



# TurtleSim



```
$ sudo apt install ros-noetic-turtlesim
```

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

```
$ rosrun turtlesim turtlesim_node
```



**turtlesim\_node**

# Topics

เปิดหน้าต่างใหม่

```
$ rostopic list
```

```
[user@host:~]# rostopic list
/rosout
/rosout_agg
/turtle1/cmd_vel
/turtle1/color_sensor
/turtle1/pose
```

# Subscribed Topics

*turtleX/cmd\_vel*

( geometry\_msgs/Twist )

# geometry\_msgs/Twist Message

---

File: **geometry\_msgs/Twist.msg**

## Raw Message Definition

```
# This expresses velocity in free space broken into its linear and angular parts.
Vector3 linear
Vector3 angular
```

## Compact Message Definition

```
geometry_msgs/Vector3 linear
geometry_msgs/Vector3 angular
```

*autogenerated on Wed, 13 Jan 2021 03:28:11*

```
$ rostopic info /turtle1/cmd_vel
```

```
[redacted]:~# rostopic info /turtle1/cmd_vel
Type: geometry_msgs/Twist

Publishers: None

Subscribers:
* /turtlesim (http://[redacted]:39525/)
```

# Published Topics

*turtleX/pose*

( *turtlesim/Pose* )

# turtlesim/Pose Message

---

File: **turtlesim/Pose.msg**

## Raw Message Definition

```
float32 x
float32 y
float32 theta

float32 linear_velocity
float32 angular_velocity
```

## Compact Message Definition

```
float32 x
float32 y
float32 theta
float32 linear_velocity
float32 angular_velocity
```

```
$ rostopic info /turtle1/pose
```

```
[...]:~# rostopic info /turtle1/pose
Type: turtlesim/Pose

Publishers:
* /turtlesim (http://[REDACTED]:39525/)

Subscribers: None
```

# Services

```
$ rosservice list
```

```
:~# rosservice list
/clear
/kill
/reset
/rosout/get_loggers
/rosout/set_logger_level
/spawn
/turtle1/set_pen
/turtle1/teleport_absolute
/turtle1/teleport_relative
/turtlesim/get_loggers
/turtlesim/set_logger_level
```

# /clear

( std\_srvs/Empty )

# **std\_srvs/Empty Service**

---

**File:** `std_srvs/Empty.srv`

## **Raw Message Definition**

```
---
```

## **Compact Message Definition**

*autogenerated on Sat, 10 Oct 2020 03:50:09*

```
$ rosservice info /clear
```

```
[...]:~# rosservice info /clear  
\Node: /turtlesim  
URI: rosrpc://[REDACTED]:35707  
Type: std_srvs/Empty  
Args:
```

/kill

( turtlesim/Kill )

# turtlesim/Kill Service

---

File: **turtlesim/Kill.srv**

## Raw Message Definition

```
string name  
---
```

## Compact Message Definition

```
string name
```

*autogenerated on Thu, 18 Feb 2021 03:29:32*

```
$ rosservice info /kill
```

```
[...]:~# rosservice info /kill  
Node: /turtlesim  
URI: rosrpc://[REDACTED]:35707  
Type: turtlesim/Kill  
Args: name
```

# /reset

( std\_srvs/Empty )

# **std\_srvs/Empty Service**

---

**File:** `std_srvs/Empty.srv`

## **Raw Message Definition**

```
---
```

## **Compact Message Definition**

*autogenerated on Sat, 10 Oct 2020 03:50:09*

```
$ rosservice info /reset
```

```
[...]:~# rosservice info /reset  
Node: /turtlesim  
URT: rosrpc://[REDACTED]:35707  
Type: std_srvs/Empty  
Args:
```

# /spawn

( [turtlesim/Spawn](#) )

# turtlesim/Spawn Service

---

File: **turtlesim/Spawn.srv**

## Raw Message Definition

```
float32 x
float32 y
float32 theta
string name # Optional. A unique name will be created and returned if this is empty
---
string name
```

## Compact Message Definition

```
float32 x
float32 y
float32 theta
string name
```

---

```
string name
```

*autogenerated on Thu, 18 Feb 2021 03:29:32*

REF : <http://docs.ros.org/en/api/turtlesim/html/srv/Spawn.html>

```
$ rosservice info /spawn
```

```
[...]:~# rosservice info /spawn
Node: /turtlesim
URI: rosrpc://[REDACTED]:35707
Type: turtlesim/Spawn
Args: x y theta name
```

*turtleX*/set\_pen

( [turtlesim/SetPen](#) )

# turtlesim/SetPen Service

---

File: **turtlesim/SetPen.srv**

## Raw Message Definition

```
uint8 r
uint8 g
uint8 b
uint8 width
uint8 off
---
```

## Compact Message Definition

```
uint8 r
uint8 g
uint8 b
uint8 width
uint8 off
```

*autogenerated on Thu, 18 Feb 2021 03:29:32*

REF : <http://docs.ros.org/en/api/turtlesim/html/srv/SetPen.html>

```
$ rosservice info /turtle1/set_pen
```

```
[REDACTED]:~# rosservice info /turtle1/set_pen
Node: /turtlesim
URI: rosrpc://[REDACTED]:35707
Type: turtlesim/SetPen
Args: r g b width off
```

*turtleX/teleport\_absolute*

( [turtlesim/TeleportAbsolute](#) )

# turtlesim/TeleportAbsolute Service

---

File: **turtlesim/TeleportAbsolute.srv**

## Raw Message Definition

```
float32 x
float32 y
float32 theta
---
```

## Compact Message Definition

```
float32 x
float32 y
float32 theta
```

*autogenerated on Thu, 18 Feb 2021 03:29:32*

```
$ rosservice info /turtle1/teleport_absolute
```

```
:~# rosservice info /turtle1/teleport_absolute
Node: /turtlesim
URI: rosrpc://:35707
Type: turtlesim/TeleportAbsolute
Args: x y theta
```

*turtleX/teleport\_relative*

( [\*turtlesim/TeleportRelative\*](#) )

# turtlesim/TeleportRelative Service

---

File: **turtlesim/TeleportRelative.srv**

## Raw Message Definition

```
float32 linear  
float32 angular  
---
```

## Compact Message Definition

```
float32 linear  
float32 angular
```

*autogenerated on Thu, 18 Feb 2021 03:29:32*

```
$ rosservice info /turtle1/teleport_relative
```

```
[~] :~# rosservice info /turtle1/teleport_relative  
Node: /turtlesim  
URI: rosrpc://[REDACTED]:35707  
Type: turtlesim/TeleportRelative  
Args: linear angular
```

# Parameters

```
$ rosparam list
```

```
:~# rosparam list
/rosdistro
/roslaunch/uris/host_
/rosversion
/run_id
/turtlesim/background_b
/turtlesim/background_g
/turtlesim/background_r
```

# turtlesim/background\_b

( *int, default: 255* )

# turtlesim/background\_g

(*int, default: 86*)

# turtlesim/background\_r

( *int, default: 69* )



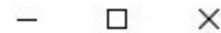
RGB : (69, 86, 255)

RQT

```
$ sudo apt install -y ros-noetic-rqt ros-noetic-rqt-common-plugins
```

```
$ rqt
```

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help



File Plugins Running Perspectives Help

-  Container
-  Actions
-  Configuration
-  Introspection
-  Logging
-  Miscellaneous Tools
-  Services
-  Topic
-  Visualization



File Plugins Running Perspectives Help

- Container
- Actions ▶
- Configuration ▶
- Introspection ▶
- Logging ▶
- Miscellaneous Tools ▶
- Services ▶
- Topics ▶ 
- Visualization ▶

