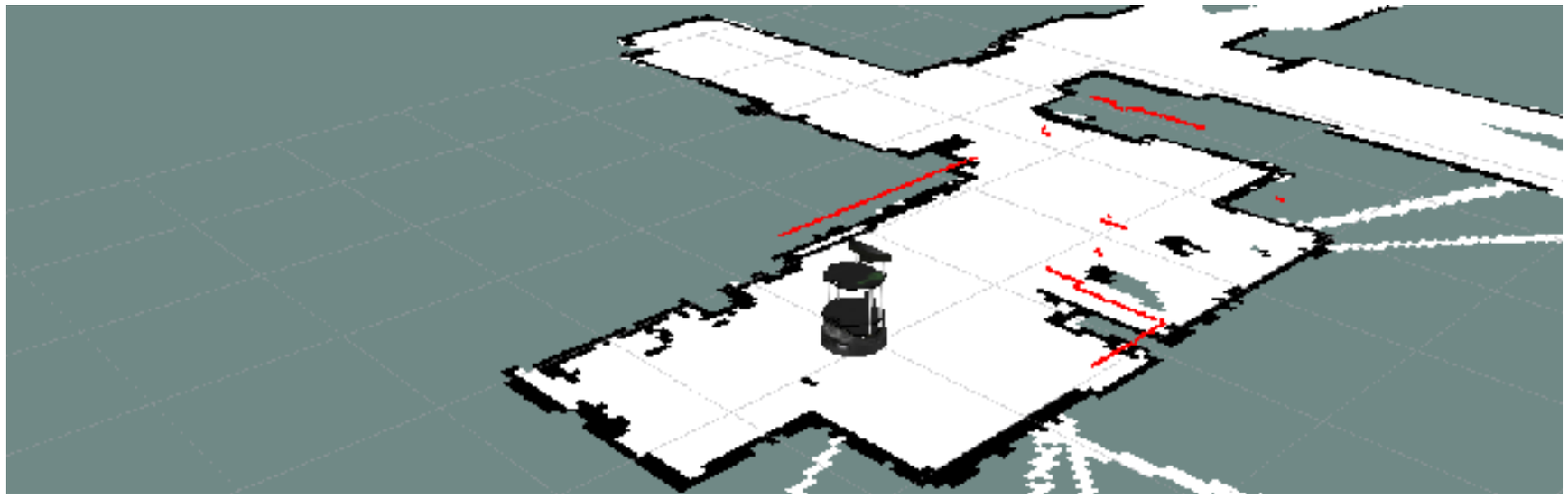
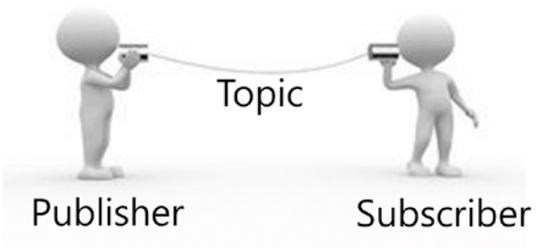


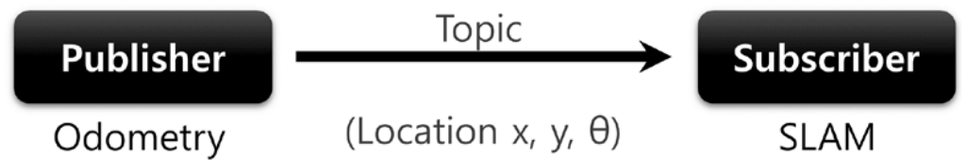
Understanding ROS Topics

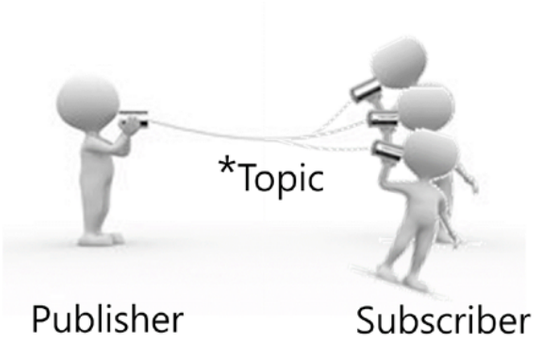
Prof. Anis Koubaa
https://www.udemy.com/user/anis-koubaa/

