**SEMANTIC MAP EXPERIMENTS SETUP AND RUNNING GUIDE**

19/08/2023

1. # Connect to the Robot Summit XL
2. # In each terminal setup robot’s connectivity: Terminal

export ROS\_DOMAIN\_ID=34

export RMW\_IMPLEMENTATION=rmw\_cyclonedds\_cpp

cd robot\_ws/

source install/setup.sh

1. # Open Rviz

rviz2

1. # Source map

ros2 service call /map\_server/load\_map nav2\_msgs/srv/LoadMap "{map\_url: /home/robot/robot\_ws/src/test/maps/ote\_indoor/otetest.yaml}"

1. # **Important!!!** Check if robot is charging. **Do not** move robot if it is charging.

ros2 topic echo /robot/battery\_estimator/data

output:

voltage: 55.0

current: 0.0

level: 100.0

time\_remaining: 420

time\_charging: 219

is\_charging: true

cell\_voltages:

- 3.3399999141693115

- 3.3459999561309814

- 3.3480000495910645

…

…

- 3.3499999046325684

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is\_charging: true # **This must be false!!!**

1. Check if ROS topics for network metrics are available and have data.

ros2 topic echo /edge\_latency

ros2 topic echo /edge\_throughput

If there is not data,

# Restart Metrics for data capture: "--- /edge\_latency" ;" /edge\_throughput"

export ROS\_DOMAIN\_ID=34

export RMW\_IMPLEMENTATION=rmw\_cyclonedds\_cpp

cd ~/git/base-hw

docker compose restart metrics

1. # Run rosbag save: run from directory where file wanted to be saved.
2. ros2 bag record --all --compression-mode file --compression-format zstd
3. ros2 bag record --all --include-hidden-topics --compression-mode file --compression-format zstd
4. # Robot camera access via browser:

axix camera

http://192.168.0.185/

1. # Run signal\_mapper launch to start creating point-cloud map.

ros2 launch era\_5g\_network\_signal\_mapper\_ros2 era\_5g\_network\_signal\_mapper\_ros2.launch.py

In RVIZ select pointcloud2 and subscribe to topic: /semantic\_pcl

1. # Run InfulxDB colour Publisher

ros2 run era\_5g\_network\_signal\_mapper\_ros2 publisher

1. # Teleop robot keyboard

ros2 run teleop\_twist\_keyboard teleop\_twist\_keyboard cmd\_vel:=/robot/move\_base/cmd\_vel

1. # Run costmap translation after map is coloured with signal point-clouds:

ros2 run era\_5g\_network\_signal\_mapper\_ros2 costmap\_translate

In Rviz subscribe to another map to topic: /map\_Semantic

*\* Note: if map is not creating after some time, try to source map again (Step 4).*

1. # Save created map:
2. save map current folder

ros2 run nav2\_map\_server map\_saver\_cli -t map\_Semantic

1. Save map and specify location of saving:

ros2 run nav2\_map\_server map\_saver\_cli -t map\_Semantic -f ~/robot\_ws/src/test/maps/ote-test04-08-2023

\* “~/robot\_ws/src/test/maps/ote-test04-08-2023” is location for saving map and name of the map.

Location “~/robot\_ws/src/test/maps/”

Name of the map ”ote-test04-08-2023”

1. # Load saved map

ros2 service call /semantic\_map\_server/load\_map nav2\_msgs/srv/LoadMap "{map\_url: /home/robot/robot\_ws/src/test/maps/map\_1691753539.yaml}"

1. # perform autonomous navigation with RVIZ by selecting 2D Pose goal arrow.
2. # Possible help to fix issues:

* Restart all containers:

cd ~/git/base-hw

docker compose down

docker compose up -d

* Fix InfluxDB of signal publisher:

cd /home/robot/Downloads/5GERA\_Integration

docker compose down

docker compose up -d

1. Connect via ssh to influx container.

ssh [root@192.168.0.1](mailto:root@192.168.0.1) # insert password.

1. Run script for signal strength publisher.

./data\_collector.sh

1. In browser check signal strength publisher:

<http://192.168.0.200:3000/?orgId=1>

* + Select 5G-Era link.
  + select to view signal for smaller interval, ex 5 minutes.

Grafana url:

<http://192.168.0.200:3000/d/d22092dc-db94-450d-9f90-83ab15516577/5gera?orgId=1&refresh=5s>

1. # Manual color mapper:

ros2 run era\_5g\_network\_signal\_mapper\_ros2 colour\_pub