Enter” to accept the default parameters, “id_rsa.pub” and “id_rsa” will be generated in “~/.ssh” folder. Then copy “id_rsa.pub” to remote computer:

```
$ scp ~/.ssh/id_rsa.pub username@ip_address:/home/username
```

Where “username” is the user name of remote computer, “ip_addreee” is the IP address of remote computer. An example is as follows:

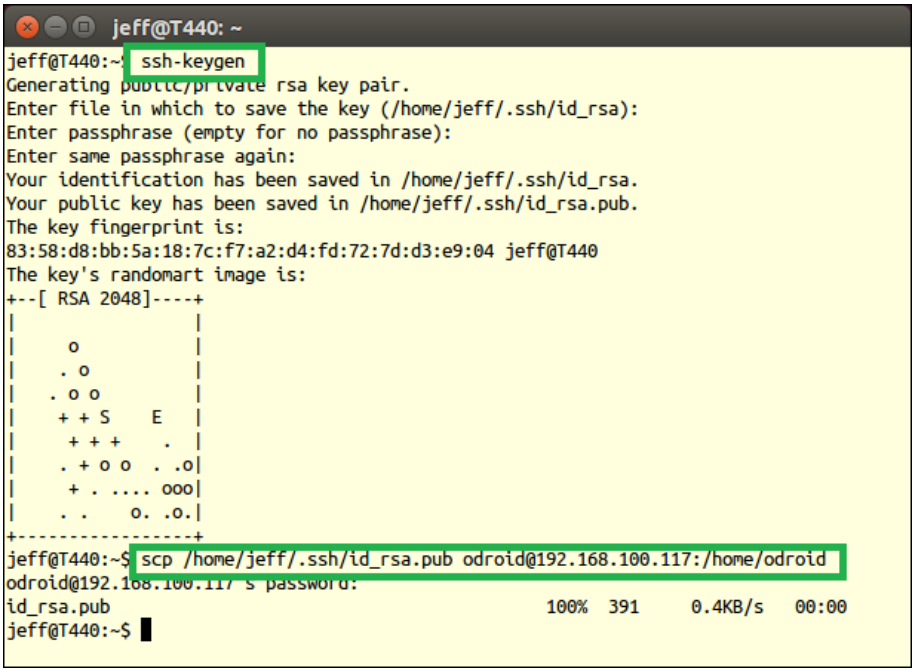


Figure 3-31 Generate public/private keys, and copy public key to remote computer

After copy "id_rsa.pub" to remote computer, login on remote computer via SSH:

$ ssh username@ip_address

After login， append the content of "id_rsa.pub" to "~/.ssh/authorized_keys" on remote computer， and change the permission of "authorized_keys" file：

$ cat id_rsa.pub >> ~/.ssh/authorized_keys

$ chmod 600 ~/.ssh/authorized_keys

Figure 3-32 SSH login on remote computer, add authorized keys and change file permission

After configuration, you can login on remote computer without a password.

3.2.2 Edit "/etc/profile" on remote computer

Login on remote computer:

$ ssh username@ip_address

Where "username" is the user name of remote computer, "ip_addreee" is the IP address of remote computer.

After login, switch to the root user, append ROS configuration scripts to "/etc/profile".

$ sudo su

$ echo "source /opt/ros/indigo/setup.bash" >> /etc/profile

Note: the ROS version here is “indigo”, you should replace that according to your ROS version.

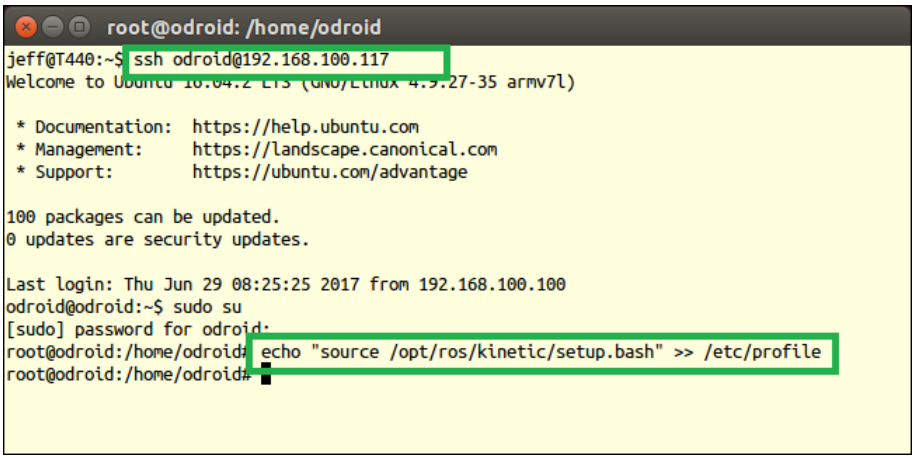
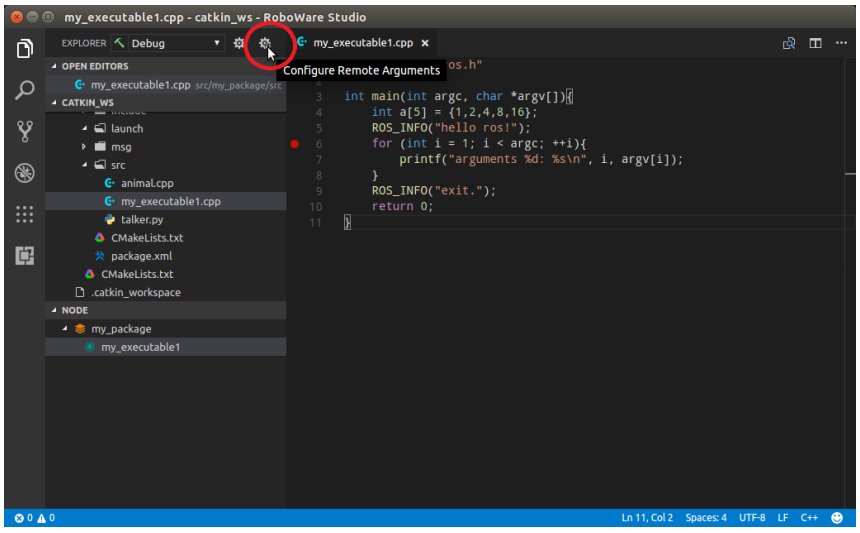


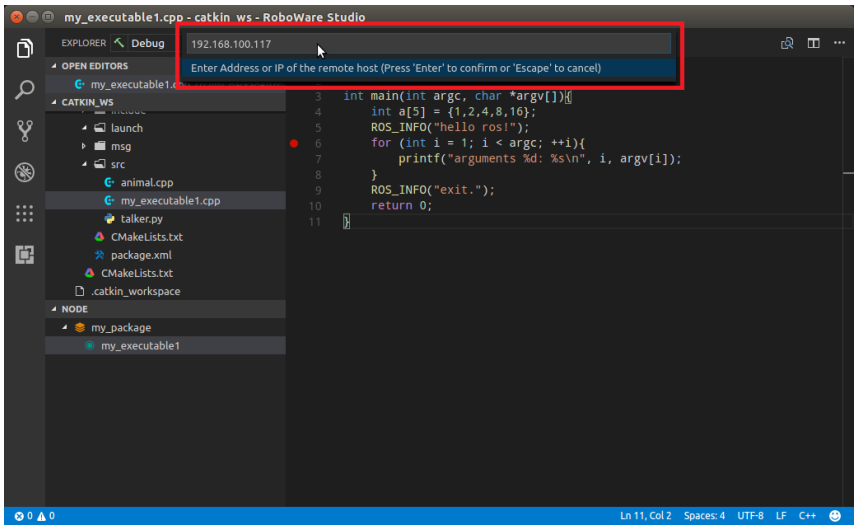
Figure 3-33 Login on remote computer and configure

3.2.3 Remote configuration

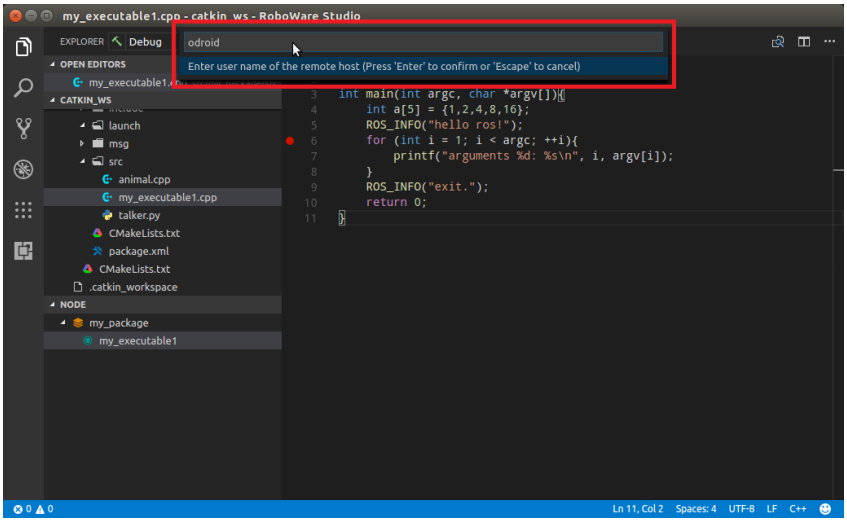
Launch RoboWare Studio, in “Explorer” view, click “Configure Remote Arguments” icon, then type remote IP address, remote user name, local private key file name, remote deploy directory step by step:



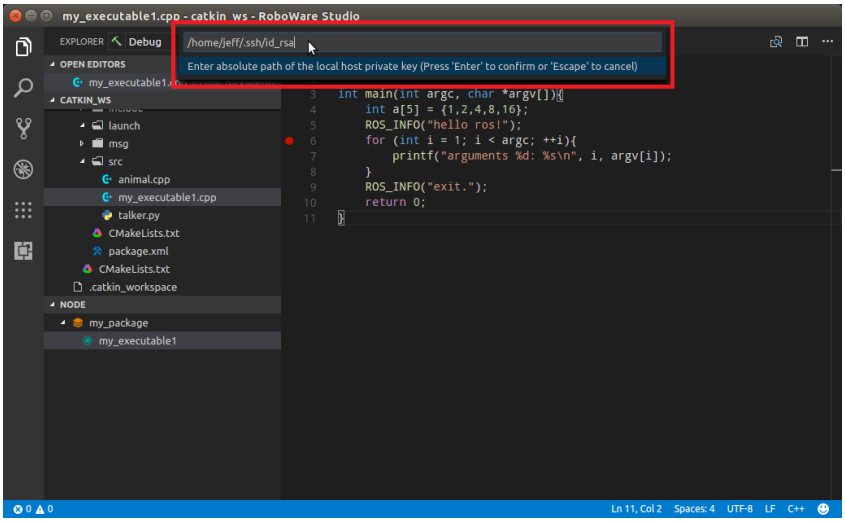
Click “Configure Remote Arguments”



