

Understanding ROS Topics

Prof. Anis Koubaa

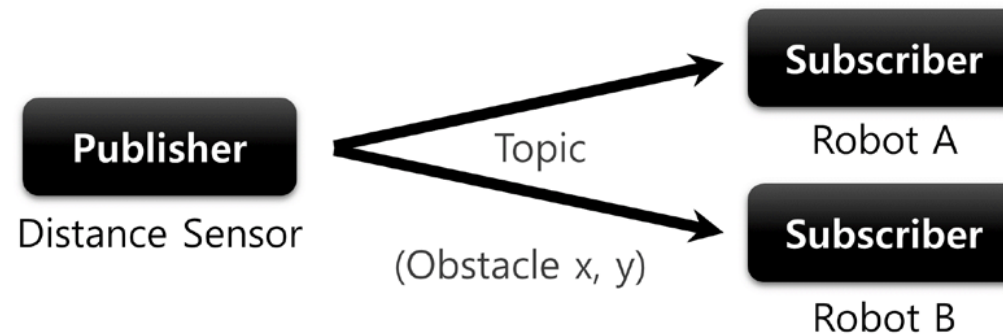
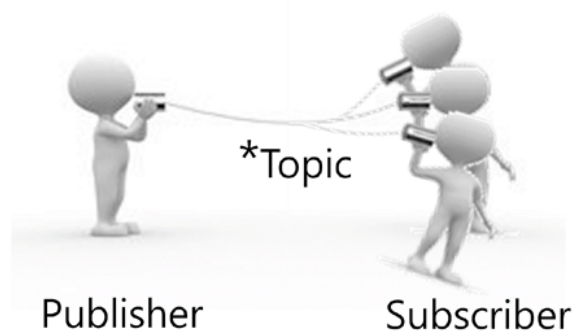
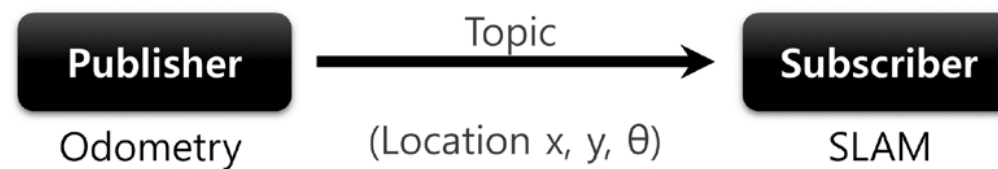
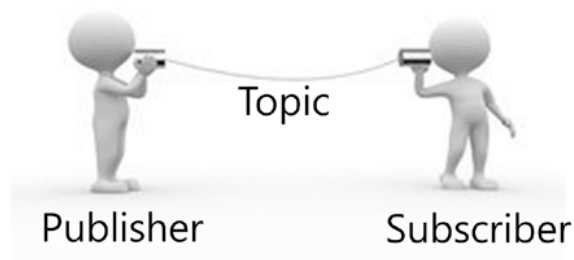
<https://www.udemy.com/user/anis-koubaa/>