- ▷ Message Publisher
- Message Type Browser
- Topic Monitor

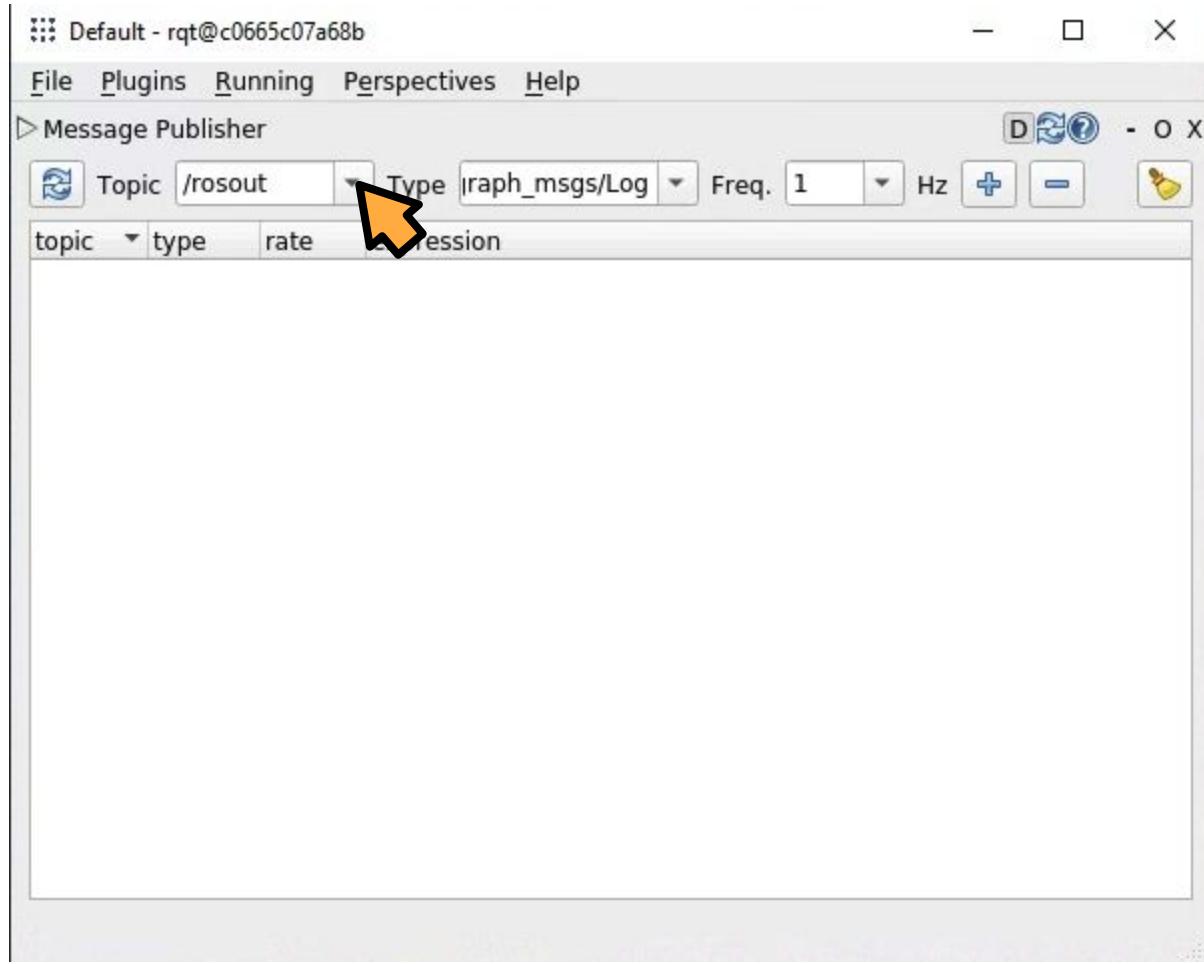
File Plugins Running Perspectives Help

-  Container
-  Actions
-  Configuration
-  Introspection
-  Logging
-  Miscellaneous Tools
-  Services
-  Topics
-  Visualization

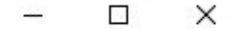
► Message Publisher

Message Type Browser

Topic Monitor



Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

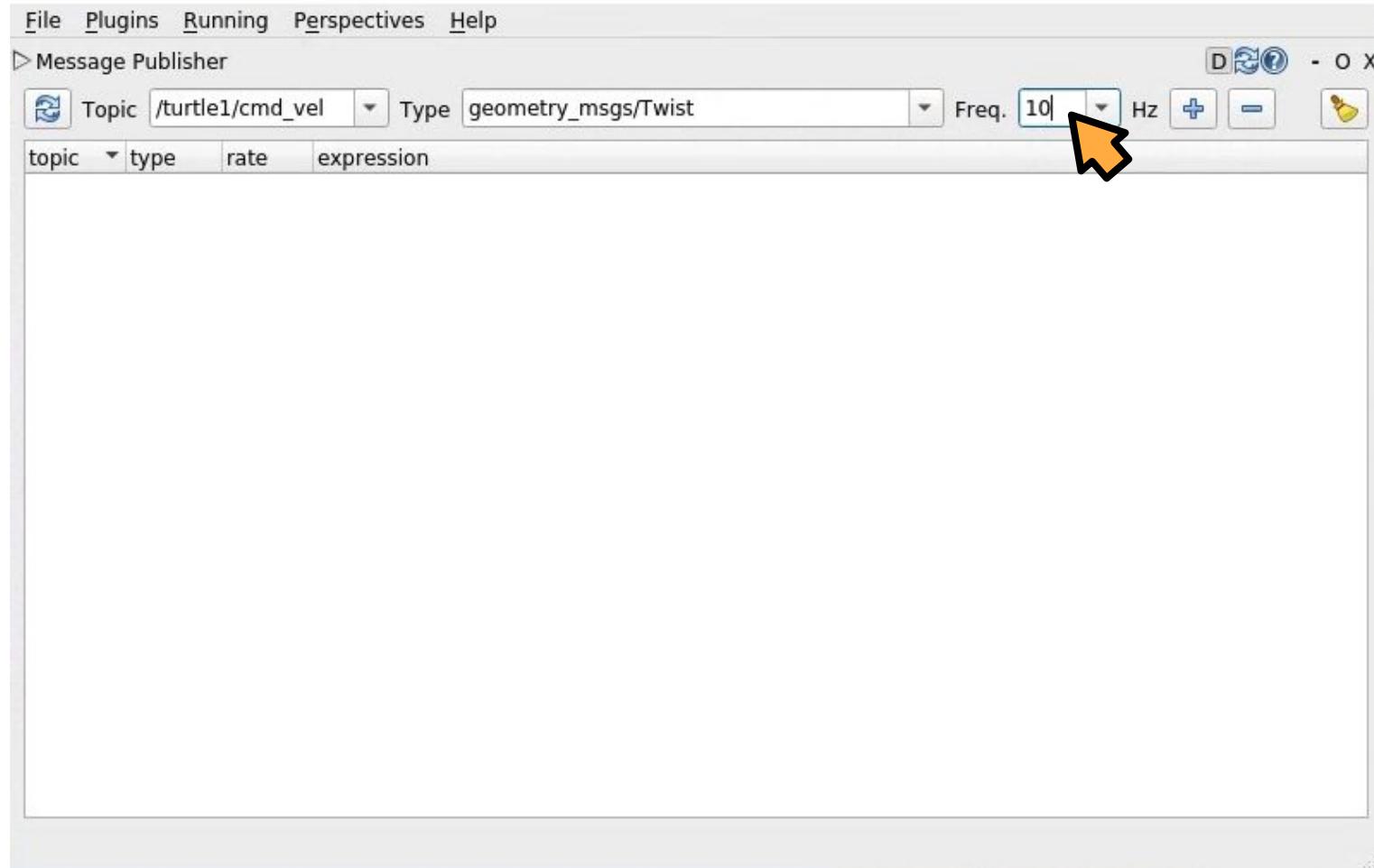
▷ Message Publisher

D ? - o x

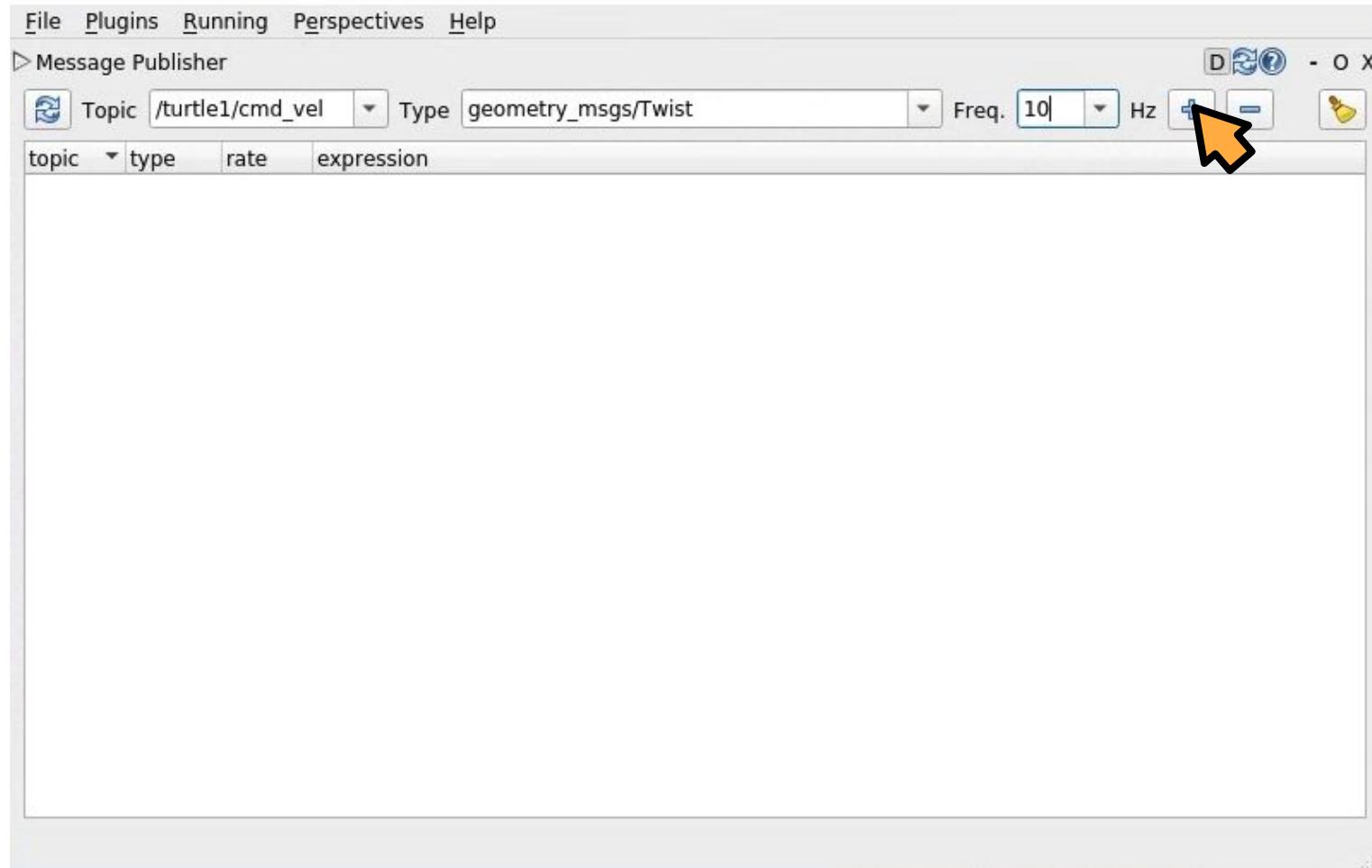
	Topic	/rosout	▼	Type	rosgraph_msgs/Log	▼	Freq.	1	▼	Hz			
topic	▼	/rosout											
		/rosout_agg											
		/turtle1/cmd_vel											
		/turtle1/color_s											
		/turtle1/pose											



