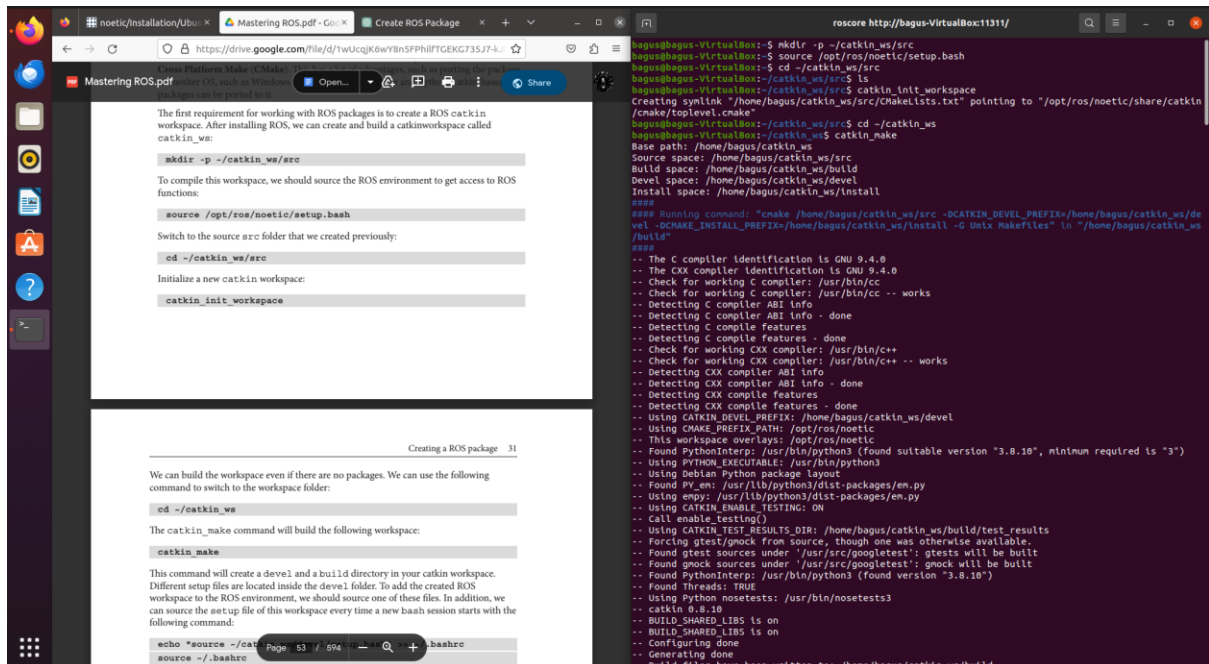


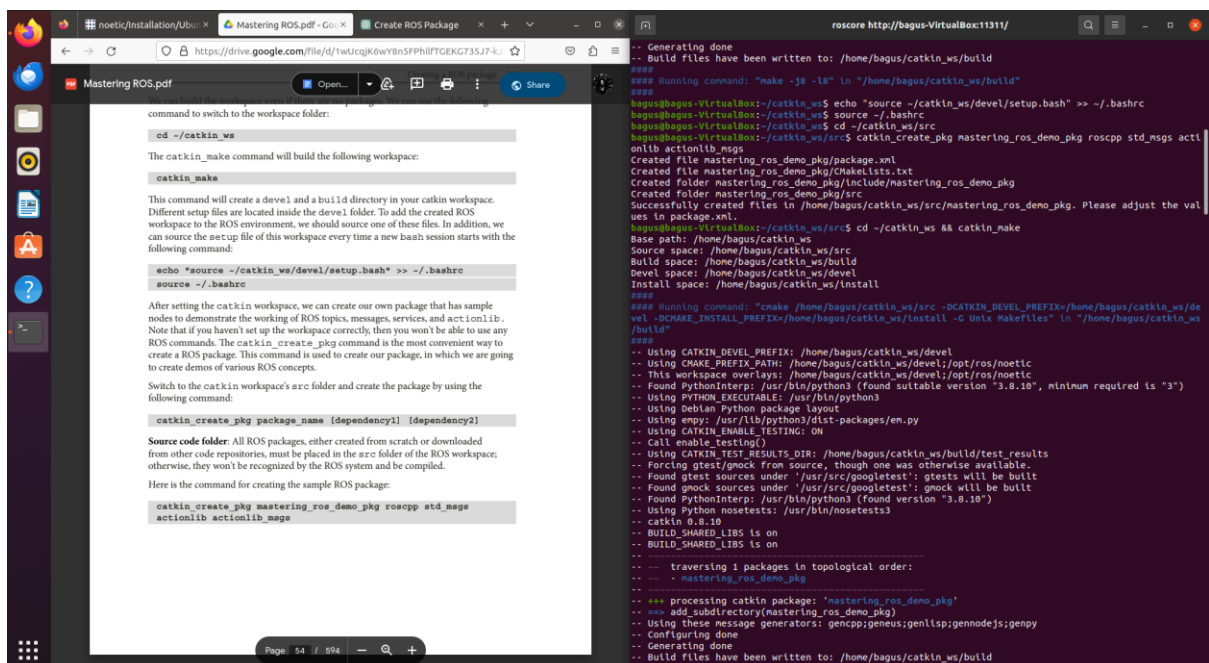
Nama : Bagus Mahardika Santoso

NIM : 1103204028



```
roscore http://bagus-VirtualBox:11311/
bagus@bagus-VirtualBox:~$ mkdir -p ~/catkin_ws/src
bagus@bagus-VirtualBox:~$ source /opt/ros/noetic/setup.bash
bagus@bagus-VirtualBox:~$ cd ~/catkin_ws/src
bagus@bagus-VirtualBox:~/catkin_ws/src$ ls
bagus@bagus-VirtualBox:~/catkin_ws/src$ catkin_init_workspace
Creating symlink ~/catkin_ws/src/.catkin_make to ~/catkin_ws/src/.catkin_make
bagus@bagus-VirtualBox:~/catkin_ws/src$ cd ~/catkin_ws
bagus@bagus-VirtualBox:~/catkin_ws$ catkin_make
Base path: /home/bagus/catkin_ws
Source space: /home/bagus/catkin_ws/src
Build space: /home/bagus/catkin_ws/build
Devel space: /home/bagus/catkin_ws/devel
Install space: /home/bagus/catkin_ws/install
####
### Running command: "cmake /home/bagus/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/home/bagus/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/home/bagus/catkin_ws/install -G Unix Makefiles" in "/home/bagus/catkin_ws/build"
####
-- The C compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Using CATKIN_DEVEL_PREFIX: /home/bagus/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/noetic
-- This workspace overlays: /opt/ros/noetic
-- Found PythonInterp: /usr/bin/python3 (found suitable version "3.8.10", minimum required is "3")
-- Using PYTHON_EXECUTABLE: /usr/bin/python3
-- Using Debian Python package layout
-- Found Py_em: /usr/lib/python3/dist-packages/em.py
-- Using empy: /usr/lib/python3/dist-packages/em.py
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/bagus/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under /usr/src/gtest: gtests will be built
-- Found gmock sources under /usr/src/gmock: gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Found Threads: TRUE
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
-- BUILD_SHARED_LIBS is on
-- Configuring done
-- Generating done
-- Build files have been written to: /home/bagus/catkin_ws/build
```

