

ROS

- Nodes
 - Processing entities
 - Mono or multi thread
 - Written in whatever language
 - Responds to an unified protocol
- ROS Ecosystem
 - Distributed Processing
 - Nodes and Messages
 - Topics
 - Publisher / Subscriber
 - Services
 - What is a Robotic system?

- `roscpp` command
 - `ping` test connectivity to node
 - `list` list active nodes
 - `machine` list nodes running on a particular machine or list machines
 - `info` print information about node
 - `kill` kill a running node
 - `cleanup` purge registration information of unreachable nodes
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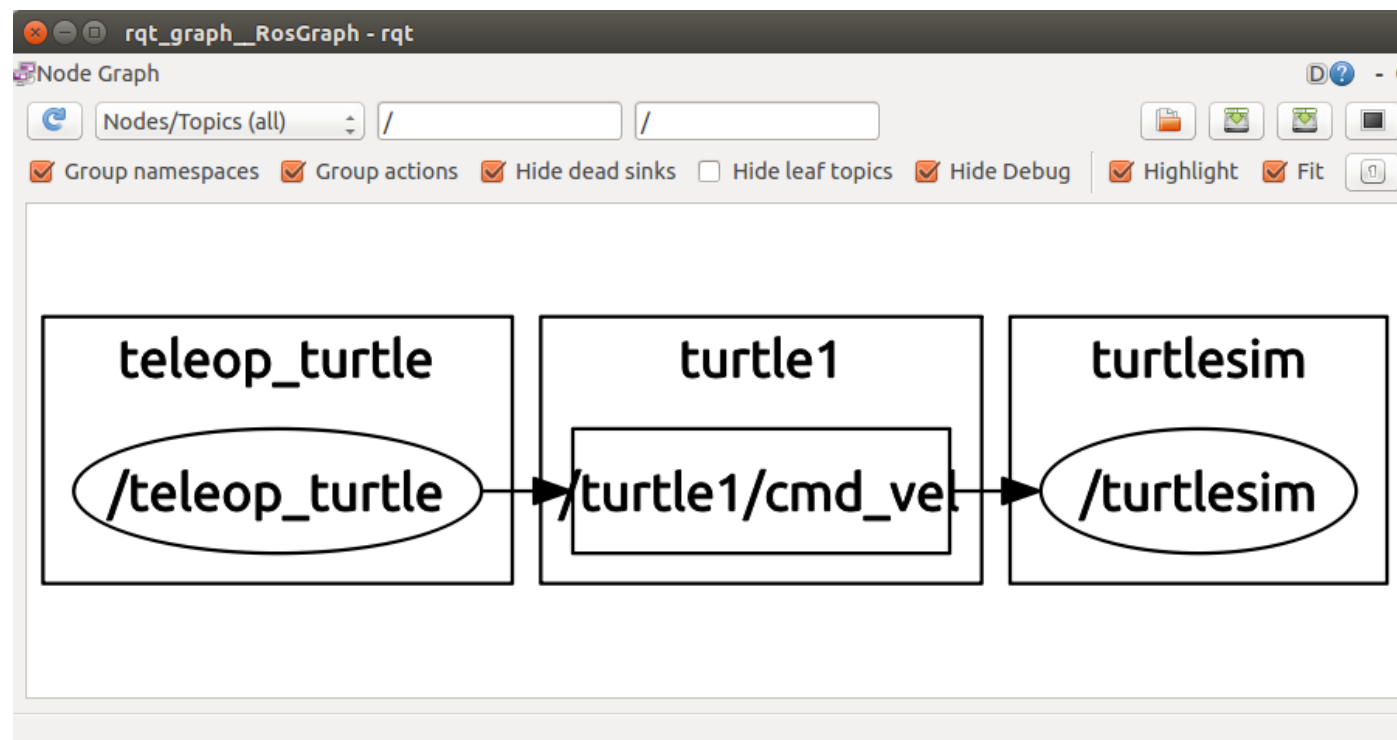
- Messages
 - A message is a unit of communication
 - It has an arbitrary, yet static and predefined structure
 - In ROS 1 is transmitted under TCP/IP protocol.
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- rosmg command
 - show Show message description
 - info Alias for rosmg show
 - list List all messages
 - md5 Display message md5sum
 - package List messages in a package
 - packages List packages that contain message

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- rqt_graph command

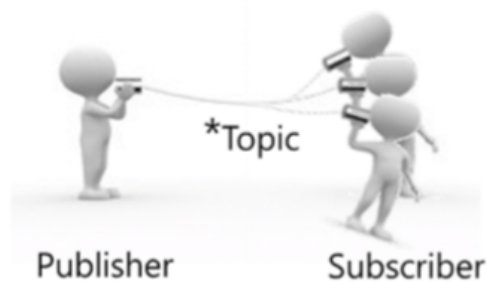
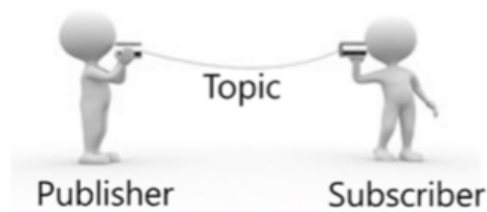


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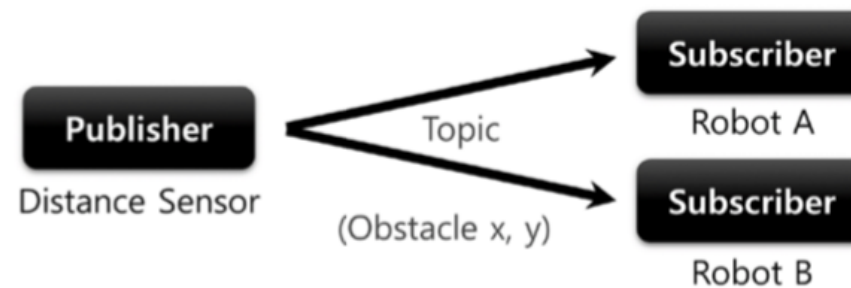
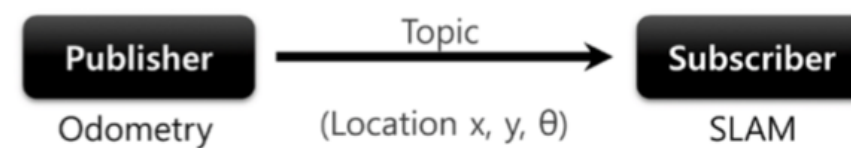
ROS

