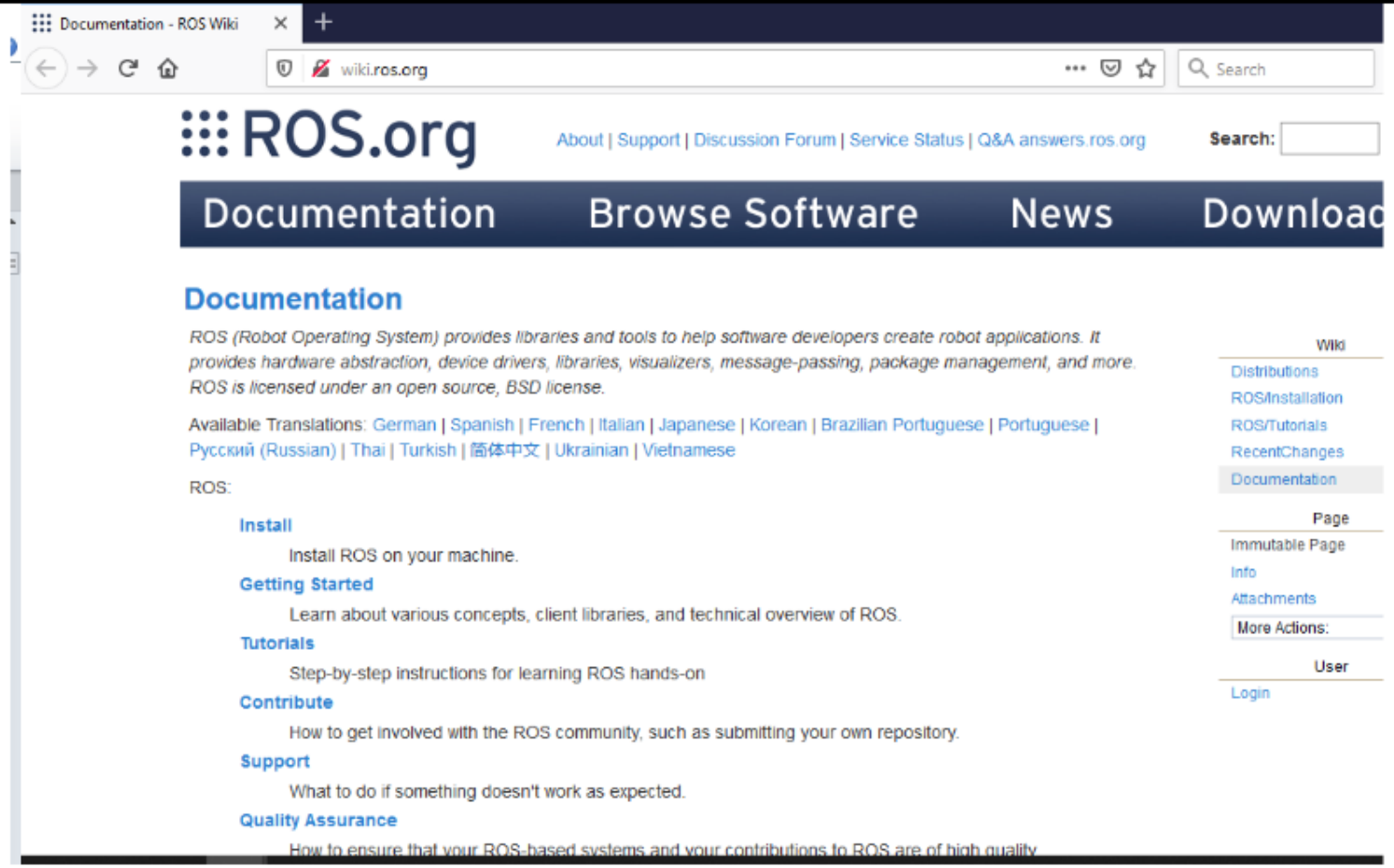


BASIC ROS DEVELOPMENT

Console Commands & Example

Example

Console Tab Nr. 1 – Starting a *roscore*

Start a roscore with

```
> roscore
```

```
student@ubuntu:~/catkin_ws$ roscore
... logging to /home/student/.ros/log/6c1852aa-e961-11e6-8543-000c297bd368/ros
launch-ubuntu-6696.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ubuntu:34089/
ros_comm version 1.11.20


SUMMARY
========

PARAMETERS
 * /rosdistro: indigo
 * /rosversion: 1.11.20

NODES

auto-starting new master
process[master]: started with pid [6708]
ROS_MASTER_URI=http://ubuntu:11311/

setting /run_id to 6c1852aa-e961-11e6-8543-000c297bd368
process[rosout-1]: started with pid [6721]
started core service [/rosout]
```

