



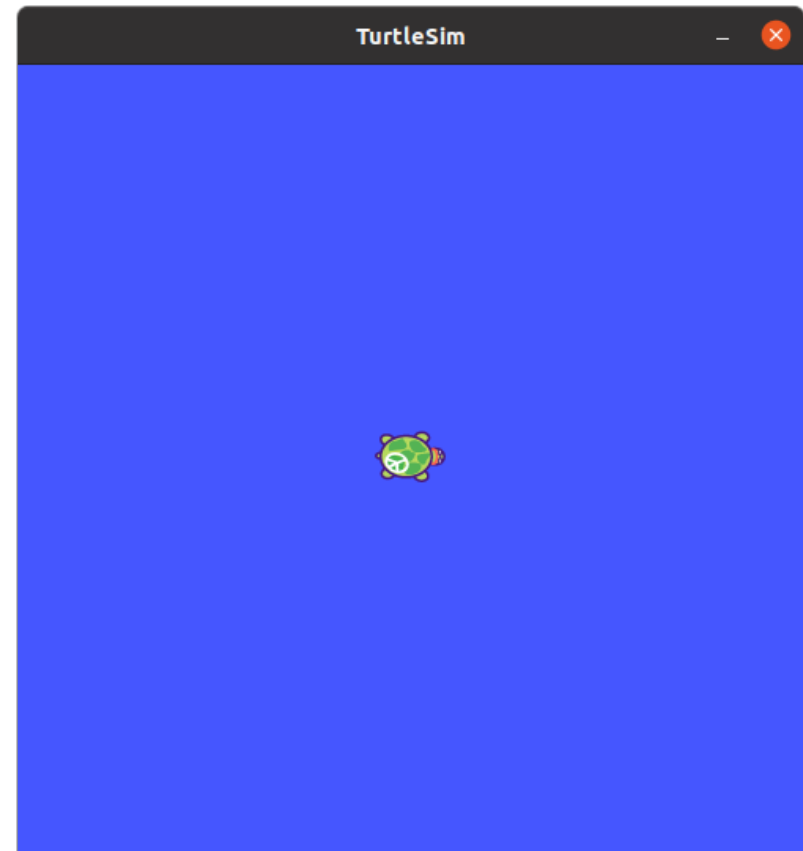
Robot Operating System

Launch file & TurtleSim

# ROS

→ Launch file

→ TurtleSim

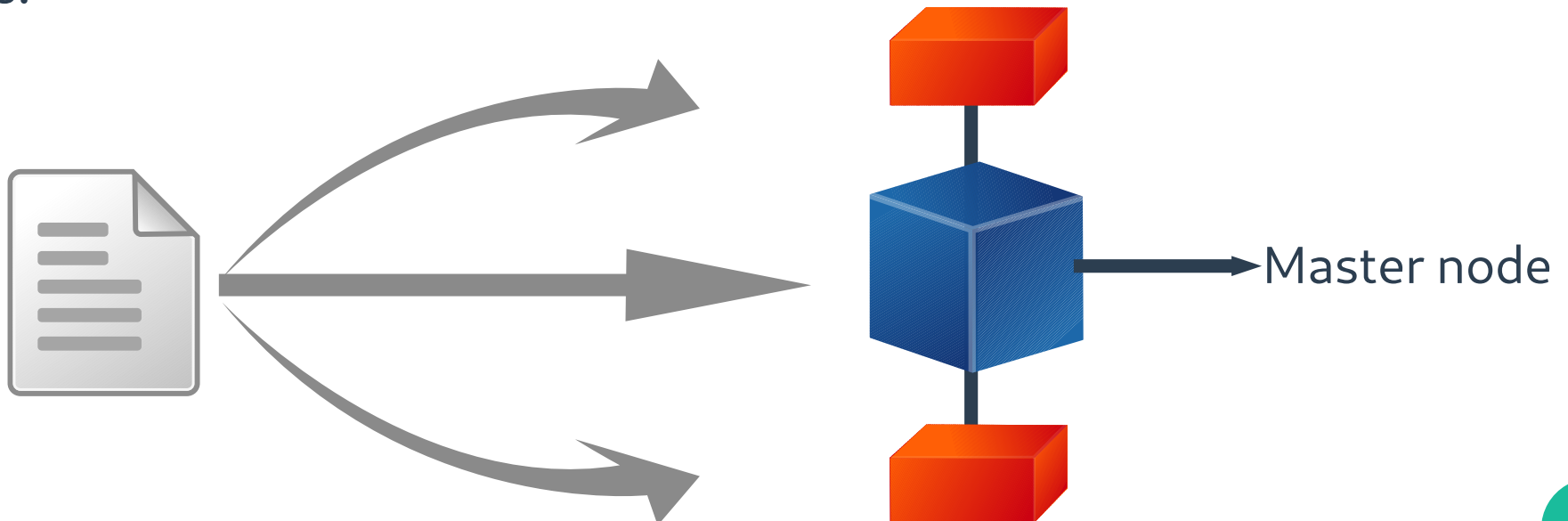


# Launch file

## What is a Launch file?

A very useful feature which allows to run several node at the same time (plus master node).

All node will be written in an XML-based file called by **roslaunch** command. This command will launch master node and any other nodes.



# Creating a Launch file

## Launch file Structure

```
<launch>  
    <node pkg="package_name" type="File_name" name="node_name" output="screen" />  
    <node pkg="package_name" type="File_name" name="node_name" />  
    .  
    .  
    .  
</launch>
```

# Creating a Launch file

## Create launch directory

```
$ mkdir launch/
```

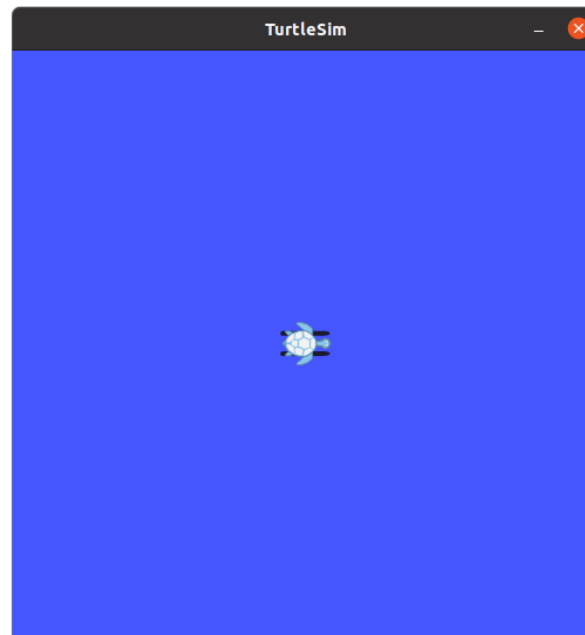
## Create launch file

```
$ > demo_launch.launch
```

# TurtleSim

## Run turtlesim node

```
$ roscore  
$ rosrun turtlesim turtlesim_node
```



# Topics, Messages and Services

## Topics

```
$ rostopic -h
```

```
rostopic bw      display bandwidth used by topic
rostopic delay   display delay of topic from timestamp in header
rostopic echo    print messages to screen
rostopic find    find topics by type
rostopic hz      display publishing rate of topic
rostopic info    print information about active topic
rostopic list    list active topics
rostopic pub     publish data to topic
rostopic type    print topic or field type
```

# Topics, Messages and Services

## Messages

```
$ rosmg -h
```

```
rosmg show      Show message description
rosmg info      Alias for rosmg show
rosmg list       List all messages
rosmg md5        Display message md5sum
rosmg package    List messages in a package
rosmg packages   List packages that contain messages
```



# Topics, Messages and Services

## Services

```
$ rosservice -h
```

```
rosservice args print service arguments  
rosservice call call the service with the provided args  
rosservice find find services by service type  
rosservice info print information about service  
rosservice list list active services  
rosservice type print service type  
rosservice uri print service ROSRPC uri
```

# Creating custom node for turtlesim

## Moving turtle for specific distance

1. Get desired distance.
2. Move turtle.
3. Calculate remaining distance.  $distance = \sqrt{(x^i - x)^2}$
4. Stop turtle.



ROS

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