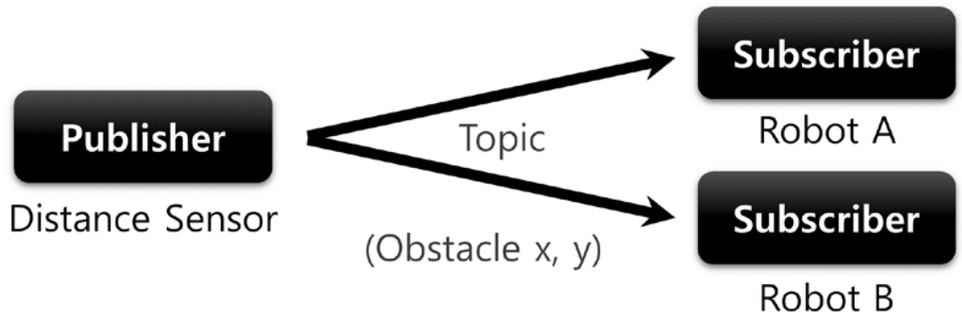
ROS

Topic



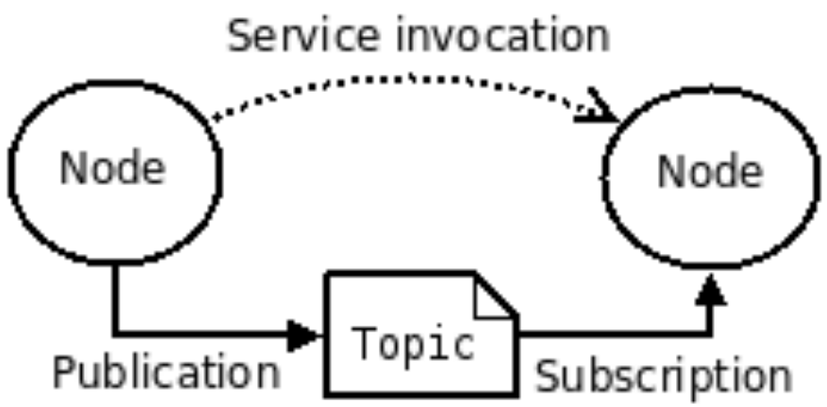




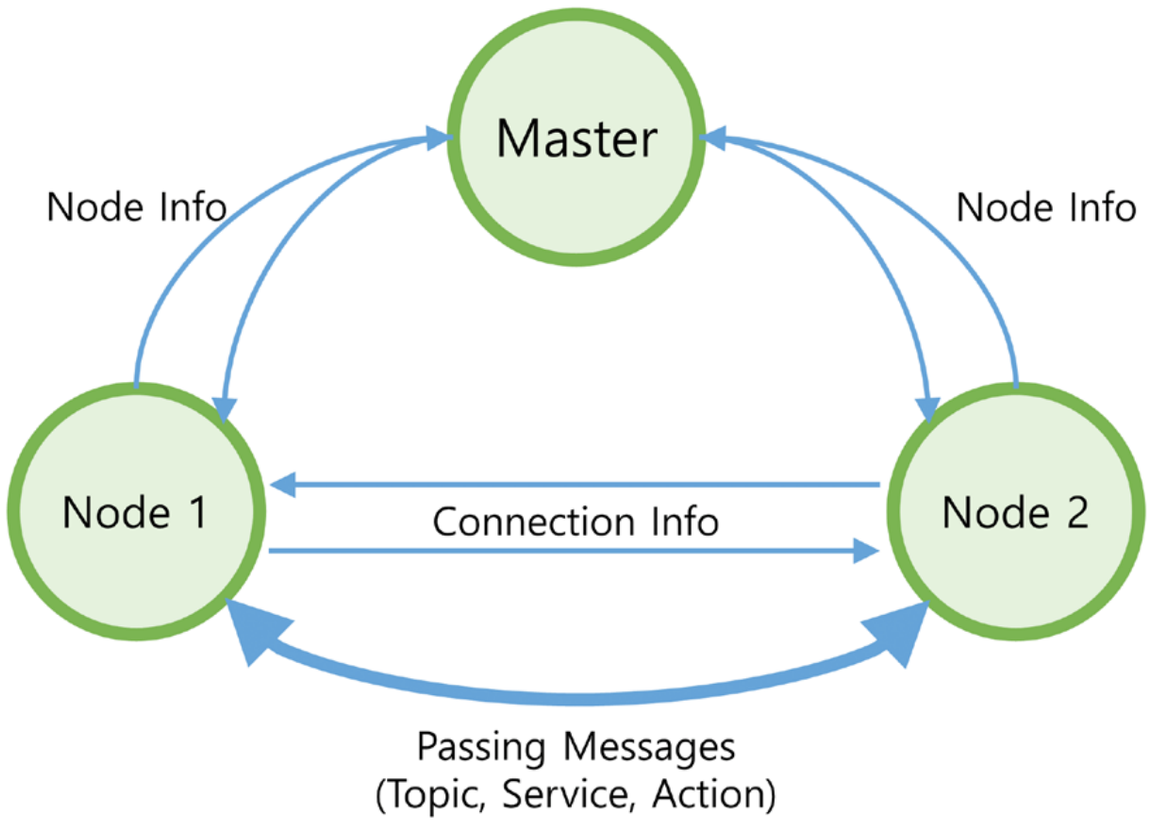


*Topic not only allows 1:1 Publisher and Subscriber communication, but also supports 1:N, N:1 and N:N depending on the purpose.

Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim



Message Communication



Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

1: Run the Master ROS Node

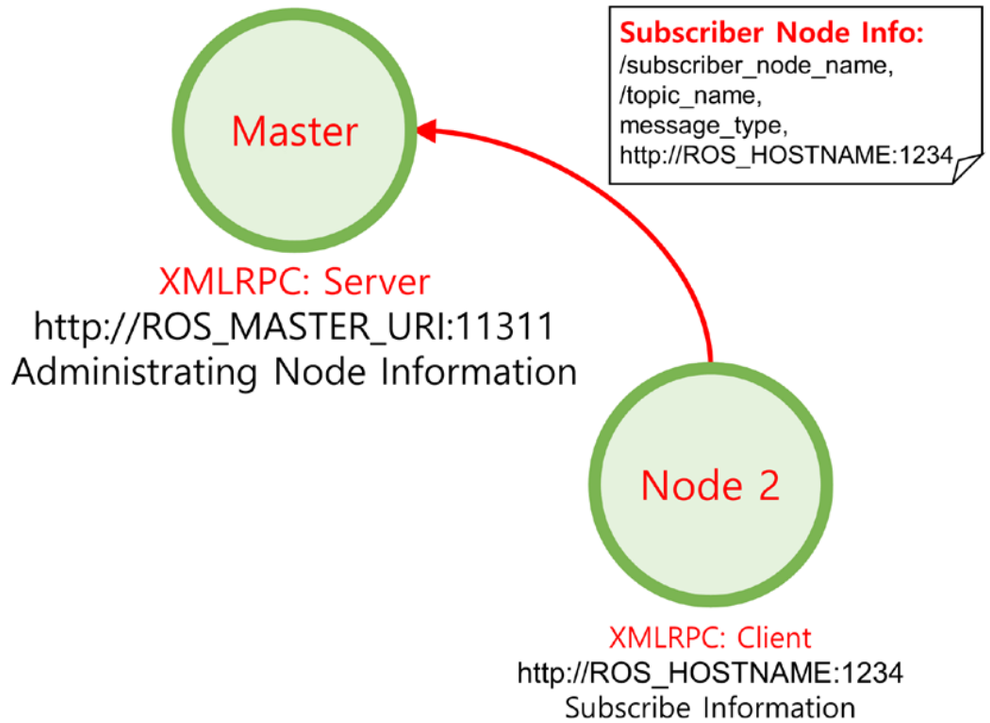
```
$ roscore
```

XMLRPC: Server
