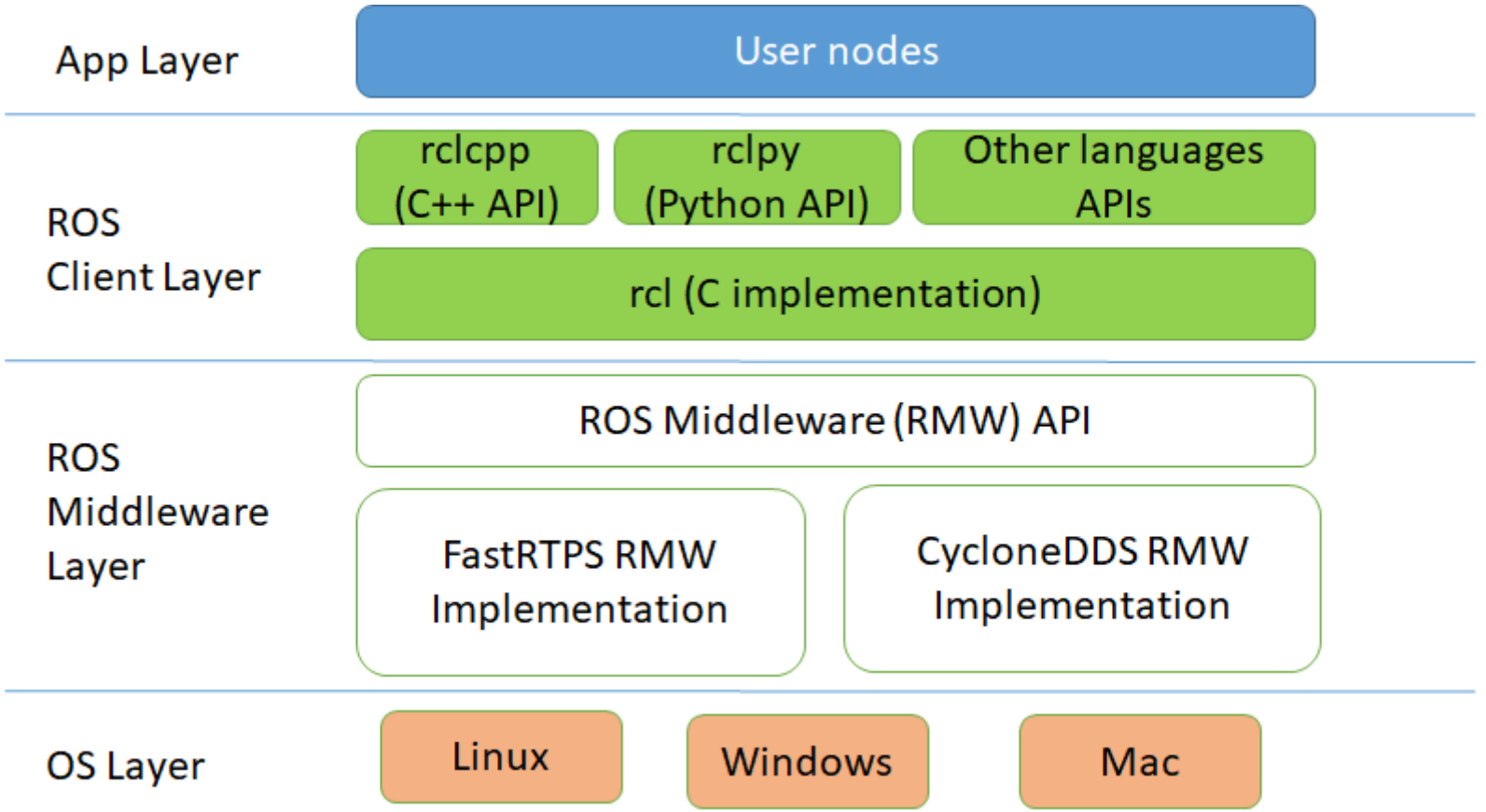
ROS 2

Setup RO2 on Virtual Ubuntu OS

https://docs.ros.org/en/galactic/Installation.html

Thong LT



https://aws.amazon.com/blogs/robotics/ros2-foxy-fitzroy-robot-development/

Nodes

Topics
Services
Parameter server

Install packets

1. **Install ros2**

- Ubuntu Linux - Focal Fossa (20.04) 64-bit

-**Step1**.

