Guidelines for the first example

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I. Introduction

THIS is the introductory example of how ROS works. In this example we will work on simple Hello World task.

II. Block Diagram

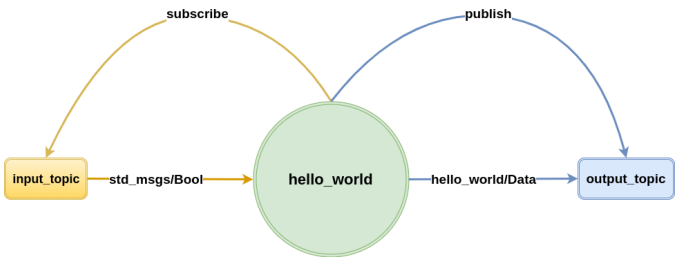

Fig. 1. Block diagram of the first example.

In this block diagram we can see that we have a node called hello_world. The node hello_world is subscribed to the topic input_topic and receives a message that is type of std_msgs/Bool. After the node receives the message if this message is true he will publish to the topic output_topic message type of hello_world/Data.

III. Creating a ROS Package

Write this in the terminal:

```
$cd ~/catkin_ws/src
$catkin_create_pkg hello_world std_msgs
 roscpp
$cd ~/catkin_ws
$catkin_make
#close and restart the terminal
$roscd hello_world
```

IV. Creating a header and cpp files in RoboWare Studio

First create the main function **hello_world.cpp**:
cpp → Add CPP File → Add to new Executable.

Create the **Hello.cpp** class:
cpp → Add CPP File → hello_world Executable File.

Create the **Hello.h** header:
include → hello_world → Add Header File → hello_world Executable File.

V. Creating a msg in RoboWare Studio

First create the folder **msg**:
hello_world → Add Msg Folder

In this folder create **Data.msg** file:
msg → Add Msg File

And after that write this in the **Data.msg**:

```
string x
```

VI. CPP code

CPP code for **Hello.h**:

```
#include <iostream>
#include "ros/ros.h"
#include <std_msgs/Bool.h>
#include <hello_world/Data.h>

class Hello{
private:
  ros::NodeHandle nh;
  ros::Subscriber sub;
  ros::Publisher pub;
  void callback(const std_msgs::Bool& msg);

public:
  Hello();
  ~Hello();
  void run();
};
```

CPP code for **Hello.cpp**:

```
#include <hello_world/Hello.h>

Hello::Hello(){
  pub = nh.advertise<hello_world::Data>
  ("output_topic", 1);
  sub = nh.subscribe("input_topic",
  1, &Hello::callback, this);
}

Hello::~Hello(){
}

void Hello::callback(const std_msgs::Bool& msg){
  if (!msg.data) {
    std::cout << "Publishing nothing!"
    << std::endl;
  }else {
    hello_world::Data text;
```

```
    std::cout << "Publish to a topic!"
    << std::endl;
    text.x = "Hello World!";
    pub.publish(text);
  }
}

void Hello::run(){
  ros::spin();
}
```

CPP code for **hello_world.cpp**:

```
#include <hello_world/Hello.h>

int main(int argc, char *argv[])
{
  ros::init(argc, argv, "hello_world");
  Hello hello;
  hello.run();
  return 0;
}
```

VII. Running example

To run this example, write this in the terminal:

```
$roscore
#in new tab (ctrl+shift+T)
$rosrun hello_world hello_world
#rqt is GUI tools
$rqt
#If we want to see the contents of the message
$rostopic echo /output_topic
```

VIII. Link for prezi

https://prezi.com/view/hK2IU9qXuRlX8DClYmVj/