



Hochschule
Bonn-Rhein-Sieg
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ROS Nodes, Topics, and Messages

Foundation Course

August 28, 2019

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1. Recap

2. ROS nodes in Python

2.1 A simple ROS node in Python

2.2 Writing a publisher node in Python

Recap

Summary of yesterday's session

- ROS is a collection of libraries and tools that helps you when you develop software for robots.
- ROS provides several ways to transfer data between nodes:
 1. ROS topics and messages (**publish/subscribe**).
 2. ROS services (**request/reply**).
 3. ROS actions (**request/reply**).
 4. Parameter server.

Recap

Summary of yesterday's session

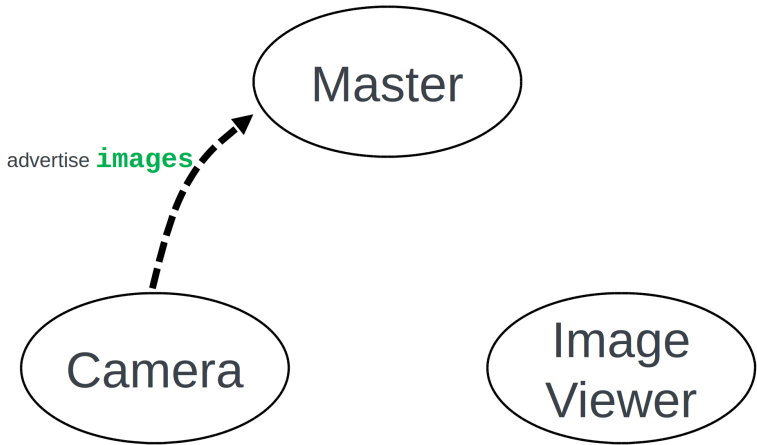
- We will focus today on ROS topics and messages..

```
graph TD; Master([Master]); Camera([Camera]); ImageViewer([Image Viewer]);
```

Master

Camera

Image
Viewer







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A simple ROS node

```
#!/usr/bin/env python

import rospy
from time import sleep

rospy.init_node("print_text")

while True:
    print "Hello world!"
    sleep(1)
```

A simple ROS node

ROS Nodes

```
#!/usr/bin/env python

import rospy

rospy.init_node("print_text")
rate = rospy.Rate(1)

while not rospy.is_shutdown():
    print "Hello world!"
    rate.sleep()
```

Three ways to run a node

ROS Nodes

There are 3 ways to run a node:

1. Like you normally do (not recommended). Example (in case of python node):

```
python <file name>
```

2. using rosrun command:

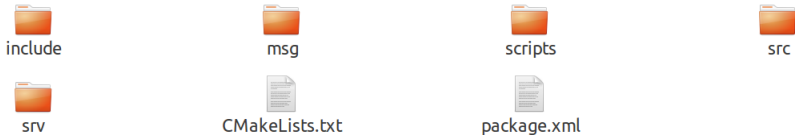
```
rosrun <package name> <node name>
```

3. Using launch files. (we'll see it later)

Let's create a package first!

ROS Nodes

- ROS commands find your files (python scripts, cpp files, launch files, message definitions) if they are located in a package inside the workspace.
- Normally, a package looks like this:



Let's create a package first!

ROS Nodes

- go to the README and do the steps for **creating a package**.

ROS commands

ROS Nodes

- Navigate to a ROS package directly:

```
roscd <package name>
```

- run a node without navigating to it's directory:

```
roslaunch <package name> <executable>
```


Let's create a package first!

ROS Nodes

- go to the README and do the steps for **running a node**.

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Writing a publisher node in Python

ROS Nodes, Topics, and Messages

- Let's extend our previous node and make it publish a String ROS message.

Writing a publisher node in Python

ROS Nodes, Topics, and Messages