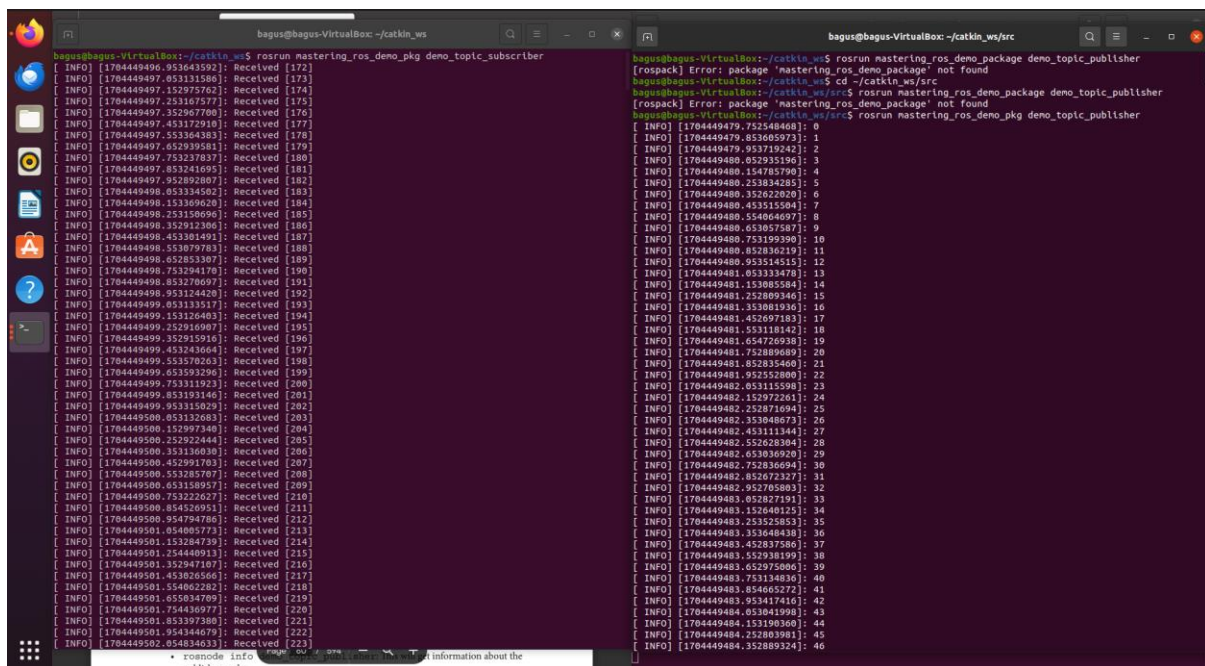
Pada chapter ini, akan melakukan pembuatan package ROS. Dengan menggunakan “mkdir -p ~/catkin_ws/src” untuk membuat struktur dasar workspace Catkin di sistem ROS. Setelah terbuat kita akan memasukkan syntax “source /opt/ros/noetic/setup.bash” untuk mengaktifkan environment ROS ke dalam terminal kemudian kita masuk ke dalam directory catkin_ws/src yang sudah kita buat dan menulis “catkin_init_workspace” untuk melakukan inisialisasi workspace catkin tersebut. Dan kemudian Kembali ke directory catkin_ws dan menulis catkin_make untuk mengcompile paket-paket ROS yang ada dalam workspace Catkin tersebut.



```
roscore http://bagus-VirtualBox:11311/
bagus@bagus-VirtualBox:~/catkin_ws/src$ cd ~/catkin_ws && catkin_make
Base path: /home/bagus/catkin_ws
Source space: /home/bagus/catkin_ws/src
Build space: /home/bagus/catkin_ws/build
Devel space: /home/bagus/catkin_ws/devel
Install space: /home/bagus/catkin_ws/install
####
### Running command: "cmake /home/bagus/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/home/bagus/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/home/bagus/catkin_ws/install -G Unix Makefiles" in "/home/bagus/catkin_ws/build"
####
-- Using CATKIN_DEVEL_PREFIX: /home/bagus/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /home/bagus/catkin_ws/devel:/opt/ros/noetic
-- This workspace overlays: /home/bagus/catkin_ws/devel:/opt/ros/noetic
-- Found PythonInterp: /usr/bin/python3 (found suitable version "3.8.10", minimum required is "3")
-- Using PYTHON_EXECUTABLE: /usr/bin/python3
-- Using Debian Python package layout
-- Using empy: /usr/lib/python3/dist-packages/em.py
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/bagus/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under /usr/src/gtest: gtests will be built
-- Found gmock sources under /usr/src/gmock: gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
-- BUILD_SHARED_LIBS is on
-- traversing 1 packages in topological order:
--   - mastering_ros_demo_pkg
-- processing catkin package: "mastering_ros_demo_pkg"
-- add subdirectory(mastering_ros_demo_pkg)
-- Using these message generators: gencpp:gemeus:genlisp:gennodes:genpy
-- Configuring done
-- Generating done
-- Build files have been written to: /home/bagus/catkin_ws/build
```

Menulis “echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc” pada terminal untuk menambahkan baris source ~/catkin_ws/devel/setup.bash ke dalam berkas konfigurasi shell

~/bashrc. setelah itu menulis “cd ~/catkin_ws/src” supaya Kembali ke directory src untuk membuat sample ROS package yang ada seperti “catkin_create_pkg mastering_ros_demo_pkg roscpp std_msgs actionlib actionlib_msgs”. Di sini roscpp merupakan dependensi pada paket ROS yang menyediakan fungsionalitas untuk mengembangkan dengan menggunakan C++. Dependensi ini mencakup berbagai fitur dasar ROS untuk pengembangan C++. Untuk std_msgs Ini adalah dependensi pada paket ROS yang menyediakan pesan-pesan standar yang umum digunakan dalam ROS. Dan untuk actionlib dan actionlib_msgs merupakan dependensi pada paket ROS yang menyediakan dukungan untuk aksi (actions) dalam ROS. Aksi adalah cara untuk menangani tugas-tugas kompleks yang dapat berjalan dalam jangka waktu yang lebih lama dan membutuhkan umpan balik.