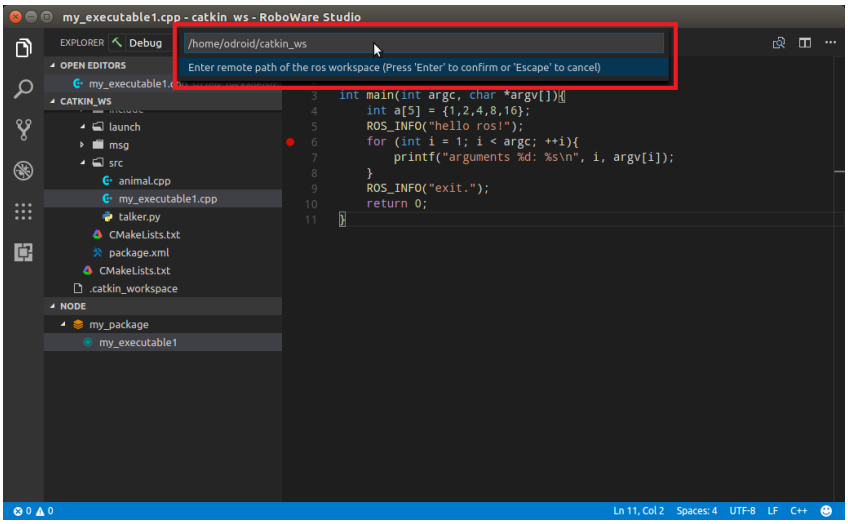
Type remote IP address



Type remote user name



Type local private key file name



Type remote deploy path

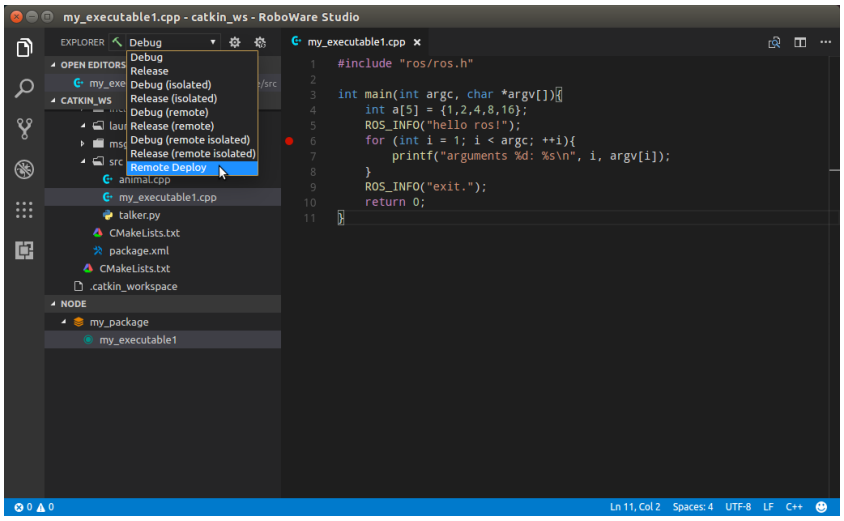
Figure 3-34 Remote configuration

3.2.4 Remote deployment

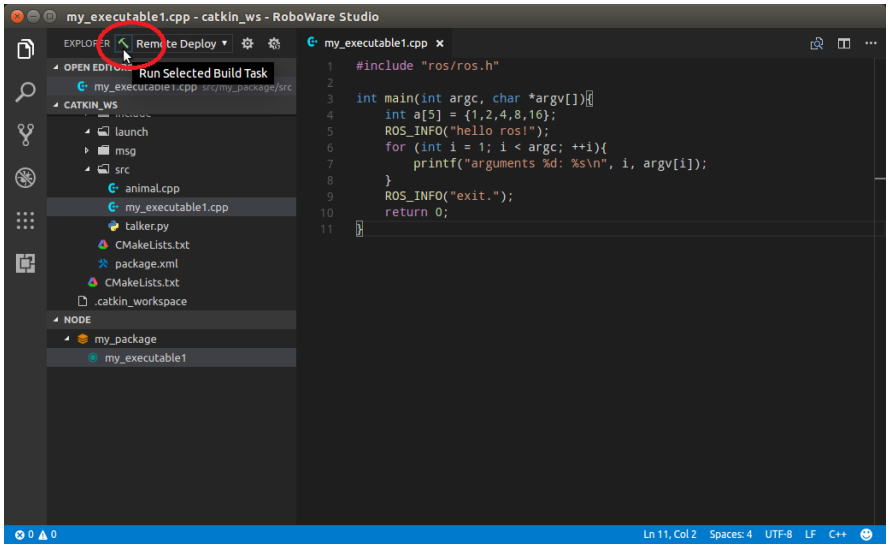
After remote configuration, you can deploy your project to remote computer.

In “Explorer” view, select “Remote Deploy” option, press “Run” icon to deploy local codes to the specified directory on remote computer (set in the previous section).

During remote deployment, the flag in the lower left corner of the status bar would be spinning. Once deployed, the output window would print successful information (Deploy Finished!).

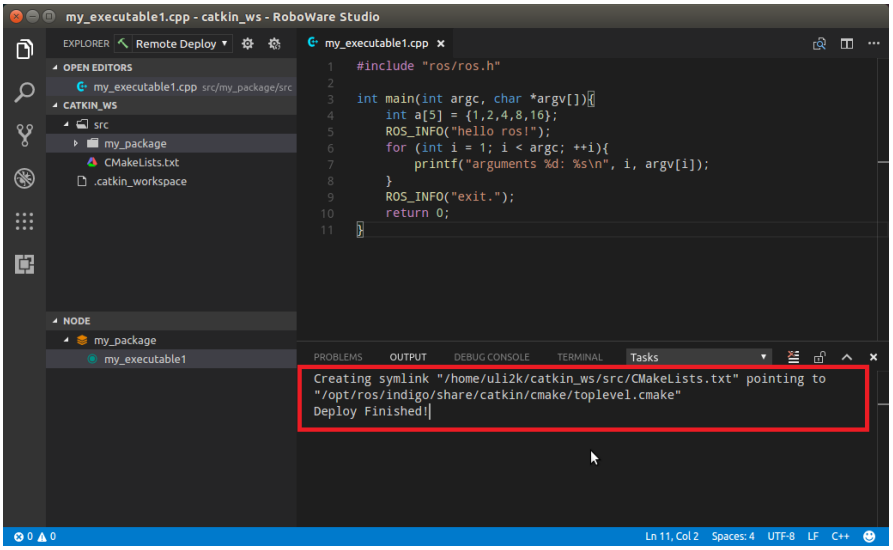


Select “Remote Deploy” option



Run deployment

Deploying



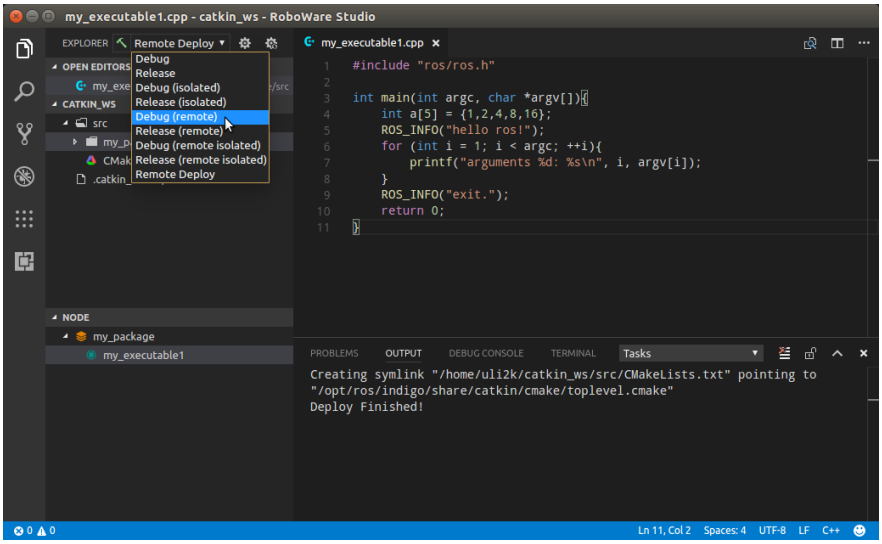
Deploy finished

Figure 3-35 Remote deployment

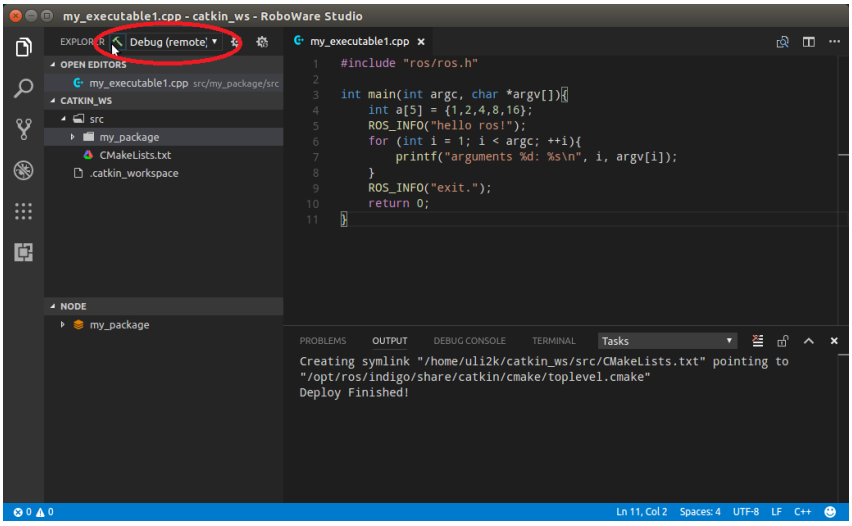
3.2.5 Remote build

After deployment, you can build remote projects.

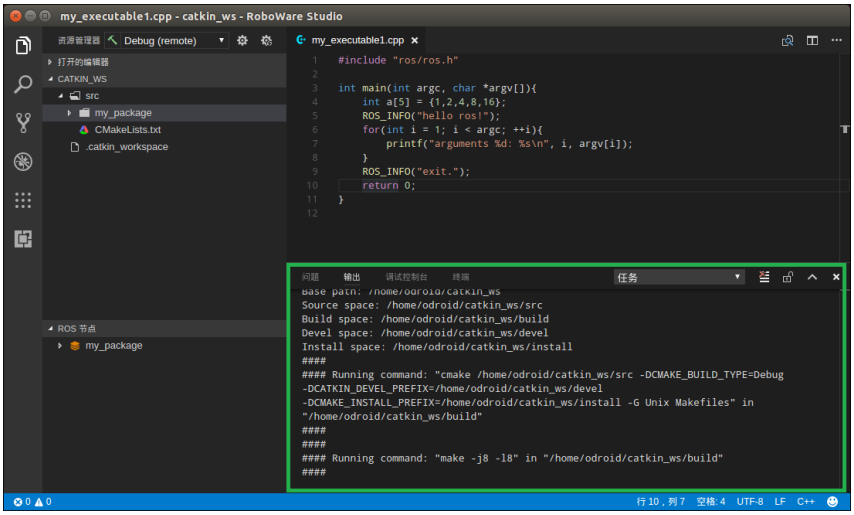
In “Explorer” view, choose “Debug (remote)” option and click “Build” button. RoboWare Studio will send build command to remote computer, and display build information in output window.



Choose “Debug(remote)” option



Remote build



Remote build information

Figure 3-36 Remote build

3.2.6 Remote clean

The “Node” section at the lower part of Explorer window will display all nodes, click “Clean ROS Node” icon to clean them.

Note: Remote build outputs will be cleaned only if “remote” options are selected, otherwise, local build outputs will be cleaned.

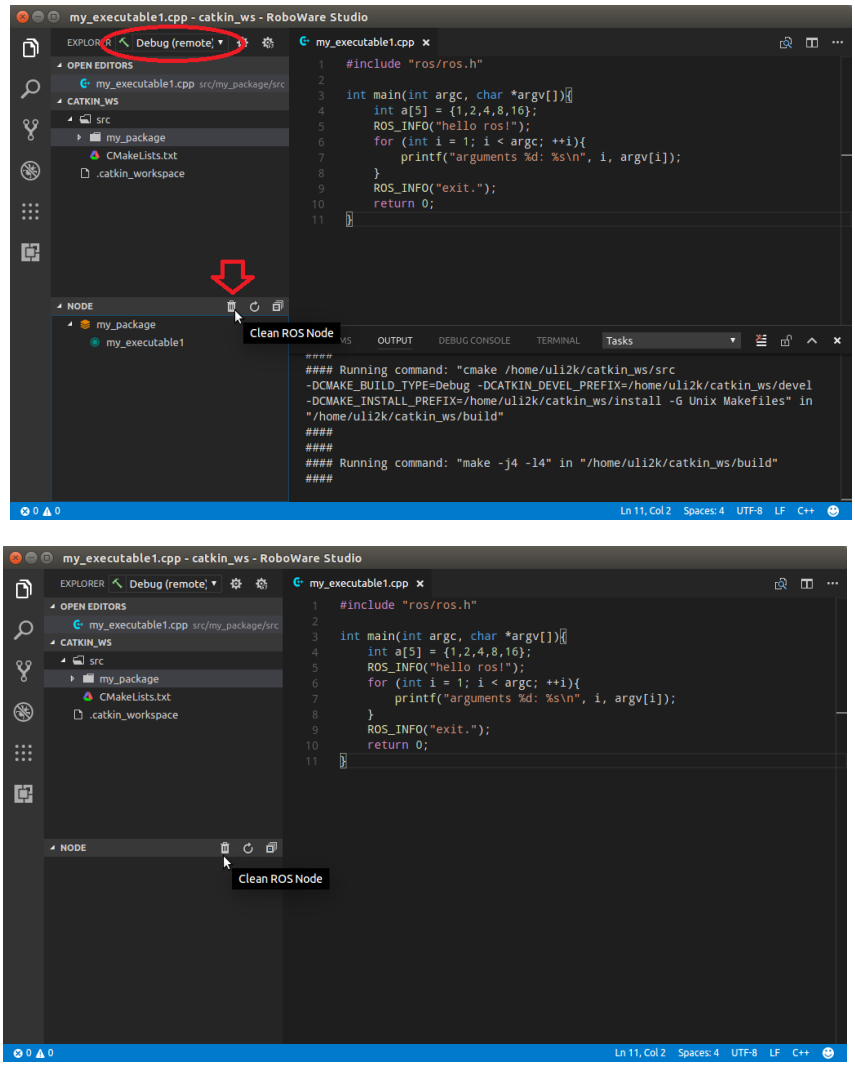


Figure 3-37 Clean remote build outputs

3.2.7 Remote debug

Before remote debug, make sure that remote workspace has been built with “Debug(remote)” mode and packages and nodes are displayed in “Node” section.

