MESSAGES QUEUES

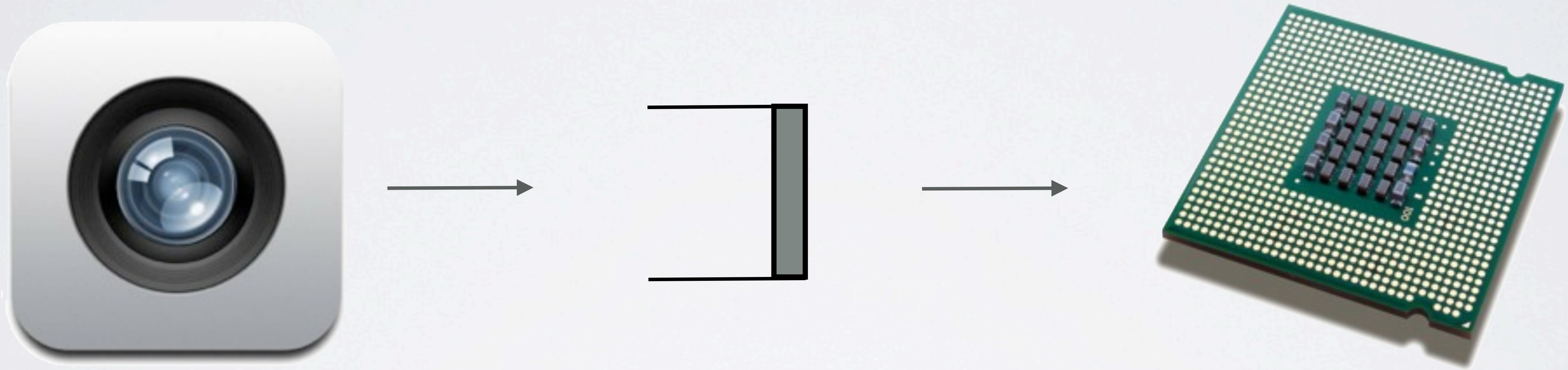
Group 05

WHAT'S A MESSAGE?

Camera Node

Processing Node

WHY A MESSAGE QUEUE?

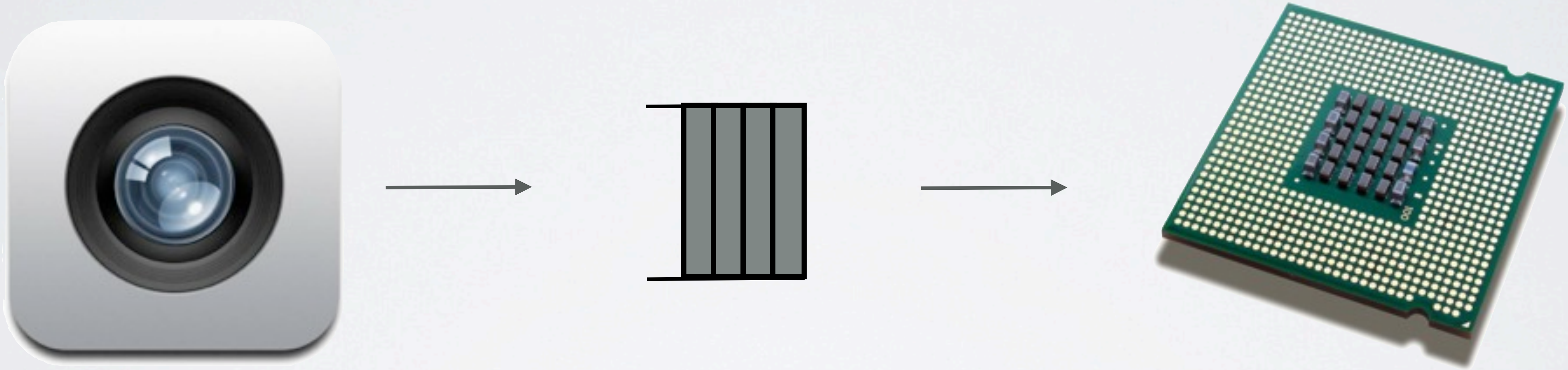


Camera Node

Message Queue

Processing Node

WHY A MESSAGE QUEUE?