The image shows two terminal windows side-by-side. The left window is titled 'bagus@bagus-VirtualBox: ~/catkin_ws' and shows the command 'roscpp masterling_ros_demo_pkg demo_topic_subscriber' being executed. The output is a long list of INFO messages, each starting with a timestamp and the word 'Received', followed by a number in brackets. The right window is titled 'bagus@bagus-VirtualBox: ~/catkin_ws/src' and shows the command 'roscpp masterling_ros_demo_pkg demo_topic_publisher' being executed. The output is a long list of INFO messages, each starting with a timestamp and the word 'Received', followed by a number in brackets. Both windows show the command prompt 'roscpp' at the bottom.

Setelah membuat node, kita akan mencoba melakukan run terhadap demo package yang sudah kita masukan tadi, yang pertama adalah roscpp masterling_ros_demo_pkg demo_topic_publisher untuk mengaktifkan eksekusi dari node yang diberi nama demo_topic_publisher yang termasuk dalam paket masterling_ros_demo_pkg tersebut. Dan roscpp masterling_ros_demo_pkg demo_topic_subscriber untuk node yang dapat subscribe pada topic.


```
bagus@bagus-VirtualBox: ~/catkin_ws$ rosrun masterling_ros_demo_pkg demo_msg_publisher
[INFO] [1704454817.83730994]: hello world
[INFO] [1704454817.93873067]: 1
[INFO] [1704454817.93873067]: hello world
[INFO] [1704454818.03843907]: 2
[INFO] [1704454818.03850076]: hello world
[INFO] [1704454818.13689278]: 3
[INFO] [1704454818.23710583]: hello world
[INFO] [1704454818.23710583]: hello world
[INFO] [1704454818.33668117]: 5
[INFO] [1704454818.43674899]: 6
[INFO] [1704454818.53690253]: hello world
[INFO] [1704454818.63718802]: hello world
[INFO] [1704454818.73714590]: 8
[INFO] [1704454818.83705192]: hello world
[INFO] [1704454818.93761579]: 9
[INFO] [1704454818.93761579]: hello world
[INFO] [1704454819.03830767]: 11
[INFO] [1704454819.13693880]: hello world
[INFO] [1704454819.23814992]: hello world
[INFO] [1704454819.33712526]: 15
[INFO] [1704454819.43770151]: 16
[INFO] [1704454819.53689542]: hello world
[INFO] [1704454819.63721949]: 18
[INFO] [1704454819.73728996]: hello world
[INFO] [1704454819.83728996]: 19
[INFO] [1704454819.93724732]: hello world
[INFO] [1704454820.03750112]: 20
[INFO] [1704454820.13690036]: hello world
[INFO] [1704454820.23674430]: 21
[INFO] [1704454820.33699615]: hello world
[INFO] [1704454820.43693286]: 22
[INFO] [1704454820.53680641]: hello world
[INFO] [1704454820.63699334]: 23
[INFO] [1704454820.73674795]: hello world
[INFO] [1704454820.83671061]: 24
[INFO] [1704454820.93681475]: hello world
[INFO] [1704454821.03691919]: 25
[INFO] [1704454821.13697159]: hello world

bagus@bagus-VirtualBox: ~/catkin_ws$ rosrun masterling_ros_demo_pkg demo_msg_subscriber
[INFO] [1704454825.13917053]: Received
[INFO] [1704454825.14036097]: Received
[INFO] [1704454825.24087497]: Received greeting [hello world ]
[INFO] [1704454825.24092945]: Received
[INFO] [1704454825.34141723]: Received greeting [hello world ]
[INFO] [1704454825.34145899]: Received
[INFO] [1704454825.43728745]: Received greeting [hello world ]
[INFO] [1704454825.43732921]: Received
[INFO] [1704454825.53652109]: Received greeting [hello world ]
[INFO] [1704454825.53655283]: Received
[INFO] [1704454825.63822003]: Received greeting [hello world ]
[INFO] [1704454825.63825803]: Received
[INFO] [1704454825.73708842]: Received greeting [hello world ]
[INFO] [1704454825.73704551]: Received
[INFO] [1704454825.83731898]: Received greeting [hello world ]
[INFO] [1704454825.83736317]: Received
[INFO] [1704454825.93715341]: Received greeting [hello world ]
[INFO] [1704454825.93719203]: Received
[INFO] [1704454826.03712760]: Received greeting [hello world ]
[INFO] [1704454826.03717007]: Received
[INFO] [1704454826.13795806]: Received greeting [hello world ]
[INFO] [1704454826.13798699]: Received
[INFO] [1704454826.23713850]: Received greeting [hello world ]
[INFO] [1704454826.23716824]: Received
[INFO] [1704454826.33752443]: Received greeting [hello world ]
[INFO] [1704454826.33756299]: Received
[INFO] [1704454826.43731181]: Received greeting [hello world ]
[INFO] [1704454826.43737777]: Received
[INFO] [1704454826.53789625]: Received greeting [hello world ]
[INFO] [1704454826.53793186]: Received
[INFO] [1704454826.63698332]: Received greeting [hello world ]
[INFO] [1704454826.63701411]: Received
[INFO] [1704454826.73758941]: Received greeting [hello world ]
[INFO] [1704454826.73753671]: Received
[INFO] [1704454826.83731333]: Received greeting [hello world ]
[INFO] [1704454826.83735198]: Received
[INFO] [1704454826.93725728]: Received greeting [hello world ]
[INFO] [1704454826.93718954]: Received
[INFO] [1704454827.03768561]: Received greeting [hello world ]
[INFO] [1704454827.03763850]: Received
[INFO] [1704454827.13748842]: Received greeting [hello world ]
[INFO] [1704454827.13751545]: Received
[INFO] [1704454827.23809469]: Received greeting [hello world ]
[INFO] [1704454827.23813211]: Received
[INFO] [1704454827.33732509]: Received greeting [hello world ]
[INFO] [1704454827.33735672]: Received
[INFO] [1704454827.43717256]: Received greeting [hello world ]
[INFO] [1704454827.43727101]: Received
[INFO] [1704454827.53714171]: Received greeting [hello world ]
[INFO] [1704454827.63718354]: Received
[INFO] [1704454827.63705187]: Received greeting [hello world ]
[INFO] [1704454827.63708694]: Received
```