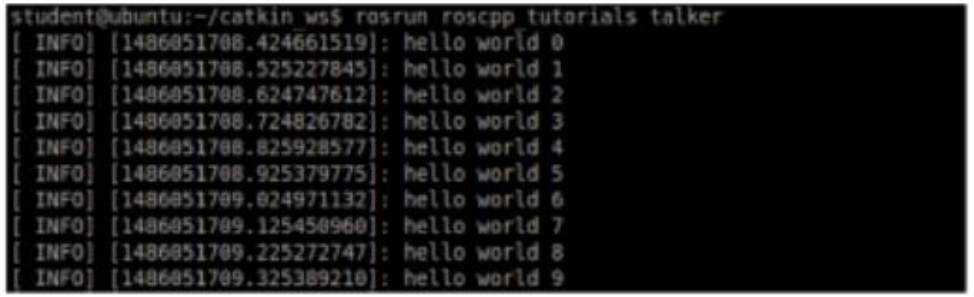
Console Commands & Example

Example

Console Tab Nr. 2 – Starting a *talker* node

Run a talker demo node with

```
> rosrun roscpp_tutorials talker
```



Console Commands & Example

Example

Console Tab Nr. 3 – Analyze *talker* node

See the list of active nodes

```
> rosnode list
```

```
student@ubuntu:~/catkin_ws$ rosnode list
/rosout
/talker
```

Show information about the *talker* node

```
> rosnode info /talker
```

```
student@ubuntu:~/catkin_ws$ rosnode info /talker
--------------------------------------------------------------------------------
Node [/talker]
Publications:
 * /chatter [std_msgs/String]
 * /rosout [rosgraph_msgs/Log]

Subscriptions: None

Services:
 * /talker/get_loggers
 * /talker/set_logger_level
```

See information about the *chatter* topic

```
> rostopic info /chatter
```

```
student@ubuntu:~/catkin_ws$ rostopic info /chatter
Type: std_msgs/String

Publishers:
 * /talker (http://ubuntu:39173/)

Subscribers: None
```

Console Commands & Example

Example

Console Tab Nr. 3 – Analyze *chatter* topic

Check the type of the *chatter* topic

```
> rostopic type /chatter
```

```
student@ubuntu:~/catkin_ws$ rostopic type /chatter
std_msgs/String
```

Show the message contents of the topic

```
> rostopic echo /chatter
```

```
student@ubuntu:~/catkin_ws$ rostopic echo /chatter
data: hello world 11874
---
data: hello world 11875
---
data: hello world 11876
```

Analyze the frequency

```
> rostopic hz /chatter
```

```
student@ubuntu:~/catkin_ws$ rostopic hz /chatter
subscribed to [/chatter]
average rate: 9.991
        min: 0.099s max: 0.101s std dev: 0.00076s window: 10
average rate: 9.996
        min: 0.099s max: 0.101s std dev: 0.00069s window: 20
```

Console Commands & Example

Example

Console Tab Nr. 4 – Starting a *listener* node

Run a listener demo node with

```
> rosrun roscpp_tutorials listener
```

```
student@ubuntu:~/catkin_ws$ rosrun roscpp_tutorials listener
[ INFO] [1486053802.204104598]: I heard: [hello world 19548]
[ INFO] [1486053802.304538827]: I heard: [hello world 19549]
[ INFO] [1486053802.403853395]: I heard: [hello world 19550]
[ INFO] [1486053802.504438133]: I heard: [hello world 19551]
[ INFO] [1486053802.604297608]: I heard: [hello world 19552]
```

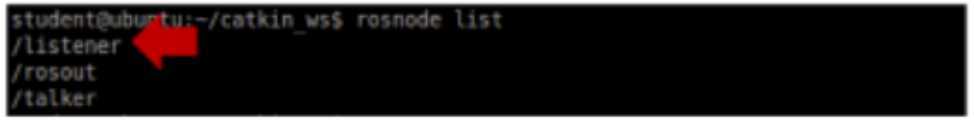
Console Commands & Example

Example

Console Tab Nr. 3 – Analyze

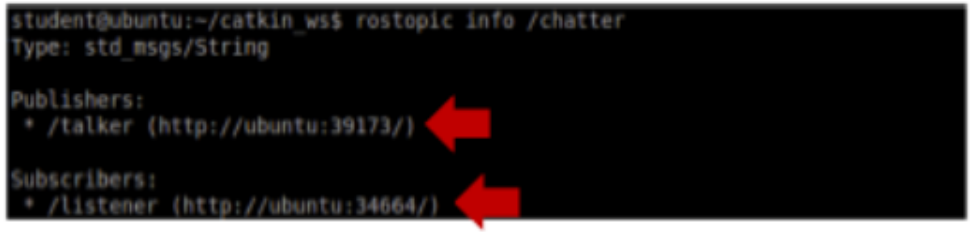
See the new *listener* node with

```
> rosnode list
```



Show the connection of the nodes over the chatter topic with

```
> rostopic info /chatter
```



Console Commands & Example

Example

Console Tab Nr. 3 – Publish Message from Console

Close the *talker* node in console nr. 2 with `Ctrl + C`

Publish your own message with

```
> rostopic pub /chatter std_msgs/String
  "data: '                                '"
```

Insert Own Text

```
student@ubuntu:~/catkin_ws$ rostopic pub /chatter std_msgs/String "data: 'ETH
Zurich ROS Course'"
publishing and latching message. Press ctrl-C to terminate
```

Check the output of the *listener* in console nr. 4

```
[ INFO] [1486054667.604322265]: I heard: [hello world 28202]
[ INFO] [1486054667.704264199]: I heard: [hello world 28203]
[ INFO] [1486054667.804389058]: I heard: [hello world 28204]
[ INFO] [1486054707.646404558]: I heard:
```

Display Own Text

Exercise: Publisher and Subscriber

1. Creating a ROS Package
   - http://wiki.ros.org/ROS/Tutorials/CreatingPackage
2. Writing a Simple Publisher and Subscriber (Python)
   - http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29