Camera Node

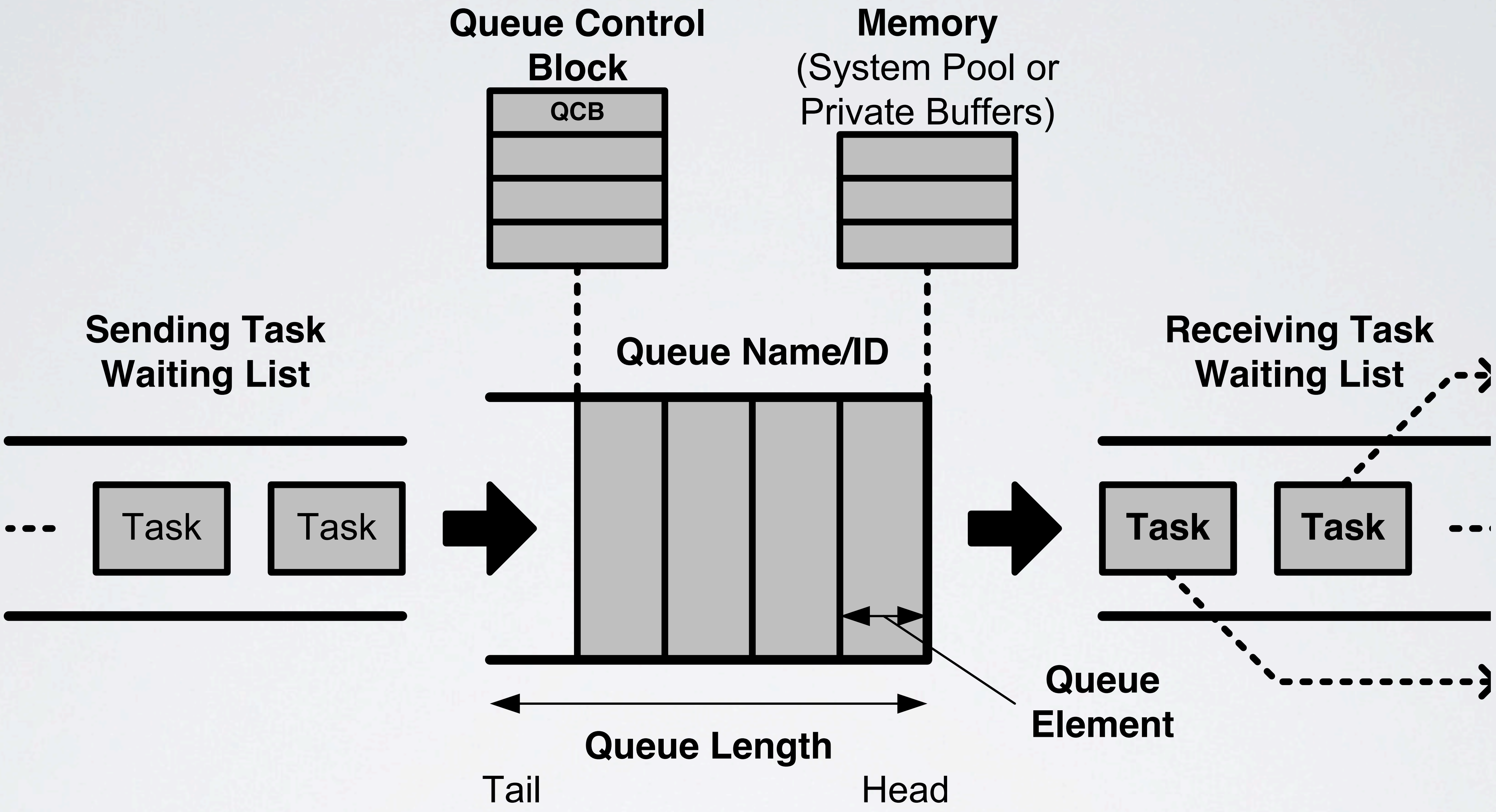
Message Queue

Processing Node

TODAY

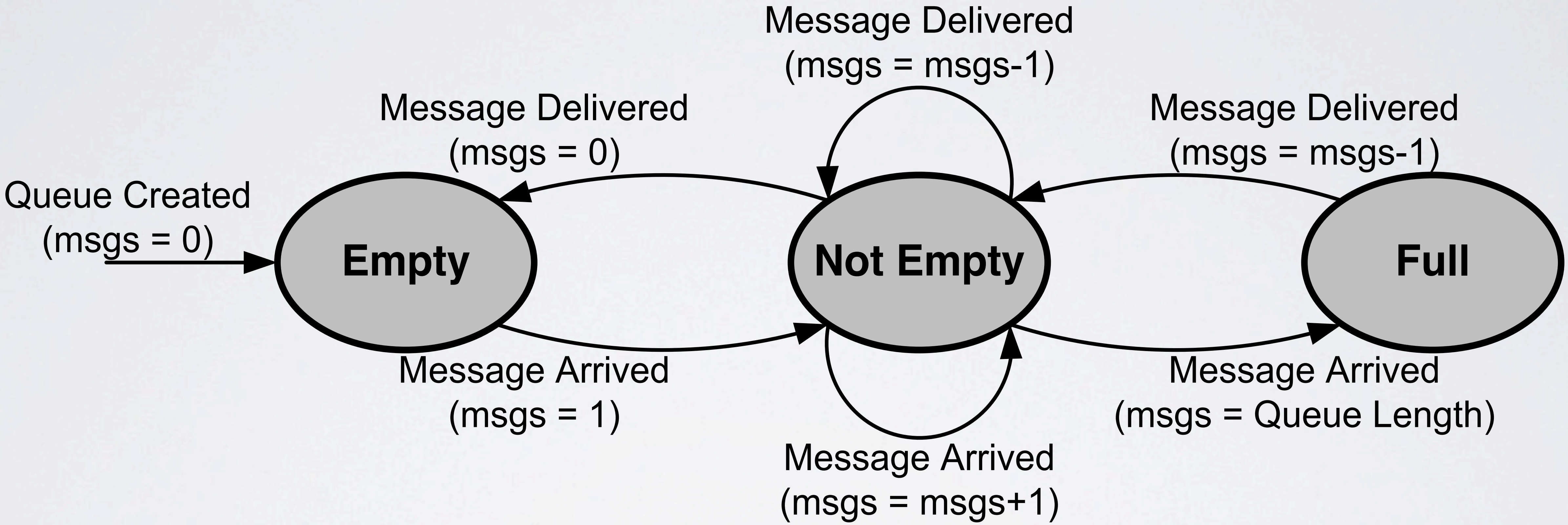
✓Introduction

- Messages in general
    - Queue states
    - Memory usage
    - Priorities
- Messages in ROS



