

## TECHNICAL REPORT UTS ROBOTICA MEMBUAT NODES PUBLISHER DAN SUBSCRIBER

FAISHAL ANWAR – TK44G7

1. Pertama tama hal yang harus kita lakukan adalah membuat workspace dalam hal ini adalah catkin\_ws. Persyaratan pertama untuk bekerja dengan paket ROS adalah membuat ruang kerja catkin ROS. Setelah menginstal ROS, kita dapat membuat dan membangun ruang kerja catkin yang disebut catkin\_ws:

```
mkdir -p ~/catkin_ws/src
```

Untuk mengkompilasi ruang kerja ini, kita harus menginisialisasi lingkungan ROS untuk mendapatkan akses ke fungsi-fungsi ROS:

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

Beralih ke direktori src yang kita buat sebelumnya:

```
cd ~/catkin_ws/src
```

Setelah melakukan beberapa proses diatas, sekarang kita akan membuat catkin package, dengan cara;

```
catkin_create_pkg mastering_ros_demo_pkg roscpp std_msgs actionlib  
actionlib_msgs
```

gambar dibawah merupakan hasil running perintah diatas;

```
Created file mastering_ros_v2_pkg/package.xml  
Created file mastering_ros_v2_pkg/CMakeLists.txt  
Created folder mastering_ros_v2_pkg/include/mastering_ros_v2_pkg  
Created folder mastering_ros_v2_pkg/src  
Successfully created files in /home/jcacace/mastering_ros_v2_pkg. Please  
adjust the values in package.xml.
```

```
[ 0%] Built target _webots_ros_generate_messages_check_deps_field_set_float  
[ 0%] Built target std_msgs_generate_messages_nodejs  
[ 0%] Built target _webots_ros_generate_messages_check_deps_field_set_int32  
[ 0%] Built target sensor_msgs_generate_messages_nodejs  
[ 0%] Built target std_msgs_generate_messages_lisp  
[ 0%] Built target sensor_msgs_generate_messages_lisp  
[ 0%] Built target mastering_ros_robot_description_pkg_xacro_generated_to_devel_space_  
[ 0%] Built target _webots_ros_generate_messages_check_deps_field_set_vec3f  
[ 0%] Built target _webots_ros_generate_messages_check_deps_node_get_field  
[ 0%] Built target _webots_ros_generate_messages_check_deps_get_float  
[ 1%] Built target e_puck_manager  
[ 64%] Built target webots_ros_generate_messages_cpp  
[ 76%] Built target webots_ros_generate_messages_py  
[ 76%] Built target webots_ros_generate_messages_eus  
[ 79%] Built target webots_ros_generate_messages_lisp  
[ 98%] Built target webots_ros_generate_messages_nodejs  
[ 98%] Built target webots_ros_generate_messages  
[ 98%] Built target keyboard_teleop  
[ 98%] Built target catch_the_bird  
[ 98%] Built target e_puck_line  
[100%] Built target panoramic_view_recorder  
[100%] Built target robot_information_parser  
[100%] Built target complete_test  
root@024a5ddf0613:~/catkin_ws#
```

2. Kemudian langkah selanjutnya yang perlu kita lakukan adalah membuat nodes, dalam kasus ini kita akan membuat 2 nodes, yang pertama adalah demo\_topic\_publisher.cpp dan demo\_topic\_subscriber.cpp

pertama tama kita buat nodes demo\_topic\_publisher.cpp

```
#include "ros/ros.h"
#include "std_msgs/Int32.h"
#include <iostream>

int main(int argc, char **argv) {
    ros::init(argc, argv, "demo_topic_publisher");
    ros::NodeHandle node_obj;
    ros::Publisher number_publisher = node_obj.advertise<std_msgs::Int32>("/numbers", 10);
    ros::Rate loop_rate(10);
    int number_count = 0;
    while ( ros::ok() ) {
        std_msgs::Int32 msg;
        msg.data = number_count;
        ROS_INFO("%d", msg.data);
        number_publisher.publish(msg);
        loop_rate.sleep();
        ++number_count;
    }
    return 0;
}
```