- Asynchronous
- Unidirectional
- N2N
- Persistent connection
- Used for streaming information

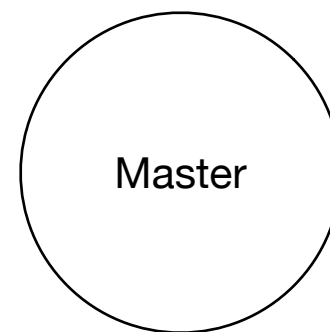
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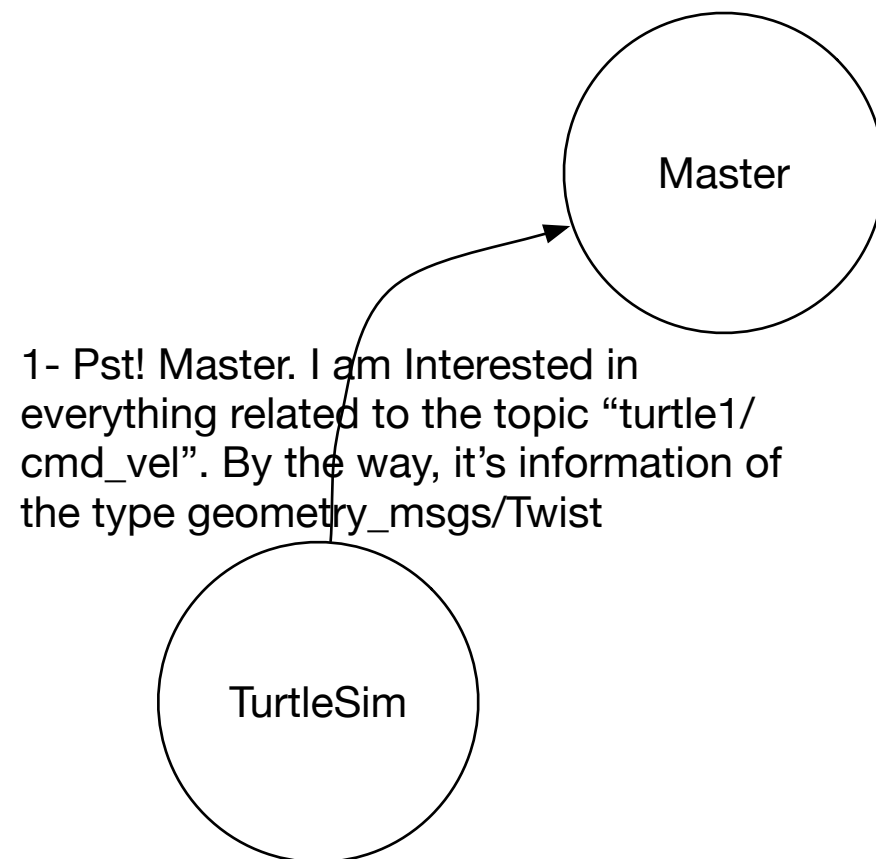
*Topic not only allows 1:1 Publisher and Subscriber communication, but also supports 1:N, N:1 and N:N depending on the purpose.



