Multi-robot queue performance

Startup file path

(1) Transbot robot:

/home/pi/transbot_ws/src/transbot_bringup/launch/bringup_robot_formation.launch

(2) Virtual machine side:

/home/pi/transbot_ws/src/transbot_ctrl/launch/transbot_joy_multi.launch
/home/pi/transbot_ws/src/transbot_ctrl/launch/play_robot_bag1.launch
/home/pi/transbot_ws/src/transbot_ctrl/launch/play_robot_bag2.launch
/home/pi/transbot_ws/src/transbot_ctrl/launch/play_robot_show.launch

Function package description:

After this function is turned on, multiple robot can drive synchronously according to the prerecorded route.

Feature package path:

/home/pi/transbot_ws/src/transbot_bringup

/home/pi/transbot_ws/src/transbot_ctrl

Function realization conditions:

1) It is necessary to configure the network of multiple Transbot robot, make all Transbot robot and the virtual machine are in the same local area network, and the virtual machine must be used as the host (Master).

2)The remote control signal receiver needs to be inserted into the virtual machine.

1. Start up function

Take two cars as an example:

1.1 Record the motion trajectory of No.1 Transbot robot

1)Input following command

```
virtual machine side:
   roscore
   roslaunch transbot_ctrl transbot_joy_multi.launch namespace:=robot1 #Enable
remote control
   No.1 Transbot robot:
   roslaunch transbot_bringup bringup_robot_formation.launch namespace:=robot1
   virtual machine side:
   rosbag record /robot1/cmd_vel #Record the speed topic content of each
moment
```

```
hboom@VM_Transbot:-$ roscore
. logging to /home/yahboom/.ros/log/ec7361e6-5bdb-11ec-824b-000c29e9c0
//roslaunch-VM_Transbot-6011.log
lecking log directory for disk usage. This may take a while.
less Ctrl-C to interrupt
one checking log file disk usage. Usage is 1GB.
                                                                                                                   pase:=robot1
y. logging to /home/yahboom/.ros/log/ec7361e6-5bdb-11ec-824b-000c29e9c080/ro
launch-VM_Transbot-6453.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.
 tarted roslaunch server http://192.168.2.114:444-7/
os_comm version 1.14.12
                                                                                                          started roslaunch server http://192.168.2.114:35327/
 IMMARY
                                                                                                          SUMMARY
                                                                                                          PARAMETERS

* /rosdistro: melodic

* /rosversion: 1.14.12

* /use_sim_time: False
  /rosdistro: melodic
/rosversion: 1.14.12
                                                                                                           ODES
                                                                                                            /robot1/
 uto-starting new master
rocess[master]: started with pid [6021]
OS_MASTER_URI=http://192.168.2.114:11311/
                                                                                                               joy_node (joy/joy_node)
transbot joy node (transbot ctrl/transbot joy.py)
                                                                                                          ROS_MASTER_URI=http://192.168.2.114:11311
 etting /run_id to ec7361e6-5bdb-11ec-824b-000c29e9c080
rocess[rosout-1]: started with pid [6032]
tarted core service [/rosout]
                                                                                                          process[robot1/joy_node-1]: started with pid [6468]
process[robot1/transbot_joy_node-2]: started with pid [6469]
[ WARN] [1639376148.827655174]: Couldn't set gain on joystick
                                                                                                           pi@Transbot:
pi@Transbot:~$
pi@Transbot:~$
pi@Transbot:~$
bot formation_launch_namespace:==shet4
 bot_formation.launch namespace:=robot1
                                                                                                            pi@Transbot:~$ rostopic list
 ..._logging to /home/pi/.ros/log/ec/361e6-5bdb-11ec-
824b-000c29e9c080/roslaunch-Transbot-12255.log
                                                                                                           /Adjust
824b-000c29e9c080/roslaunch-Transbot-12255.log //JoyState
Checking log directory for disk usage. This may take //PWMServo
 a while
                                                                                                            /TargetAngle
                                                                                                             control_mode/
Done checking log file disk usage. Usage is <1GB.
                                                                                                            /diagnostics
                                                                                                            /edition
started roslaunch server http://192.168.2.103:34697/
                                                                                                           /move_base/cancel
                                                                                                            /robot1/cmd_vel
                                                                                                           //obot1/cmd_vet
//robot1/transbot_node/parameter_descriptions
/robot1/transbot_node/parameter_updates
/robot2/cmd_vel
/robot2/joy
/robot2/joy/set_feedback
 SUMMARY
 PARAMETERS
     /robot1/transbot_node/imu: /transbot/imu
     /robot1/transbot_node/vel: /transbot/get_vel
                                                                                                            /rosout
      /rosdistro: melodic
                                                                                                            /rosout_agg
                                                                                                            /transbot/get_vel
/transbot/imu
 NODES
```