Default - rqt@c0665c07a68b



Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

## ▷ Message Publisher

D S ? - O X



Topic /turtle1/cmd\_vel



Type geometry\_msgs/Twist



Freq.

10



Hz



topic	type	rate	expression
-------	------	------	------------

/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
------------------	---------------------	-------	--



Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

Message Publisher

D ? - O X



Topic /turtle1/cmd\_vel

Type geometry\_msgs/Twist

Freq.

10

Hz



topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
angular	geometry_msgs/Vector3		



Default - rqt@c0665c07a68b

- □ ×

File Plugins Running Perspectives Help

▷ Message Publisher

D R ? - o x

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.0	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Default - rqt@c0665c07a68b

- □ ×

File Plugins Running Perspectives Help

▷ Message Publisher

D C ? - o X



Topic /turtle1/cmd\_vel



Type geometry\_msgs/Twist



Freq. 10



Hz



topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.0	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

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## ▷ Message Publisher

D - O X



Topic /turtle1/cmd\_vel

Type geometry\_msgs/Twist

Freq.

10

Hz



topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



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## ▷ Message Publisher

D E ? - O X



Topic /turtle1/cmd\_vel

Type geometry\_msgs/Twist

Freq.

10

Hz



topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



File Plugins Running Perspectives Help

## ▷ Message Publisher

D S ? - O X



Topic

/turtle1/cmd\_vel



Type

geometry\_msgs/Twist



Freq.

10



Hz



+



-



topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



File Plugins Running Perspectives Help

▷ Message Publisher



- O X



Topic /turtle1/cmd\_vel



Type geometry\_msgs/Twist



Freq. 10



Hz



topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

File Plugins Running Perspectives Help

> Mes: Container

topic

- Actions
- Configuration
- Introspection
- Logging
- Miscellaneous Tools
- Services
- Topics
- Visualization

geometry\_msgs/Twist

Freq. 10 Hz

rate	expression
10.00	
vector3	
0.2	
0.0	
vector3	
0.0	



File Plugins Running Perspectives Help

▷ Mes topic

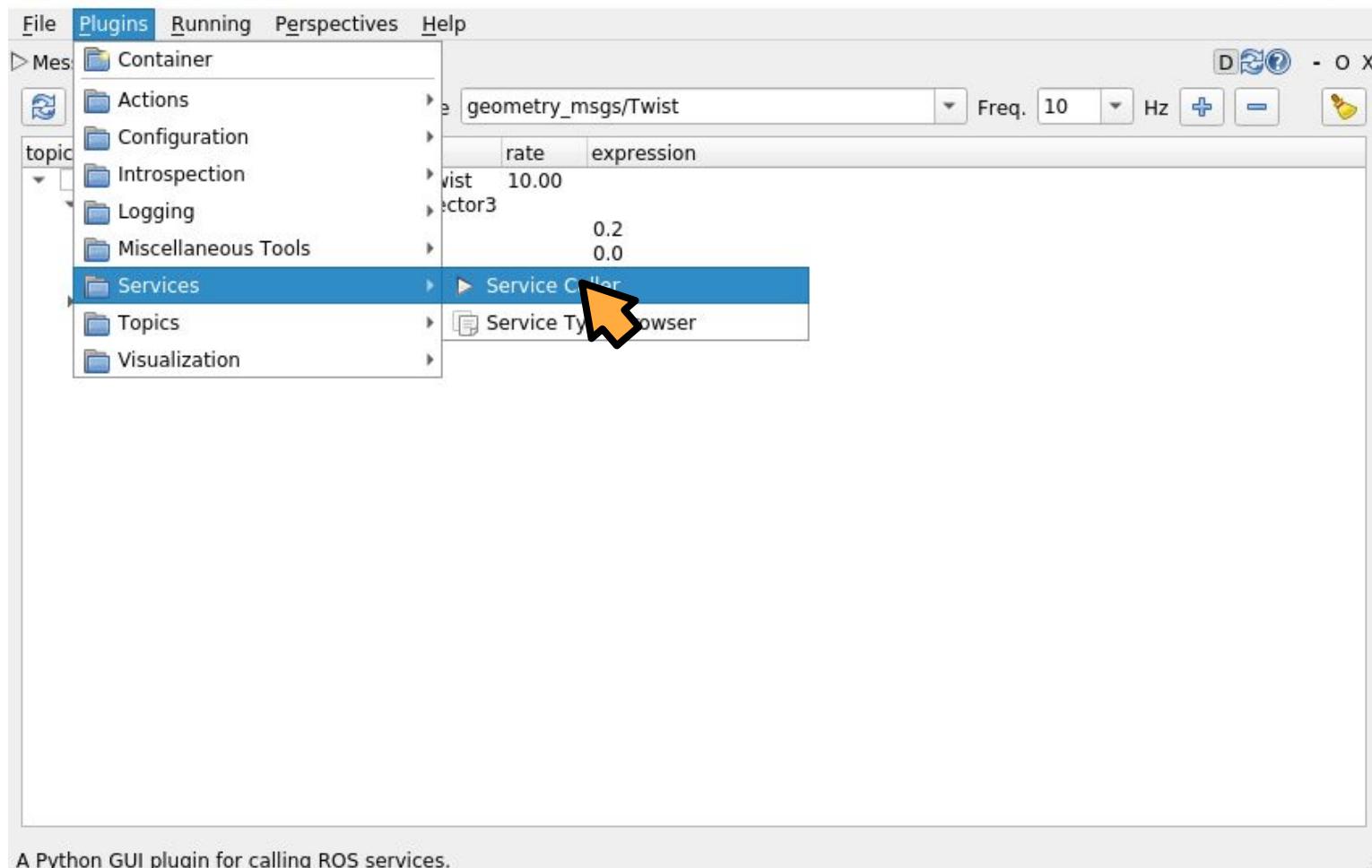
- Container
- Actions
- Configuration
- Introspection
- Logging
- Miscellaneous Tools
- Services**
- Topics
- Visualization

geometry\_msgs/Twist Freq. 10 Hz + - ⚙️ 🔍 🌐

rate expression  
10.00  
vector3  
0.2  
0.0

Service Caller Service Type Browser

Plugins related to ROS services.