https://docs.ros.org/en/galactic/Installation/Ubuntu-Development-Setup.html

-**Step2.**

https://docs.ros.org/en/galactic/Installation/Ubuntu-Install-Debians.html

sudo apt install ros-galactic-desktop
source /opt/ros/galactic/setup.bash

2**. Install packets in C++ (rclcpp)**

3**. Install packets for testing**

source /opt/ros/galactic/setup.bash
ros2 run demo_nodes_cpp talker

source /opt/ros/galactic/setup.bash
ros2 run demo_nodes_py listener

Cli on ros 2

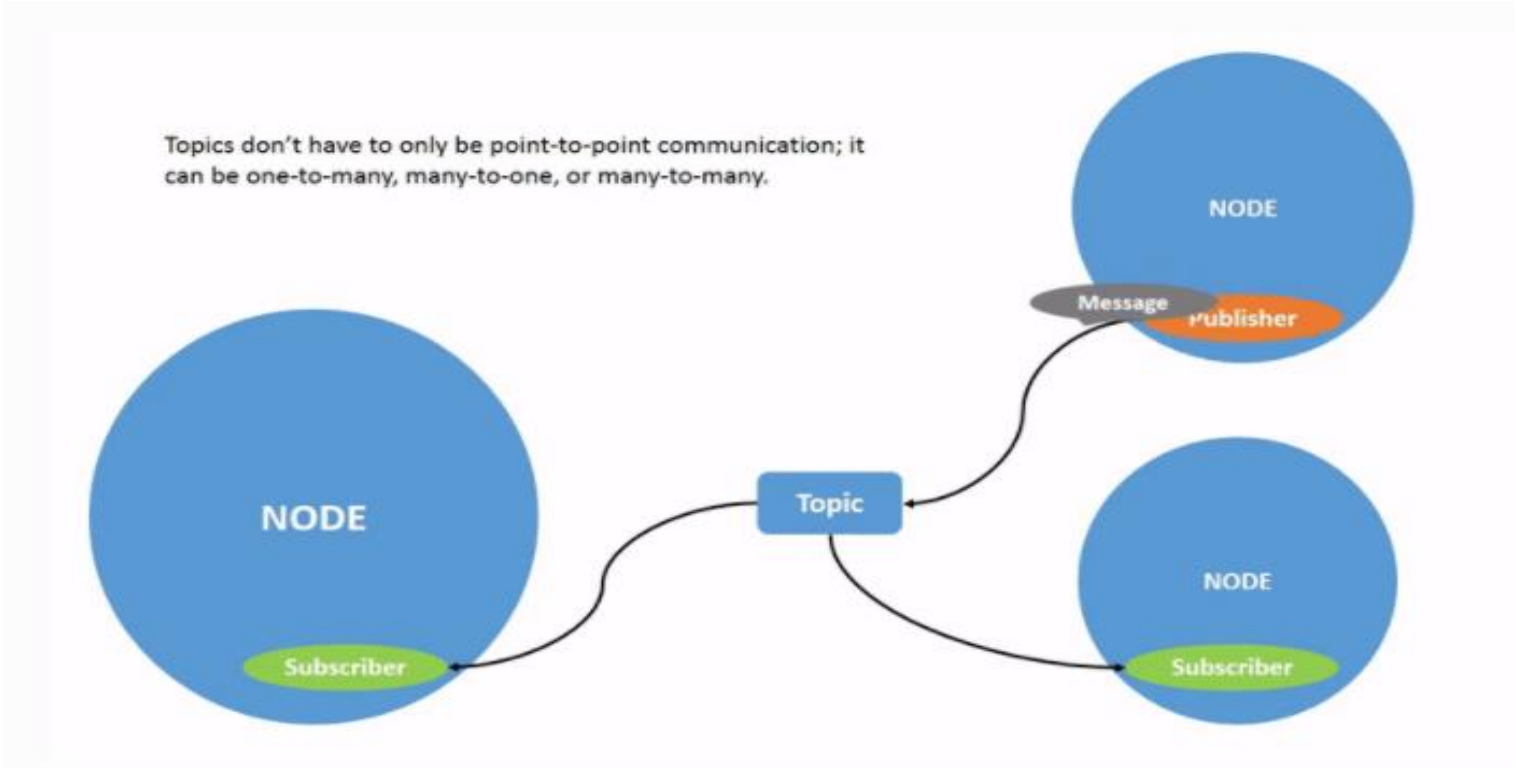
- ros2 node list
- ros2 node info <node_name>

```
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ros2 node list
/talker
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ros2 node info  talker
Unable to find node 'talker'
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ros2 node info  /talker
/talker
  Subscribers:
    /parameter_events: rcl_interfaces/msg/ParameterEvent
  Publishers:
    /chatter: std_msgs/msg/String
    /parameter_events: rcl_interfaces/msg/ParameterEvent
    /rosout: rcl_interfaces/msg/Log
  Service Servers:
    /talker/describe_parameters: rcl_interfaces/srv/DescribeParameters
    /talker/get_parameter_types: rcl_interfaces/srv/GetParameterTypes
    /talker/get_parameters: rcl_interfaces/srv/GetParameters
    /talker/list_parameters: rcl_interfaces/srv/ListParameters
    /talker/set_parameters: rcl_interfaces/srv/SetParameters
    /talker/set_parameters_atomically: rcl_interfaces/srv/SetParametersAtomically
  Service Clients:

  Action Servers:

  Action Clients:

thonglt@thonglt-virtual-machine:~/ros2_galactic$
```



