

## 19.Topic message recording and playback

ros provides the rosbag tool for recording and playing data. It records the data in the specified rostopic into a data package with a .bag suffix, which facilitates offline analysis and processing of the data.

### 19.1. rosbag command

The commands of rosbag are as follows:

rosbag command	Function
check	Determine whether a package can be processed in the current system or migrated.
decompress	Compress one or more package files.
filter	Unzip one or more package files.
fix	Fix the message in the package file for playback in the current system.
help	Obtain relevant command guidance and help information.
info	Summarize the content of one or more package files.
play	Playback the content of one or more package files in a time synchronized manner.
record	Record a package file with the content of the specified topic.
reindex	Reindex one or more package files.

Commonly used ones are record and play, which are recording messages and playing messages respectively.

#### 19.1.2 record recording message

The command format of rosbag record recording message is,

```
rosbag record /topic_name
```

Among them, /topic\_name is the name of the topic where the message needs to be recorded. If the parameter -a is provided, for example,

```
rosbag record -a
```

With the parameter -a, it means recording all current topic data without specifying a certain topic. Of course, you can also record multiple topics that you are interested in, for example,

```
rosbag record /topic_name1 /topic_name2
```

When you want to stop recording, press ctrl c to stop. The data packet will be named after the current time, with the suffix .bag, and saved in the terminal directory where the recording command is run. If you want to specify the name of the generated data packet, add the parameter -O on the command line, for example,

```
rosvag record -O save_topic.bag /topic_name
```

### 19.1.3 View packet information

The command format of rosvag info to view packet information is,

```
rosvag info file_name.bag
```

Open the terminal in the folder where the data package is located, and then enter the above command to see the information of the data package, including topic name, size, data type, etc., for example,

```
yahboom@yahboom-virtual-machine:~$ rosvag info turtle_vel.bag
path:          turtle_vel.bag
version:       2.0
duration:      9.8s
start:         Oct 24 2023 19:35:52.76 (1698147352.76)
end:           Oct 24 2023 19:36:02.52 (1698147362.52)
size:          15.1 KB
messages:      89
compression:   none [1/1 chunks]
types:         geometry_msgs/Twist [9f195f881246fdfa2798d1d3eebca84a]
topics:        /turtle1/cmd_vel  89 msgs      : geometry_msgs/Twist
yahboom@yahboom-virtual-machine:~$
```

You can also use the parameter -y to convert it into YAML format for viewing.

```
rosvag info -y file_name.bag
```

for example,

```
yahboom@yahboom-virtual-machine:~$ rosvag info -y turtle_vel.bag
path: turtle_vel.bag
version: 2.0
duration: 9.753484
start: 1698147352.762795
end: 1698147362.516279
size: 15417
messages: 89
indexed: True
compression: none
types:
  - type: geometry_msgs/Twist
    md5: 9f195f881246fdfa2798d1d3eebca84a
topics:
  - topic: /turtle1/cmd_vel
    type: geometry_msgs/Twist
    messages: 89
```

### 19.1.4. Play data packets

The command format of rosvag play to play data packets is,

```
rosvag play file_name.bag
```

Open the terminal in the folder where the data package is located, and then enter the above command to play the topic information recorded in the data package. It can be understood as a publisher publishing information according to the default frequency. If you want to change the rate of message publishing, you need to add `-r`, followed by a number corresponding to the playback rate.

```
roslaunch learn_launch turtle_ctrl.launch
```

If you want to loop playback, add the `-l` parameter.

```
roslaunch learn_launch turtle_ctrl.launch
```

If the recorded data packet contains multiple data and you only want to play the topic of interest, you need to add the `--topic` command.

```
roslaunch learn_launch turtle_ctrl.launch --topic /topic_name
```

During the playback command, if you want to pause playback midway, you can press the space bar to pause or continue playback.