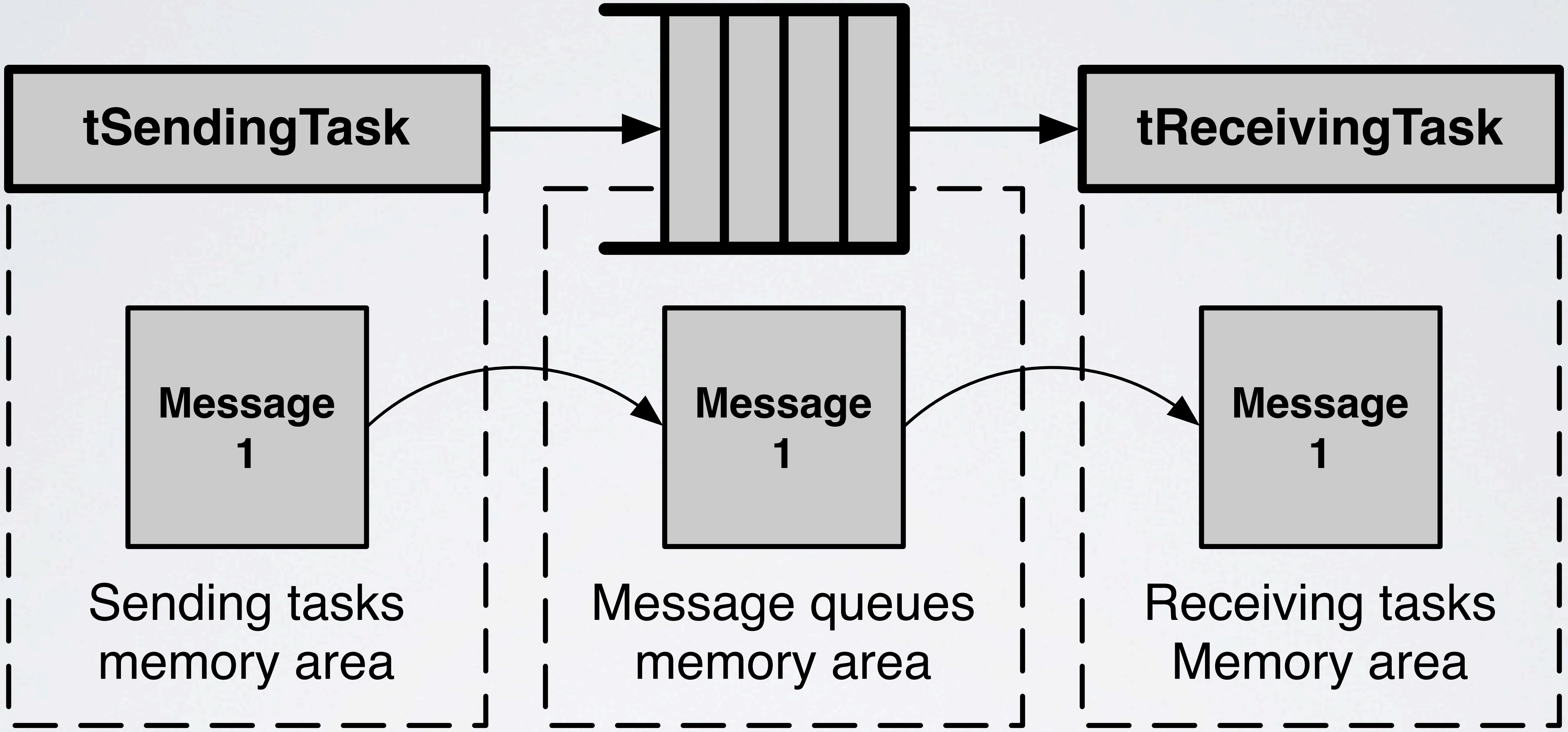
DEFINING A QUEUE

Real Time Concepts for Embedded Systems - Qing li et. al.



QUEUE STATES

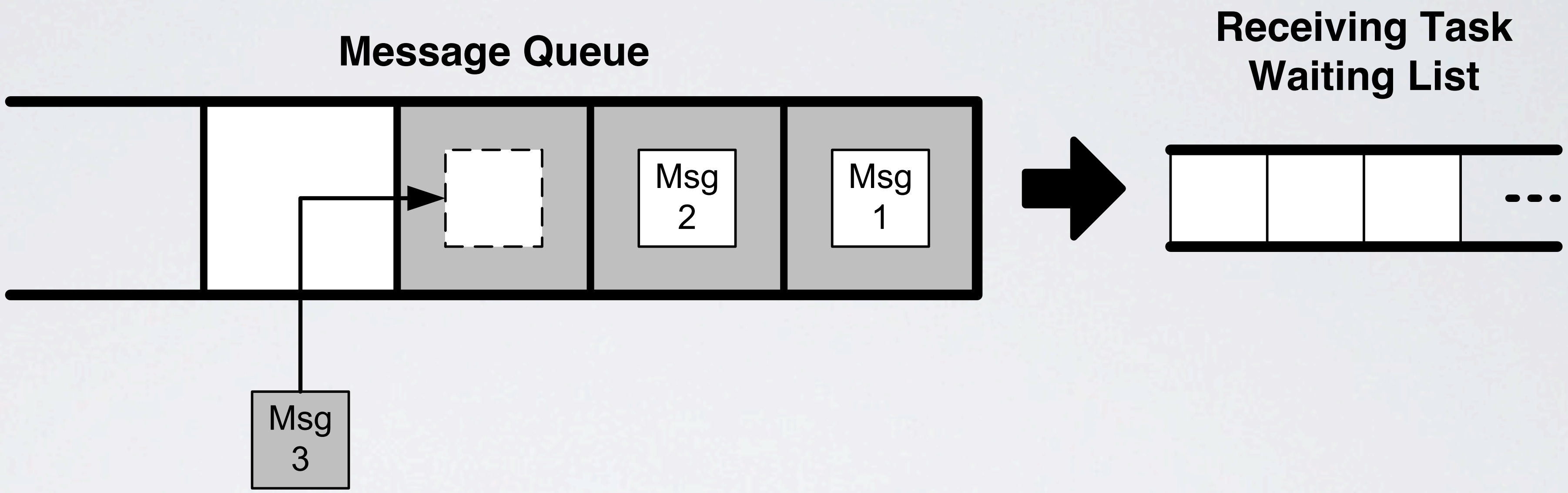
Real Time Concepts for Embedded Systems - Qing li et. al.


tSendingTask
tReceivingTask
Message 1
Message 1
Message 1
Sending tasks memory area
Message queues memory area
Receiving tasks Memory area

MEMORY USAGE

Real Time Concepts for Embedded Systems - Qing li et. al.