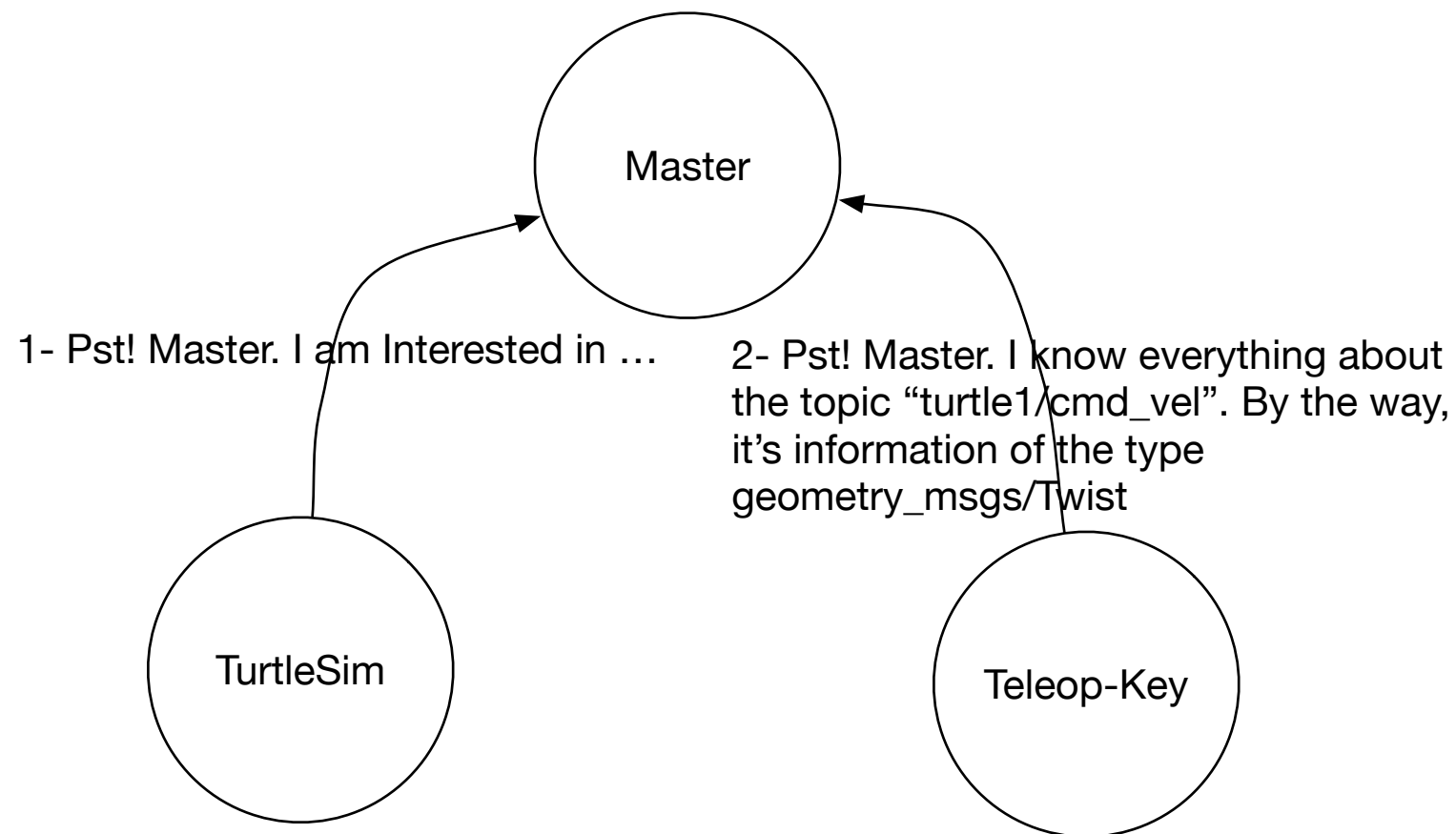
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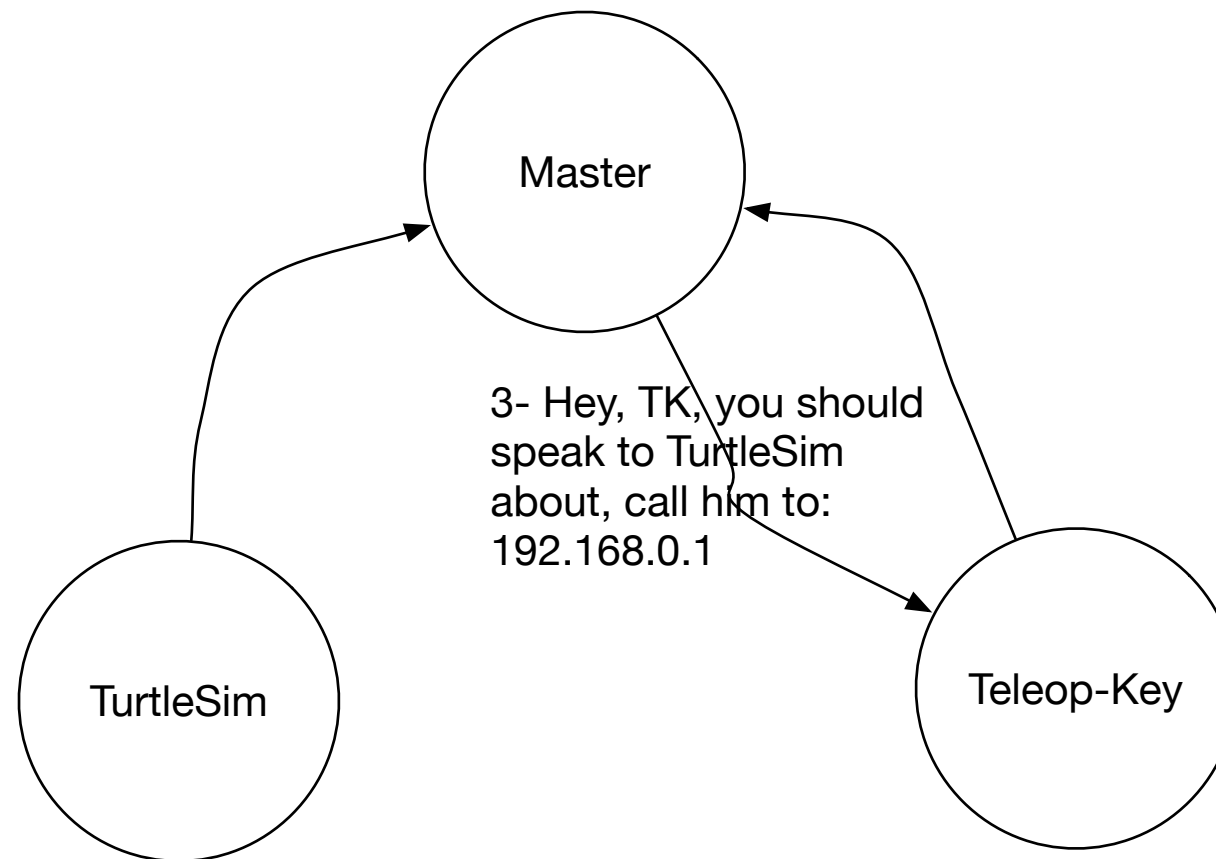
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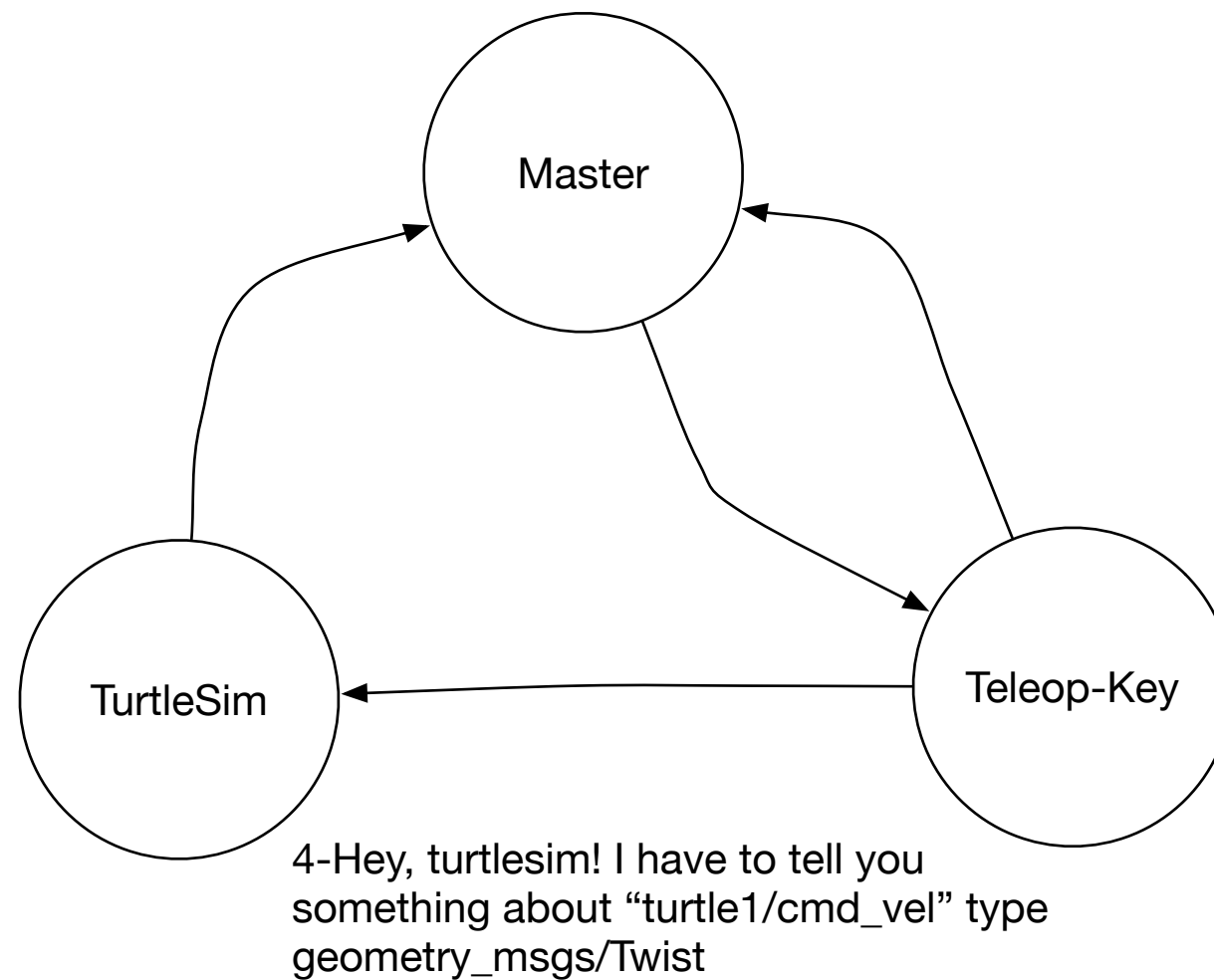