Melakukan percobaan menambahkan Message file(.msg) dan service file(.srv) pada node, dengan file yang sudah ada, saya melakukan run pada 2 terminal untuk melihat apakah publisher dan subscriber tersebut sedang berjalan atau tidak.

```
bagus@bagus-VirtualBox: ~/catkin_ws$ rosrun masterling_ros_demo_pkg demo_service_server
[INFO] [1704454948.18016047]: Ready to receive from client.
[INFO] [1704454955.99900601]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.19980187]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.29972513]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.39989319]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.49954425]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.59976789]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.69991147]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.79954087]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.89937602]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.99975913]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.09979261]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.19980793]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.29953058]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.39989361]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.49994175]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.59942614]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.69986107]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.79953168]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.89962246]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.99976403]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.09976018]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.19957327]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.29918017]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.39961463]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.49921288]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.59962276]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.69953152]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.79933573]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.89923567]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.99948294]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.09960213]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.19955024]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.29944904]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.39950397]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.49962338]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.59962272]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.69983915]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.79983781]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.89937648]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.99971697]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.09967267]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.19948555]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.29954878]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.39944765]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.49964480]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.59967017]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.69982433]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.79983390]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.89957603]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.99957603]: From Client [Sending from Here], Server says [Received Here]

bagus@bagus-VirtualBox: ~/catkin_ws$ rosrun masterling_ros_demo_pkg demo_service_client
[INFO] [1704454955.99926709]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.099911027]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.19984953]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.29951548]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.399891272]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.4998067409]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.59987711]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.6999674545]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.79997971]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.899675955]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454956.99984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.099824190]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.199538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.29975955]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.39984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.499824190]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.599538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.69975958]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.79984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.899824190]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454957.999538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.09975958]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.19984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.299538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.39975958]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.49984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.599538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.69984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.799538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.89984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454958.999538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.09984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.199538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.29984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.399538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.49984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.599538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.69984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.799538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.89984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454959.999538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.09984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.199538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.29984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.399538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.49984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.599538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.69984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.799538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.89984987]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454960.999538846]: From Client [Sending from Here], Server says [Received Here]
[INFO] [1704454961.09984987]: From Client [Sending from Here], Server says [Received Here]
```

Melakukan percobaan menggunakan demo_service_server dan demo_service_client, dengan file yang sudah ada, saya melakukan run pada 2 terminal untuk melihat apakah sudah bisa berjalan atau tidak.