2)After turning on the drive control system of No.1 Transbot robot, we can enter the command rostopic list to view the topics currently subscribed by No.1 Transbot robot.

The velocity topic subscribed to is /robot1/cmd_vel.

Then we open another terminal in the virtual machine and enter the command rosbag record /robot1/cmd_vel to record the speed of No.1 Transbot robot at each moment.

```
boom@VM_Transbot:~$ rosbag record /robot1/cmd vel
                                                                            yahboom@VM_Transbot:~$ rosbag info 2021-12-13-14-46-
 INFO] [1639377983.718854322]: Subscribing to /robot1/
md vel
                                                                            23.bag
                                                                            path:
                                                                                              2021-12-13-14-46-23.bag
INFO] [1639377983.722015988]: Recording to '2021-12-1
-14-46-23.bag'.
                                                                            version:
                                                                                              2.0
                                                                            duration:
                                                                                             0.0s
`Cyahboom@VM_Transbot:~$
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
                                                                                             Dec 13 2021 14:46:26.59 (1639377986.59)
Dec 13 2021 14:46:26.59 (1639377986.59)
                                                                            start:
                                                                            end:
                                                                           size:
                                                                                              6.0 KB
 ahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
                                                                            messages:
                                                                            compression: none [1/1 chunks]
                                                                                             geometry_msgs/Twist [9f195f881246fdfa27
                                                                            types:
                                                                            98d1d3eebca84a]
                                                                                             /robot1/cmd_vel 1 msg
                                                                            topics:
                                                                                                                                      : geometry_
                                                                           msgs/Twist
yahboom@VM_Transbot:~$
/ahboom@VM_Transbot:~$
```

3. Then, we can remotely control the robot to move, and the system will record the speed at the current moment.

After recording the route, press ctrl+c in the terminal where the command "rosbag record /robot1/cmd_vel" is run to end the recording. At this point, the system will generate a data

package named time and suffixed with .bag in the terminal directory (default is the home directory).

This data packet records the speed of the Transbot car at each moment.

We can input the command "rosbag info packet name" to view the contents of the packet, and find that the topics is consistent with what was just recorded.

2. Record the motion trajectory of No.1 Transbot robot

1)Input following command

```
virtual machine side:
    roscore
    roslaunch transbot_ctrl transbot_joy_multi.launch namespace:=robot2 #Enable
    remote control
    No.2 Transbot robot:
    roslaunch transbot_bringup bringup_robot_formation.launch namespace:=robot2 #

开启底盘
    virtual machine side:
    rosbag record /robot2/cmd_vel #Record the speed topic content of each
    moment
```

```
yahboom@VM_Transbot:~$ rosbag record /robot2/cmd_vel
[ INFO] [1639378681.940346958]: Subscribing to /robot2/cmd_vel
[ INFO] [1639378681.943233510]: Recording to '2021-12-13-14-58-01.bag'.
^Cyahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$ ^C
yahboom@VM_Transbot:~$
```

The recording steps are the same as above. After the recording is over, a data package named at the current time and suffixed with .bag is generated.

3. Load the two data packages into the startup file

Modify the /home/yahboom/transbot_ws/src/transbot_ctrl/launch/play_robot_bag1.launch file in the virtual file, and replace the data packet in the file with the data packet that just recorded the speed of No.1 Transbot robot.

Modify the play_robot_bag2.launch file in the same directory, and replace the data packet in the file with the data packet that just recorded the speed of the No.2 Transbot robot.

These two commands are to enable the function of playing the data packet rosbag play.



After modification, run following command in the virtual machine terminal.

 $roslaunch \ transbot_ctrl \ play_robot_show.launch$