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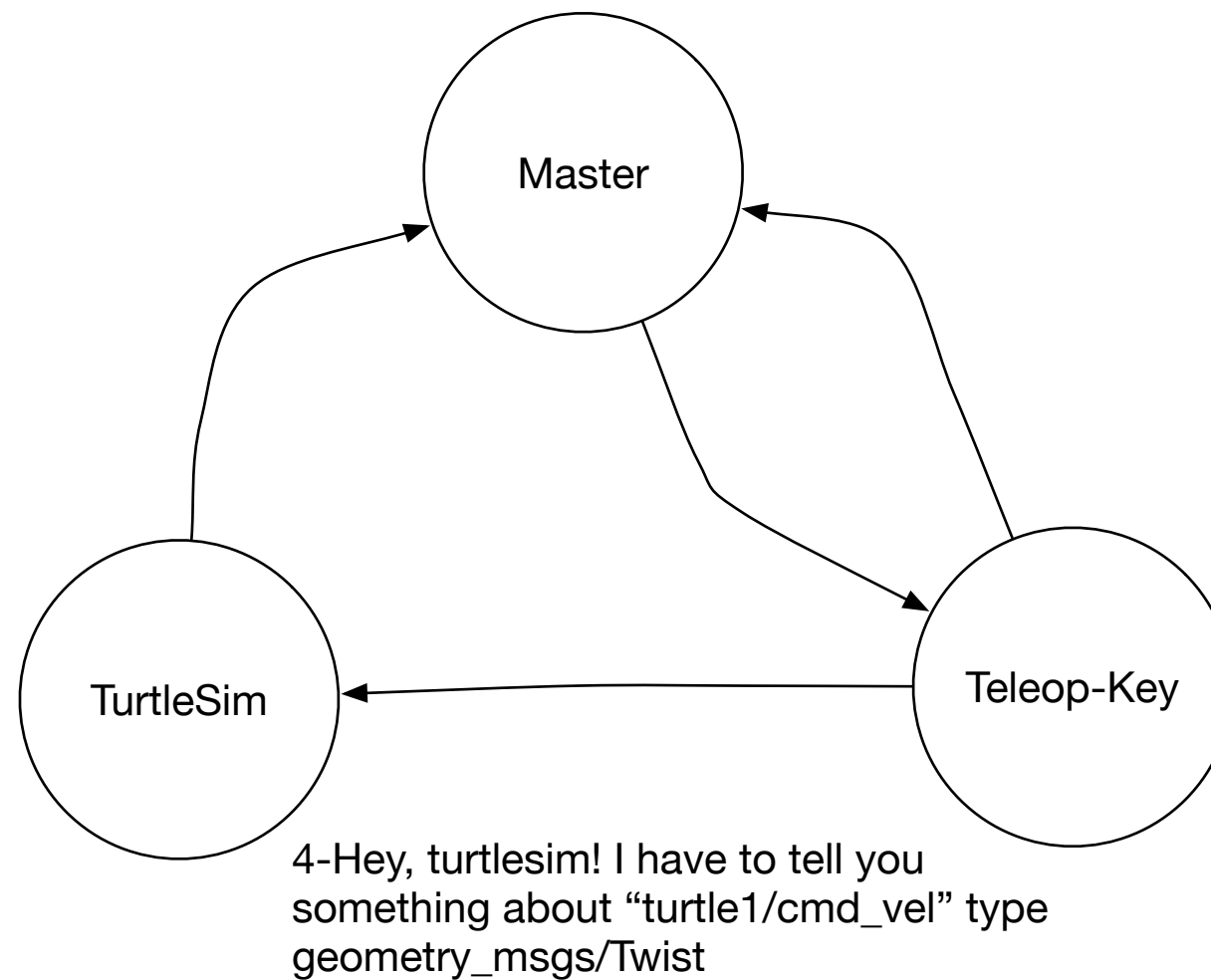
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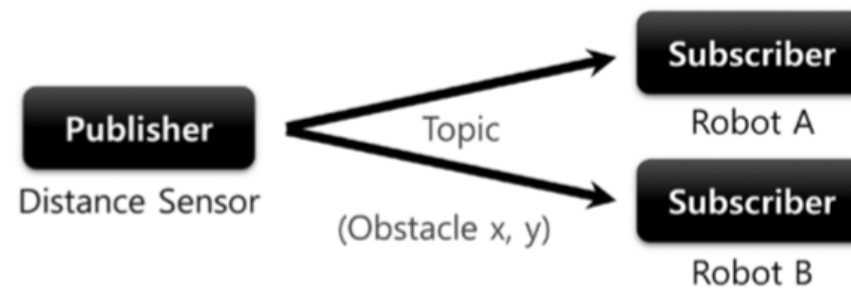
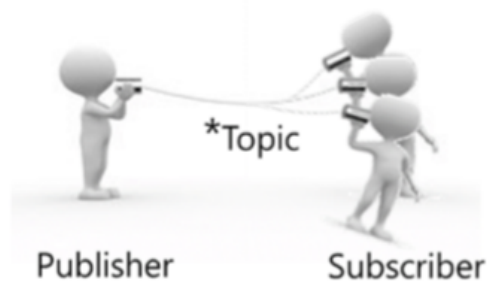