http://ROS_MASTER_URI:11311
Administrating Node Information

Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

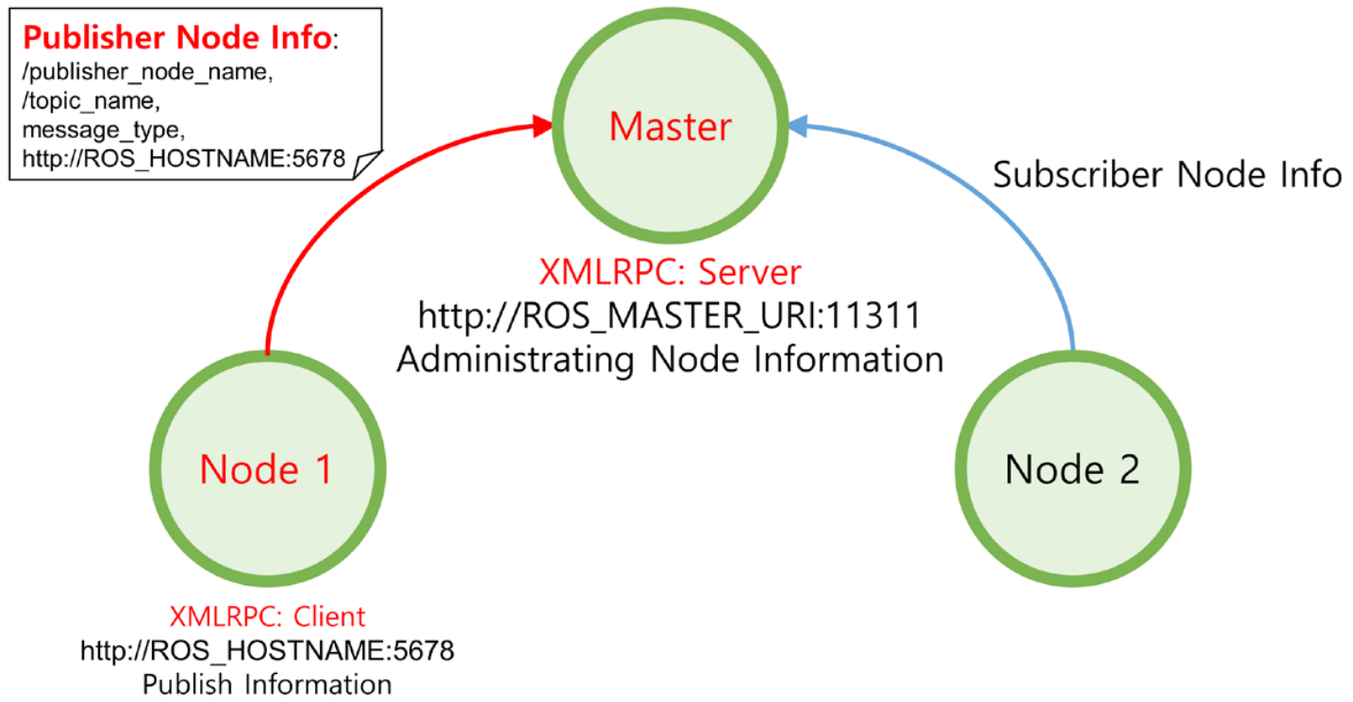
2: Running the Subscriber

```
$ rosrun PACKAGE_NAME NODE_NAME
$ roslaunch PACKAGE_NAME LAUNCH_NAME
```