ROS

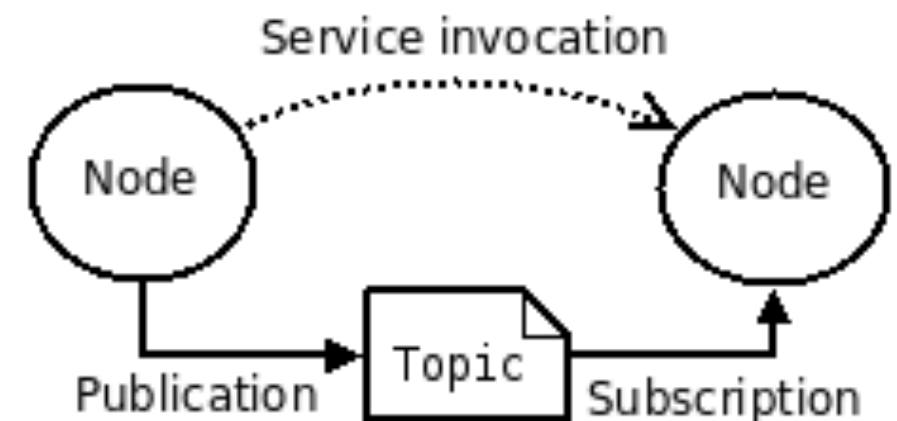


Topic

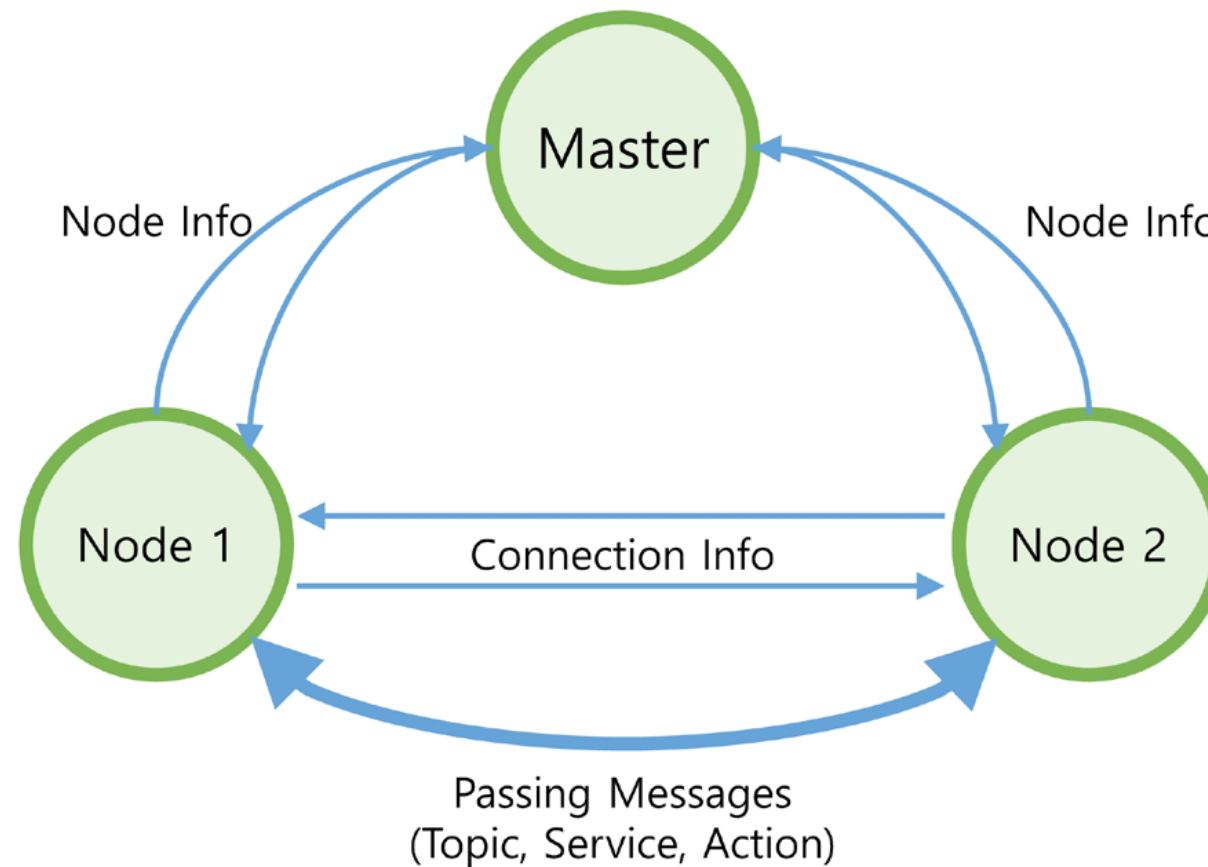


*Topic not only allows 1:1 Publisher and Subscriber communication, but also supports 1:N, N:1 and N:N depending on the purpose.