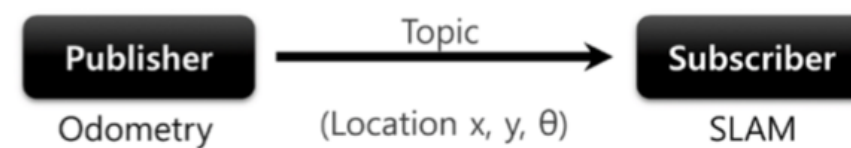
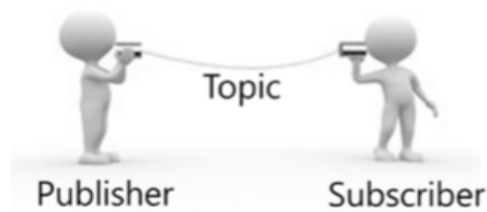
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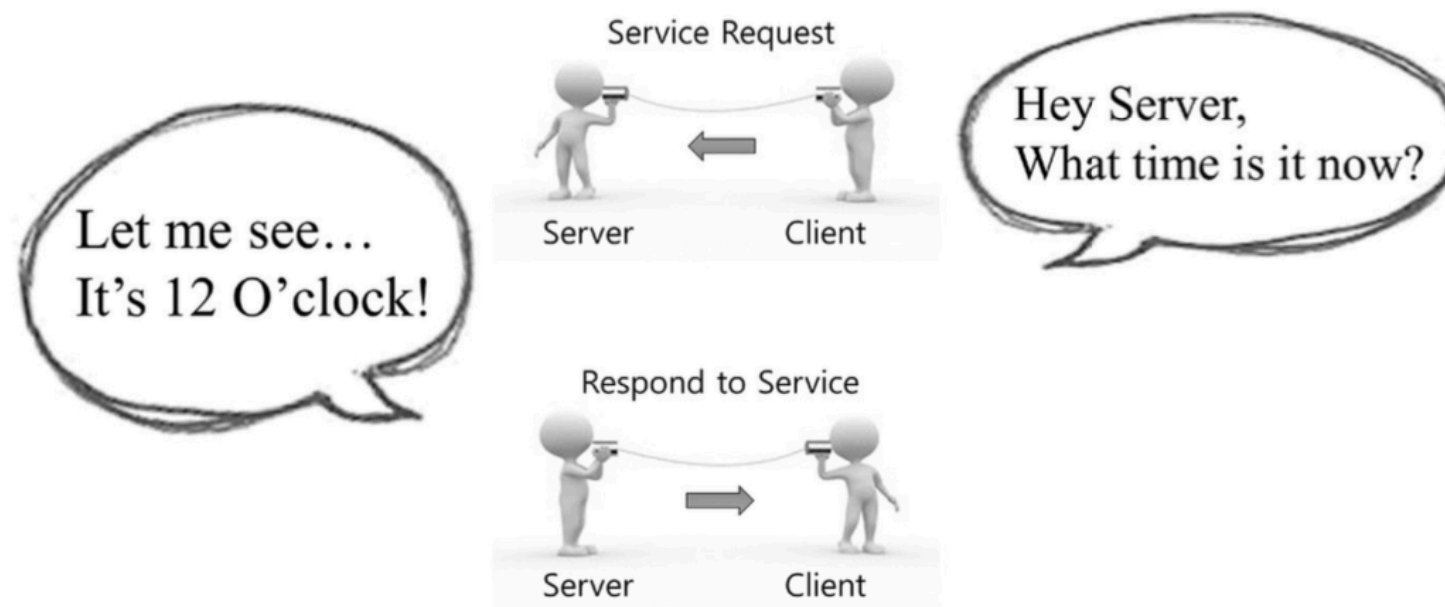
Writing a publisher and a subscriber: Chat exercise.