Kemudian kita buat nodes demo\_topic\_subscriber

```
#include "ros/ros.h"
#include "std_msgs/Int32.h"
#include <iostream>

void number_callback(const std_msgs::Int32::ConstPtr& msg) {
    ROS_INFO("Received [%d]", msg->data);
}

int main(int argc, char **argv) {
    ros::init(argc, argv, "demo_topic_subscriber");
    ros::NodeHandle node_obj;
    ros::Subscriber number_subscriber = node_obj.subscribe("/numbers", 10, number_callback);
    ros::spin();
    return 0;
}
```

Kemudian kita lakukan add executable pada CMakeList.txt, agar nodes yang sudah kita buat terbaca oleh program sebagai file executable.

```

    ${Boost_INCLUDE_DIRS}
)
#This will create executables of the nodes
add_executable(demo_topic_publisher src/demo_topic_publisher.cpp)
add_executable(demo_topic_subscriber src/demo_topic_subscriber.cpp)
#This will link executables to the appropriate libraries
add_executable(demo_msg_publisher src/demo_msg_publisher.cpp)
add_executable(demo_msg_subscriber src/demo_msg_subscriber.cpp)

add_dependencies(demo_msg_publisher mastering_ros_demo_pkg_generate_messages_cpp)
add_dependencies(demo_msg_subscriber mastering_ros_demo_pkg_generate_messages_cpp)
target_link_libraries(demo_msg_publisher ${catkin_LIBRARIES})
target_link_libraries(demo_msg_subscriber ${catkin_LIBRARIES})
target_link_libraries(demo_topic_publisher ${catkin_LIBRARIES})
target_link_libraries(demo_topic_subscriber ${catkin_LIBRARIES})

add_executable(demo_service_server src/demo_service_server.cpp)
add_executable(demo_service_client src/demo_service_client.cpp)
add_dependencies(demo_service_server mastering_ros_demo_pkg_generate_messages_cpp)
add_dependencies(demo_service_client mastering_ros_demo_pkg_generate_messages_cpp)