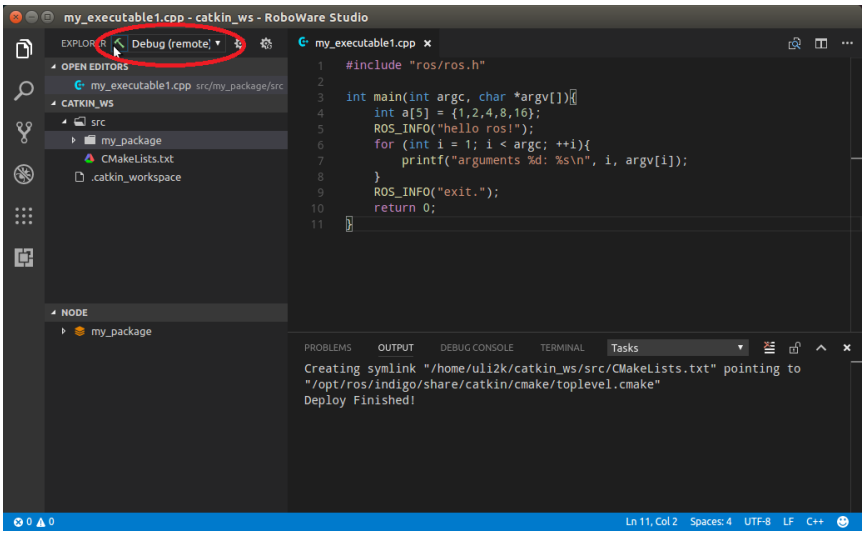


Figure 3-38 Nodes built with “Debug (remote)” option

In “Debug” view, the debugger is changed to “C++ (remote)” automatically.

Select a node in “Node” section, then you can follow the local debug instructions to debug the remote node.

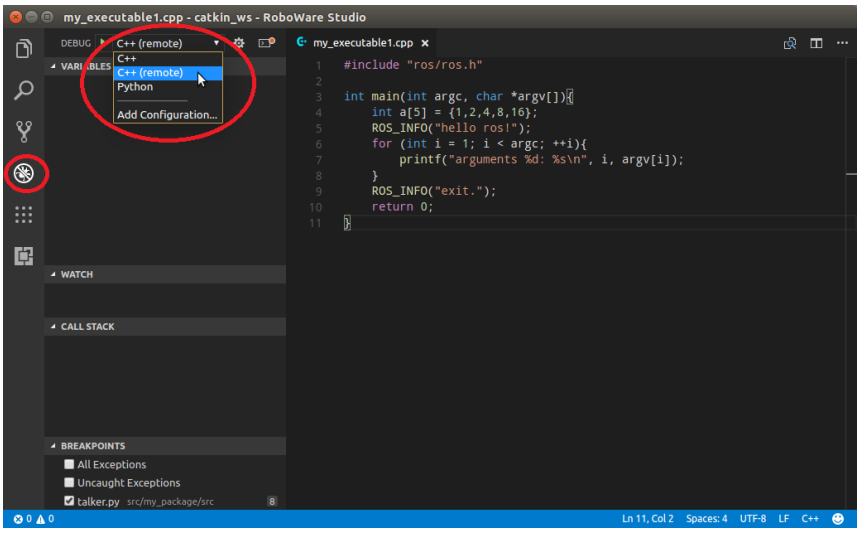


Figure 3-39 The debugger is changed to “C++ (remote)” automatically

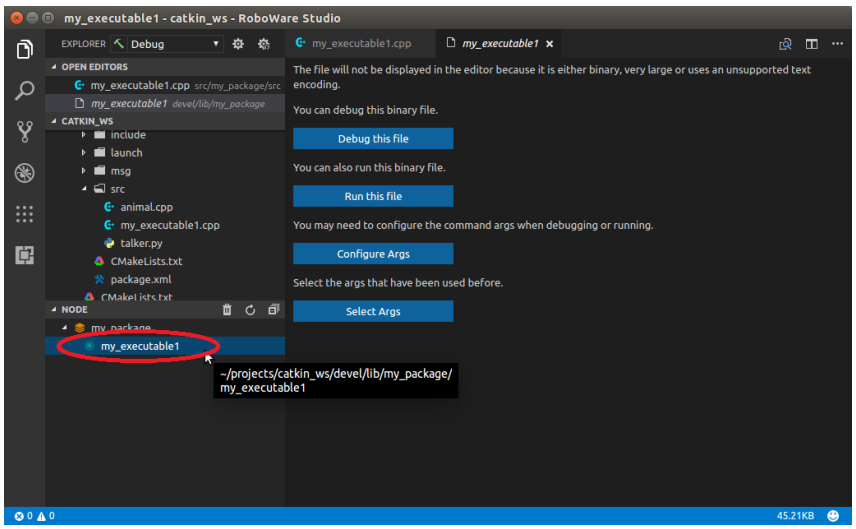


Figure 3-40 Remote debug

3.2.8 Remote deploy multiple packages

By default, RoboWare Studio would deploy all packages in current workspace. If you want to deploy one or more of these packages to remote computer, you could right click on the package name and select “Activate ROS Package”. Only active packages would be deployed to remote computers when we click deploy button.

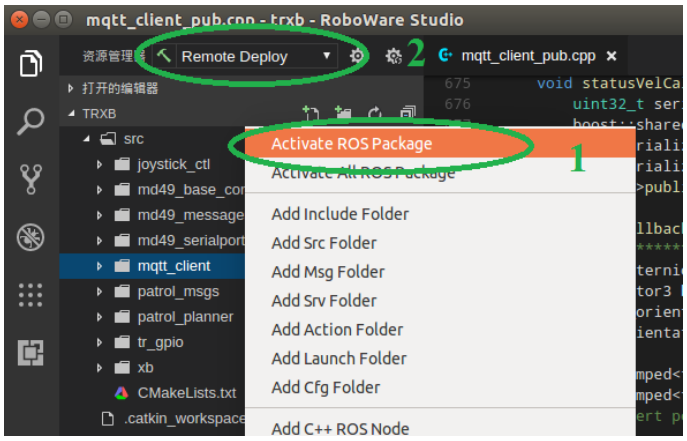


Figure 3-41 Deploy one or more packages

Just like local build, by default, clicking “Build” button will build all packages. If we want to build multiple packages, we can right-click package name, select “Activate ROS Package” to set it to activate it. One or more packages can be activated in this way. Now, the inactive packages will be shown as strikethrough, they will not be built when wen click “Build” button.

3.2.9 Launch remote file

Right click on launch file name, select “Run Remote Launch File”, RoboWare Studio will launch remote file in an integrated terminal. Use “Ctrl+C” to abort.

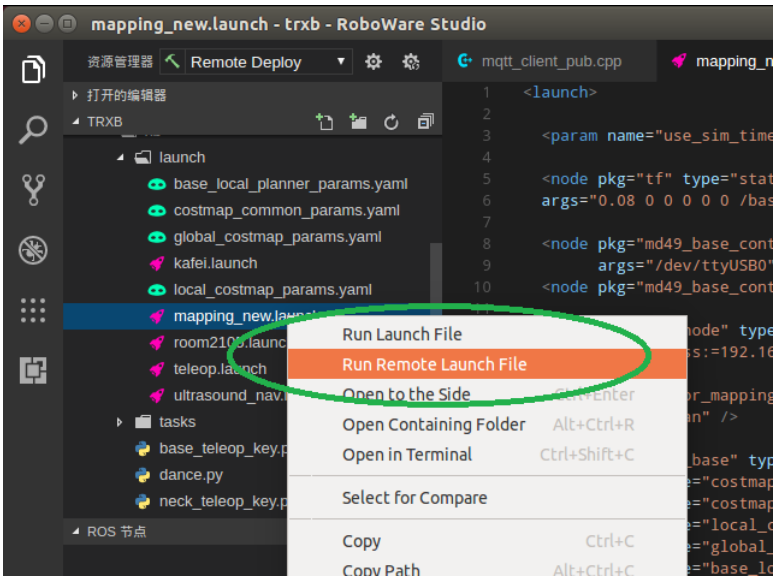


Figure 3-42 Launch remote file

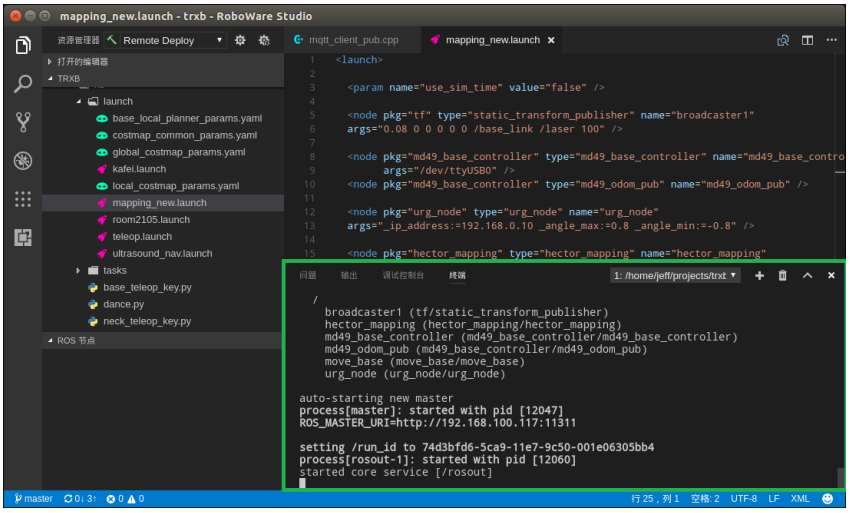


Figure 3-43 Launch file is running

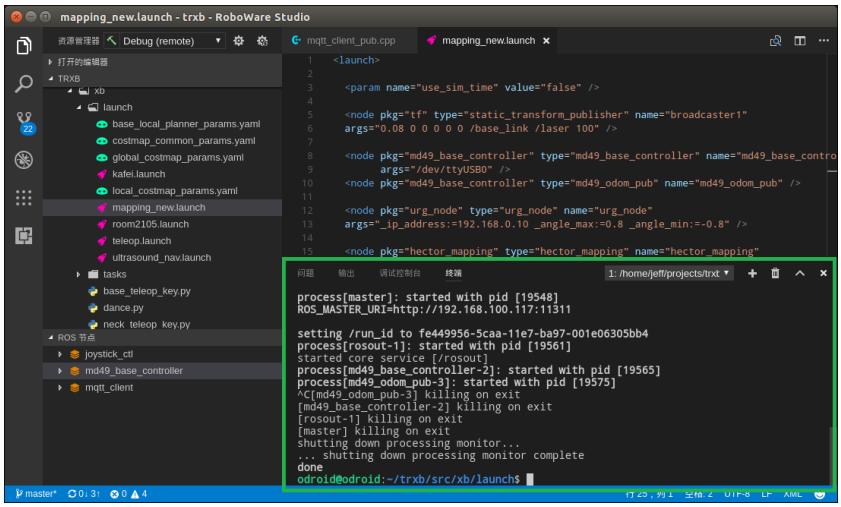


Figure 3-44 Use “Ctrl+C” to abort

3.3 Wizard for creating C++/Python node or class

RoboWare Studio provide a wizard for creating C++/Python node or class. You can create C++ or Python node by right clicking on package name, select “Add C++ ROS Node” or “Add Python ROS Node”, respectively. You can also create a C++ class by selecting “Add C++ Class”.