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



Message Communication



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1: Run the Master ROS Node

```
$ roscore
```

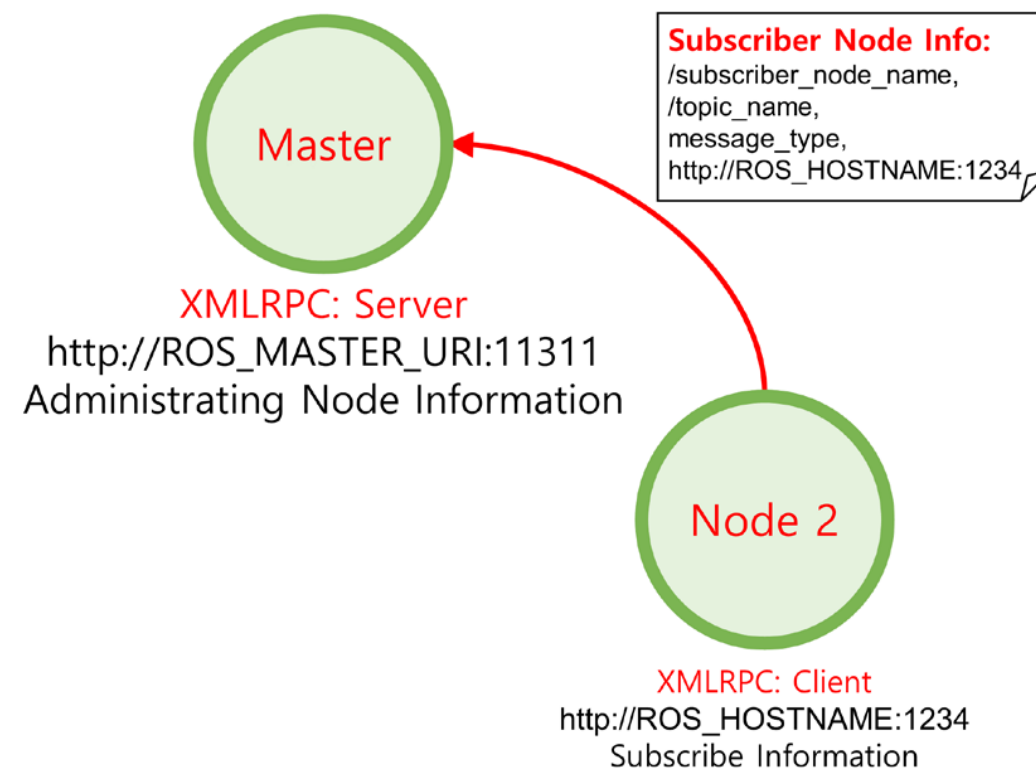


XMLRPC: Server
http://ROS_MASTER_URI:11311
Adminstrating Node Information