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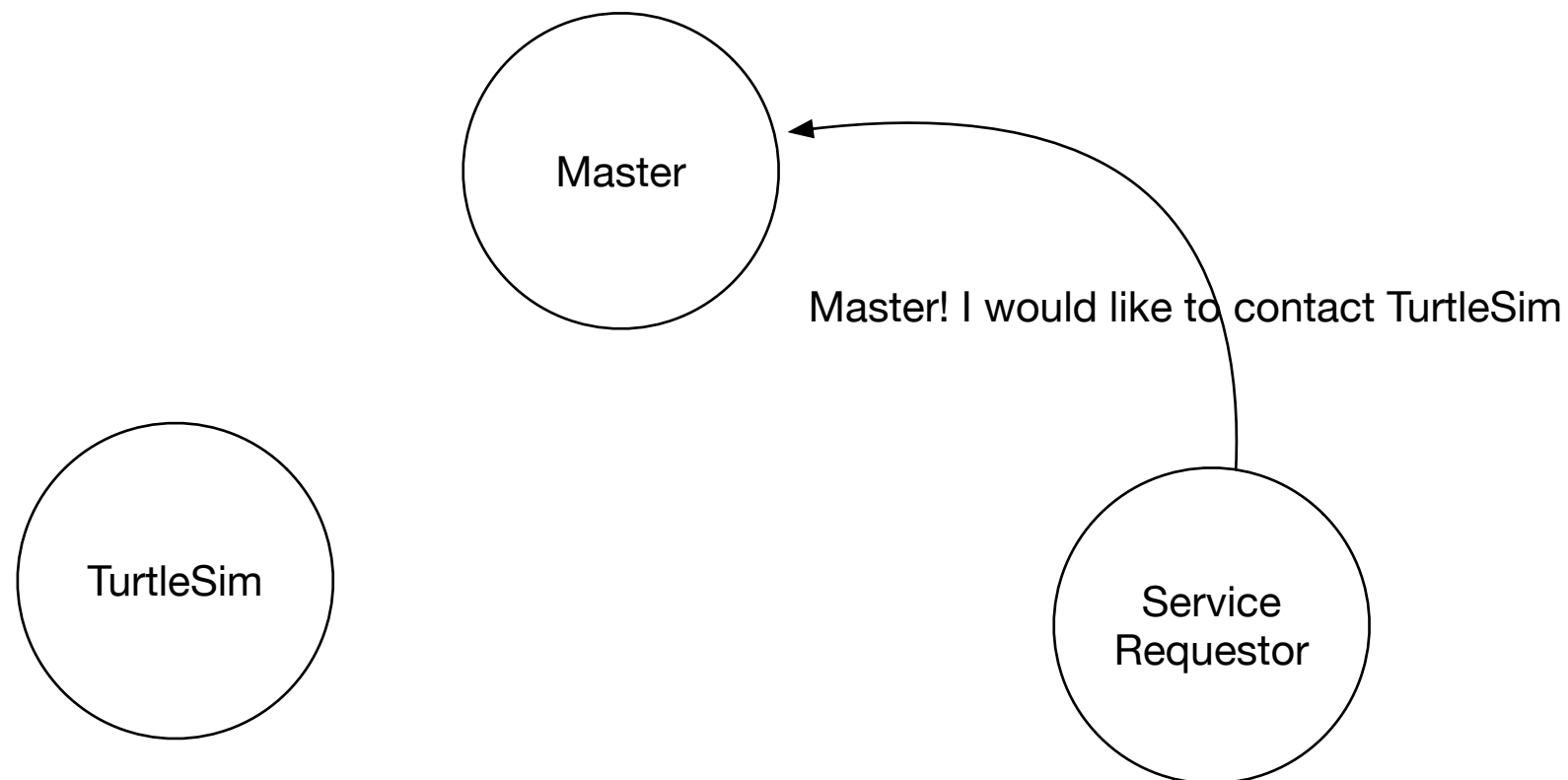
ROS