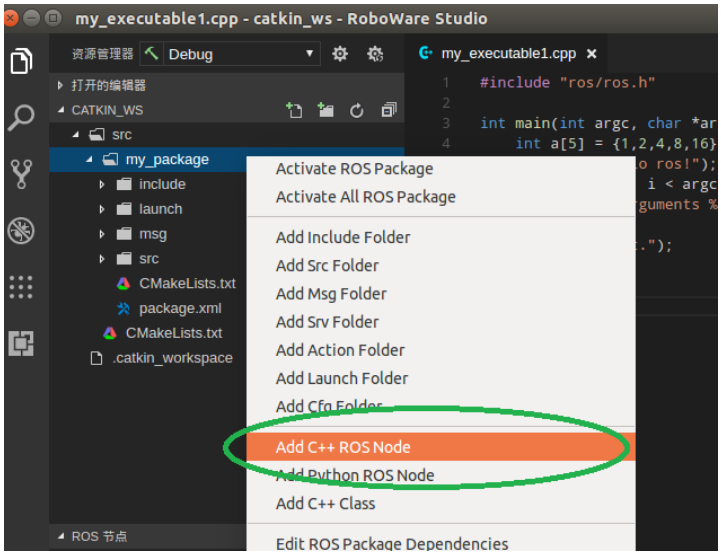


Figure 3-45 Wizard for creating node or class

By default, two files(a publisher and a subscriber) will be created at the same time. For example, if you want to create a C++ subscriber named “chatter”, you can right click on package name and select “Add C++ ROS Node”, then type “chatter” in the text editor and press “Enter”, there will be two files named “chatter_pub.cpp” and “chatter_sub.cpp” to be created. Right click on “chatter_pub.cpp” and select “Delete”, “chatter_pub.cpp” will be deleted and “chatter_sub.cpp” will be kept. The CMakeLists.txt file will be updated automatically.

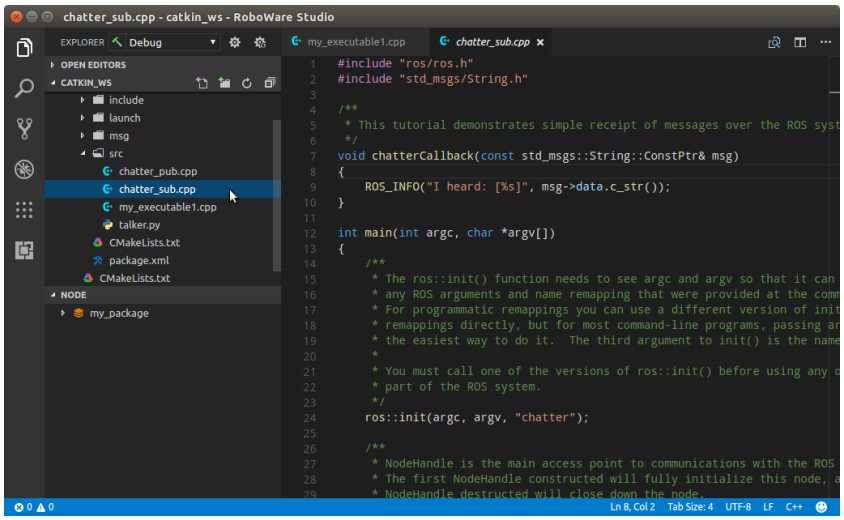
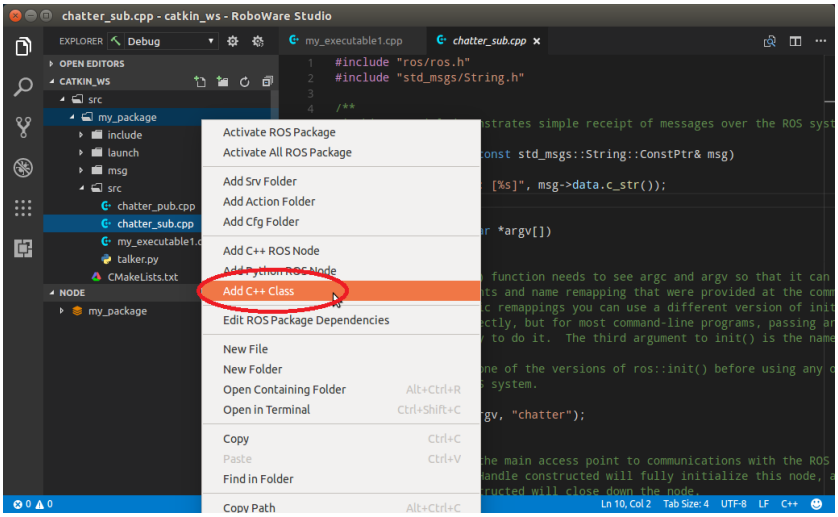


Figure 3-46 Create C++ node

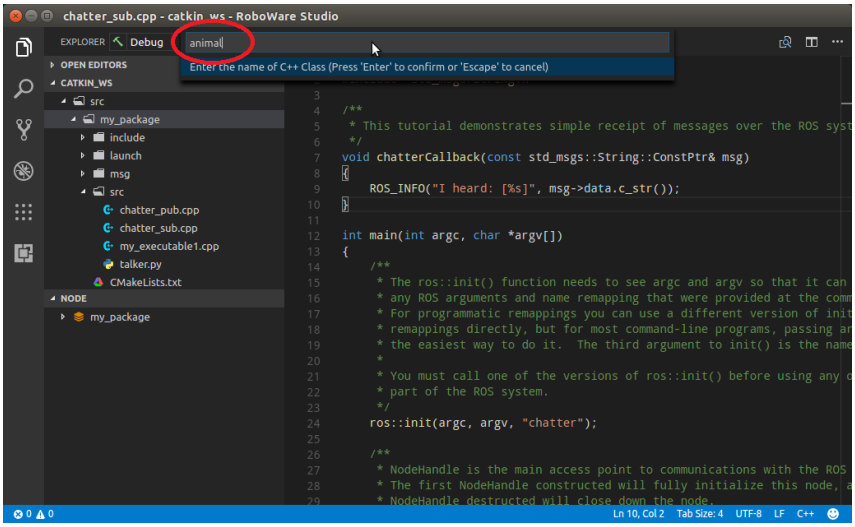
Similarly, when creating Python node, there will be a “*_sub.py” and a “*_pub.py” too, delete the unwanted one.

Creating C++ class is similar to creating node. Here, for example, we will create a C++ class named “animal”.

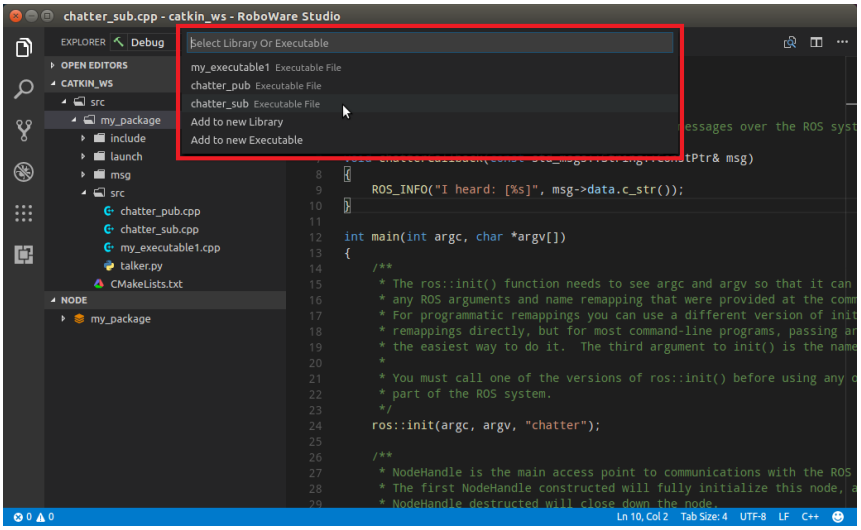
First, right click on package name, choose “Add C++ Class”, type the name “animal” and add it to a library or an executable, then press “Enter”, a header file named “animal.h” in “include/<package_name>” directory and a cpp file named “animal.cpp” in “src” directory will be created. The CMakeLists.txt file will be updated automatically.



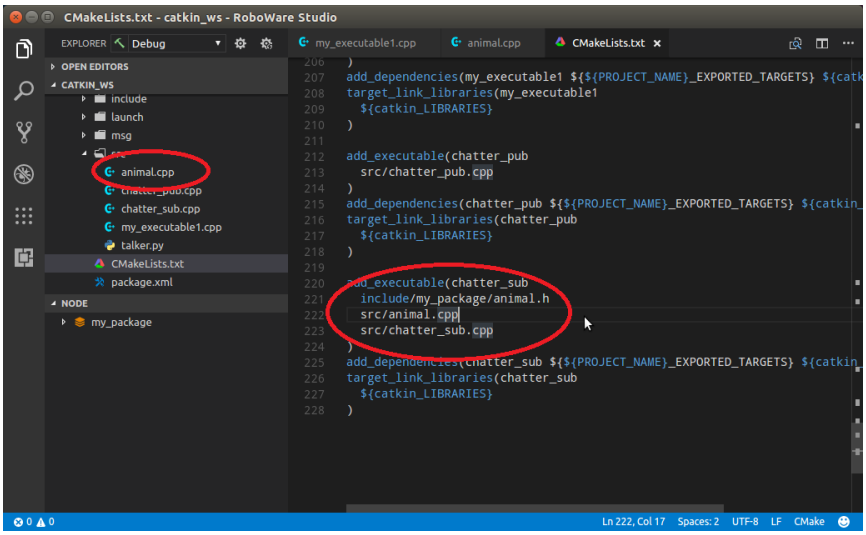
Choose “Add C++ Class”



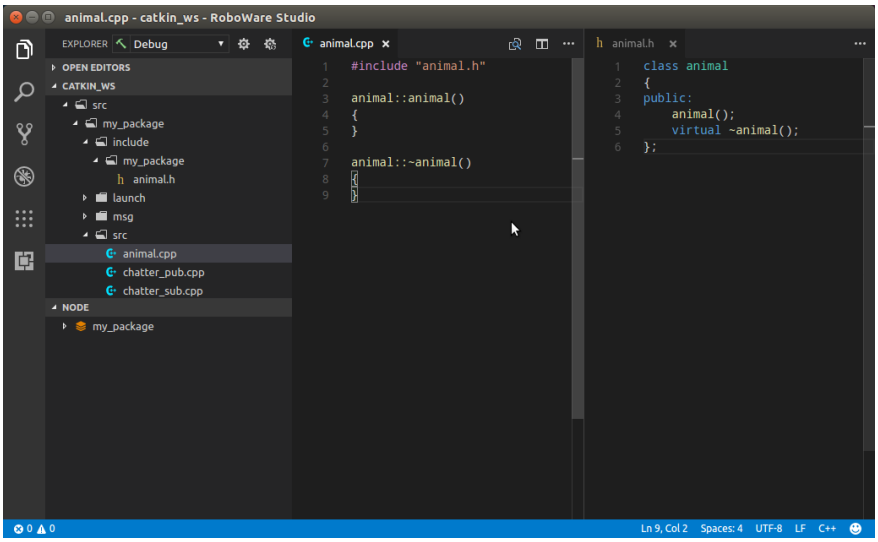
Type class name “animal”



Select target libraries or executables



Creating “animal”class



Contents of “animal” class

Figure 3-47 Create a class named “animal”

3.4 Preferences

By selecting “File – Preferences”, RoboWare Studio provides a graphical user interface as follows to configure language settings, workspace setting, color themes, etc.