File Plugins Running Perspectives Help

Message Publisher



- O X

Service Caller



- O X

Topic :e1/cmd\_vel

Type :msgs/Twist

Freq. 10

Hz



topic type rate expression

<input checked="" type="checkbox"/> /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service /clear



Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

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## Message Publisher



- O X

## Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service
/clear
/kill
/reset
/clear std::string
/rosout/get_loggers
/rosout/set_logger_level
/rqt_gui_py_node_4240/get_loggers
/rqt_gui_py_node_4240/set_logger_level
/spawn
/turtle1/set_pen
/turtle1/teleport_absolute
/turtle1/teleport_relative
/turtlesim/get_loggers
/turtlesim/set_logger_level



Call

File Plugins Running Perspectives Help

Message Publisher

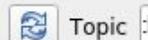


- O X

Service Caller



- O X



Topic /le1/cmd\_vel



Type geometry\_msgs/Twist



Freq. 10



Hz



topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

0.2



Service /clear



Call



Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value



File Plugins Running Perspectives Help

Message Publisher



- O X

Service Caller



- O X

Topic :e1/cmd\_vel

Type \_msgs/Twist

Freq. 10

Hz



topic type rate expression

<input type="checkbox"/> /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service /clear



Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

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## Message Publisher



- O X

## Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type
/reset	std::string
/clear	std::string
/rosout/get_loggers	
/rosout/set_logger_level	
/rqt_gui_py_node_4240/get_loggers	
/rqt_gui_py_node_4240/set_logger_level	
/spawn	
/turtle1/set_pen	
/turtle1/teleport_absolute	
/turtle1/teleport_relative	
/turtlesim/get_loggers	
/turtlesim/set_logger_level	



Call

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▷ Message Publisher



-

O

X

▷ Service Caller



-

O

X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service	/reset

## Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

## Response

Field	Type	Value

Call





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## ▷ Message Publisher



-

0

X

## ▷ Service Caller



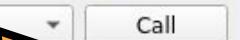
-

0

X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service /reset

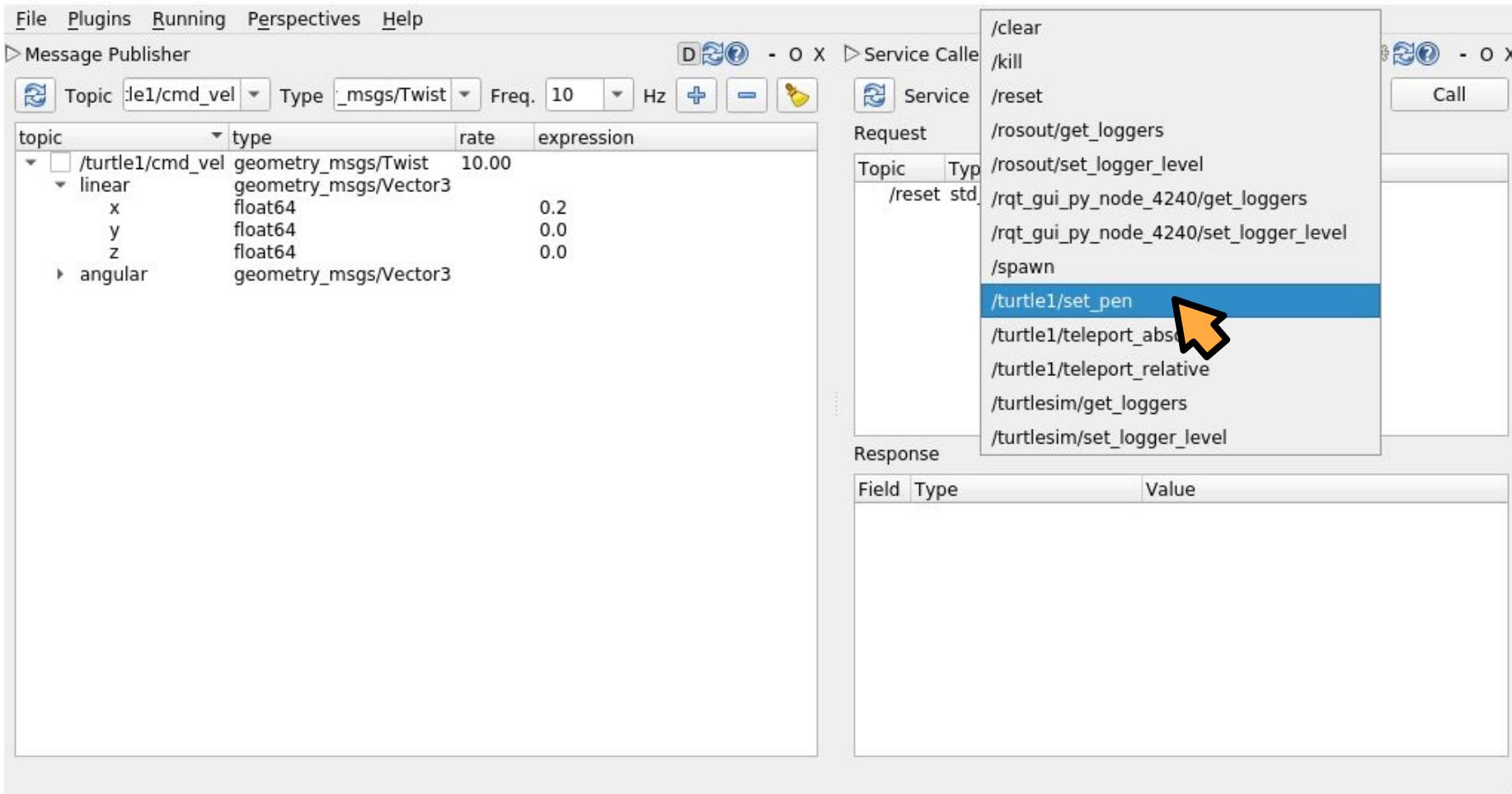


## Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

## Response

Field	Type	Value



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## Message Publisher



- O X

## Service Caller



- O X

Topic /t1/cmd\_vel ▾ Type geometry\_msgs/Twist ▾ Freq. 10 ▾ Hz

topic	type	rate	expression
/t1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service /t1/set\_pen ▾ Call

## Request

Topic	Type	Expression
/t1/set_pen	turtlesim/SetPenRequest	
r	uint8	0
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0



## Response

Field	Type	Value

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Message Publisher



- O X

Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service	Expression	Call
/turtle1/set_pen		

## Request

Topic	Type	Expression
/turtle1/set_pen	turtlesim/SetPenRequest	
r	uint8	0
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0



## Response

Field	Type	Value

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## Message Publisher



- O X

## Service Caller



- O X



Topic /le1/cmd\_vel



Type \_msgs/Twist



Freq. 10



Hz



topic

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Service /turtle1/set\_pen



Call



## Request

Topic	Type	Expression
/turtle1/set_pen	turtlesim/SetPenRequest	
r	uint8	255
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0

## Response

Field	Type	Value

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## Message Publisher



- O X

## Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type	Expression
/turtle1/set_pen	turtlesim/SetPenRequest	
r	uint8	255
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0

## Response

/ turtlesim/SetPenResponse

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Message Publisher



- O X

Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



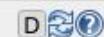
Topic	Type	Expression
/turtle1/set_pen	turtlesim/SetPenRequest	
r	uint8	255
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0

Response

Field	Type	Value
/	turtlesim/SetPenResponse	

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## ▷ Message Publisher



- O X

## ▷ Service Caller



- O X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service	/turtle1/set_pen	Call
---------	------------------	------

## Request

Topic	Type	Expression
✓ /turtle1/set_pen	turtlesim/SetPenRequest	
r	uint8	255
g	uint8	0
b	uint8	0
width	uint8	0
off	uint8	0

## Response

Field	Type	Value
/	turtlesim/SetPenResponse	



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## Message Publisher



- O X

## Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type
/reset	std::string
/clear	std::string
/rosout/get_loggers	
/rosout/set_logger_level	
/rqt_gui_py_node_4240/get_loggers	
/rqt_gui_py_node_4240/set_logger_level	
/spawn	
/turtle1/set_pen	
/turtle1/teleport_absolute	
/turtle1/teleport_relative	
/turtlesim/get_loggers	
/turtlesim/set_logger_level	



Call

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▷ Message Publisher



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X

▷ Service Caller



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X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service	/reset

## Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

## Response

Field	Type	Value

Call





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## ▷ Message Publisher



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▷ Service Caller



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X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Service

