

20. ROS2 Recording and Playback Tool

1. Introduction to Recording and Playback Tools

Bag2, a commonly used recording and playback tool in ROS2, is used to record topic data. We can use this command to store topic data as a file. Later, we can directly publish the topic data in the bag file without starting a node.

This tool is very useful when developing a real robot. For example, we can record topic data when the robot encounters a problem. After recording, we can publish it multiple times for testing and experimentation, or share the topic data with others to verify algorithms.

We will try using the bag tool to record topic data and replay it.

2. Usage Tutorial

2.1. Start the topic node to record

For example, the talker in the ros2 demo:

```
ros2 run demo_nodes_py talker
```

2.2. Recording

`/topic-name` is the topic name

```
# Record a single topic
ros2 bag record /topic-name
# Record multiple topics
ros2 bag record topic-name1 topic-name2
# Record all topics
ros2 bag record -a
```

Other Options

`-o name` Customize the output file name

```
ros2 bag record -o file-name topic-name
```

`-s` Storage format

Currently only supports sqlite3; others are available with extensions.

2.3. Viewing Recorded Topic Information

Before playing a video, you can view relevant information about the video through the file information, such as the time, size, type, and number of topic records.

```
# Assume the recorded file is rosbag2_2023_10_31-07_58_23
ros2 bag info rosbag2_2023_10_31-07_58_23
```

2.4. Play and View

2.4.1. Play

Next, we can replay the data using the following command.

```
ros2 bag play rosbag2_2023_10_31-07_58_23
```

2.4.2. View

Use the `ros2 topic` command to view the data.

```
ros2 topic echo /chatter
```

2.4.3. Playback Options

1. Play at Multiple Speeds -r

The `-r` option modifies the playback speed. For example, the `-r` value, for example, 10 means 10x speed, playing the topic ten times faster.

```
ros2 bag play rosbag2_2023_10_31-07_58_23 -r 10
```

2. Loop Playback -l

This is for looping a single song.

```
ros2 bag play rosbag2_2023_10_31-07_58_23 -l
```

3. Play a Single Topic

```
ros2 bag play rosbag2_2023_10_31-07_58_23 --topics /chatter
```

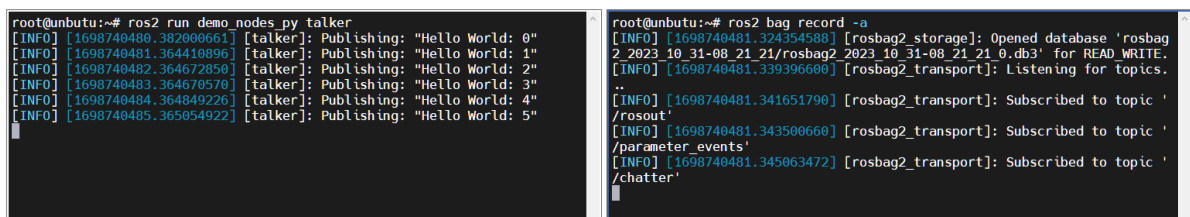
3. Example

3.1. Running the talker node

```
ros2 run demo_nodes_py talker
```

3.2. Recording

```
# Record all topics  
ros2 bag record -a
```



The image shows two terminal windows side-by-side. The left window shows the output of `ros2 run demo_nodes_py talker`, displaying five 'Hello World' messages published by the talker node. The right window shows the output of `ros2 bag record -a`, displaying information about opening the database, listening for topics, and subscribing to `/rosout`, `/parameter_events`, and `/chatter`.

How do I stop recording? Simply press `Ctrl+C` in the terminal to interrupt the recording.

You will then find a folder named `rosbag2_2023_10_31-08_21_21` in the terminal.

Open the folder to see its contents.

```
root@unbutu:~# ls
rosbag2_2023_10_31-08_21_21  yahboomcar_ros2_ws
root@unbutu:~# cd rosbag2_2023_10_31-08_21_21/
root@unbutu:~/rosbag2_2023_10_31-08_21_21# ls
metadata.yaml  rosbag2_2023_10_31-08_21_21_0.db3
root@unbutu:~/rosbag2_2023_10_31-08_21_21#
```

This completes the recording.

3.3. Play and View

Here we loop the playback.

```
ros2 bag play rosbag2_2023_10_31-07_58_23 -l
```

Open another terminal to view the topic:

```
ros2 topic echo /chatter
```

```
root@unbutu:~# ls
rosbag2_2023_10_31-08_21_21  yahboomcar_ros2_ws
root@unbutu:~# ros2 bag play rosbag2_2023_10_31-08_21_21/ -l
[INFO] [1698740802.654185287] [rosbag2_storage]: Opened database 'rosbag2_2023_10_31-08_21_21//rosbag2_2023_10_31-08_21_21_0.db3' for READ_ONLY.

root@unbutu:~# ros2 topic list
/chatter
/parameter_events
/rosout
root@unbutu:~# ros2 topic echo /chatter
data: 'Hello World: 18'
---
data: 'Hello World: 19'
---
data: 'Hello World: 20'
---
data: 'Hello World: 21'
---
data: 'Hello World: 22'
---
data: 'Hello World: 23'
---
data: 'Hello World: 24'
---
data: 'Hello World: 25'
---
data: 'Hello World: 26'
---
data: 'Hello World: 27'
---
```