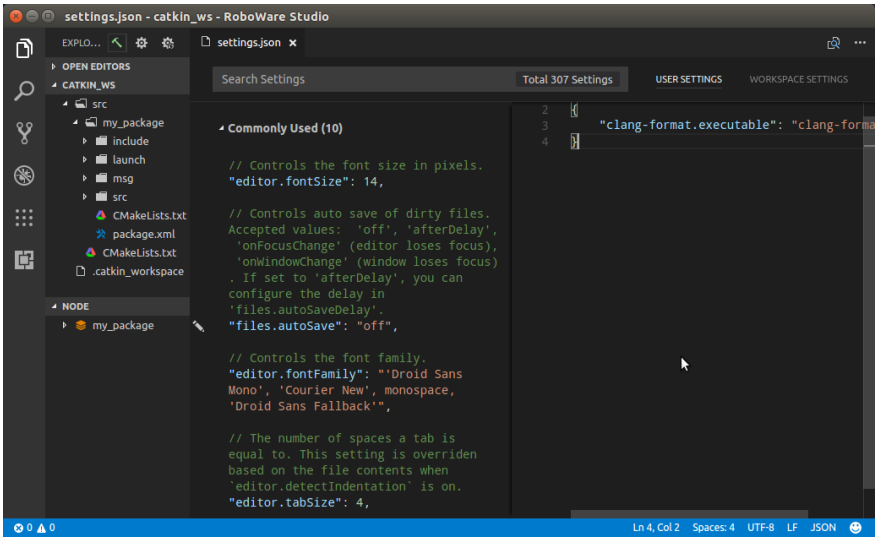


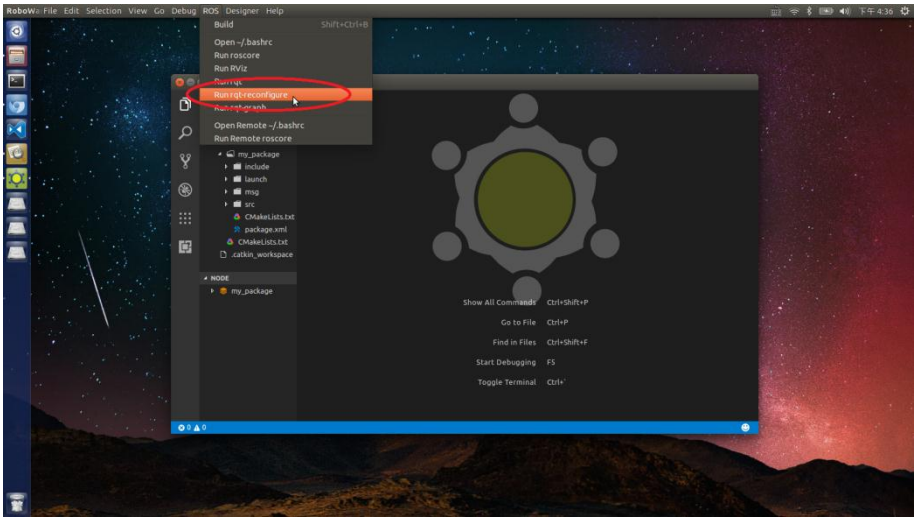
Figure 3-48 RoboWare Studio preferences

3.5 ROS graphical tools

3.5.1 Run roscore, RViz, rqt, rqt-reconfigure, rqt-graph

In the menu bar, you could run commonly used ROS tools by selecting “ROS - Run roscore”, “ROS - Run RViz”, “ROS – Run rqt”, “ROS – Run rqt-reconfigure” and “ROS run rqt-graph”.

Moreover, you could run remote roscore by selecting “ROS – Run Remote roscore”.



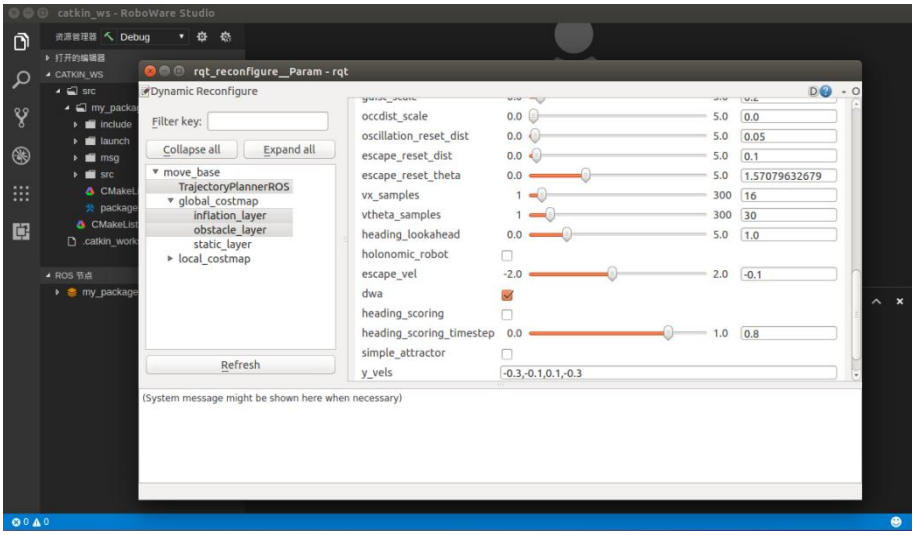


Figure 3-49 Run rqt-reconfigure

3.5.2 Display active topics/nodes/services and installed packages/messages/services

Go into “ROS” view by clicking ROS icon on left sidebar, the active topics/nodes/services and installed packages/messages/services will be displayed. You can expand and collapse each section to view the contents.

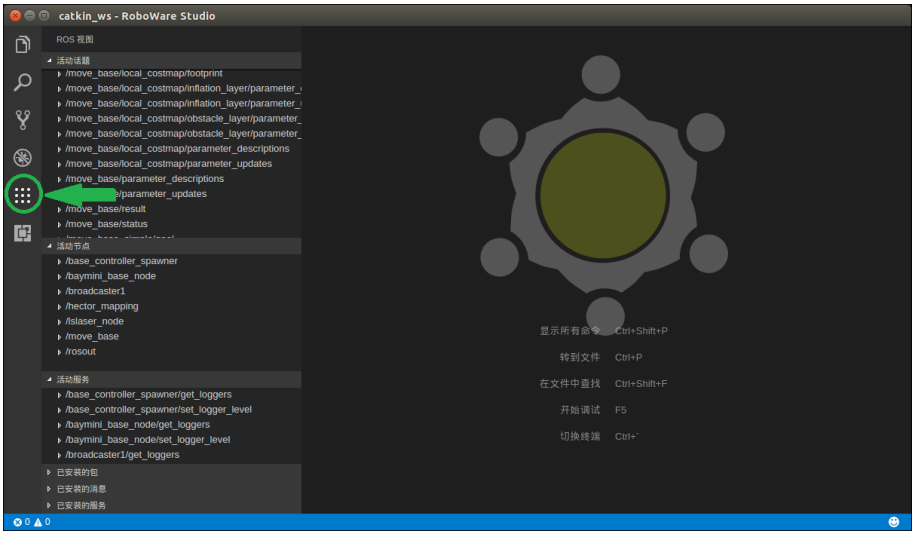


Figure 3-50 Go into ROS view

You can click the names of topics/nodes/services to check their descriptions, or double click their names to view the real-time data streams.

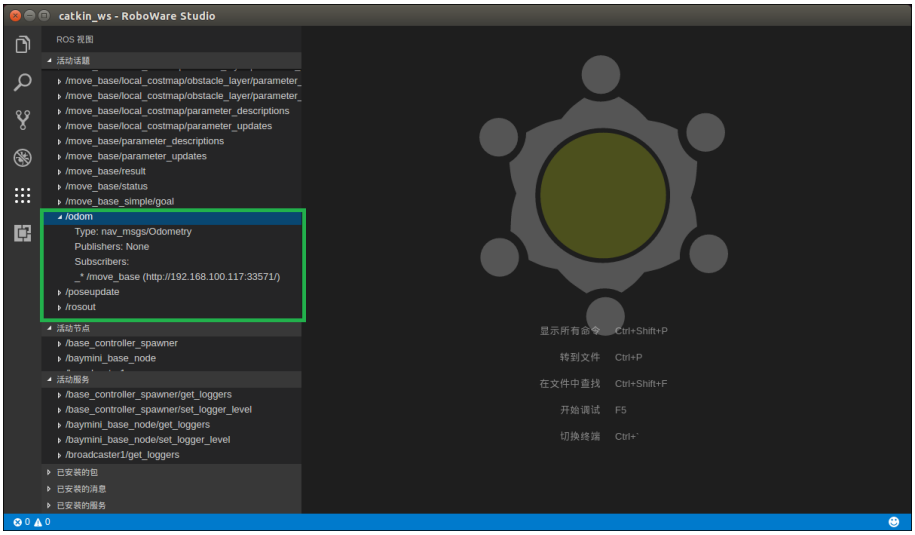


Figure 3-51 check topic descriptions

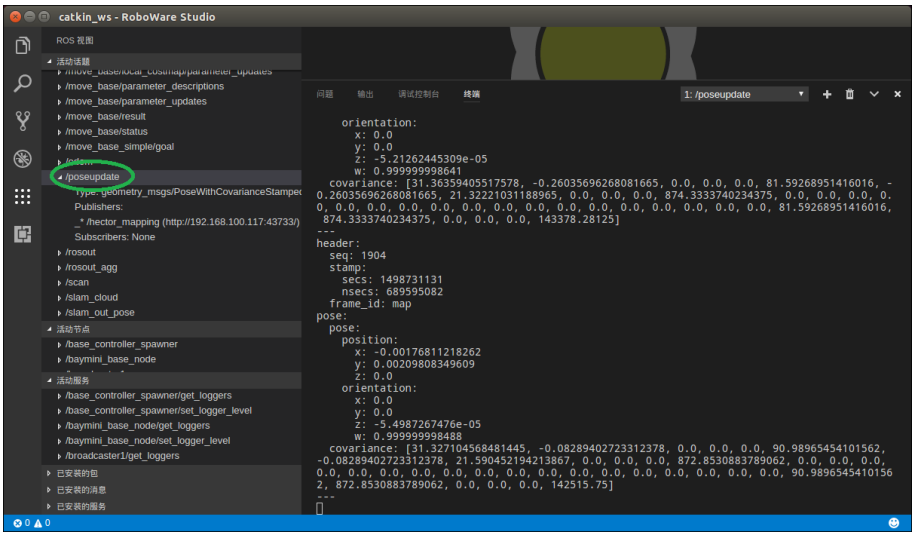


Figure 3-52 View real-time data streams of a topic

3.5.3 Record to or play rosbag

Ⅰ. Record

As shown in previous section, in the “ROS” view, all active topics are listed. You can use “rosbag” tools to record them by clicking “Record ROS Topic” icon, all active topics will be recorded by default. If you want to record one or more topics, you can press “Ctrl” key, and choose topic names you want to record by clicking them, then click “Record ROS Topic” icon to record them.

The recorded bag file will be saved in root directory of current workspace, its name is in a format of “yyyy-MM-dd-HH-mm-ss.bag”. You can stop recording by “Ctrl+C” in the integrated terminal.