- Synchronous
- Bidirectional
- N2N
- Transient connection
- Used for requesting a service

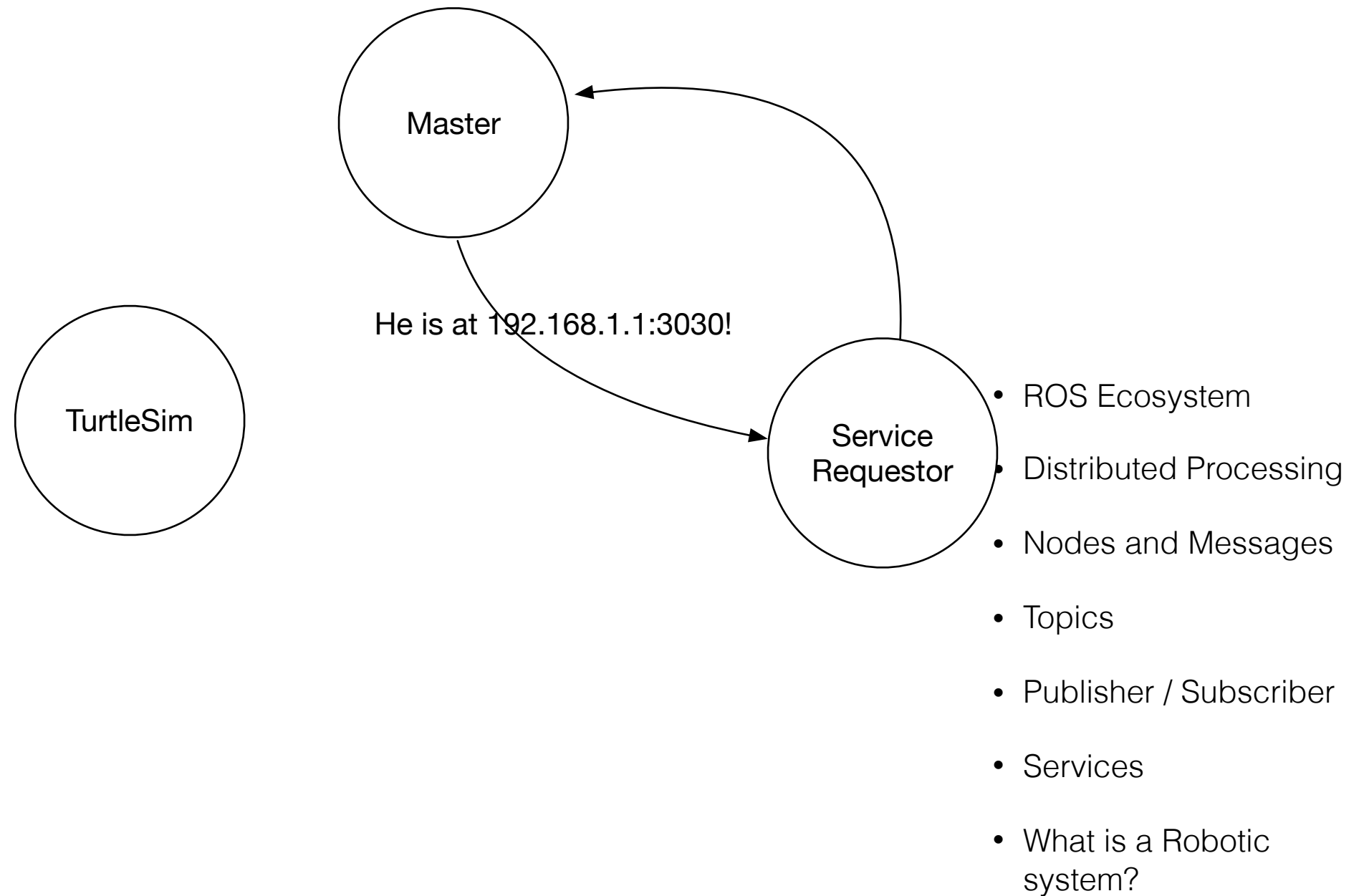
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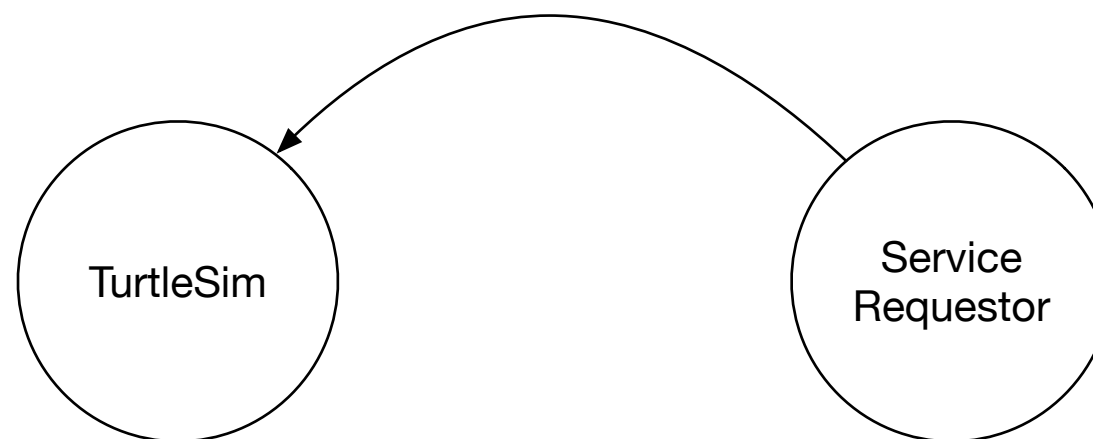
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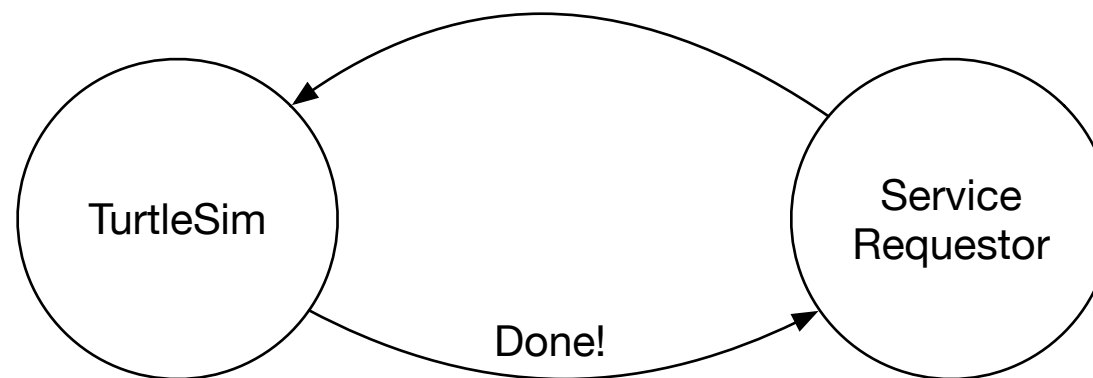
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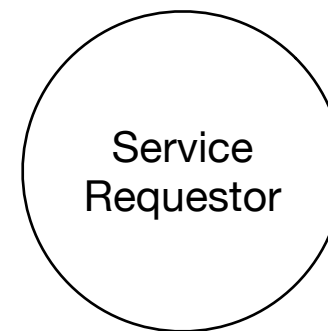
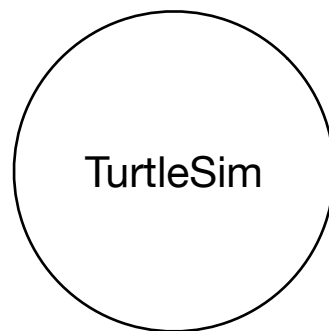
Hey, Turtle sim, change your pen color to yellow, please.