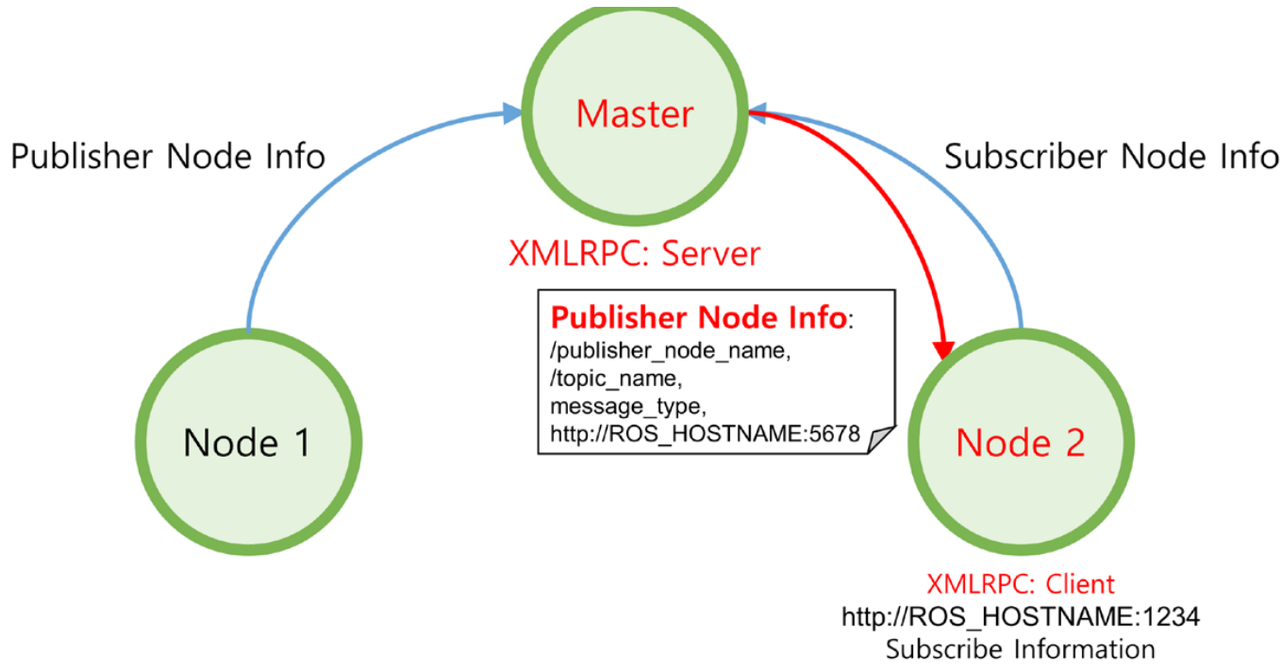
Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

3: Running the Publisher



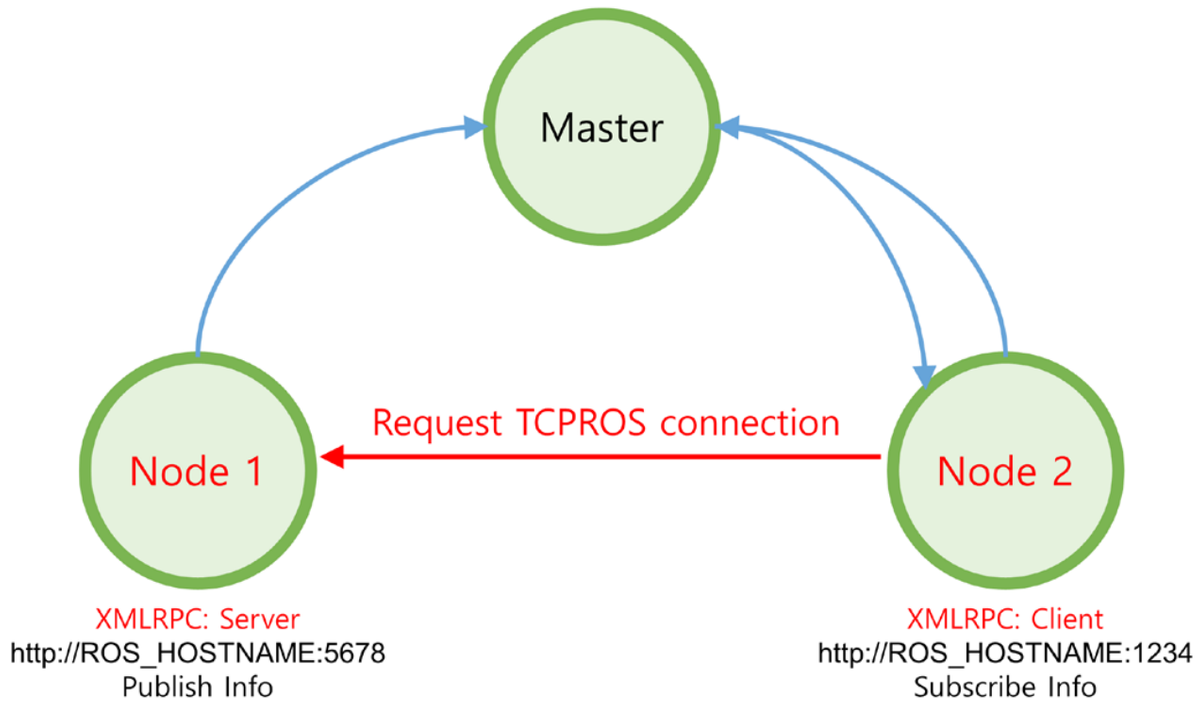
Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