FIFO



Message Queue

Receiving Task Waiting List

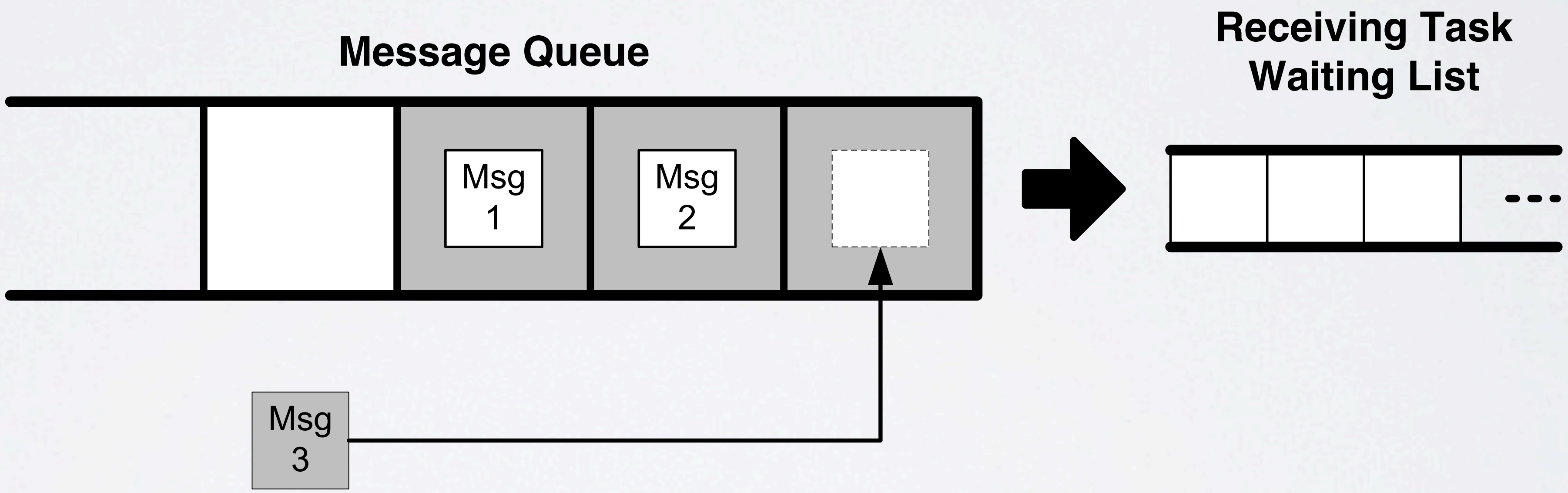
Msg 2

Msg 1

Msg 3

...

