ROS 2 Basic Concepts

Estimated time to completion: **2 minutes**

2.3 What is a Package?

ROS 2 uses **packages** to organize its programs. You can think of a package as **a collection of all the files related to a specific ROS 2 program**; all its CPP files, Python files, configuration files, compilation files, launch files, and parameters files. Also, organizing your ROS 2 programs in packages makes sharing them with other developers/users much easier.

In ROS2, you can create two types of packages:

- **Python packages**
- **CMake (C++) packages**

For this course, we will focus on the first type. **Python packages will contain Python executables**.

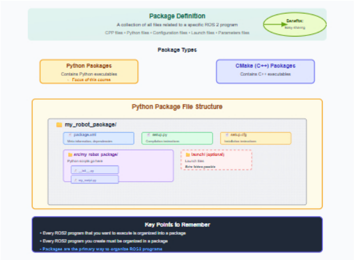
Every Python package will have the following structure of files and folders:

- `package.xml` - File containing meta-information about the package (maintainer of the package, dependencies, etc.).
- `setup.py` - File containing instructions for how to compile the package.
- `setup.cfg` - Contains instructions for how to install the package.
- `src` /**\<package_name>** - This directory is named after your package. You will put all your Python scripts inside this folder. It already contains an empty `__init__.py` file by default.

Some packages might contain extra folders. For instance, the `launch` folder contains the package's launch files (you will read more about it later).

To summarize, you should remember the following:

- Every ROS2 program that you want to execute is organized into a package.
- Every ROS2 program you create must be organized in a package.
- Packages are the primary way to organize for ROS2 programs.


Package Definition
A collection of all files related to a specific ROS 2 program
CPP files • Python files • Configuration files • Launch files • Parameters files
Benefits:
Easy sharing
Package Types
Python Packages
Contains Python executables
Focus of this course
CMake (C++) Packages
Contains C++ executables
Python Package File Structure
my_robot_package/
package.xml
Meta information, dependencies
setup.py
Compilation instructions
setup.cfg
Installation instructions
src/my_robot_package/
Python scripts go here
__init__.py
my_script.py
launch/ (optional)
Launch files
More folders possible
Key Points to Remember
• Every ROS2 program that you want to execute is organized into a package
• Every ROS2 program you create must be organized in a package
• Packages are the primary way to organize ROS2 programs

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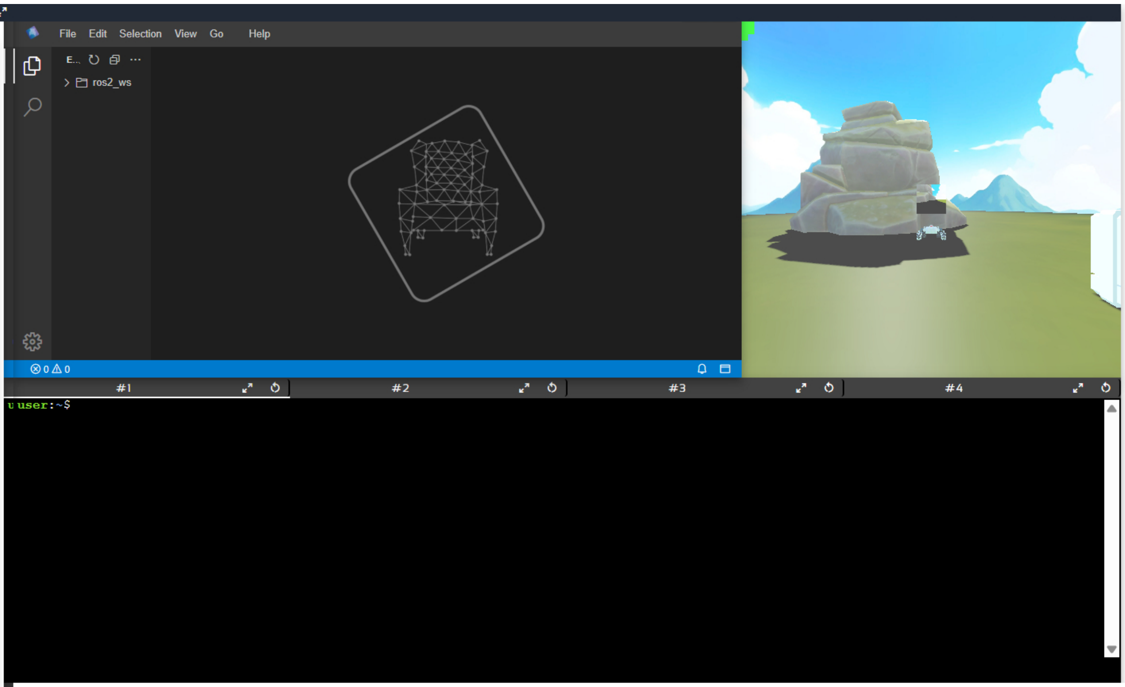

```
user:~$
```

2.3 - What is a Package?