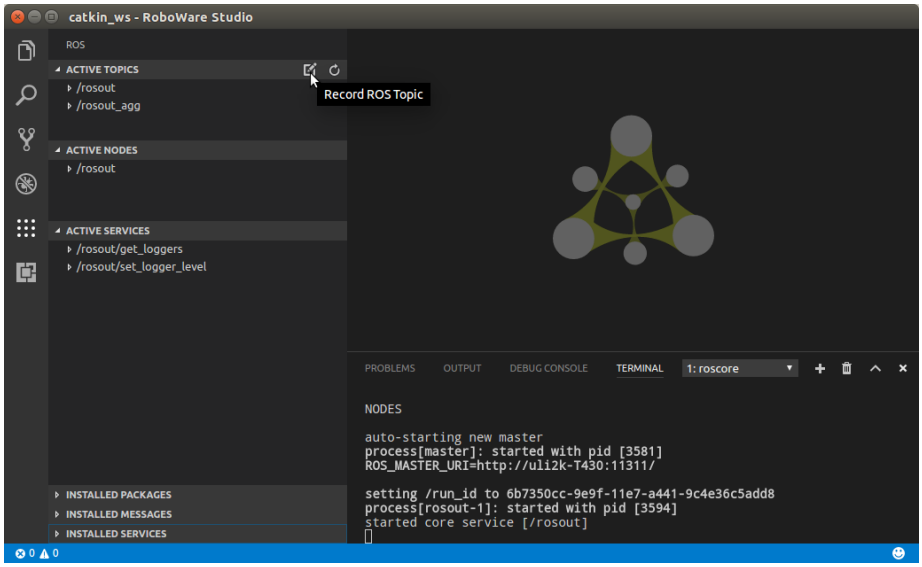
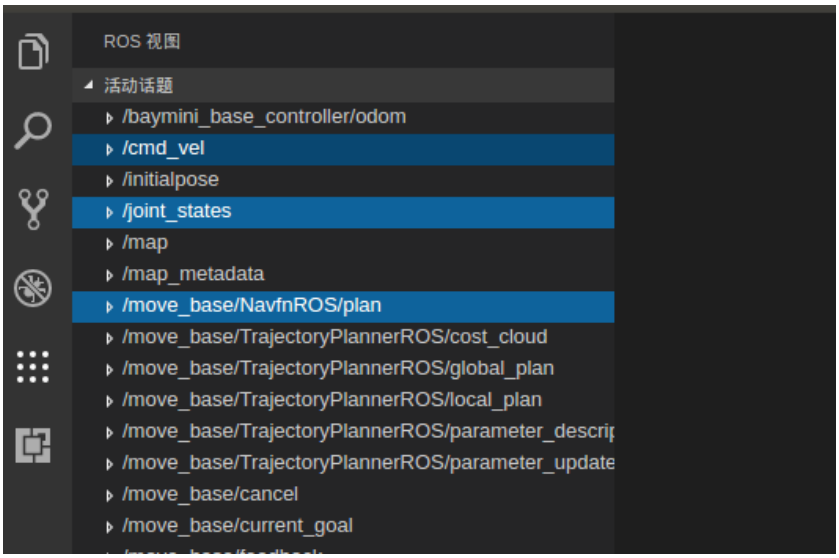
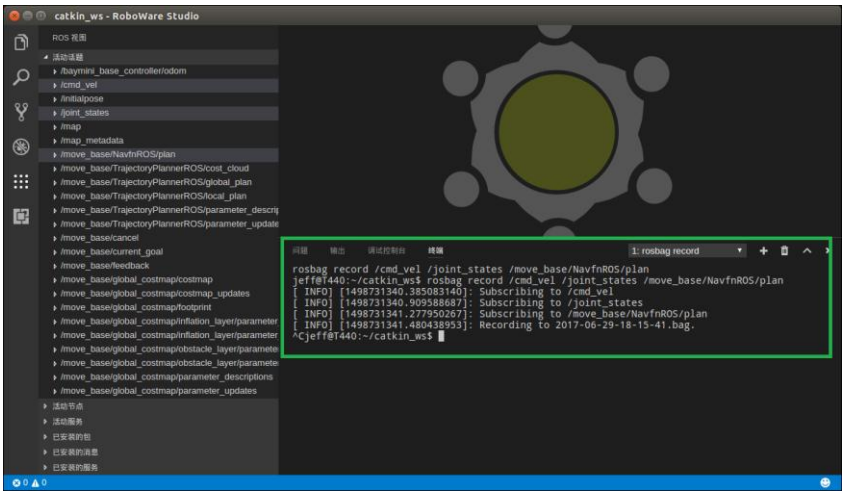


Figure 3-53 Record all active topics



Choose one or more topics



“Ctrl+C” to stop recording

Figure 3-54 Record ROS topics

II．Play

In “Explorer” view, you can play bag file by right clicking on the bag file name and selecting “Play Bag File”. You can also select “Loop Play Bag File” to play it in a loop. Since this task is executed in integrated terminal, you can type “Ctrl+C” in the integrated terminal to stop playing.

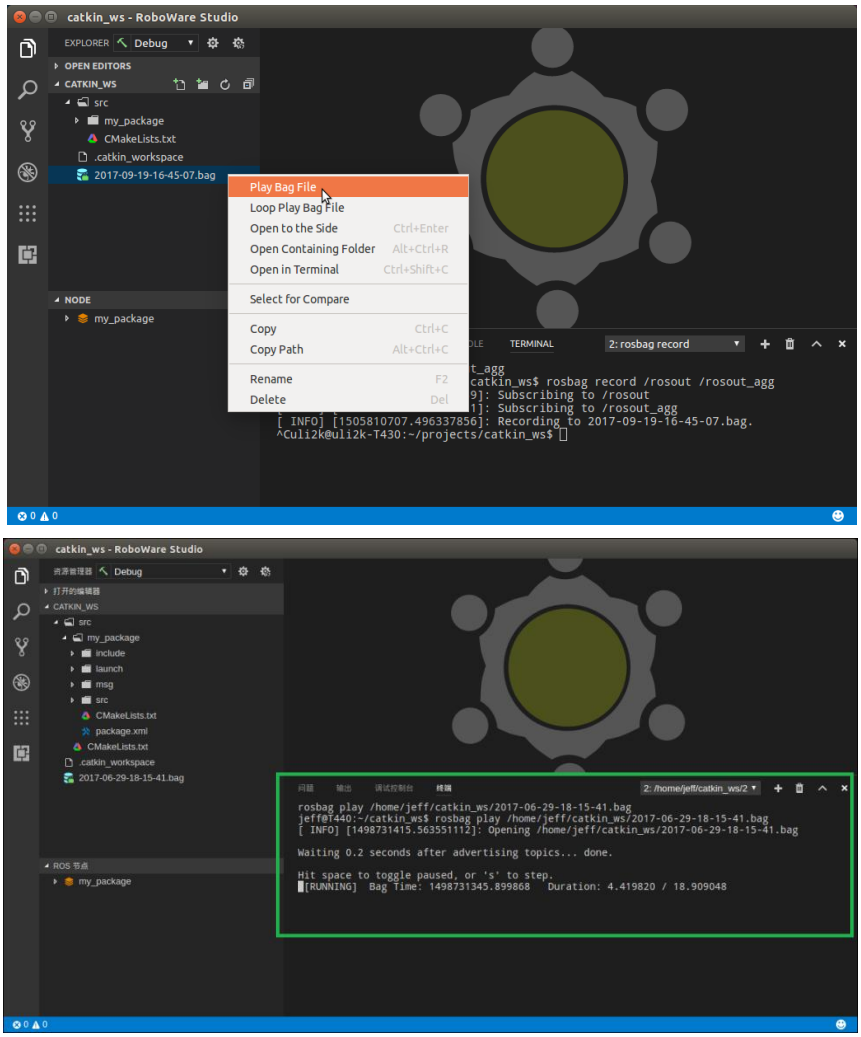
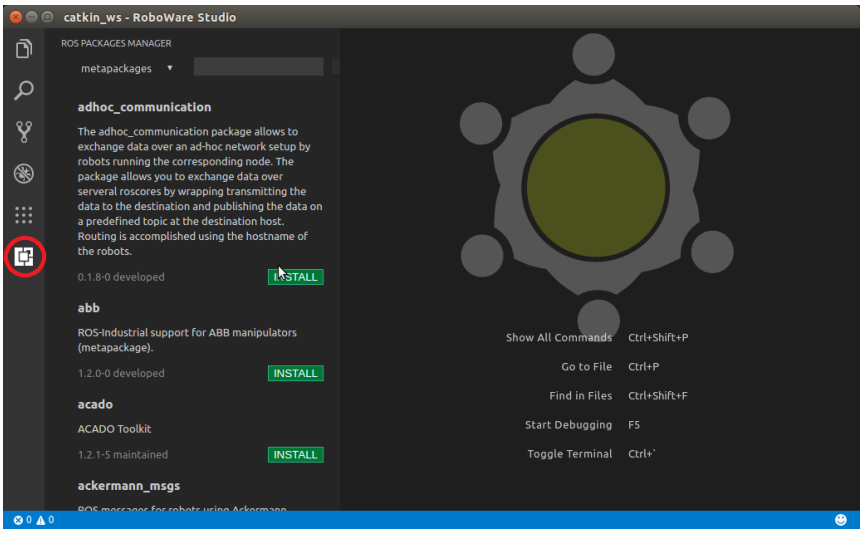


Figure 3-55 Play bag file

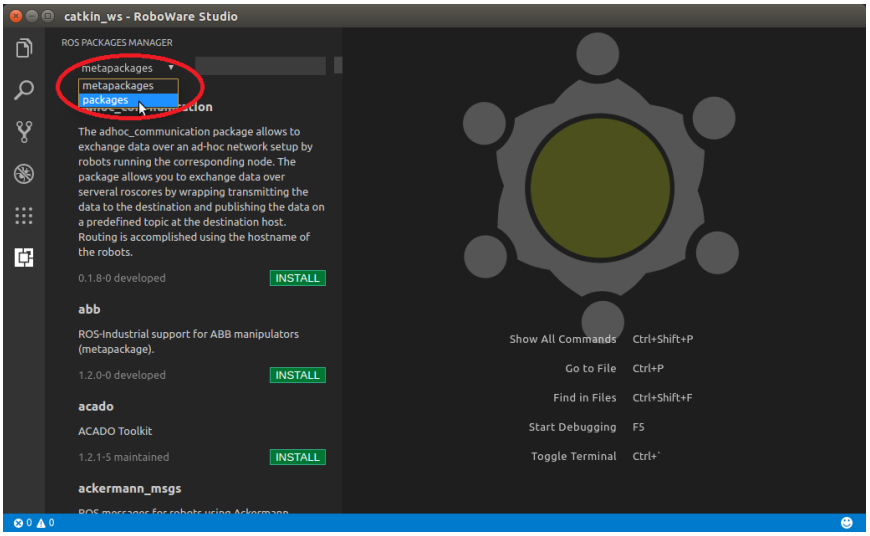
3.6 ROS Packages Manager

Go into “ROS Packages Manager” view by clicking “ROS Packages Manager” icon in the left sidebar. RoboWare Studio will detect ROS distro automatically and list all packages of this distro (including installed and uninstalled packages). You can choose “metapackages” and “packages” to view theirs lists. Searching of packages is also supported.

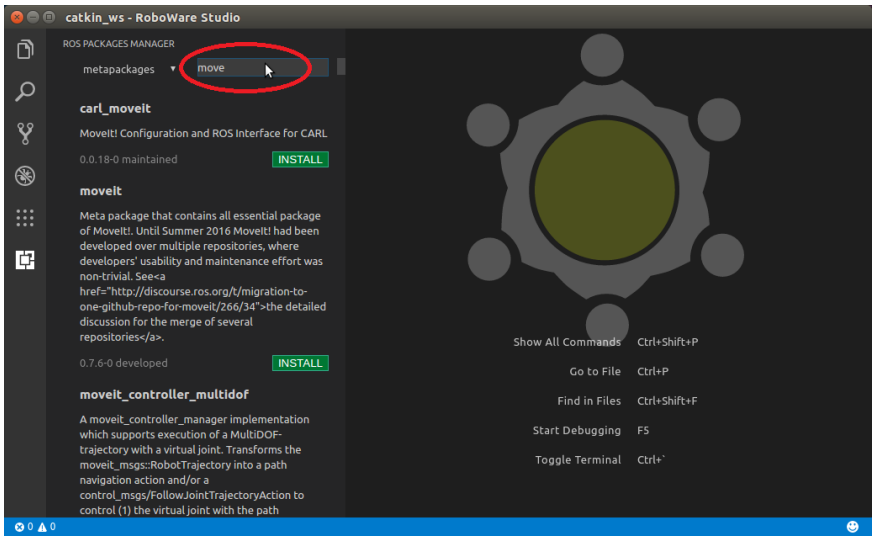
You can click the package name to view its wiki page just in RoboWare Studio. All packages can be (un)installed by clicking the (un)install button.