LIFO



Message Queue

Receiving Task Waiting List

Msg 1

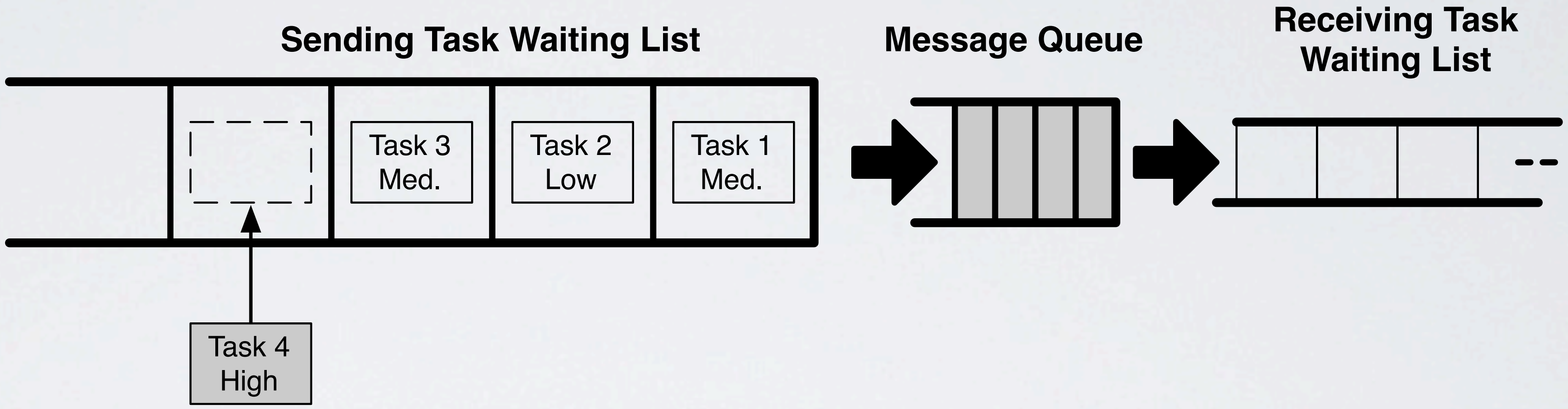
Msg 2

Msg 3

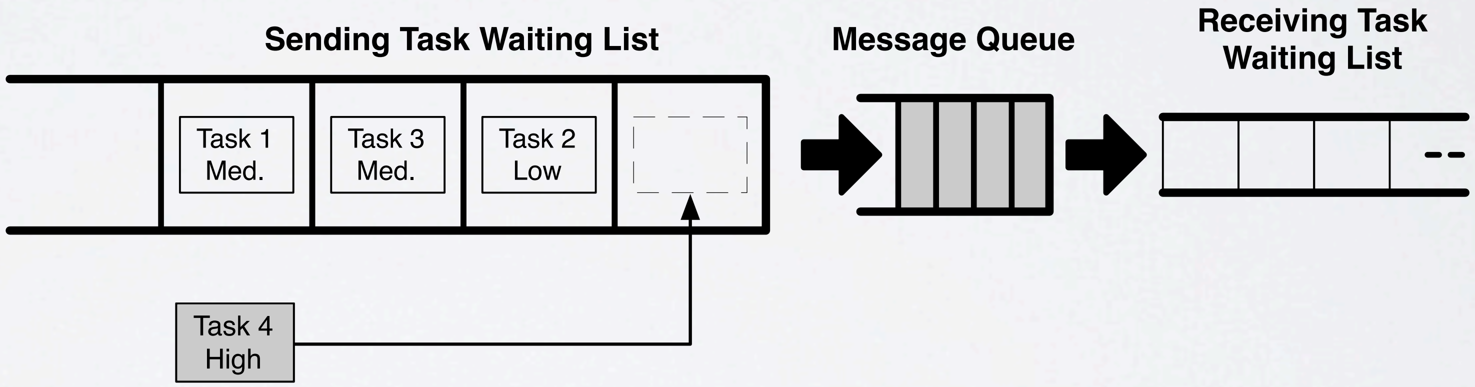
...

Real Time Concepts for Embedded Systems - Qing li et. al.

FIFO



Priority



Real Time Concepts for Embedded Systems - Qing li et. al.

TODAY

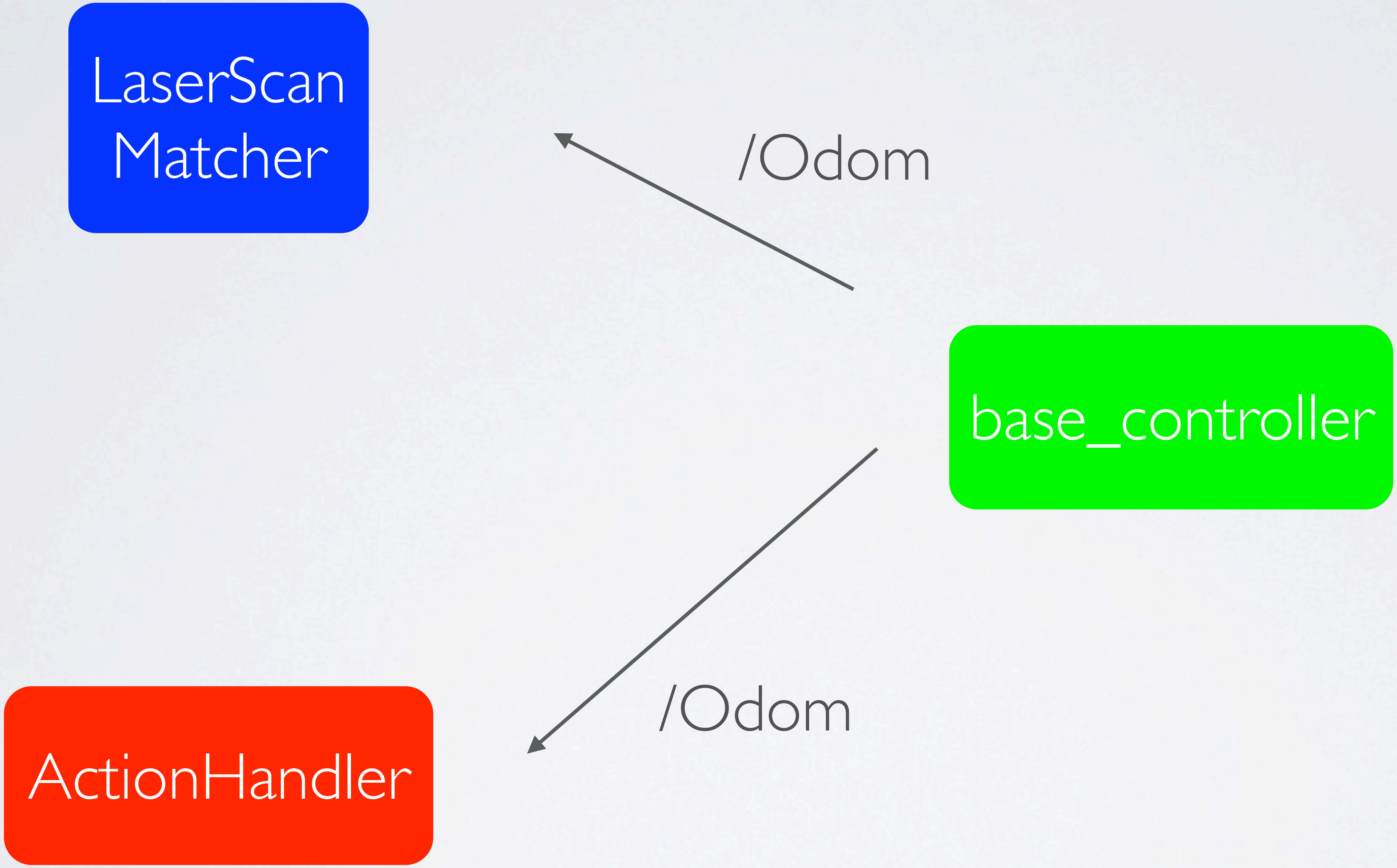
✓Introduction

✓Messages in general

- Queue states
- Memory usage
- Priorities

➡Messages in ROS

WHAT'S A MESSAGE IN ROS?