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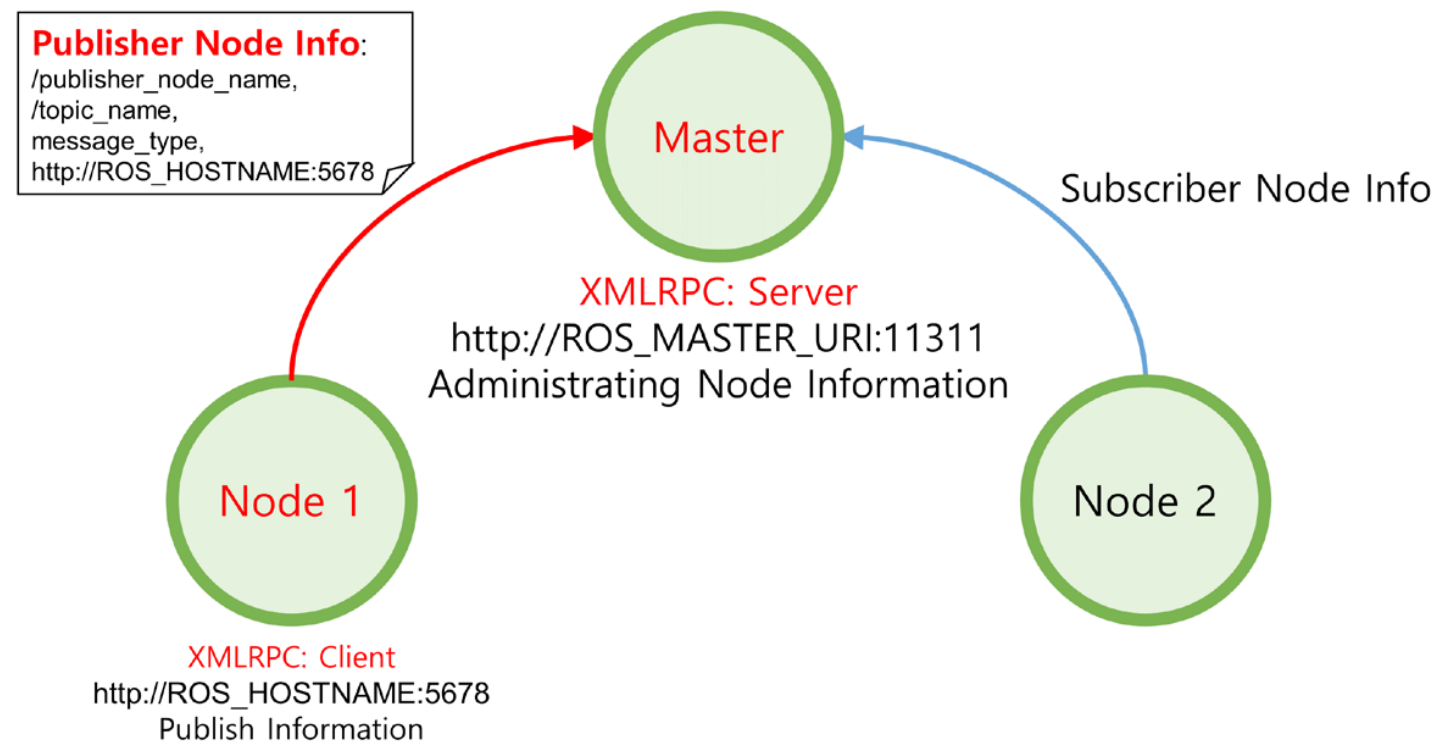
2: Running the Subscriber

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



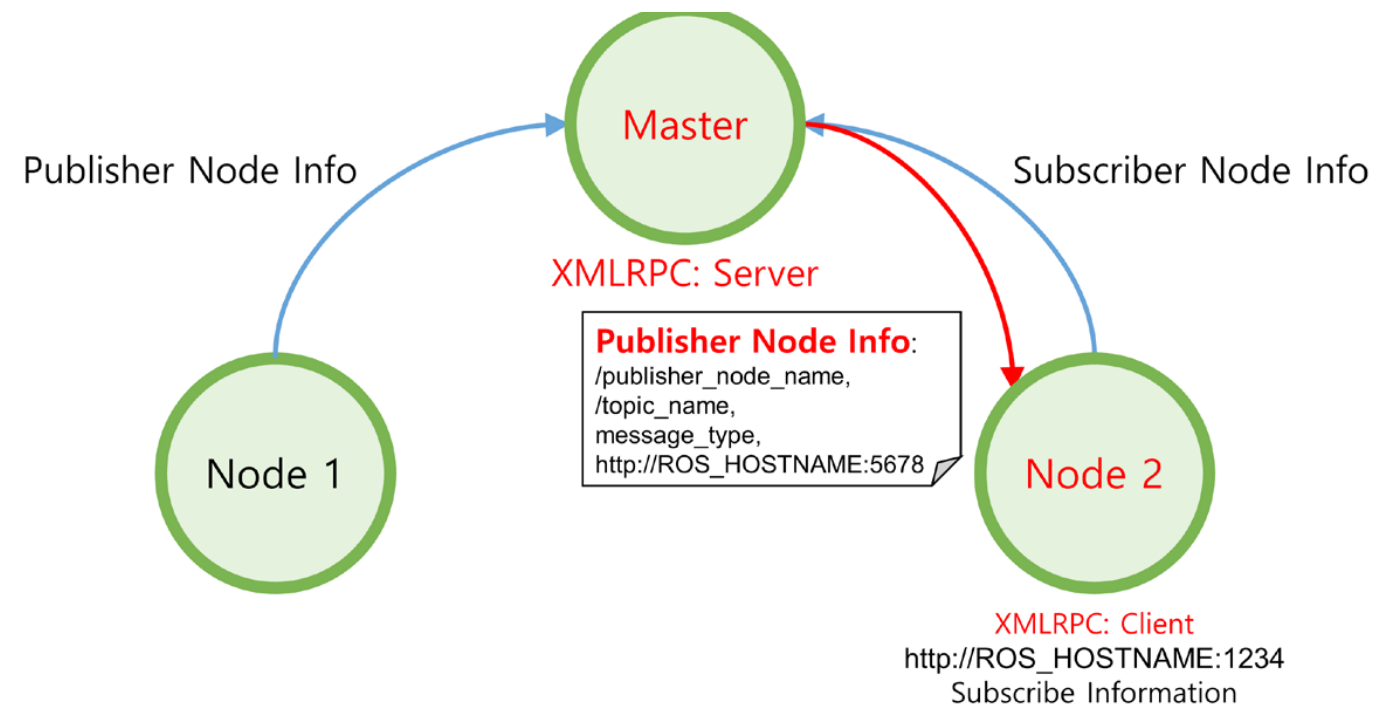
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3: Running the Publisher