https://docs.ros.org/en/galactic/Tutorials/Topics/Understanding-ROS2-Topics.html

rclcpp

- ros2 node list
- ros2 node info <node_name>

rclcpp

How to create an example

https://docs.ros.org/en/galactic/Tutorials/Writing-A-Simple-Cpp-Service-And-Client.html

installing system dependencies.

http://wiki.ros.org/rosdep
http://wiki.ros.org/rosdep/Tutorials/How%20to%20add%20a%20system%20dependency

https://colcon.readthedocs.io/en/released/

ROS 2 package and packets in workpaces

https://docs.ros.org/en/foxy/Tutorials/Creating-Your-First-ROS2-Package.html

Example at

https://github.com/ros2/examples/tree/master/rclcpp
https://roboticsbackend.com/create-a-ros2-cpp-package/

colcon

- https://colcon.readthedocs.io/en/released/user/quick-start.html

```
$ mkdir -p /tmp/workspace/src      # Make a workspace directory with a src subdirectory
$ cd /tmp/workspace                # Change directory to the workspace root
$ <...>                            # Populate the `src` directory with packages
$ colcon list                      # List all packages in the workspace
$ colcon graph                     # List all packages in the workspace in topological order
                                   # and visualize their dependencies
$ colcon build                     # Build all packages in the workspace
$ colcon test                      # Test all packages in the workspace
$ colcon test-result --all         # Enumerate all test results
$ . install/local_setup.bash       # Setup the environment to use the built packages
$ <...>                            # Use the built packages
```

Build an example

```
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ls
build  install  log  ros2.repos  src
thonglt@thonglt-virtual-machine:~/ros2_galactic$
thonglt@thonglt-virtual-machine:~/ros2_galactic$ pwd
/home/thonglt/ros2_galactic
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ls
build  install  log  ros2.repos  src
thonglt@thonglt-virtual-machine:~/ros2_galactic$ ls src/
ament  eclipse-cyclonedds  eclipse-iceoryx  eProsima  osrf  ros  ros2  ros-perception
thonglt@thonglt-virtual-machine:~/ros2_galactic$
```

- https://github.com/ros2/examples

Build an example from ros2

Step1: cd src

Step2: git clone https://github.com/ros2/examples

Step3: cd ..