LaserScan Matcher

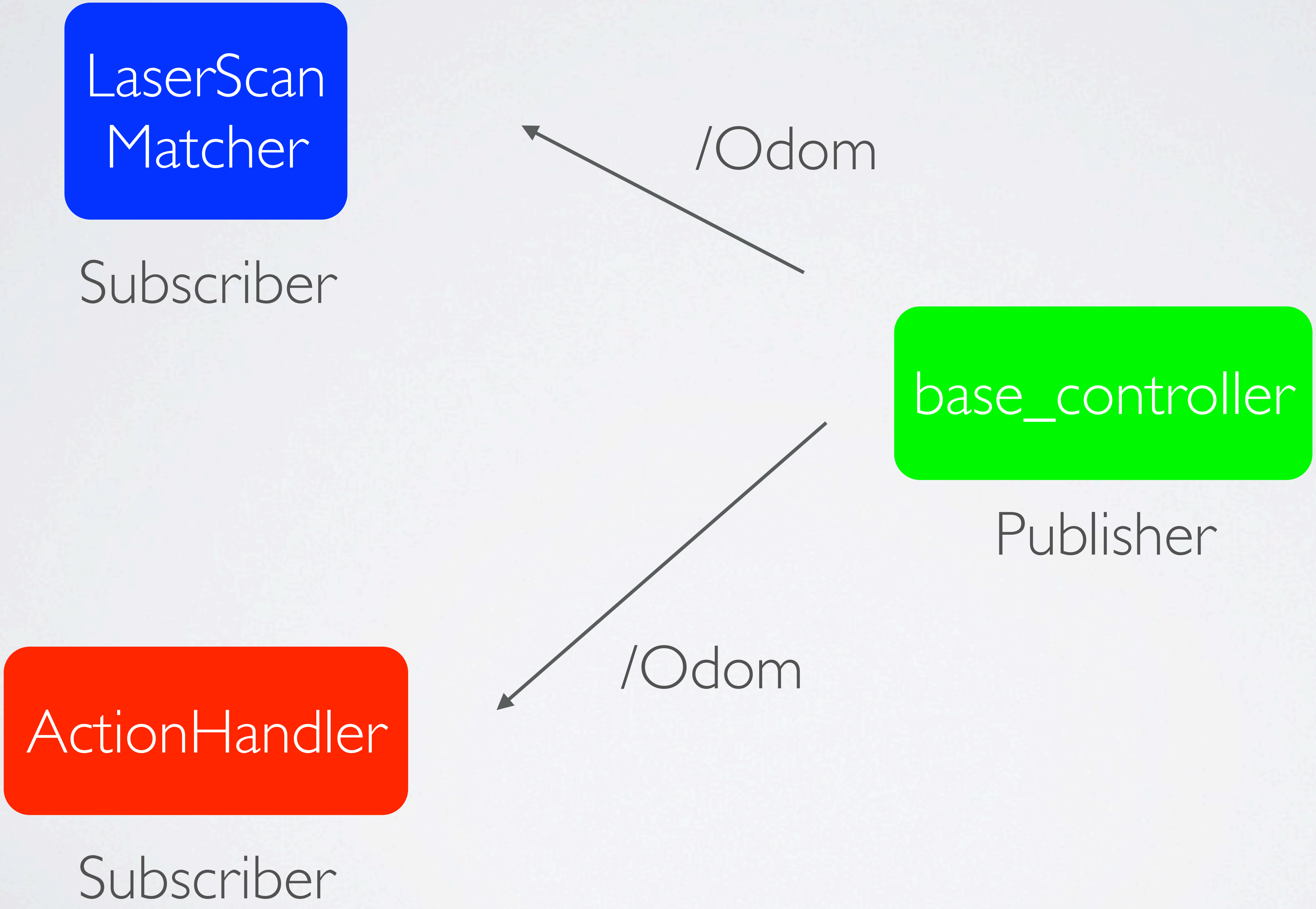
/Odom

base_controller

/Odom

ActionHandler

WHAT'S A MESSAGE IN ROS?