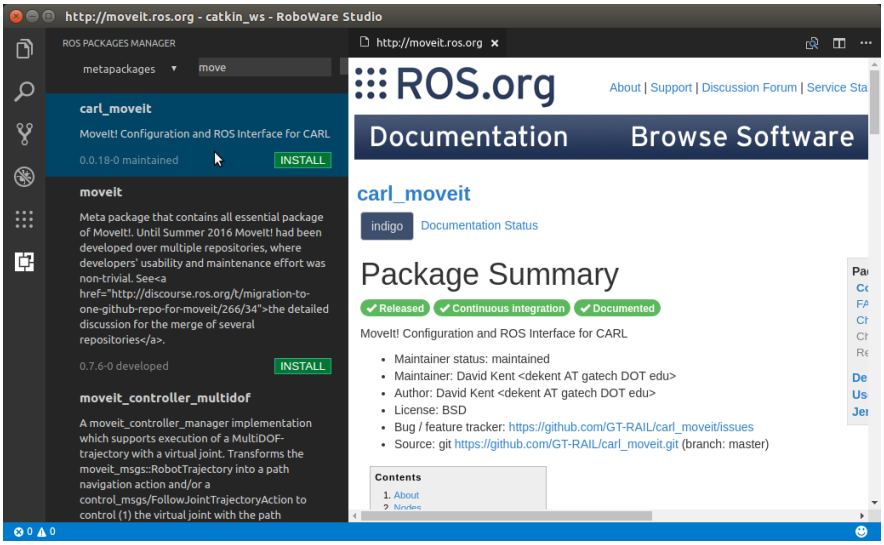
Open ROS Packages Manager



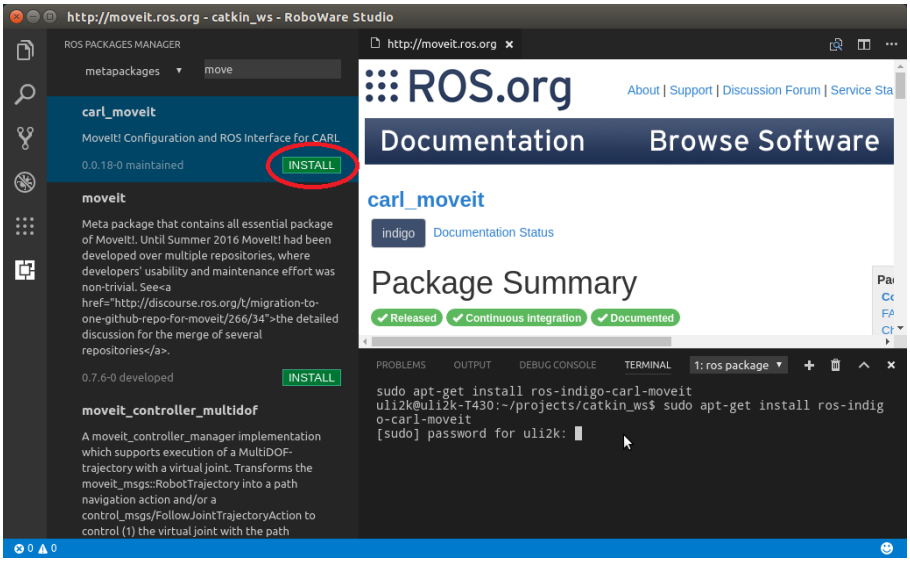
Choose ROS packages or meta packages option



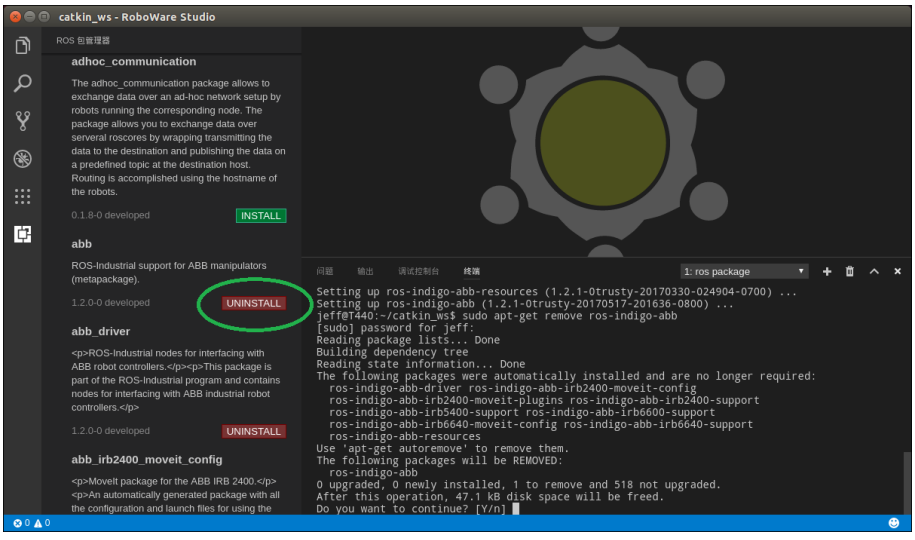
Type package name to search



View wiki page of a package



Package installation

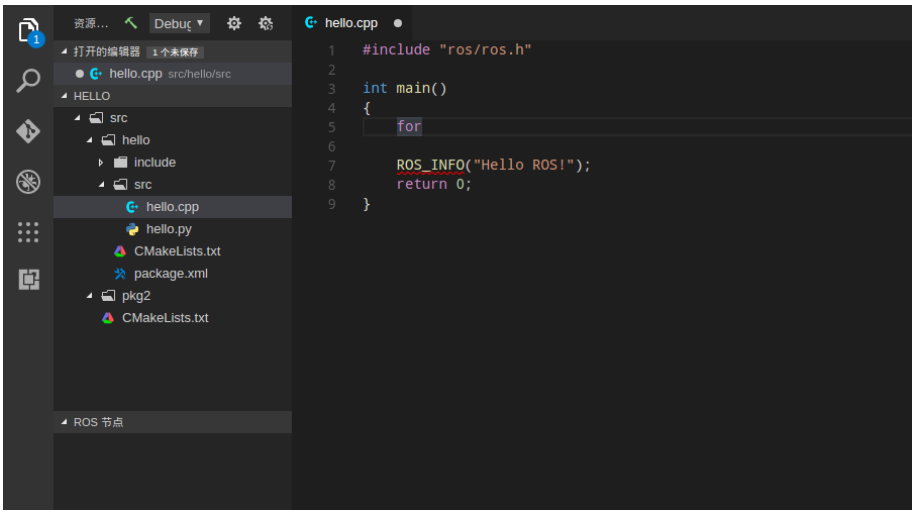


Package uninstallation

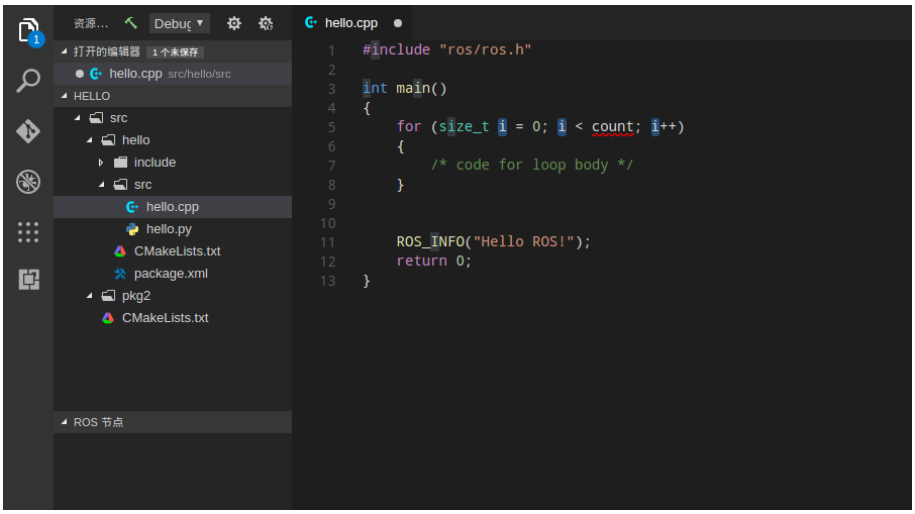
Figure 3-56 ROS Packages Manager

3.7 Snippets

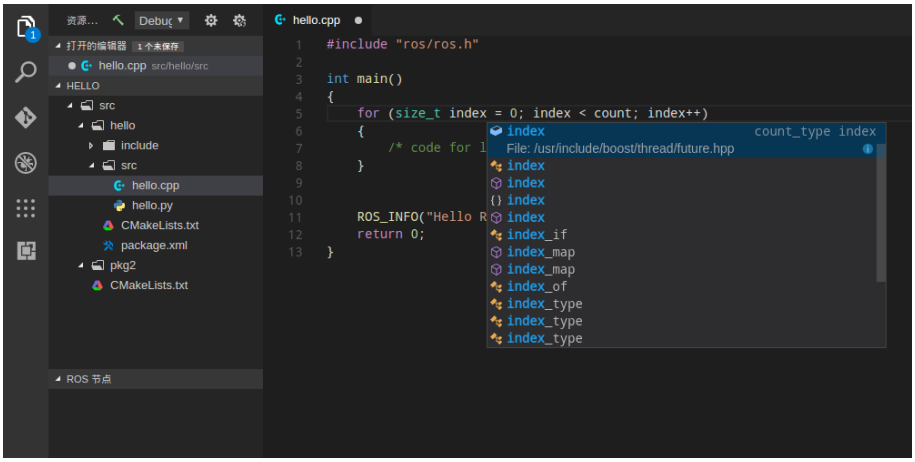
Snippet is a small region of re-usable source code, which is formally defined by RoboWare Studio. When you are coding, type the prefix and press the “Tab” key to automatically compete the code. Even better, RoboWare Studio supports variable modification of snippets, for example, the “for loop” snippet in C++:



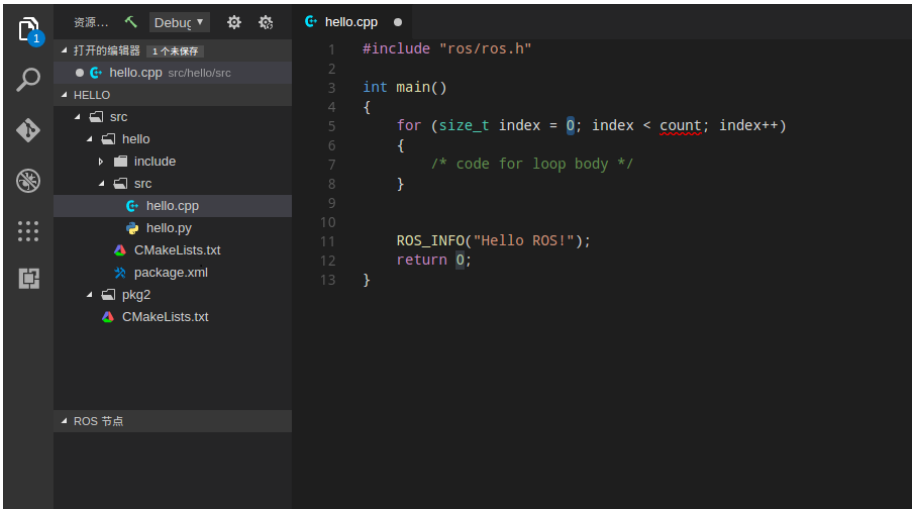
Type “for” prefix



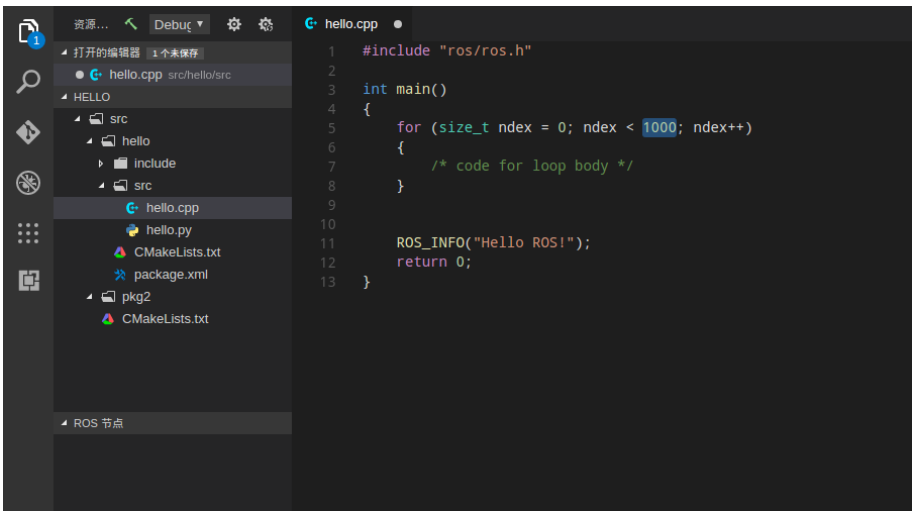
Press the “Tab” key to automatically compete the “for loop” code