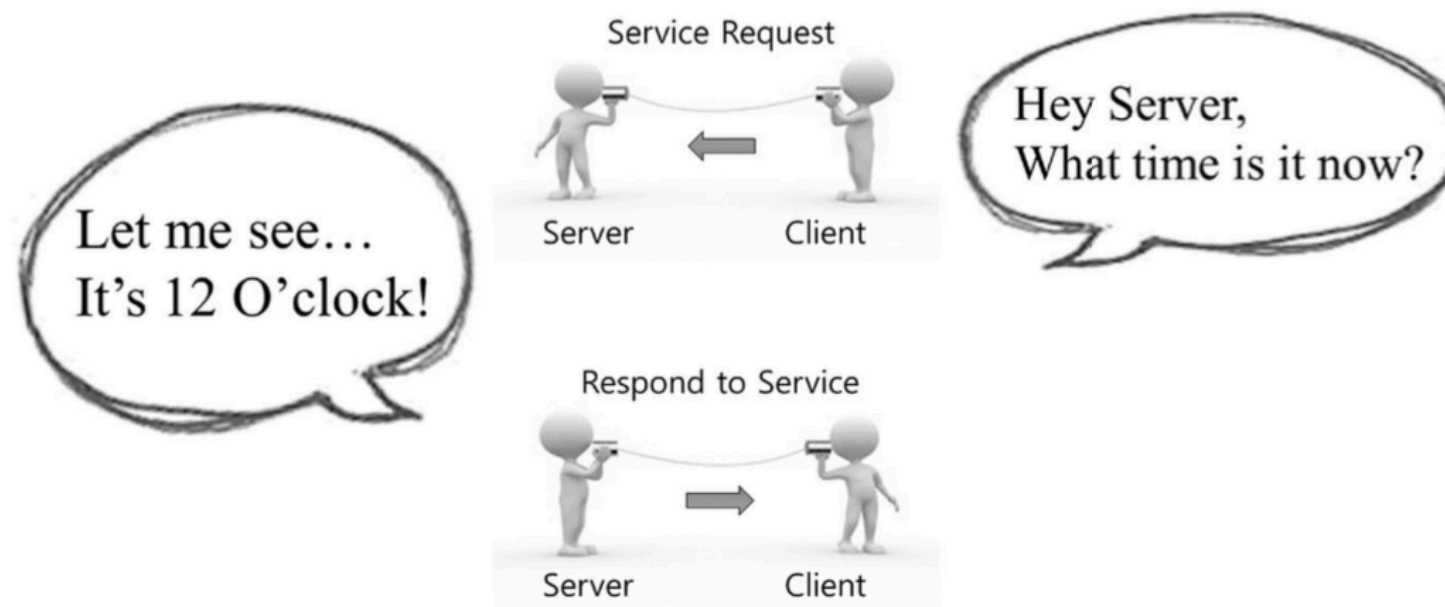
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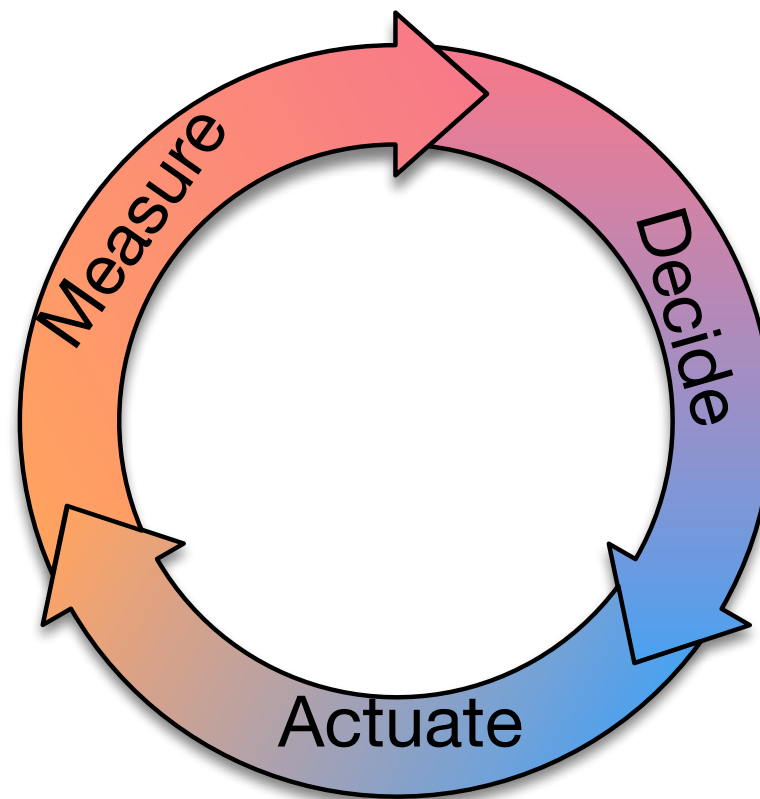


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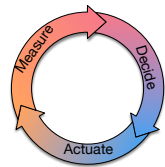
- Robot

A mechanical device capable of performing a variety tasks interacting with the environment

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- Measure specific environmental properties
 - Analyse and model specific aspects of reality
 - Act over the environment for transforming the reality
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Then, what is a program in ROS?

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