LaserScan Matcher

Subscriber

/Odom

base_controller

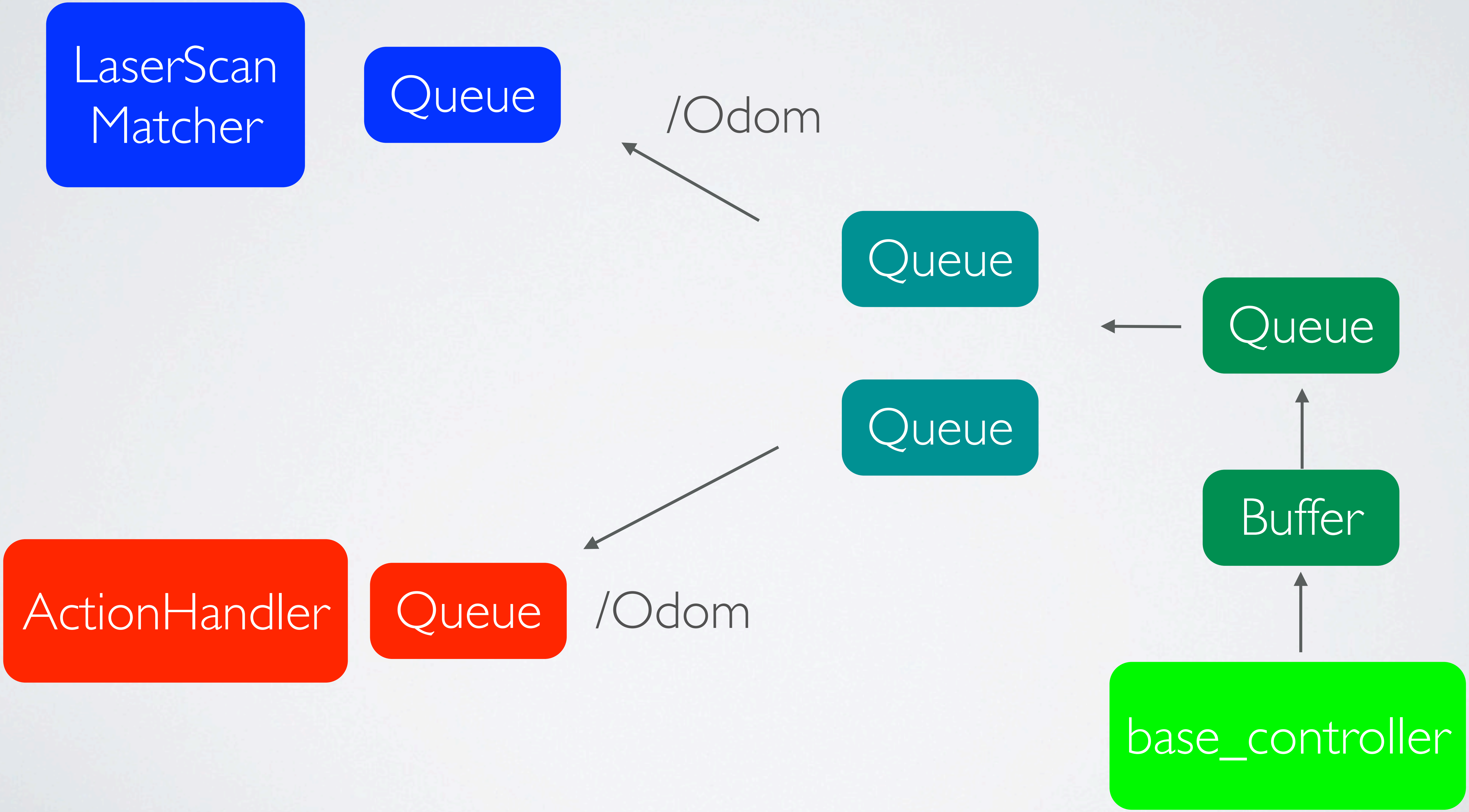
Publisher

/Odom

ActionHandler

Subscriber

WHAT'S A MESSAGE IN ROS?



WHAT'S A MESSAGE IN ROS?

base_controller

```
template<class message_type>

ros::Publisher advertise(const
std::string& topic, uint32_t queue_size);
```

LaserScan Matcher

```
ros::Subscriber sub =
nh.subscribe("topic", 1, callback);
```

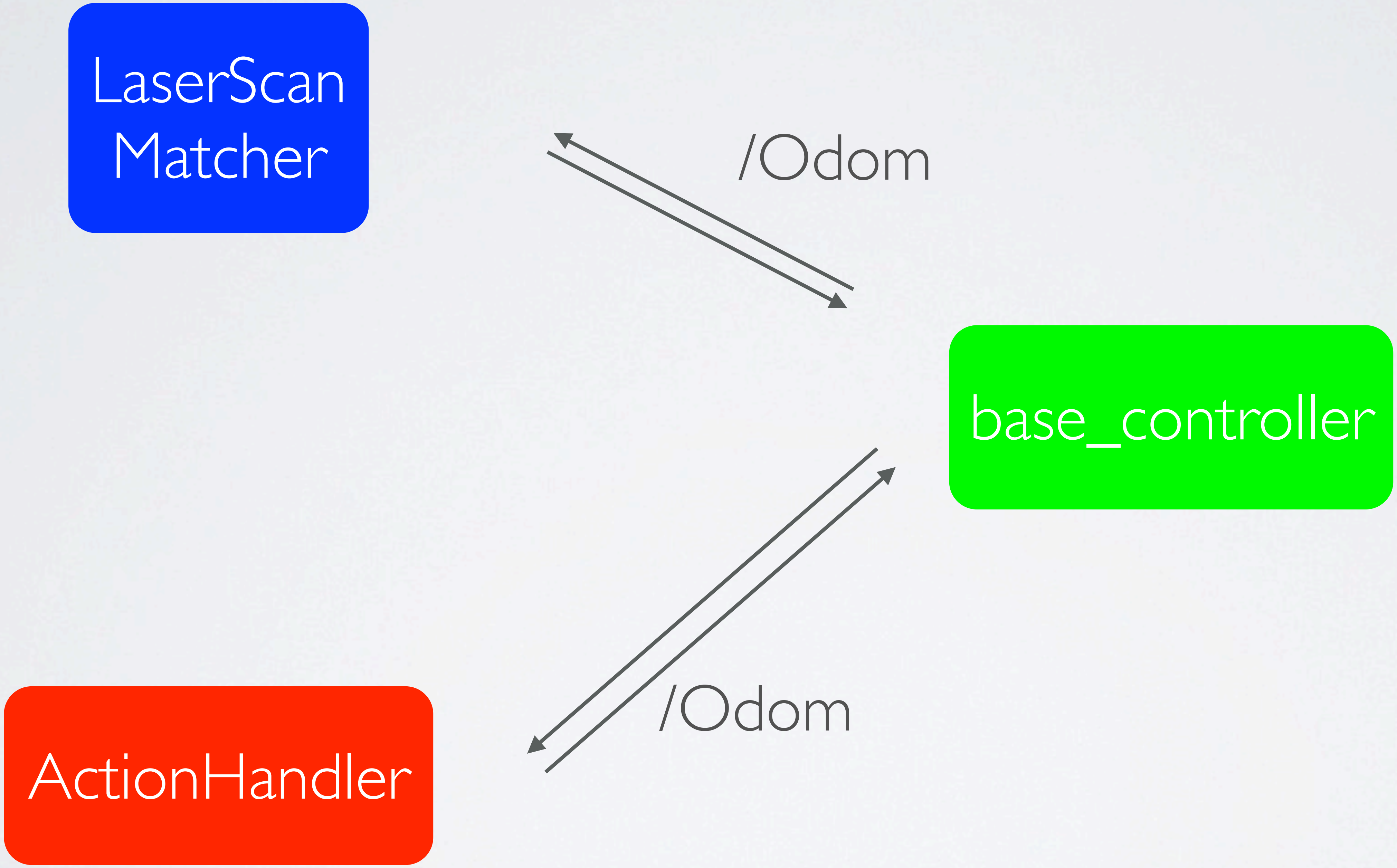
http://mirror.umd.edu/roswiki/roscpp(2f)Overview(2f)Publishers(20)and(20)Subscribers.html

