

(a)

```

6
7   پکیج های مربوط به dependencies پکیجی که ساخته میشود در
   rosdistro/rosdep/base.yaml پدیدار میشوند و پکیج های مربوط خود ros2
   در rosdistro/humble/distribution.yaml قرار میگیرند
8

```

(b)

```

2
3   پکیج slam_toolbox از آنجایی که پکیج خارجی هستش و باید به پکیج
   مربوطه اضافه شود توسط rosddep هندل میشه ولی ffmpeg از پکیج های
   آماده ros2 بوده و از طریق humble مورد استفاده قرار میگیرد
4

```

(c)

```

1   روشی مستقل از زبان برنامه نویسی برای تعیین interface بین node ها
   در ros2 است که برای message, service, action مورد استفاده قرار
   میگیرد. وقتی nodeای در ros2 احتیاج پیدا کند تا از IDL استفاده کند
   فایل آن را در source code خود اضافه کرده و برای ارسال و دریافت
   پیام ها از آن استفاده میکند, IDL در آدرس های پکیج مورد نظر مانند
   "msg" یا "srv" قرار میگیرد.

```

(2)

The image shows three terminal windows from a user named redha@juanFlatro. The first window shows the installation of ROS2 using `install/setup.bash` and running a simulation with `ros2 run yangsim server`. The second window shows the execution of a test script `test.sh` which outputs a series of log messages from `[yin_client_node]` and `[rclcpp]` with various status codes and sums. The third window shows the installation of ROS2 again, followed by running a service simulation with `ros2 run yinsim service`.

```

redha@juanFlatro: ~/ros2_ws
redha@juanFlatro:~$ cd ros2_ws/
redha@juanFlatro:~/ros2_ws$ . install/setup.bash
redha@juanFlatro:~/ros2_ws$ ros2 run yangsim server
[]

redha@juanFlatro:~$ ros2 topic echo /conversation std_msgs/msg/String
data: 'yin said: I am Yin, some mistake me for an actual material entity but I a
m moreof a concept,81,7322'
...
data: 'yang said: Hi Yin, I am Yang the opposite of you.,38,3271'
...
data: 'yin said: Interesting Yang, so one could say, in a philosophical sense, w
e aretwo polar elements,86,8053'
...
data: 'yang said: Yes, Yin; we ourselves, do not mean anything since we are only
employed to express a relation,93,8658'
...
data: 'yin said: We, Yang, are therefore the balancing powers in the universe.,6
1,5622'
...
data: 'yang said: Precisely, Yin; we are used to describe how things function in
relation to each other and to the universe.,106,9842'
...
data: 'yin said: Difficult and easy complete each other.,39,3673'
...
data: 'yang said: For what is and what is not beget each other.,45,4051'
...
data: 'yin said: Long and short show each other.,31,2869'
...
data: 'yang said: High and low place each other.,30,2699'
...
data: 'yin said: Noise and sound harmonize each other.,37,3496'
...
data: 'yang said: Before and behind follow each other.,36,3332'
...
data: 'yin said: You shine your light,20,1947'
...
data: 'yang said: And you fade into the darkness.,31,2852'
...
[]

redha@juanFlatro:~$ cd ros2_ws/
redha@juanFlatro:~/ros2_ws$ . install/setup.bash
redha@juanFlatro:~/ros2_ws$ ros2 run yinsim service
[]

redha@juanFlatro:~/ros2_ws$ bash test.sh
[INFO] [1678460059.774019377] [yin_client_node]: Result : 7322
[INFO] [1678460060.419175428] [rclcpp]: Sum: 3271
[INFO] [1678460060.827240395] [yin_client_node]: Result : 8053
[INFO] [1678460061.464886062] [rclcpp]: Sum: 8658
[INFO] [1678460061.815612614] [yin_client_node]: Result : 5622
[INFO] [1678460062.469087267] [rclcpp]: Sum: 9842
[INFO] [1678460062.825871603] [yin_client_node]: Result : 3673
[INFO] [1678460063.122799188] [rclcpp]: Sum: 4051
[INFO] [1678460063.508606082] [yin_client_node]: Result : 2869
[INFO] [1678460064.134231310] [rclcpp]: Sum: 2699
[INFO] [1678460064.543226749] [yin_client_node]: Result : 3496
[INFO] [1678460065.144069702] [rclcpp]: Sum: 3332
[INFO] [1678460065.540324698] [yin_client_node]: Result : 1947
[INFO] [1678460065.938773395] [rclcpp]: Sum: 2852
redha@juanFlatro:~/ros2_ws$ []

```