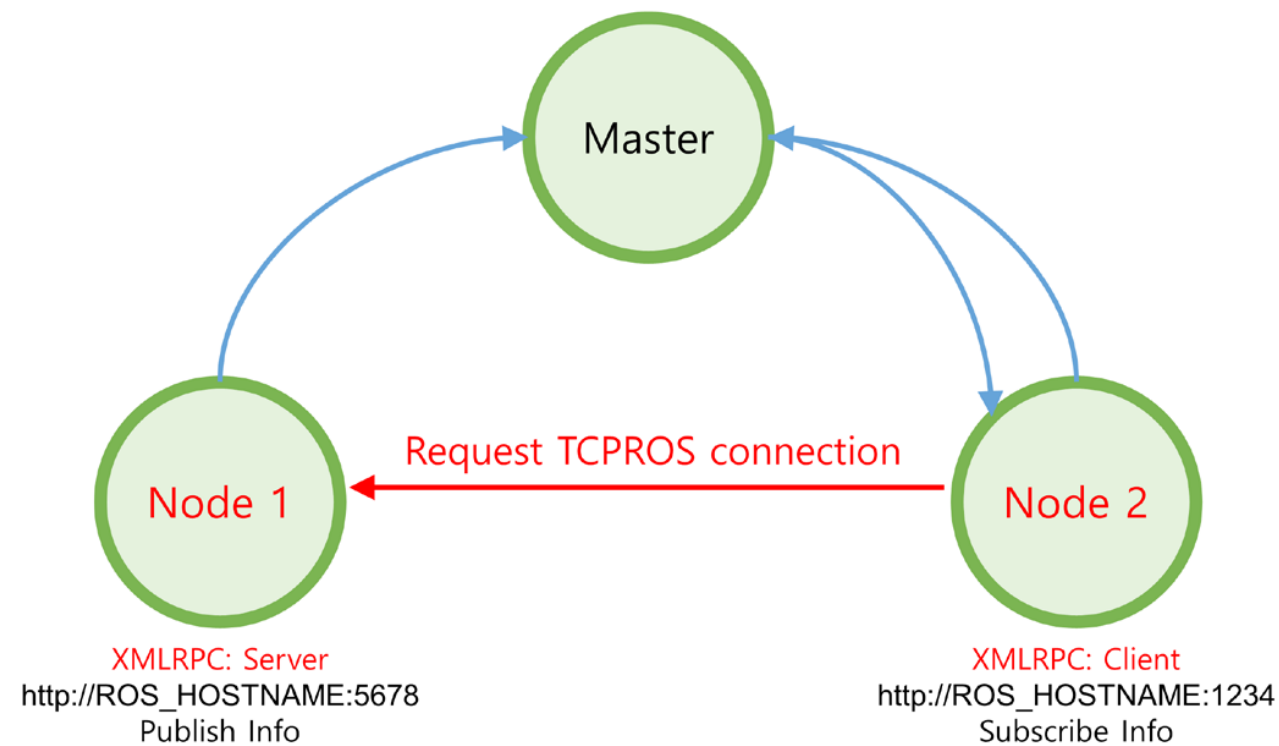
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4: Provide Publisher Info