4: Provide Publisher Info



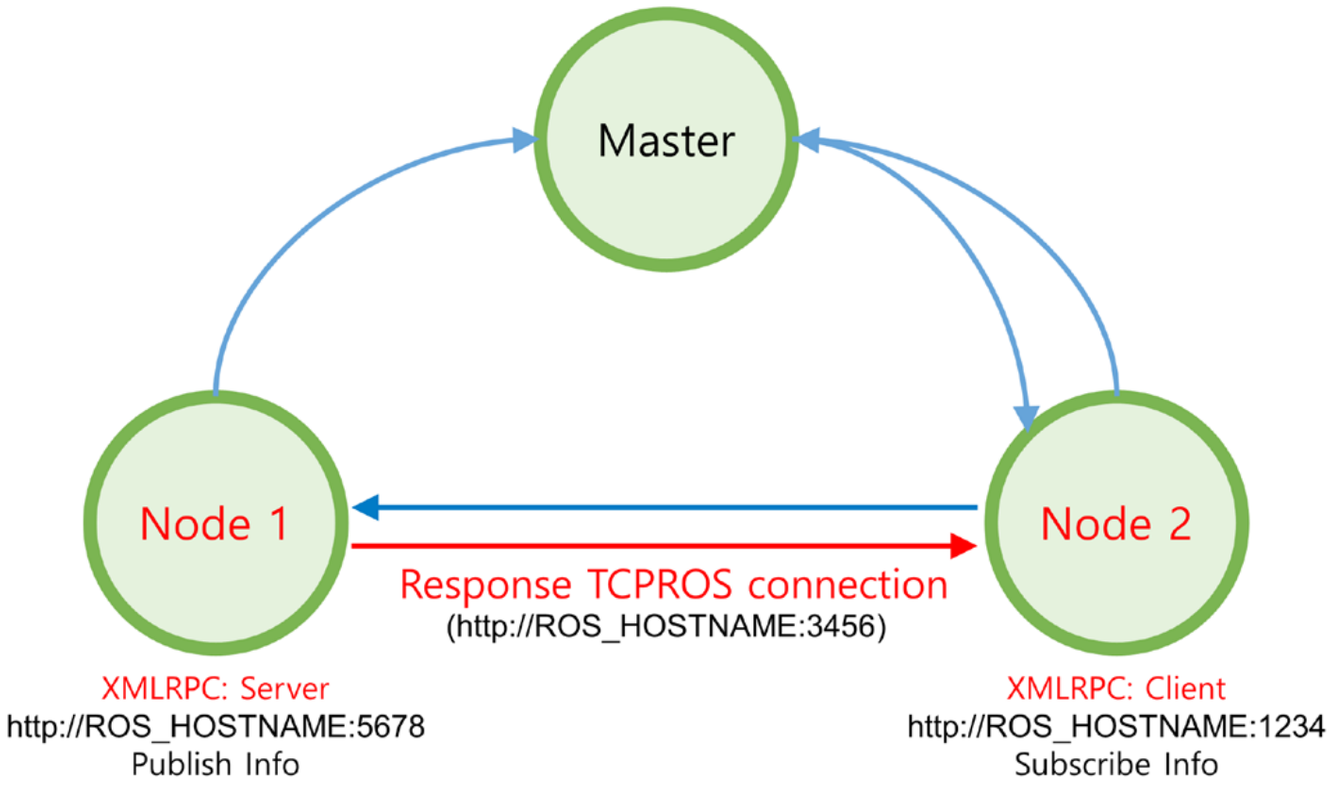
Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