```

Kemudian lakukan running code dari kedua code nodes diatas setelah melakukan beberapa konfigurasi lain seperti yang disampaikan pada buku, berikut merupakan output code

```

[ INFO] [1704459209.184257497]: 16
[ INFO] [1704459209.204326476]: 17
[ INFO] [1704459209.384319523]: 18
[ INFO] [1704459209.484335896]: 19
[ INFO] [1704459209.584291744]: 20
[ INFO] [1704459209.684433382]: 21
[ INFO] [1704459209.784349744]: 22
[ INFO] [1704459209.884412981]: 23
[ INFO] [1704459209.984218554]: 24
[ INFO] [1704459210.084234446]: 25
[ INFO] [1704459210.184231132]: 26
[ INFO] [1704459210.284225642]: 27
[ INFO] [1704459210.384280797]: 28
[ INFO] [1704459210.484346615]: 29
[ INFO] [1704459210.584224133]: 30
[ INFO] [1704459210.684277290]: 31
[ INFO] [1704459210.784238295]: 32
[ INFO] [1704459210.884325935]: 33
[ INFO] [1704459210.984278182]: 34
[ INFO] [1704459211.084301789]: 35
[ INFO] [1704459211.184255599]: 36
[ INFO] [1704459211.284227747]: 37
[ INFO] [1704459211.384225626]: 38
[ INFO] [1704459211.484228655]: 39
[ INFO] [1704459211.584239643]: 40
[ INFO] [1704459211.684239331]: 41
[ INFO] [1704459211.784238797]: 42
[ INFO] [1704459211.884240282]: 43
[ INFO] [1704459211.984221680]: 44
[ INFO] [1704459212.084318759]: 45
[ INFO] [1704459212.184228921]: 46
[ INFO] [1704459212.284232657]: 47
[ INFO] [1704459212.384233682]: 48
[ INFO] [1704459212.484288516]: 49
[ INFO] [1704459212.584211769]: 50
[ INFO] [1704459212.68425376]: 51
[ INFO] [1704459212.784222575]: 52
[ INFO] [1704459212.884204116]: 53
[ INFO] [1704459212.984285644]: 54
[ INFO] [1704459213.084234727]: 55
[ INFO] [1704459213.184222920]: 56
[ INFO] [1704459213.284212683]: 57
[ INFO] [1704459213.384205381]: 58
[ INFO] [1704459213.484217298]: 59
[ INFO] [1704459213.584313853]: 60
[ INFO] [1704459213.684271126]: 61
[ INFO] [1704459213.784201299]: 62
[ INFO] [1704459213.884216414]: 63
[ INFO] [1704459213.984212947]: 64
[ INFO] [1704459214.084212312]: 65
[ INFO] [1704459214.184197713]: 66

[ INFO] [1704459224.184505152]: Received [166]
[ INFO] [1704459224.284583932]: Received [167]
[ INFO] [1704459224.384598977]: Received [168]
[ INFO] [1704459224.484714953]: Received [169]
[ INFO] [1704459224.585050345]: Received [170]
[ INFO] [1704459224.685149542]: Received [171]
[ INFO] [1704459224.785333466]: Received [172]
[ INFO] [1704459224.885332181]: Received [173]
[ INFO] [1704459224.984542347]: Received [174]
[ INFO] [1704459225.084675398]: Received [175]
[ INFO] [1704459225.185210564]: Received [176]
[ INFO] [1704459225.284591833]: Received [177]
[ INFO] [1704459225.384763976]: Received [178]
[ INFO] [1704459225.484570612]: Received [179]
[ INFO] [1704459225.584635166]: Received [180]
[ INFO] [1704459225.684674862]: Received [181]
[ INFO] [1704459225.784613742]: Received [182]
[ INFO] [1704459225.884556928]: Received [183]
[ INFO] [1704459225.984559272]: Received [184]
[ INFO] [1704459226.084651732]: Received [185]
[ INFO] [1704459226.184520281]: Received [186]
[ INFO] [1704459226.284527285]: Received [187]
[ INFO] [1704459226.384562146]: Received [188]
[ INFO] [1704459226.484673431]: Received [189]
[ INFO] [1704459226.584617440]: Received [190]
[ INFO] [1704459226.685022795]: Received [191]
[ INFO] [1704459226.784529861]: Received [192]
[ INFO] [1704459226.884486890]: Received [193]
[ INFO] [1704459226.984557959]: Received [194]
[ INFO] [1704459227.084498891]: Received [195]
[ INFO] [1704459227.184564701]: Received [196]
[ INFO] [1704459227.284465546]: Received [197]
[ INFO] [1704459227.384536856]: Received [198]
[ INFO] [1704459227.484538315]: Received [199]
[ INFO] [1704459227.58458387]: Received [200]
[ INFO] [1704459227.684534226]: Received [201]
[ INFO] [1704459227.785039622]: Received [202]
[ INFO] [1704459227.884900440]: Received [203]
[ INFO] [1704459227.984780971]: Received [204]
[ INFO] [1704459228.084932647]: Received [205]
[ INFO] [1704459228.185250154]: Received [206]
[ INFO] [1704459228.284661853]: Received [207]
[ INFO] [1704459228.384441450]: Received [208]
[ INFO] [1704459228.485494190]: Received [209]
[ INFO] [1704459228.584484929]: Received [210]
[ INFO] [1704459228.685197622]: Received [211]
[ INFO] [1704459228.785232284]: Received [212]
[ INFO] [1704459228.885340861]: Received [213]
[ INFO] [1704459228.984582695]: Received [214]
[ INFO] [1704459229.084614110]: Received [215]

```