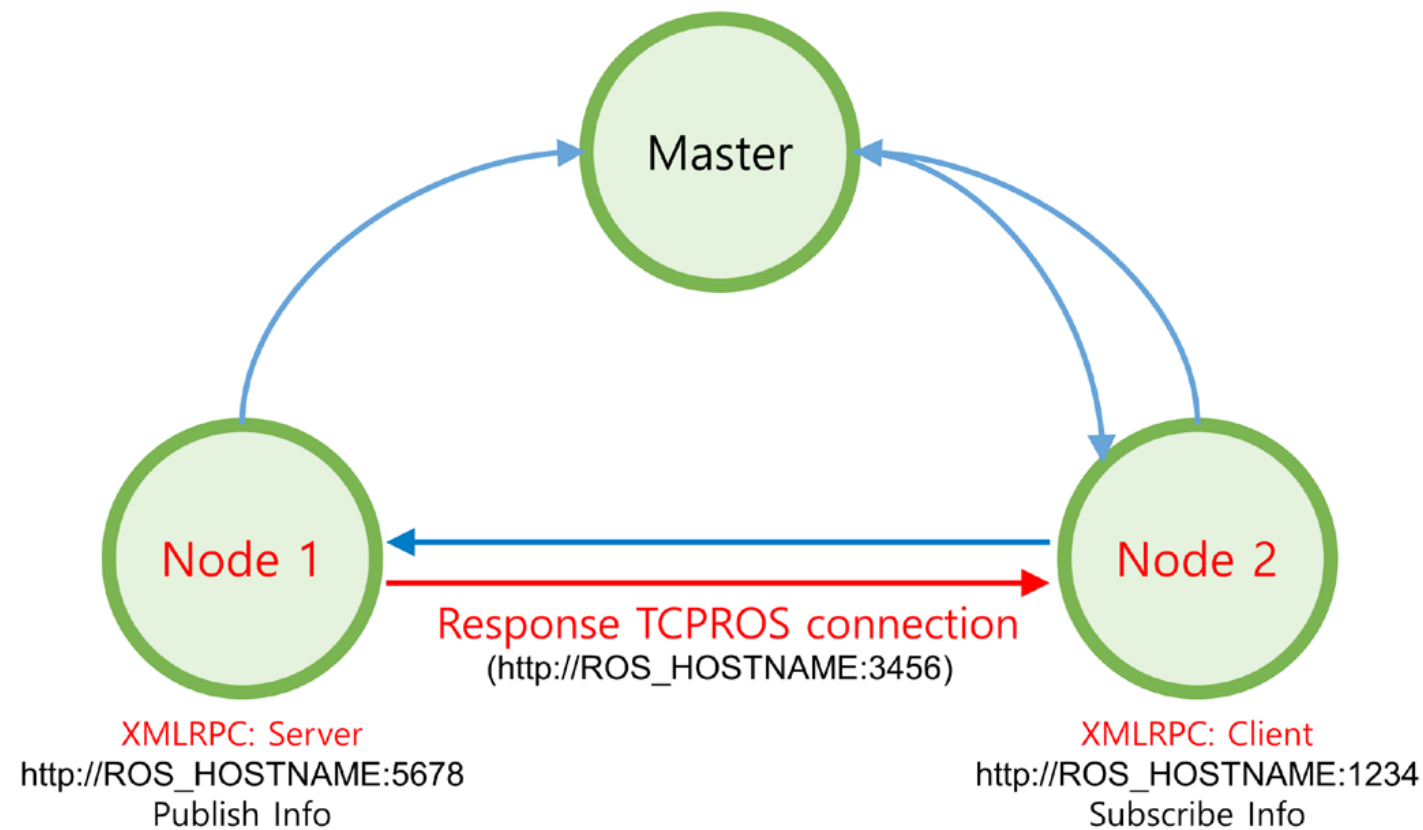
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5: Establish Connection Request