DEFINING A MESSAGE

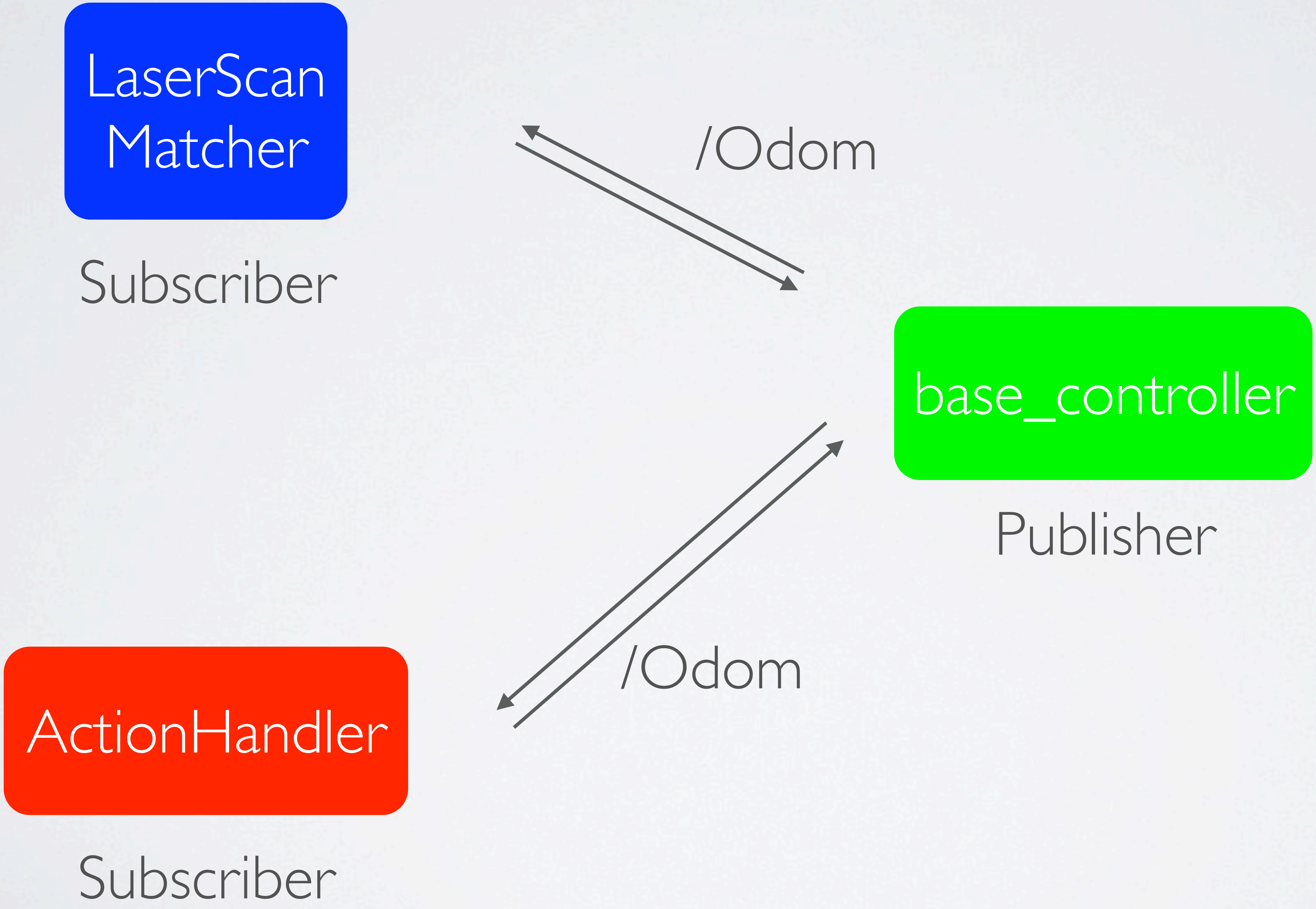
```
#sequence ID
uint32 seq

# * stamp.secs
# * stamp.nsecs
time stamp

# 0: no frame
# 1: global frame
string frame_id

#content
int64 order
float64 amount
```

http://www.ros.org/wiki/msg

SERVICES IN ROS



SERVICES IN ROS



DEFINING A SERVICE

Request

Response

```
#request
string orders

   ---

#response
int64 order
float64 amount
```

SUMMARY

- Messages are used for communication between nodes
- Queues store messages temporarily
- ROS nodes communicate over topics
- Bilateral communcation via services

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