5: Establish Connection Request



Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

6: Connection Response

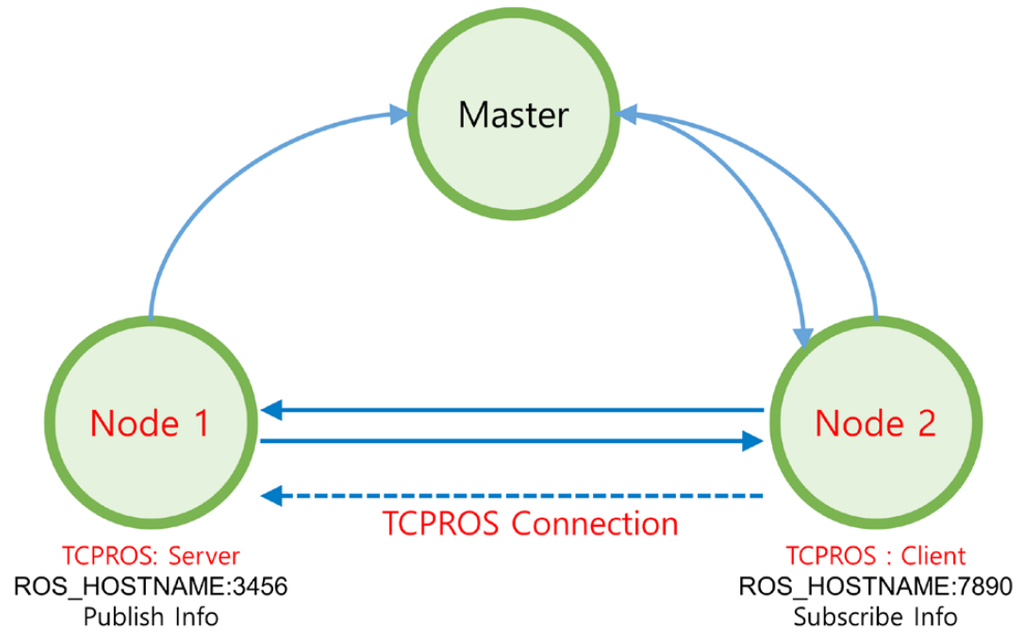


Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

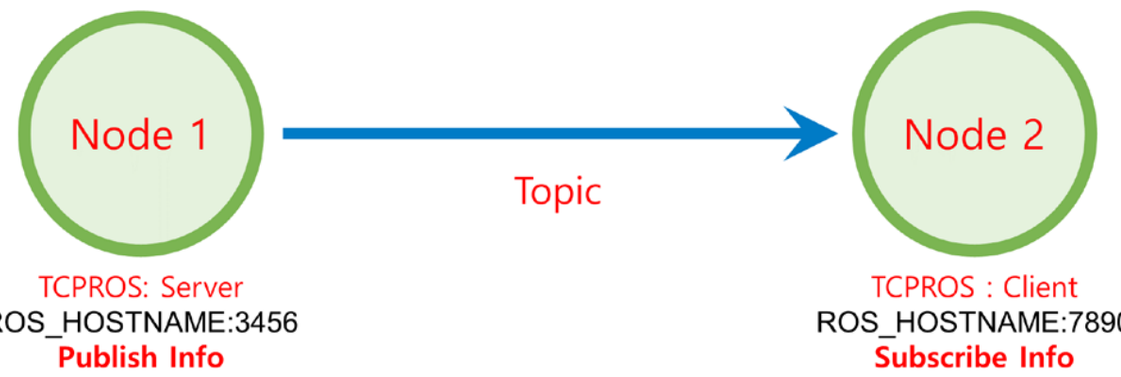
7: TCP Connection

TCPROS Connection

The subscriber node creates a client for the publisher node using TCPROS, and connects to the publisher node. At this point, the communication between nodes uses TCP/IP based protocol called TCPROS.