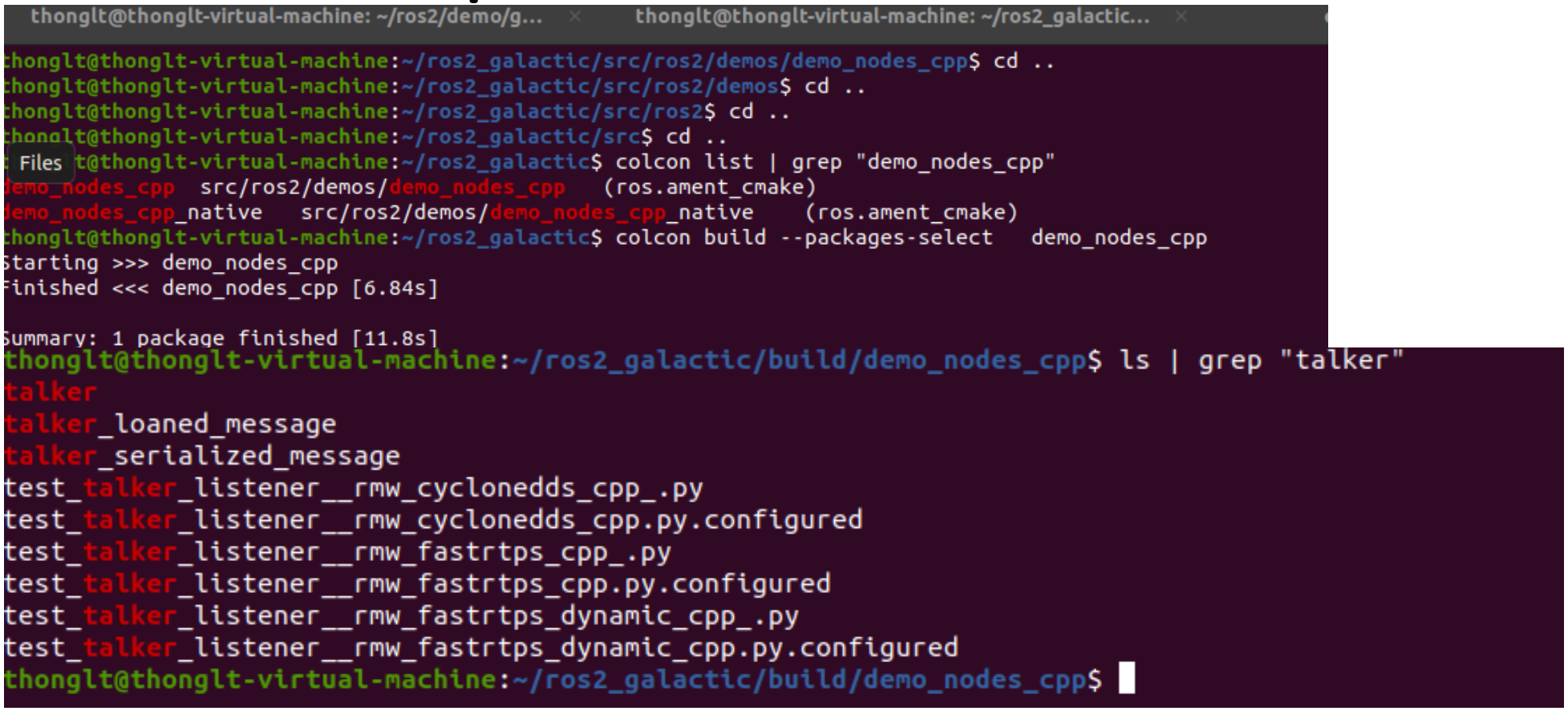
Step4: colcon list | grep “examples”

Step5: colcon build --packages-select src/ros2/examples/rclcpp/services/minimal_client

Step6: . ~/ros2_galactic/install/local_setup.bash

Step7: ros2 run demo_nodes_cpp minimal_client

Build an example from ros2



colcon build --packages-select demo_nodes_cpp

. ~/ros2_galactic/install/local_setup.bash

ros2 run demo_nodes_cpp talker