The screenshot shows a terminal window with two panes. The left pane displays the output of the command `roslaunch mastering_ros_demo_pkg demo_action_server`. It shows the action server starting and processing goal 10. The right pane shows the output of the command `roslaunch mastering_ros_demo_pkg demo_action_client 10 1`. It shows the action client sending goal 10 and preempting it.

```
bagus@bagus-VirtualBox: ~/catkin_ws
[INFO] [1704458999.561361387]: Starting Demo Action Server
[INFO] [1704459001.971264408]: /demo_action is processing the goal 10
[INFO] [1704459001.972490596]: Setting to goal 0 / 10
[INFO] [1704459002.171496393]: Setting to goal 1 / 10
[INFO] [1704459002.371545593]: Setting to goal 2 / 10
[INFO] [1704459002.571400475]: Setting to goal 3 / 10
[INFO] [1704459002.771824720]: Setting to goal 4 / 10
[INFO] [1704459002.971347112]: Setting to goal 5 / 10
[WARN] [1704459002.971423900]: /demo_action got preempted!

bagus@bagus-VirtualBox: ~/catkin_ws$ roslaunch mastering_ros_demo_pkg demo_action_client 10 1
[INFO] [1704459001.764166020]: Waiting for action server to start.
[INFO] [1704459001.970925598]: Action server started, sending goal.
[INFO] [1704459001.970966095]: Sending goal [10] and Preempt time of [1]
[INFO] [1704459002.972234161]: Action did not finish before the time out.
bagus@bagus-VirtualBox: ~/catkin_ws$
```

Mencoba action node dengan “`roslaunch mastering_ros_demo_pkg demo_action_server`” dan action client node “`roslaunch mastering_ros_demo_pkg demo_action_client 10 1`” dan menampilkan hasil seperti gambar diatas.