/reset



▼

Call

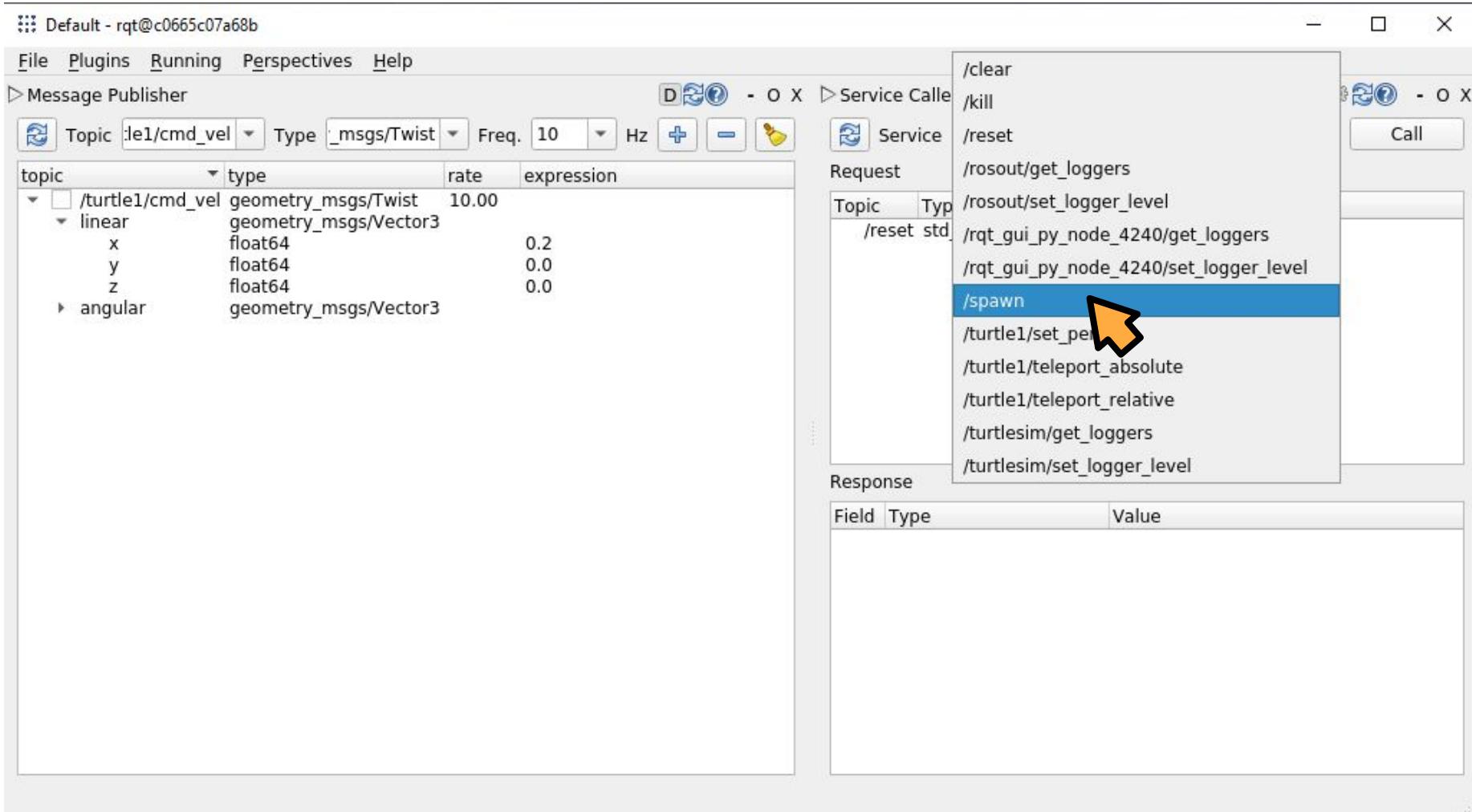
## Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

## Response

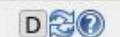
Field	Type	Value





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## ▷ Message Publisher



- O X

## ▷ Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Topic

/e1/cmd\_vel

Type

msgs/Twist

Freq.

10

Hz



+

-



Service

/spawn



Call



## Request

Topic	Type	Expression
/spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	"



## Response

Field	Type	Value

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## ▷ Message Publisher



- O X

## ▷ Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type	Expression
/spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	" "

## Request

Topic	Type	Expression
/spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	" "



## Response

Field	Type	Value

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> Message Publisher



- O X

&gt; Service Caller



- O X

Topic :/e1/cmd\_vel

Type :geometry\_msgs/Twist

Freq. 10

Hz



topic type

✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00
linear	geometry_msgs/Vector3	
x	float64	0.2
y	float64	0.0
z	float64	0.0
angular	geometry_msgs/Vector3	

Service /spawn

Call

Request

Topic	Type	Expression
-------	------	------------

✓ /spawn	turtlesim/SpawnRequest	
----------	------------------------	--

x	float32	0.0
---	---------	-----

y	float32	0.0
---	---------	-----

theta	float32	0.0
-------	---------	-----

name	string	'turtle2'
------	--------	-----------

Response

Field	Type	Value
-------	------	-------



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▶ Message Publisher



- O X

▶ Service Caller



- O X

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type	Expression
✓ /spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	'turtle2'

## Request

Topic	Type	Expression
✓ /spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	'turtle2'

## Response

Field	Type	Value
✓ /	turtlesim/SpawnResponse	
name	string	'turtle2'



File Plugins Running Perspectives Help

Message Publisher



- O X

Service Caller



- O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Topic	Type	Expression
/spawn	turtlesim/SpawnRequest	
x	float32	0.0
y	float32	0.0
theta	float32	0.0
name	string	'turtle2'

#### Response

Field	Type	Value
/	turtlesim/SpawnResponse	
name	string	'turtle2'

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic **turtle1/cmd\_vel** ▾ Type **geometry\_msgs/Twist** ▾ Freq. **10** Hz **[+]** **[-]** **[brush]**

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Service **/clear** Call

Request

Topic	Type
/clear	std::string

/kill  
/reset  
/rosout/get\_loggers  
/rosout/set\_logger\_level  
/rqt\_gui\_py\_node\_26031/get\_loggers  
/rqt\_gui\_py\_node\_26031/set\_logger\_level  
/spawn  
/turtle1/set\_pen  
/turtle1/teleport\_absolute  
/turtle1/teleport\_relative

Response

Field
/turtle2/set_pen
/turtle2/teleport_absolute
/turtle2/teleport_relative
/turtlesim/get_loggers
/turtlesim/set_logger_level

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

Service Caller

- O X

Topic `turtle1/cmd_vel` Type `geometry_msgs/Twist` Freq. 10 Hz

to	type	rate	expression
<code>turtle1/cmd_vel</code>	<code>geometry_msgs/Twist</code>	10.00	
linear	<code>geometry_msgs/Vector3</code>		
x	<code>float64</code>	0.2	
y	<code>float64</code>	0.0	
z	<code>float64</code>	0.0	
angular	<code>geometry_msgs/Vector3</code>		

Service `/clear`

Request

Topic	Type	Expression
<code>/clear</code>	<code>std_srvs/EmptyRequest</code>	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



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> Message Publisher

D O X > Service Caller

D O X

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		

D O X

Service /clear

Call

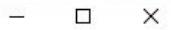
Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic /rosout

Type rosgraph\_msgs/Log

Freq. 10 Hz

+ - ⚡

topic	rate	expression
/rosout		
/rosout_agg		
/turtle1/cmd_vel	10.00	try_msgs/Twist
/linear/turtle1...r_sensor		try_msgs/Vector3
/turtle1/cmd_vel	0.2	
/turtle1/r_sensor	0.0	
/turtle2/cmd_vel	0.0	
/turtle2...r_sensor		
/turtle2/pose		try_msgs/Vector3

Service /clear

Call

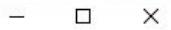
Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic /rosout

Type rosgraph\_msgs/Log

Freq. 10 Hz

+ - ⚡

topic	rate	expression
/rosout		
/rosout_agg		
/turtle1/cmd_vel	try_msgs/Twist	10.00
/linear/turtle1...r_sensor	try_msgs/Vector3	
x /turtle1/pose		0.2
y /turtle2/cmd_vel		0.0
z /turtle2...r_sensor		0.0
angular/turtle2/pose	msgs/Vector3	



Service /clear

Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic /rosout

Type rosgraph\_msgs/Log

Freq. 10 Hz

+ - ⚡

topic	rate	expression
/rosout	try_msgs/Twist	10.00
/rosout_agg	try_msgs/Vector3	
/turtl		
linear		
/turtle1/cmd_vel		
x	/turtle1/pose	0.2
y	/turtle2/cmd vel	0.0
z	/turtle2...r_sensor	0.0
angu		
/turtle2/pose	try_msgs/Vector3	

Service /clear

Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Service Caller

Service	Type	Call
/clear	std_srvs/EmptyRequest	

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

Message Publisher



- O X

Service Caller



Topic urtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic type rate expression

✓ /turtle1/cmd\_vel geometry\_msgs/Twist 10.00

linear geometry\_msgs/Vector3

x float64 0.2

y float64 0.0

z float64 0.0

angular geometry\_msgs/Vectors

✓ /turtle2/cmd\_vel geometry\_msgs/Twist 10.00

Topic /clear Service /clear Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

Message Publisher



Service Caller



Topic urtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic type rate expression

/turtle1/cmd\_vel geometry\_msgs/Twist 10.00  
linear geometry\_msgs/Vector3  
x float64 0.2  
y float64 0.0  
z float64 0.0  
angular geometry\_msgs/Vector3  
/turtle2/cmd\_vel geometry\_msgs/Twist 10.00



Service /clear Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher Service Caller

Topic /turtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
angular	geometry_msgs/Vector3		

Request

Service /clear Call

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value



Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher



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> Service Caller



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Topic /turtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic type rate expression

✓ /turtle1/cmd\_vel geometry\_msgs/Twist 10.00

  linear geometry\_msgs/Vector3

    x float64

    y float64

    z float64

    0.2

  angular geometry\_msgs/Vector3

✓ /turtle2/cmd\_vel geometry\_msgs/Twist 10.00

  linear geometry\_msgs/Vector3

    x float64

    y float64

    z float64

    0.0

  angular geometry\_msgs/Vector3



Topic /clear Type std\_srvs/EmptyRequest Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic urtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.0	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Topic Service /clear Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic urtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		
/turtle2/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		



Service /clear

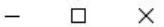
Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic urtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic type rate expression

✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00
↳ linear	geometry_msgs/Vector3	
x	float64	0.2
y	float64	0.0
z	float64	0.0
↳ angular	geometry_msgs/Vector3	
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00
↳ linear	geometry_msgs/Vector3	
x	float64	0.5
y	float64	0.0
z	float64	0.0
↳ angular	geometry_msgs/Vector3	

Service /clear

Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic **turtle2/cmd\_vel** Type **geometry\_msgs/Twist** Freq. **10** Hz **[+]** **[-]** **[!]**

topic	type	rate	expression
-------	------	------	------------

✓ /turtle1/cmd\_vel geometry\_msgs/Twist 10.00

  ↳ linear geometry\_msgs/Vector3

    x float64 0.2

    y float64 0.0

    z float64 0.0

  ↳ angular geometry\_msgs/Vector3

✓ /turtle2/cmd\_vel geometry\_msgs/Twist 10.00

  ↳ linear geometry\_msgs/Vector3

    x float64 0.5

    y float64 0.5

    z float64 0.0

  ↳ angular geometry\_msgs/Vector3

Service **/clear** Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

Message Publisher

Service Caller

Call

Topic /turtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
	geometry_msgs/Vector3		
	float64	0.2	
	float64	0.0	
	float64	0.0	
▶ angular	geometry_msgs/Vector3		
/turtle2/cmd_vel	geometry_msgs/Twist	10.00	
	geometry_msgs/Vector3		
	float64	0.5	
	float64	0.5	
	float64	0.0	
▶ angular	geometry_msgs/Vector3		

Service /clear

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

Service Caller

Service Caller

Topic **urte2/cmd\_vel** Type **geometry\_msgs/Twist** Freq. **10** Hz **[+]** **[-]** **[bell]**

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
angular	geometry_msgs/Vector3		

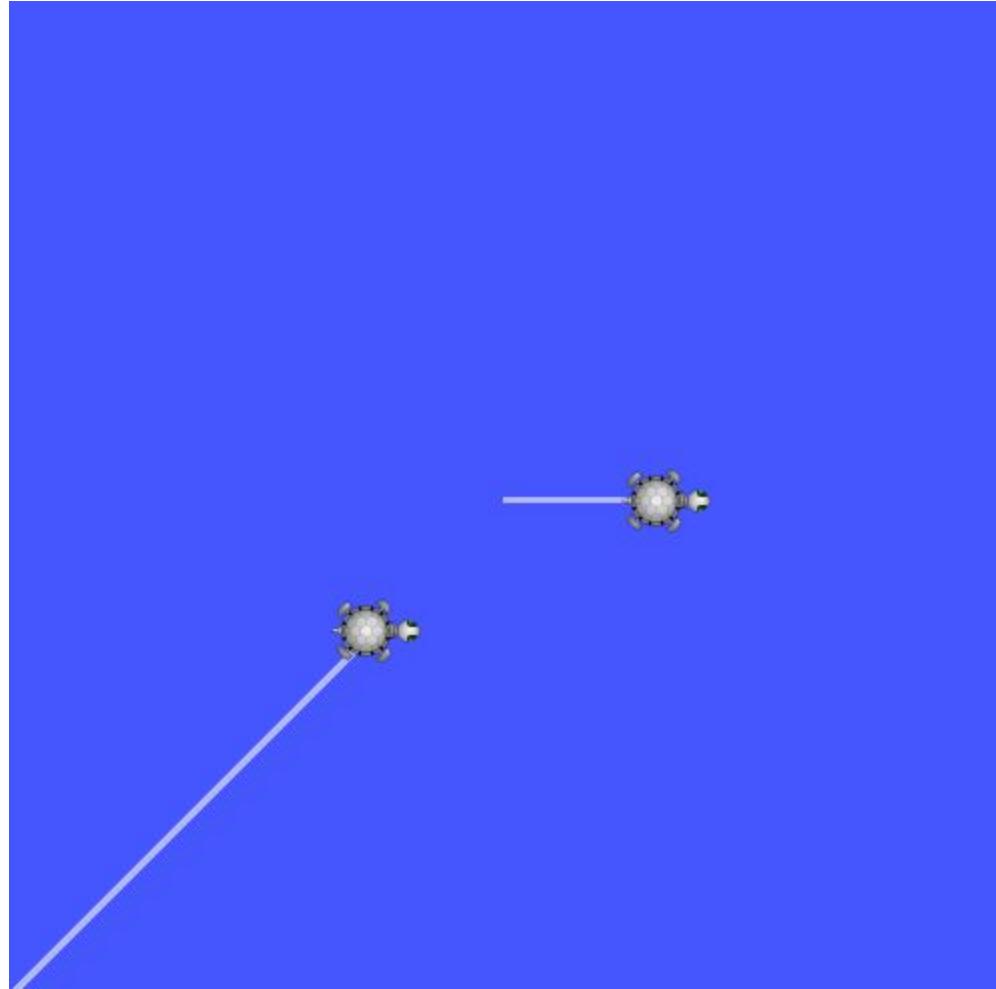
Service **/clear** **[Call]**

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value



Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

Service Caller



topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
geometry_msgs/Vector3			
float64		0.2	
float64		0.0	
float64		0.0	
angular	geometry_msgs/Vector3		
geometry_msgs/Vector3			
float64		0.5	
float64		0.5	
float64		0.0	
angular	geometry_msgs/Vector3		

Service /clear

Call

Request

Topic	Type	Expression
/clear	std_srvs/EmptyRequest	

Response

Field	Type	Value

**File Plugins Running Perspectives Help**

Message Publisher

Topic **urte2/cmd\_vel** ▾ Type **geometry\_msgs/Twist** ▾ Freq. **10** Hz **[+]** **[=]** **[?] [!]**

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

D S O X

D S O X

Service **/clear**

Call



Request

Topic

Type

Expression

/clear std\_srvs/EmptyRequest

Response

Field

Type

Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

> Message Publisher

D S O X > Service Caller

D S O X

Topic **turtle2/cmd\_vel** Type **geometry\_msgs/Twist** Freq. **10 Hz** + - ⚡

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Service **/clear**

Request

Topic	Type
/clear	std::string

Response

Field	Type
/kill	
/reset	
/rosout/get_loggers	
/rosout/set_logger_level	
/rqt_gui_py_node_26031/get_loggers	
/rqt_gui_py_node_26031/set_logger_level	
/spawn	
/turtle1/set_pen	
/turtle1/teleport_absolute	
/turtle1/teleport_relative	
/turtlesim/get_loggers	
/turtlesim/set_logger_level	

Call

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher



topic	type	rate	expression
/turtle1/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
angular	geometry_msgs/Vector3		
/turtle2/cmd_vel	geometry_msgs/Twist	10.00	
linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
angular	geometry_msgs/Vector3		

Service Caller



Service	Type
/clear	
/kill	
Request	
Topic	Type
/reset	
/clear std	
/rosout/get_loggers	
/rosout/set_logger_level	
/rqt_gui_py_node_26031/get_loggers	
/rqt_gui_py_node_26031/set_logger_level	
/spawn	
/turtle1/set_pen	
/turtle1/teleport_absolute	
/turtle1/teleport_relative	
Response	
Field	Type
/turtlesim/get_loggers	
/turtlesim/set_logger_level	



Default - rqt@c0665c07a68b



File Plugins Running Perspectives Help

Message Publisher

Service Caller

Call

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Service /reset

Call

Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

Response

Field	Type	Value

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

Service Caller

Call

Topic /turtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Service /reset

Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

Response

Field	Type	Value
/	std_srvs/EmptyResponse	



```
$ rosparam set /turtlesim/background_r 255
```

**File Plugins Running Perspectives Help****> Message Publisher****D S O X > Service Caller****D S O X - Call****Topic** **turtle2/cmd\_vel** **Type** **geometry\_msgs/Twist** **Freq.** **10 Hz** **+ -** **!****topic** **type** **rate** **expression**└─ **/turtle1/cmd\_vel** **geometry\_msgs/Twist** **10.00**  └─ **linear** **geometry\_msgs/Vector3**    **x** **float64** **0.2**    **y** **float64** **0.0**    **z** **float64** **0.0**  └─ **angular** **geometry\_msgs/Vector3**└─ **/turtle2/cmd\_vel** **geometry\_msgs/Twist** **10.00**  └─ **linear** **geometry\_msgs/Vector3**    **x** **float64** **0.5**    **y** **float64** **0.5**    **z** **float64** **0.0**  └─ **angular** **geometry\_msgs/Vector3****Service** **/reset****Request****Topic** **Type** **Expression**

/reset std\_srvs/EmptyRequest

**Call****Response****Field** **Type** **Value**

/ std\_srvs/EmptyResponse

Default - rqt@c0665c07a68b

File Plugins Running Perspectives Help

Message Publisher

Service Caller

Call

Topic /turtle2/cmd\_vel Type geometry\_msgs/Twist Freq. 10 Hz + - ⚡

topic	type	rate	expression
✓ /turtle1/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.2	
y	float64	0.0	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		
✓ /turtle2/cmd_vel	geometry_msgs/Twist	10.00	
↳ linear	geometry_msgs/Vector3		
x	float64	0.5	
y	float64	0.5	
z	float64	0.0	
↳ angular	geometry_msgs/Vector3		