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6: Connection Response

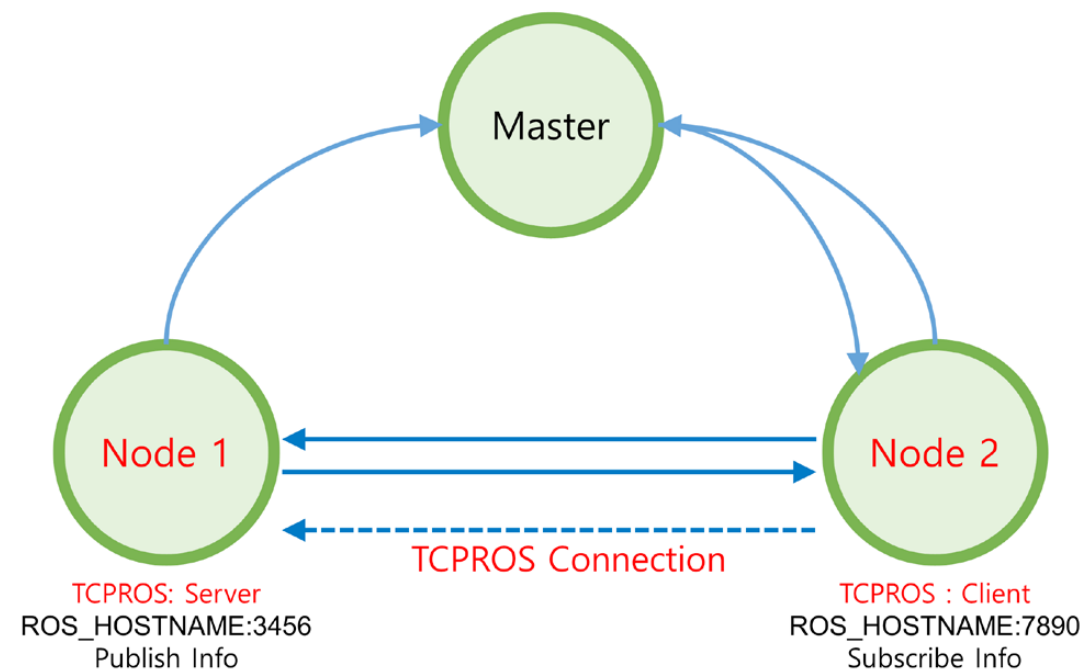


Reference Book: **ROS Robot Programming** (in English).
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7: TCP Connection

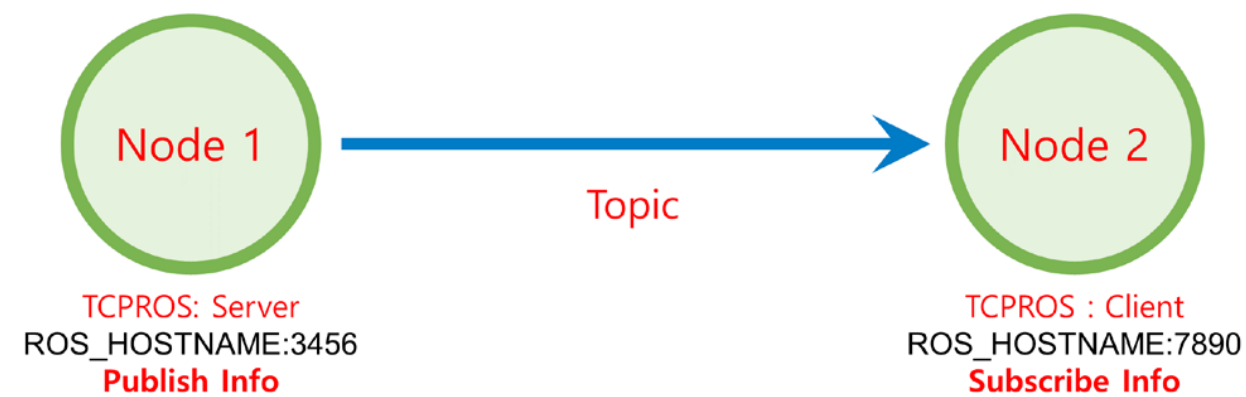
TCPROS Connection

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.