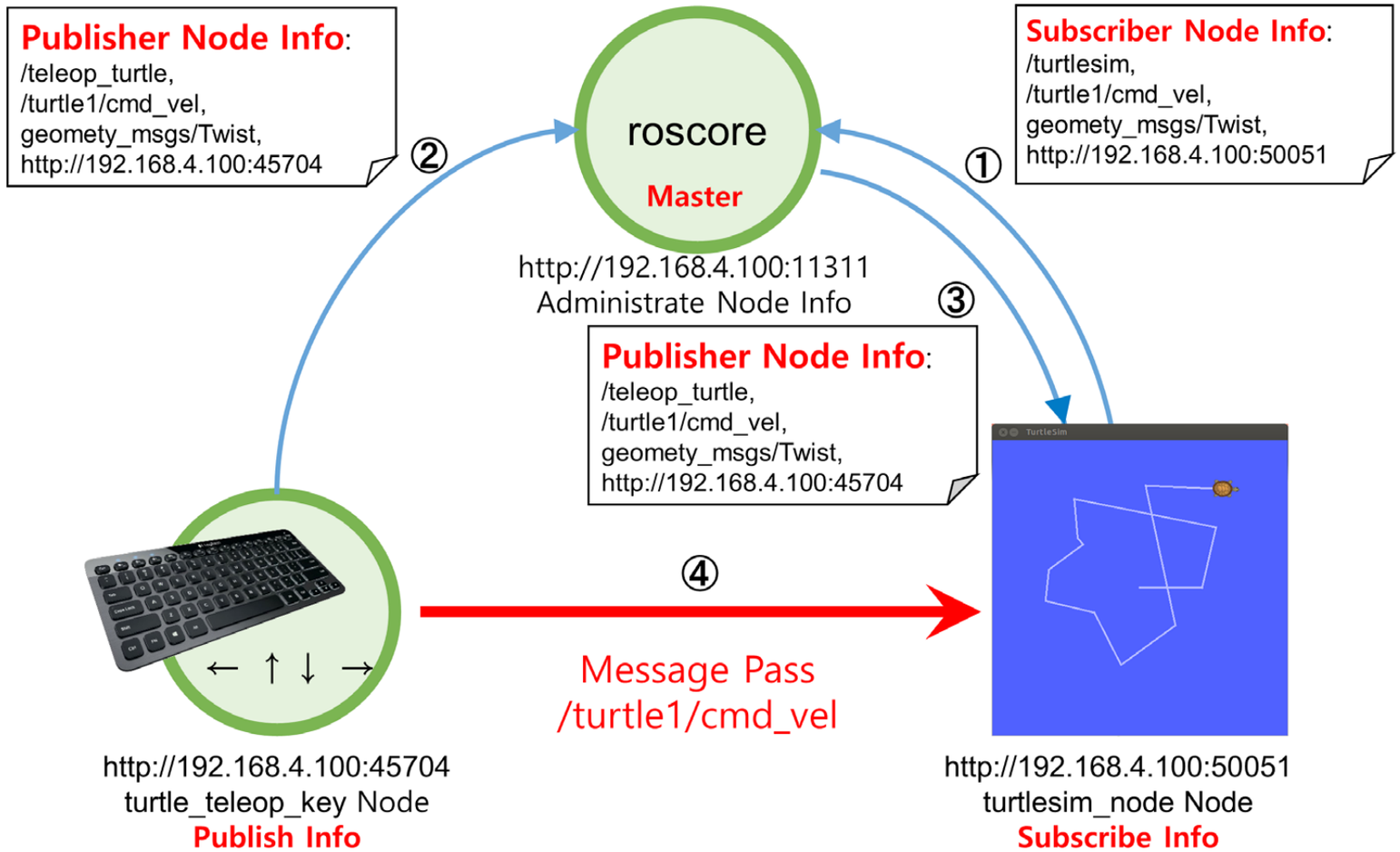


8: Message Transmission



Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

Example



Reference Book: **ROS Robot Programming** (in English).
Authors: Yoonseok Pyo, Hancheol Cho, Leon Jung, Darby Lim

Practical Tips to Write Publisher and Subscriber for ROS Topics

- **Publisher**
  - **Step 1.** Determine a **name** for the topic to publish
  - **Step 2.** Determine the **type** of the messages that the topic will publish
  - **Step 3.** Determine the **frequency** of topic publication (how many message per second)
  - **Step 4.** Create a publisher object with parameters chosen
  - **Step 5.** Keep publishing the topic message at the selected frequency

Practical Tips to Write Publisher and Subscribers for ROS Topics

- **Subscriber**
  - **Step 1.** Identify the **name** for the topic to listen to
  - **Step 2.** Identify the **type** of the messages to be received
  - **Step 3.** Define a callback function that will be automatically executed when a new message is received on the topic
  - **Step 4.** Start listening for the topic messages
  - **Step 5.** Spin to listen for ever (in C++)