Service /reset

Request

Topic	Type	Expression
/reset	std_srvs/EmptyRequest	

Response

Field	Type	Value
/	std_srvs/EmptyResponse	



กด `ctrl+c` ใน ทุกๆ หน้า เพื่อหยุดการทำงาน

และ กดปิดหน้าจอทั้งหมด

ทดลองทำ

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

```
$ rosrun turtlesim turtlesim_node
```

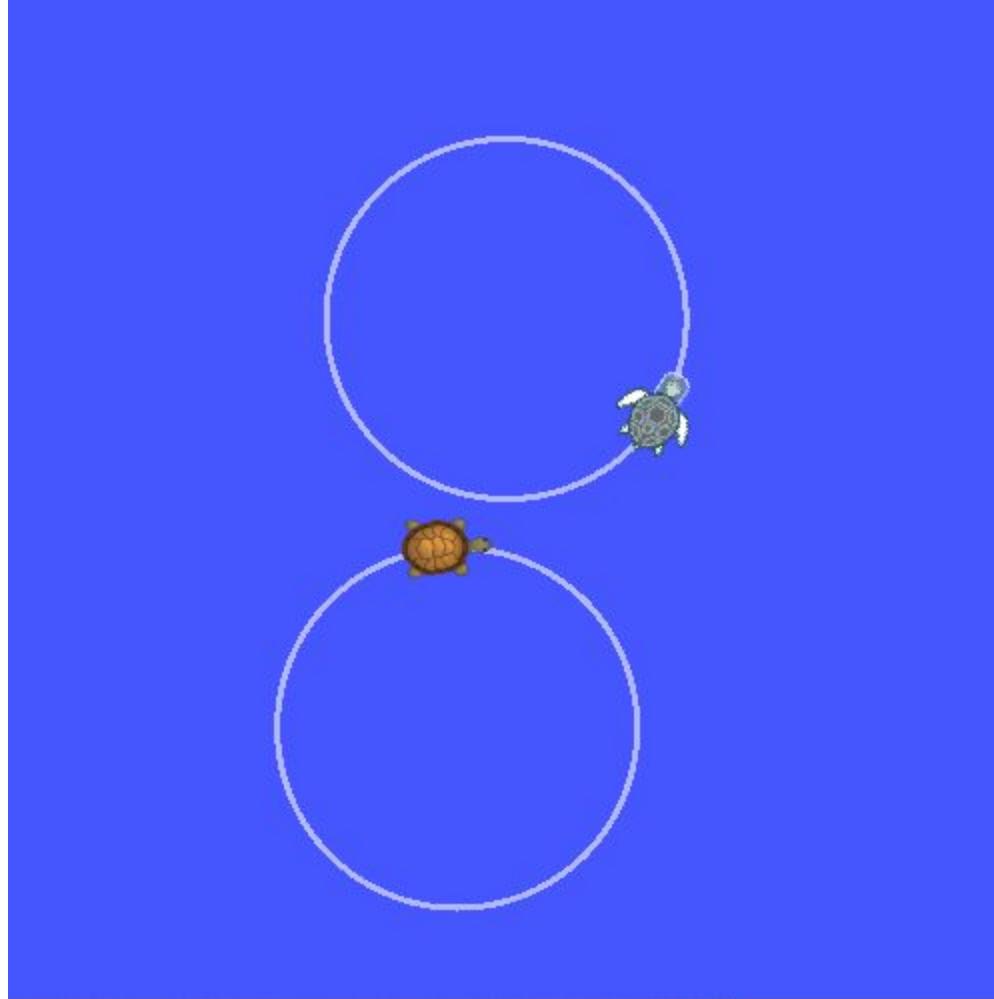
ໂຈທຍໍ



នៅលី



ໂຈທຍໍ



នៅលី





กด `ctrl+c` ใน ทุกๆ หน้า เพื่อหยุดการทำงาน

และ กดปิดหน้าจอทั้งหมด

turtle\_teleop\_key

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtlesim_node
```



เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtle_teleop_key
```

```
[redacted]:~$ rosrun turtlesim turtle_teleop_key
Reading from keyboard
-----
Use arrow keys to move the turtle. 'q' to quit.
```