Variable modification in the “for loop” snippet



Press the “Tab” key to jump between variables



Change value of a variable after press the “Tab” key

Figure 3-57 Snippets

All the snippets and their prefixes available in C++ and Python are listed below:

C++ Structure	Prefix
#if	#i

#ifdef	#ifd
#ifndef	#ifn
#else	#e
#define	#def
#undef	#und
inc	inc
Inc	Inc
typedef	type
enum	enum
union	uni
struct	stru
class	class
namespace	name
main	main
if	if
else	el
else if	ei
for	for
do	do
while	while
switch	swi
case	case
try	try
map	map
string	str
vector	vect
template	temp
ros::init	ros::init
ros::Publisher	ros::pub
ros::Subscriber	ros::sub
ros while	roswhile

Python Structure	Prefix
py	py
py3	py3
ase	ase
asne	asne
asr	asr
as	as
fail	fail
prop	prop
ifmain	ifmain
.	.

if	if
if/else	if/else
elif	elif
else	else
while	while
while/else	while/else
for	for
for/else	for/else
try/except	try/except
try/finally	try/finally
try/except/else	try/except/else
try/except/finally	try/except/finally
try/except/else/finally	try/except/else/finally
with	with
def	def
def(class method)	def(class method)
def(static class method)	def(static class method)
def(abstract class method)	def(abstract class method)
class	class
lambda	lambda
if(main)	if(main)
async/def	async/def
async/for	async/for
async/for/else	async/for/else
async/with	async/with
pdb	pdb
rospy.init_node	ros.init
rospy.Publisher	ros.pub
rospy.Subscriber	ros.sub
ros while	roswhile

3.8 Vim mode

Select “Edit” - “Toggle Vim Mode” in the menu to switch between normal edit mode and Vim edit mode.

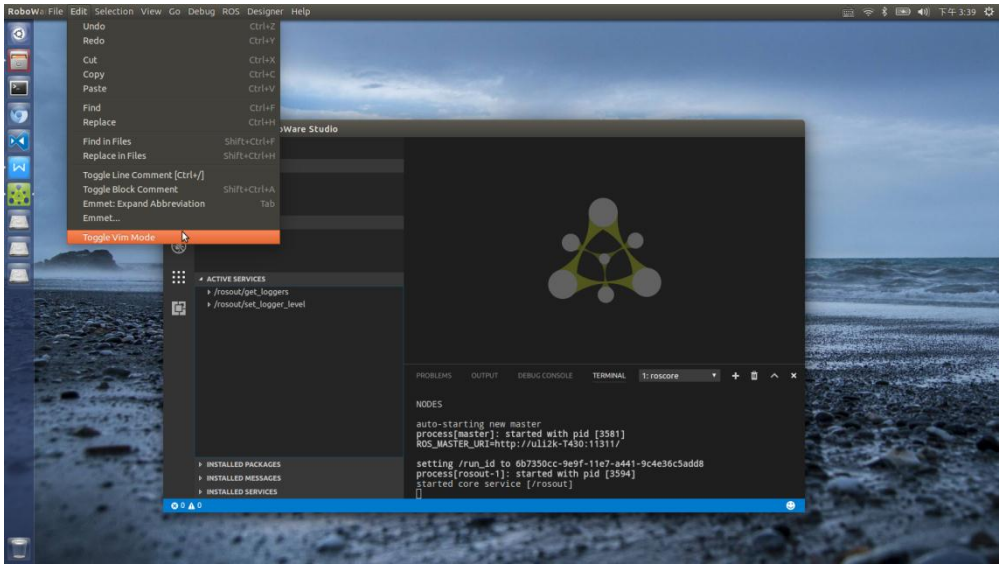


Figure 3-58 Toggle Vim Mode

Features of Vim extension:

(1) Modes: normal, insert, command-line, visual, visual line, visual block

(2) Command combinations (c3w, daw, 2dd, etc)

(3) Highly versatile command remapping (jj to <Esc>, : to command panel, etc.)

(4) Incremental search with / and ?

(5) Popular vim plugin features built-in (easymotion, surround, commentary)

(6) Vim settings similar to those found in .vimrc

Select “File” - “Preferences” - “Settings”, choose “Vim Configuration” to configure custom settings.

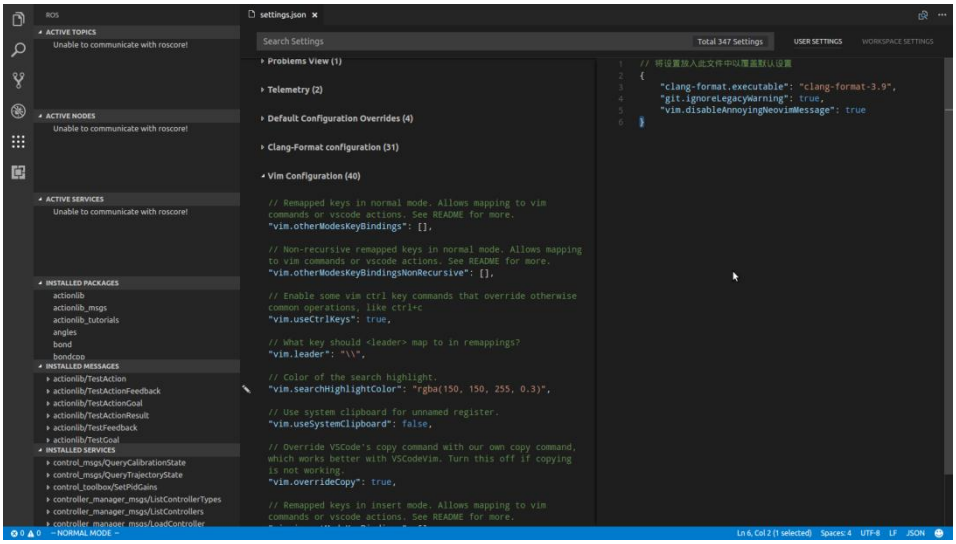


Figure 3-59 Vim configuration

For example, you can set “vim.easymotion” to “true” to enable easymotion function. (<leader> is configurable and is \ by default)

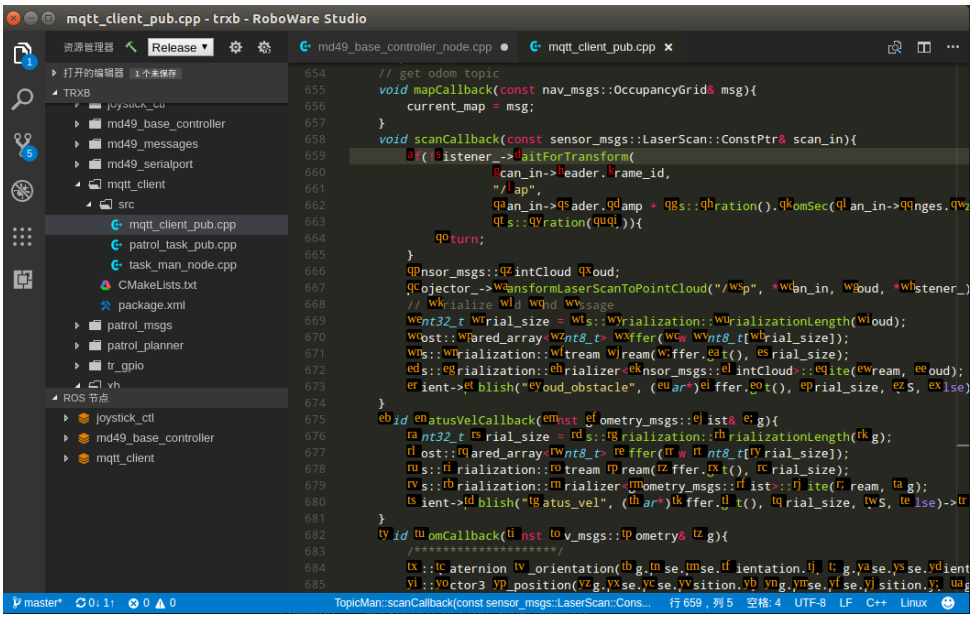


Figure 3-60 Easymotion in Vim

4 FAQ

4.1 How to import an existing ROS workspace?

There are TWO situations:

(1) For normal ROS workspaces which is created with command-line “catkin_init_workspace” command, you can directly import it by clicking “Open Workspace” button in “Explorer” view, or by selecting “File” – “Open Workspac” in the menu.

(2) For ROS workspace which is created by previous version of RoboWare Studio, you need to delete the “.vscode” hidden folder first, then import it.

4.2 How to upgrade RoboWare Studio?

Download the latest version of RoboWare Studio installation file and install, the previous version will be replaced automatically.

4.3 How to change the interface language?

In the menu, select “File” – “Preferences” - “Language Settings” to open the configuration file.

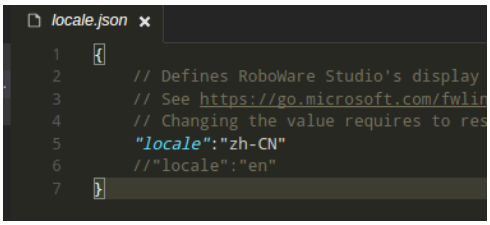


Figure 4-1 Language configuration file

"locale":"zh-CN" indicates Chinese language,

"locale":"en" indicates English language.

Use “//” to comment(disable) them.

After modification, close and restart RoboWare Studio for the changes to take effect.

4.4 “Path is not ROS Workspace” warning while creating new workspace.

One possibility is that ROS environment is not imported correctly, After installation of ROS, you need to add the following scripts in the “~/.bashrc” file:

source /opt/ros/indigo/setup.bash (for indigo distro)

OR

source /opt/ros/kinetic/setup.bash (for kinetic distro)

Official tutorials of ROS installation can be found here:

http://wiki.ros.org/indigo/Installation/Ubuntu (for indigo distro)

http://wiki.ros.org/kinetic/Installation/Ubuntu (for kinetic distro)

4.5 “Linter pylint is not installed” warning.

You need to install “pylint” by executing the following commands in a terminal:

$ sudo apt-get install python-pip

$ sudo python -m pip install pylint

4.6 “Git version is too low” warning.

You need to upgrade git, open a terminal and execute:

$ sudo apt-add-repository ppa:git-core/ppa

$ sudo apt-get update

$ sudo apt-get install git

4.7 ROS node named “test” cannot be built.

Don’t name a ROS node “test”, otherwise it will not be built successfully.

4.8 Stuck while buiding workspace.

Memory could be too small and there are too many packages in current workspace. Now, you can choose one or several of them to build with RoboWare Studio.

4.9 Explorer cannot be refreshed automatically while adding or deleting files

RoboWare Studio uses “inotify” tool to monitor directories for changes. By default the inotify limit is set to 8192, when this limit is not enough to monitor all files inside a directory, the limit must be increased for RoboWare Studio to work properly.

You can set a new limit by editing “/etc/sysctl.conf” file:

$ sudo vi /etc/sysctl.conf

Find “fs.inotify.max_user_watches” option and set its value to a proper number, like: 100000. Then reboot your system to take effect.

4.10 Cannot edit/select/copy.

Probably because it’s in Vim mode, just switch to normal mode by select “Edit” – “Toggle Vim Mode” in the menu.

4.11 How to jump back/forward while editing? How to set keyboard shortcuts?

You can press “Ctrl+Shift+-” to jump forward, and “Ctrl+Alt+-” to jump back. Select “File” – “Preferences” - “Keyboard Shortcuts” to set keyboard shotcuts.

4.12 Cannot position CMakelists.txt error when compiling.

First, remove the tasks.json file in .vscode folder of workspace root, then close and reopen the workspace.