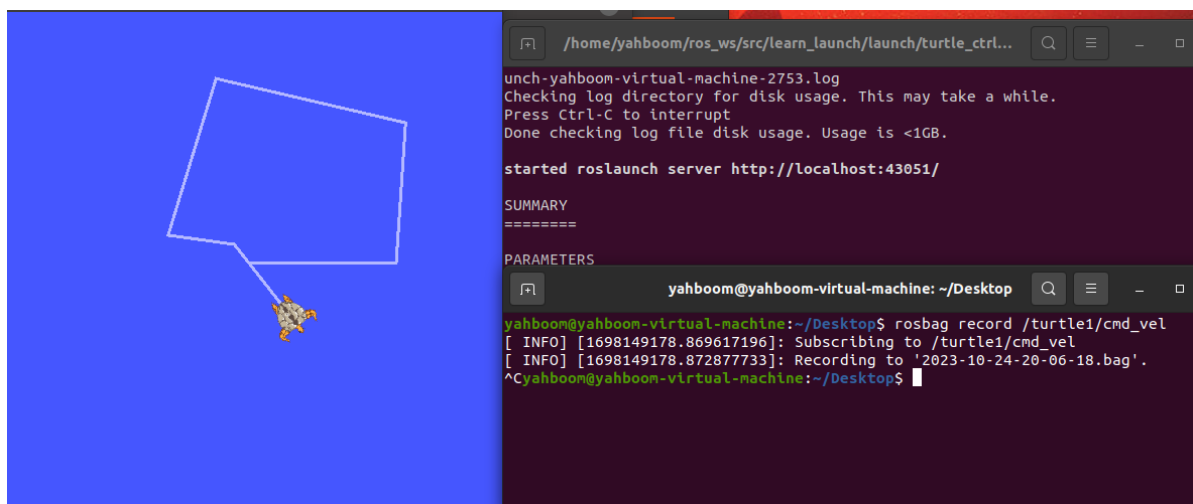
## 19.2 rosbag instance operation

We first run the program to control the little turtle, and record the speed topic of the little turtle at this time, and then play it again and enter in the terminal,

```
roslaunch learn_launch turtle_ctrl.launch
```

Then enter the following command to record the speed topic data of the little turtle,

```
roslaunch learn_launch turtle_ctrl.launch
```



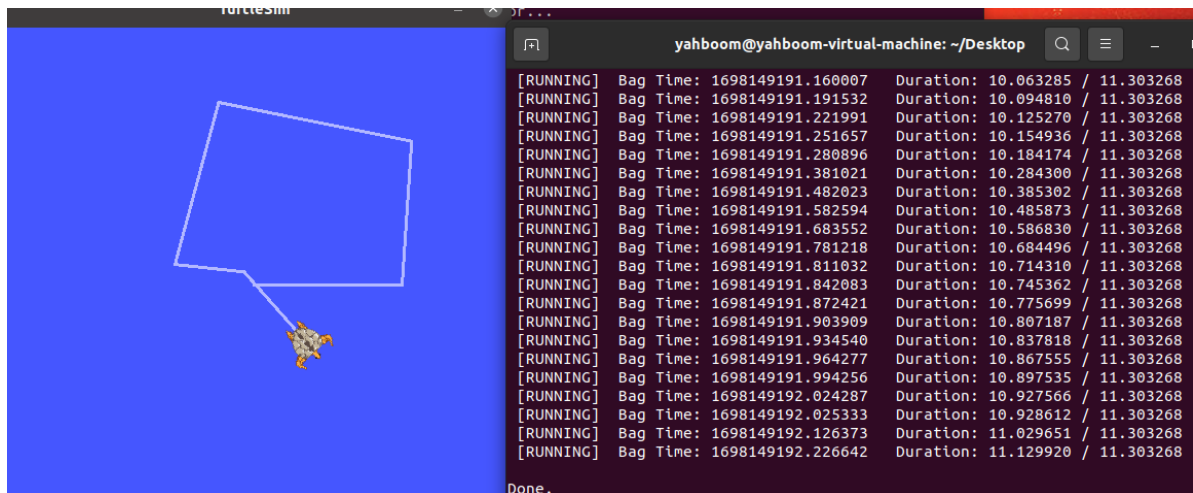
Click on the terminal that starts the launch file, and press up, down, left, and right to control the movement of the little turtle. After the exercise is completed, click on the terminal to start the command to record the topic, `ctrl c` to close the recording, and a data packet (.bag suffix) with time as the unit will be generated in the terminal directory. Here I am in the `~/Desktop` directory. The generated package name is `2023-10-24-20-06-18.bag`.

Also use ctrl c to close turtle\_ctrl.launch, then run only the small turtle node and enter in the terminal,

```
roslaunch learn_launch turtle_node.launch
```

Open another terminal, use the cd command to switch to the directory of the data packet just recorded, and enter,

```
rosbag play 2023-10-24-20-06-18.bag #Replace the bag here with the name you just recorded
```



As shown in the figure above, the terminal that plays the data packet will continue to play (publish) the data. After receiving the speed control instruction, the little turtle starts moving according to the speed value.

You can use rosbag info to check the relevant information of this data packet and enter it in the terminal.

```
rosbag info 2023-10-24-20-06-18.bag #Replace the bag here with the name you just recorded
```

```
yahboom@yahboom-virtual-machine:~/Desktop$ rosbag info 2023-10-24-20-06-18.bag
path:      2023-10-24-20-06-18.bag
version:   2.0
duration:  11.3s
start:     Oct 24 2023 20:06:21.10 (1698149181.10)
end:       Oct 24 2023 20:06:32.40 (1698149192.40)
size:      28.3 KB
messages:  217
compression: none [1/1 chunks]
types:     geometry_msgs/Twist [9f195f881246dfda2798d1d3eebca84a]
topics:    /turtle1/cmd_vel  217 msgs : geometry_msgs/Twist
yahboom@yahboom-virtual-machine:~/Desktop$
```