# กดปุ่มลูกศรบน keyboard ของเรา

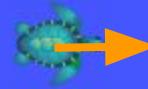


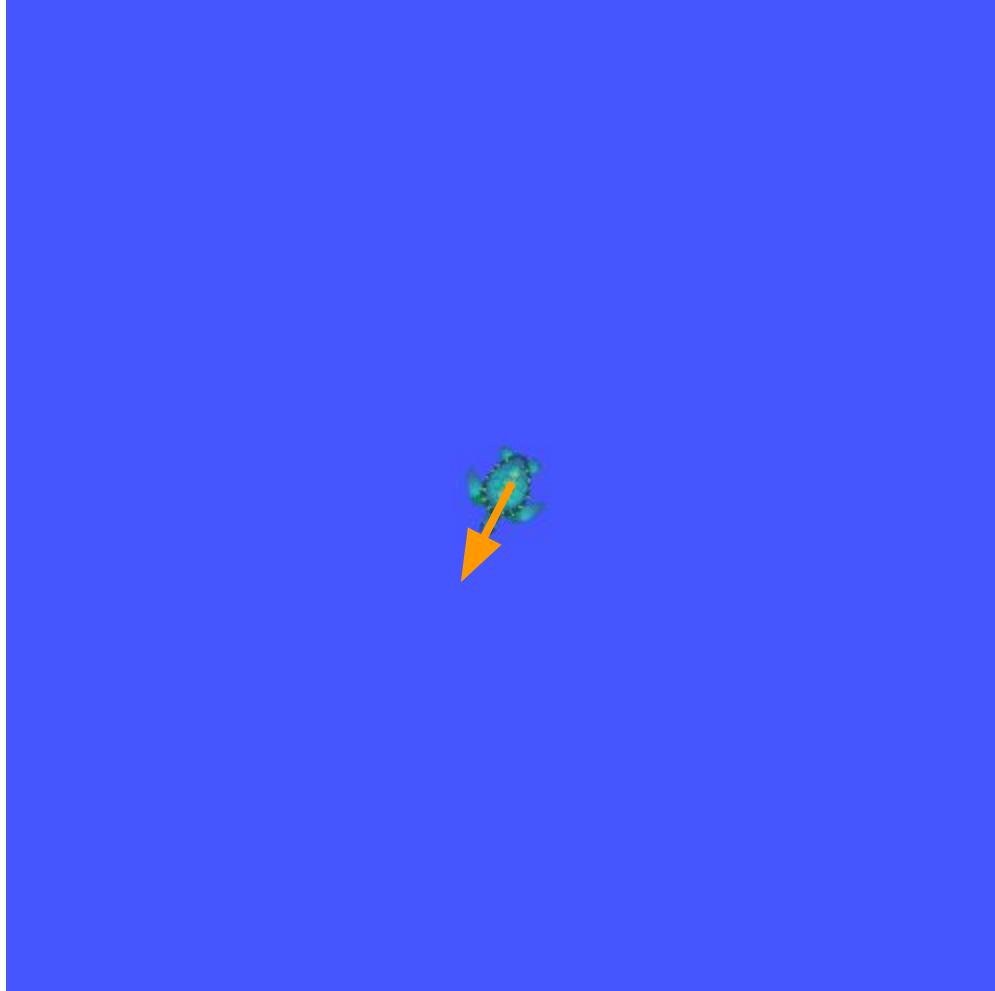
REF: <https://postimg.cc/nixLMd3s>

# กดปุ่มลูกศรบน keyboard ของเรา



REF: <https://postimg.cc/nixLMd3s>



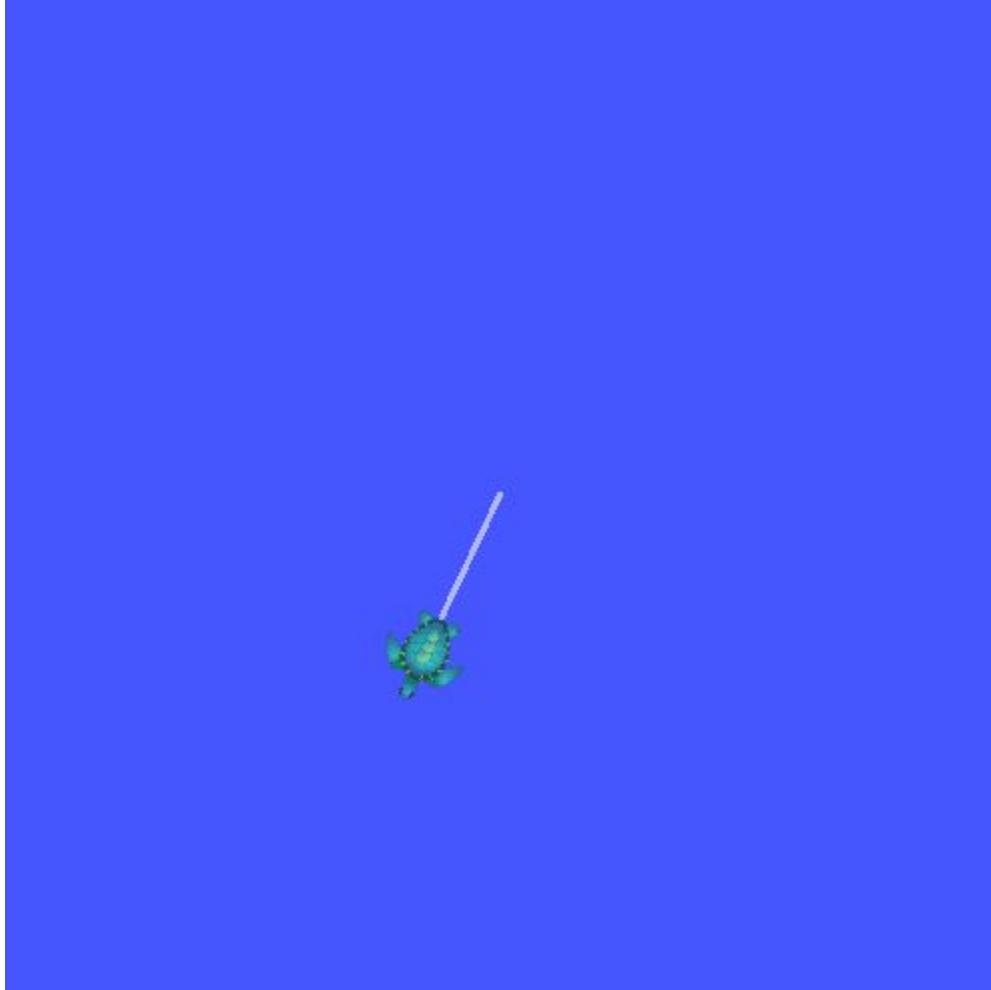


# กดปุ่มลูกศรบน keyboard ของเรา



REF: <https://postimg.cc/nixLMd3s>





กด `ctrl+c` ใน ทุกๆ หน้า เพื่อหยุดการทำงาน

และ กดปิดหน้าจอทั้งหมด

# Turtlesim with ROSPy

ทำการสร้าง package ใหม่

```
$ catkin_create_pkg turtlesim_test rospy std_msgs roscpp
```

```
$ roscd turtlesim_test/src
```

การ subscribe ข้อมูล

(cmdvel)

```
$ rostopic info /turtle1/cmd_vel
```

```
[...]  
$ rostopic info /turtle1/cmd_vel  
Type: geometry_msgs/Twist  
  
Publishers: None  
  
Subscribers:  
* /turtlesim (http://[REDACTED]:43407/)
```

```
$ rosmsg show geometry_msgs/Twist
```

```
[...]:~$ rosmsg show geometry_msgs/Twist
geometry_msgs/Vector3 linear
  float64 x
  float64 y
  float64 z
geometry_msgs/Vector3 angular
  float64 x
  float64 y
  float64 z
```

```
$ gedit copy_that.py
```

```
#!/usr/bin/env python3
import rospy
from geometry_msgs.msg import Twist

def get_cmd_vel(data):
    print(data)

if __name__ == "__main__":
    rospy.init_node("follow_that", anonymous=True)
    sub = rospy.Subscriber('/turtle1/cmd_vel', Twist, callback=get_cmd_vel)
    rospy.spin()
```

```
$ chmod +x copy_that.py
```

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtlesim_node
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtle_teleop_key
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim_test copy_that.py
```

กลับไปหน้า `turtle_teleop_key`

```
[...]:~$ rosrun turtlesim turtle_teleop_key  
Reading from keyboard  
-----  
Use arrow keys to move the turtle. 'q' to quit.  
[...]
```

# กดปุ่มลูกศรบน keyboard ของเรา



REF: <https://postimg.cc/nixLMd3s>



กลับไปหน้า `copy_that`

```
[...]:~$ rosrun turtlesim_test copy_that.py
linear:
  x: 2.0
  y: 0.0
  z: 0.0
angular:
  x: 0.0
  y: 0.0
  z: 0.0
```

กด `ctrl+c` ใน ทุกๆ หน้า เพื่อหยุดการทำงาน

และ กดปิดหน้าจอทั้งหมด

ทำการ spawn เต่าอีกตัว

```
[C:\Users\user]:~$ rosservice info /spawn
Node: /turtlesim
URI: rosrpc://c0665c07a68b:46769
Type: turtlesim/Spawn
Args: x y theta name
```

```
$ gedit copy_that.py
```

```
#!/usr/bin/env python3
import rospy
from geometry_msgs.msg import Twist

def get_cmd_vel(data):
    print(data)

if __name__ == "__main__":
    rospy.init_node("follow_that", anonymous=True)
    sub = rospy.Subscriber('/turtle1/cmd_vel', Twist, callback=get_cmd_vel)
    rospy.spin()
```

```
#!/usr/bin/env python3
import rospy
from geometry_msgs.msg import Twist
from turtlesim.srv import SpawnRequest, Spawn

def get_cmd_vel(data):
    print(data)

if __name__ == "__main__":
    rospy.init_node("follow_that", anonymous=True)
    sub = rospy.Subscriber('/turtle1/cmd vel'. Twist. callback=get cmd_vel)
    spawn_ser = rospy.ServiceProxy('/spawn', Spawn)
    spawn_ser(SpawnRequest(x=1.0, y=1.0, theta=0.0, name="turtle2"))
    rospy.spin()
```

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtlesim_node
```



เปิดหน้าต่างใหม่

```
$ rosrun turtlesim_test copy_that.py
```



กด `ctrl+c` ใน ทุกๆ หน้า เพื่อหยุดการทำงาน

และ กดปิดหน้าจอทั้งหมด

ทำให้เต่าอีกตัววิ่งเลียนแบบตัวแรก

```
$ rostopic info /turtle1/cmd_vel
```

```
:~$ rostopic info /turtle1/cmd_vel
Type: geometry_msgs/Twist
```

Publishers:

- \* /teleop\_turtle (<http://c0665c07a68b:35925/>)

Subscribers:

- \* /turtlesim (<http://c0665c07a68b:43279/>)

```
$ rosmsg show geometry_msgs/Twist
```

```
:~$ rosmsg show geometry_msgs/Twist
geometry_msgs/Vector3 linear
  float64 x
  float64 y
  float64 z
geometry_msgs/Vector3 angular
  float64 x
  float64 y
  float64 z
```

```
$ gedit copy_that.py
```

```
#!/usr/bin/env python3
import rospy
from geometry_msgs.msg import Twist
from turtlesim.srv import SpawnRequest, Spawn

def get_cmd_vel(data):
    print(data)

if __name__ == "__main__":
    rospy.init_node("follow_that", anonymous=True)
    sub = rospy.Subscriber('/turtle1/cmd_vel', Twist, callback=get_cmd_vel)
    spawn_ser = rospy.ServiceProxy('/spawn', Spawn)
    spawn_ser(SpawnRequest(x=1.0, y=1.0, theta=0.0, name="turtle2"))
    rospy.spin()
```

```
#!/usr/bin/env python3
import rospy
from geometry_msgs.msg import Twist
from turtlesim.srv import SpawnRequest, Spawn

cmd_data = None

def get_cmd_vel(data):
    global cmd_data
    cmd_data = data

if __name__ == "__main__":
    rospy.init_node("follow_that", anonymous=True)
    sub = rospy.Subscriber('/turtle1/cmd_vel', Twist, callback=get_cmd_vel)
    spawn_ser = rospy.ServiceProxy('/spawn', Spawn)
    spawn_ser(SpawnRequest(x=1.0, y=1.0, theta=0.0, name="turtle2"))
    pub = rospy.Publisher('/turtle2/cmd_vel', Twist, queue_size=10)
    while not rospy.is_shutdown():
        rospy.wait_for_message('/turtle1/cmd_vel', Twist)
        pub.publish(cmd_data)
```

```
$ roscore
```

```
:~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://[REDACTED]:39823/
ros_comm version 1.15.13

SUMMARY
=====
PARAMETERS
  * /rosdistro: noetic
  * /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://[REDACTED]:11311/

setting /run_id to [REDACTED]
process[rosout-1]: started with pid [3028]
started core service [/rosout]
-
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtlesim_node
```



เปิดหน้าต่างใหม่

```
$ rosrun turtlesim turtle_teleop_key
```

เปิดหน้าต่างใหม่

```
$ rosrun turtlesim_test copy_that.py
```



กลับไปหน้า `turtle_teleop_key`

# กดปุ่มลูกศรบน keyboard ของเรา



REF: <https://postimg.cc/nixLMd3s>



# กดปุ่มลูกศรบน keyboard ของเรา



REF: <https://postimg.cc/nixLMd3s>

# กดปุ่มลูกศรบน keyboard ของเรา



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