The screenshot shows a terminal window with two panes. The left pane displays the content of the `demo_topic.launch` file, which defines a publisher node and a subscriber node. The right pane shows the output of the command `roslaunch mastering_ros_demo_pkg demo_topic.launch`. It shows the launch file being processed and the nodes starting.

```
<?xml version="1.0" ?>
<launch>
  <node name="publisher_node" pkg="mastering_ros_demo_pkg"
    type="demo_topic_publisher" output="screen"/>
  <node name="subscriber_node" pkg="mastering_ros_demo_pkg"
    type="demo_topic_subscriber" output="screen"/>
</launch>

Let's discuss what is in the code:
<?xml version="1.0" ?>

This line is useful as it allows text editors to recognize this launch file as a markup
language file that enables text highlighting. The <launch> and </launch> tags are the root
elements in a launch file. All the definitions will be inside these tags.

The <node> tag specifies the desired node to launch:

<node name="publisher_node" pkg="mastering_ros_demo_pkg"
  type="demo_topic_publisher" output="screen"/>

The name tag inside <node> indicates the name of the node, pkg is the name of the
package, and type is the name of the executable we are going to launch.

After creating the demo_topic.launch launch file, we can launch it using the
following command:

roslaunch mastering_ros_demo_pkg demo_topic.launch

SUMMARY
=====
PARAMETERS
* /rostdistro: noetic
* /rosversion: 1.16.0

NODES
auto-starting new master
process[master]: started with pid [116512]
ROS_MASTER_URI=http://bagus-VirtualBox:11311/

setting /run_id to 282d5752-abbf-11ee-bc31-85a208d428f9
process[rosout-1]: started with pid [116522]
started core service [/rosout]
*[rosout-1] killing on exit
[master] killing on exit
shutting down processing monitor...
.. shutting down processing monitor complete
done
bagus@bagus-VirtualBox: ~/catkin_ws$ roslaunch mastering_ros_demo_pkg demo_topic.launch
... logging to /home/bagus/.ros/log/72ea2680-abc9-11ee-bc31-85a208d428f9/roslaunch-bagus-VirtualBox-1
17114.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://bagus-VirtualBox:38097/

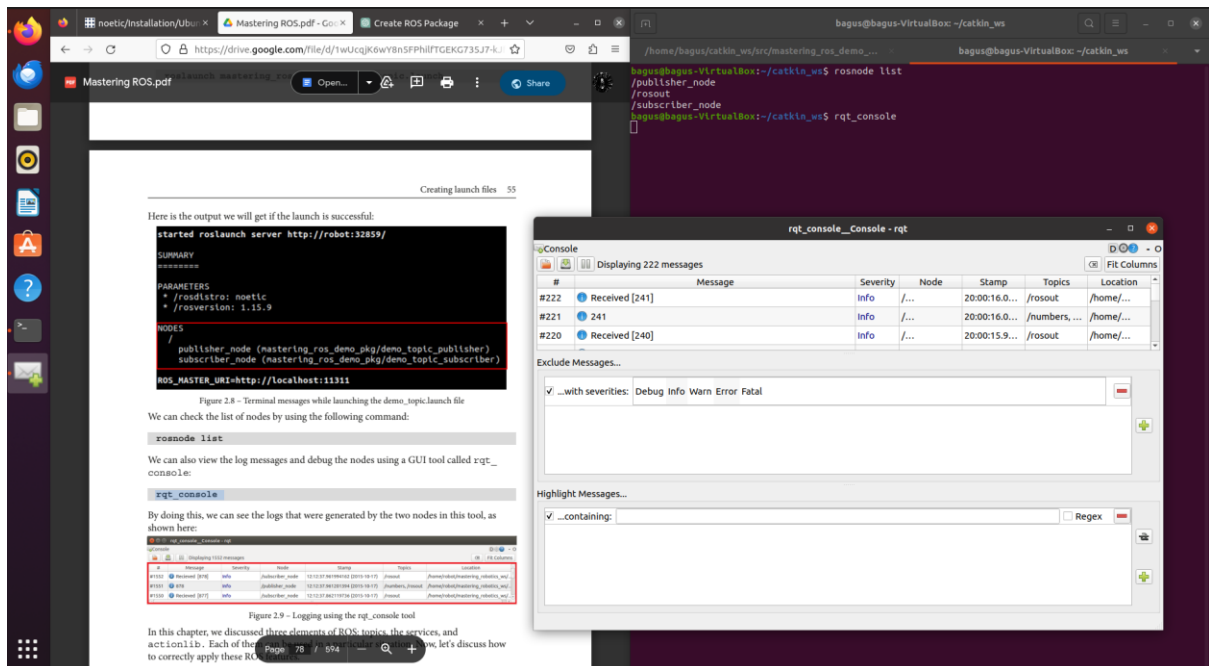
SUMMARY
=====
PARAMETERS
* /rostdistro: noetic
* /rosversion: 1.16.0

NODES
/
  publisher_node (mastering_ros_demo_pkg/demo_topic_publisher)
  subscriber_node (mastering_ros_demo_pkg/demo_topic_subscriber)

auto-starting new master
process[master]: started with pid [117124]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to 72ea2680-abc9-11ee-bc31-85a208d428f9
process[rosout-1]: started with pid [117134]
started core service [/rosout]
process[publisher_node-2]: started with pid [117137]
process[subscriber_node-3]: started with pid [117142]
[INFO] [1704459220.573722383]: 0
[INFO] [1704459220.674880239]: 1
[INFO] [1704459220.773816481]: 2
[INFO] [1704459220.874202951]: 3
[INFO] [1704459220.874202951]: Received [3]
```

Melihat apakah Nodes publisher_node dan subscriber_node sudah masuk.



Percobaan “roslaunch mastering_ros_demo_pkg demo_topic.launch” di terminal utama kemudian pada terminal lain menulis “rosnode list” dan “rqt_console”. “roslaunch mastering_ros_demo_pkg demo_topic.launch” merupakan syntax yang digunakan untuk meluncurkan suatu konfigurasi yang didefinisikan dalam berkas demo_topic.launch di dalam paket mastering_ros_demo_pkg. rosnode list merupakan syntax yang digunakan untuk menampilkan daftar semua node yang sedang berjalan di sistem ROS saat ini. rqt_console adalah perintah yang digunakan untuk meluncurkan RQT Console, yang merupakan alat GUI untuk melihat log dan pesan debug dari node-node ROS.