ROS Tutorials

The official ROS tutorials are very comprehensive, however I found the way they present ROS to a beginner results in a very steep learning curve. Here is our own set of tutorials, which are a work in progress. I may reference tutorials from other sites if I find them useful.

Pre-requisites

Basic linux command-line knowledge (specifically BASH) is assumed. If you are completely unfamiliar with the command line, check out thiscodecademy tutorial, or this series of videos.

High Level Concepts

ROS is many things, it is primarily a communication framework, but it also has a huge set of useful tools, including viewing data, navigating the filesystem, and starting up processes.

Each process is called a **node**. Nodes are designed to do a specific task. We can create complex functionality (such as controlling a robot) by building multiple nodes and having them talk together.

There are several ways for nodes to talk to each other, the most common one is a **topic**. The basic idea is that a single node can “publish” data to a topic, and then one or more nodes can “subscribe” to the topic and receive the data.

Nodes are typically grouped together into a **package**. All of our software is in a single package called “robosub”. When you install ROS, several other packages are installed that provide some useful functionality, such as rqt_plot.

Command Line Tools

ROS provides many useful command-line tools. Your BASH environment gets access to these when you have the following line in your ~/.bashrc file:

```
source /opt/ros/indigo/setup.bash
```

Most ROS commands support tab autocompletion, so take advantage of it!

Navigating the filesystem

ROS has a few different commands that are useful for moving and looking around. They are typically in the form:

```
$ <command> <package_name> <...>
```

Most are based on the typical navigation functions:

- roscd
- rosls

Starting nodes

Starting a single node

While you can manually find the executable (or python script) and run it manually, ROS provides a tool for quickly finding and starting a node, the `rosrun` command:

```
$ rosrun <package_name> <node_name>
```

Starting multiple nodes

The `roslaunch` command allows you to launch multiple nodes at the same time. The nodes are specified in a special file called a launch file.

```
$ rosrun <package_name> <launchfile_name>
```

More information about launch files can be found here

Viewing active nodes and topics

The `rosnode` command shows information about nodes. You can view all currently running nodes by running

```
$ rosnode list
```

Likewise, the `rostopic` command shows information about topics. You can view all currently active topics by running

```
$ rostopic list
```

How to Write a ROS Node

Check out these tutorials for whatever language you're using: C++ Python

From:
https://robosub.eecs.wsu.edu/wiki/ - **Palouse RoboSub Technical Documentation**

Permanent link:
https://robosub.eecs.wsu.edu/wiki/cs/ros/tutorials/start?rev=1473904049

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