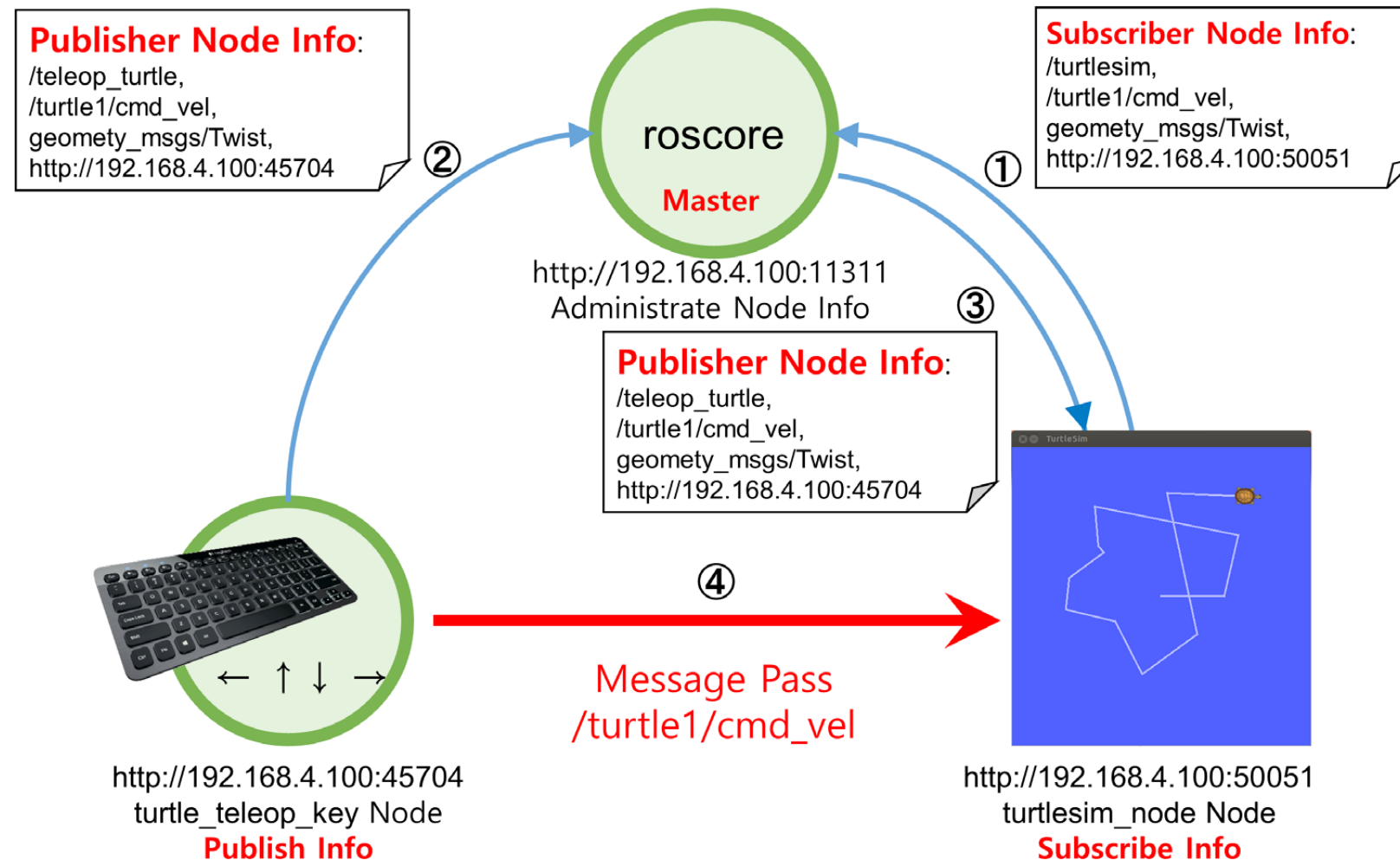
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8: Message Transmission



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Example



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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++)