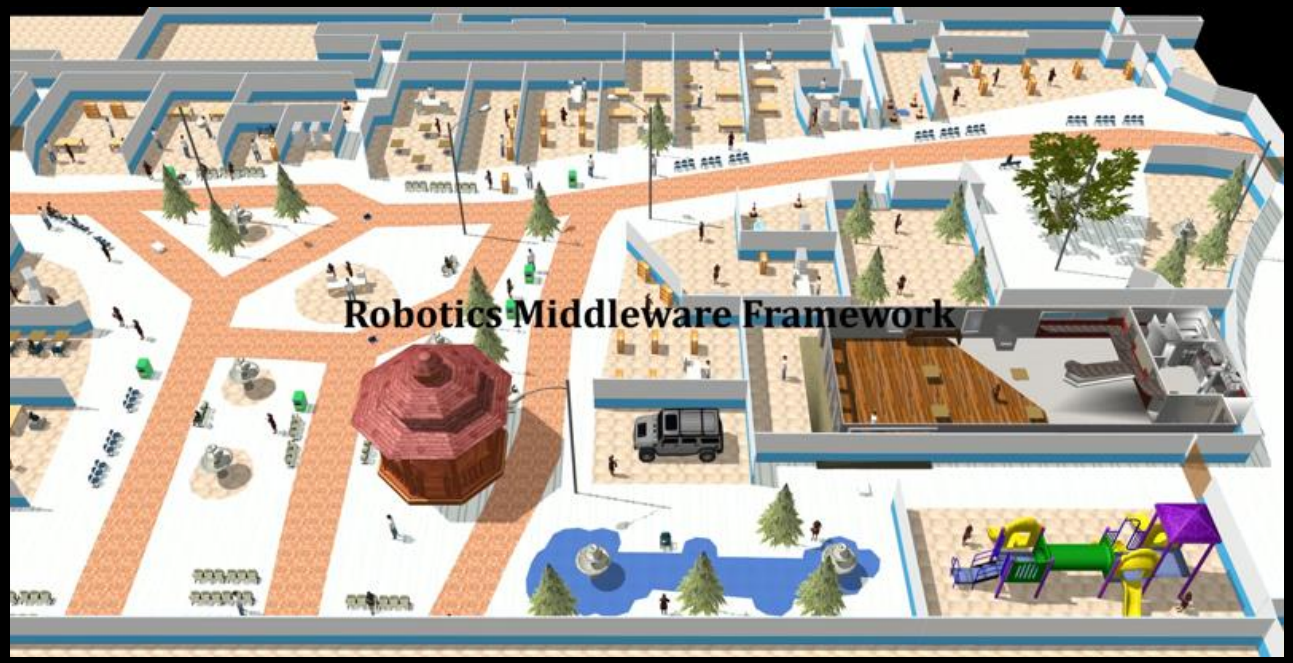
Open-RMF

A Common Language for Robot Interoperability



Lecture 4

정은빈

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Airport Terminal world 실행

환경 불러오기

```
cd ~/rmf_ws && source install/setup.bash
```

Classic Gazebo로 **Airport Terminal** world 실행

```
ros2 launch rmf_demos_gz_classic airport_terminal.launch.xml
```

Airport Terminal world Demo

Airport Terminal world 실행

환경 불러오기

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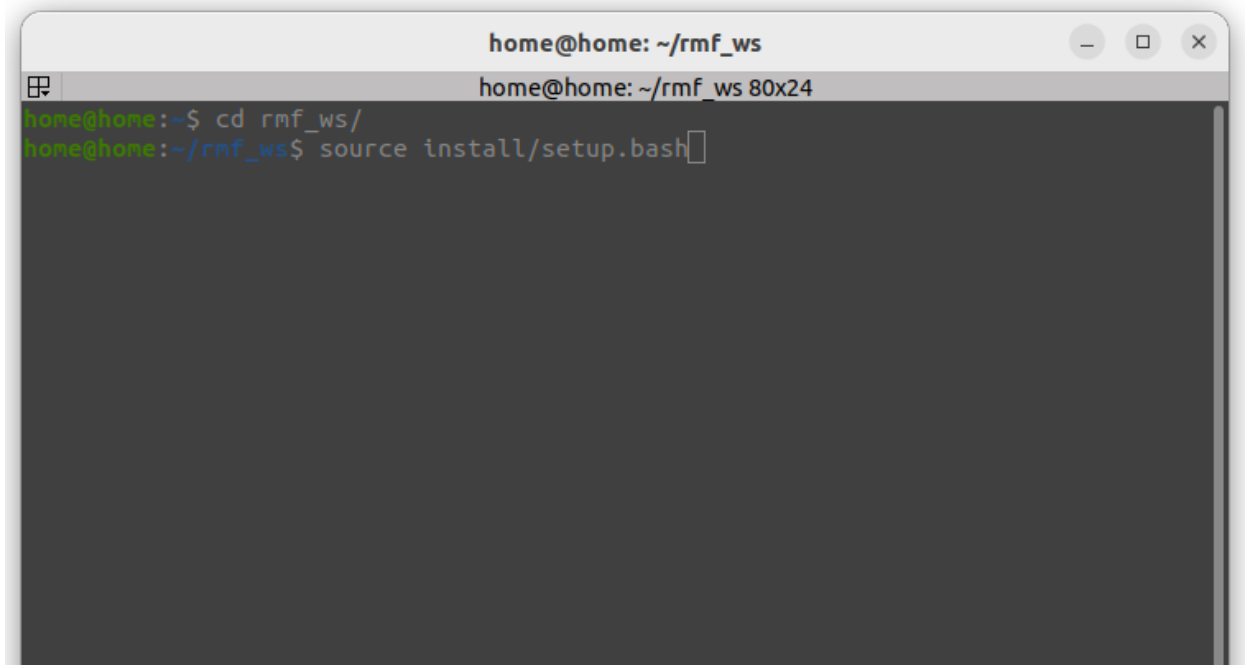
```

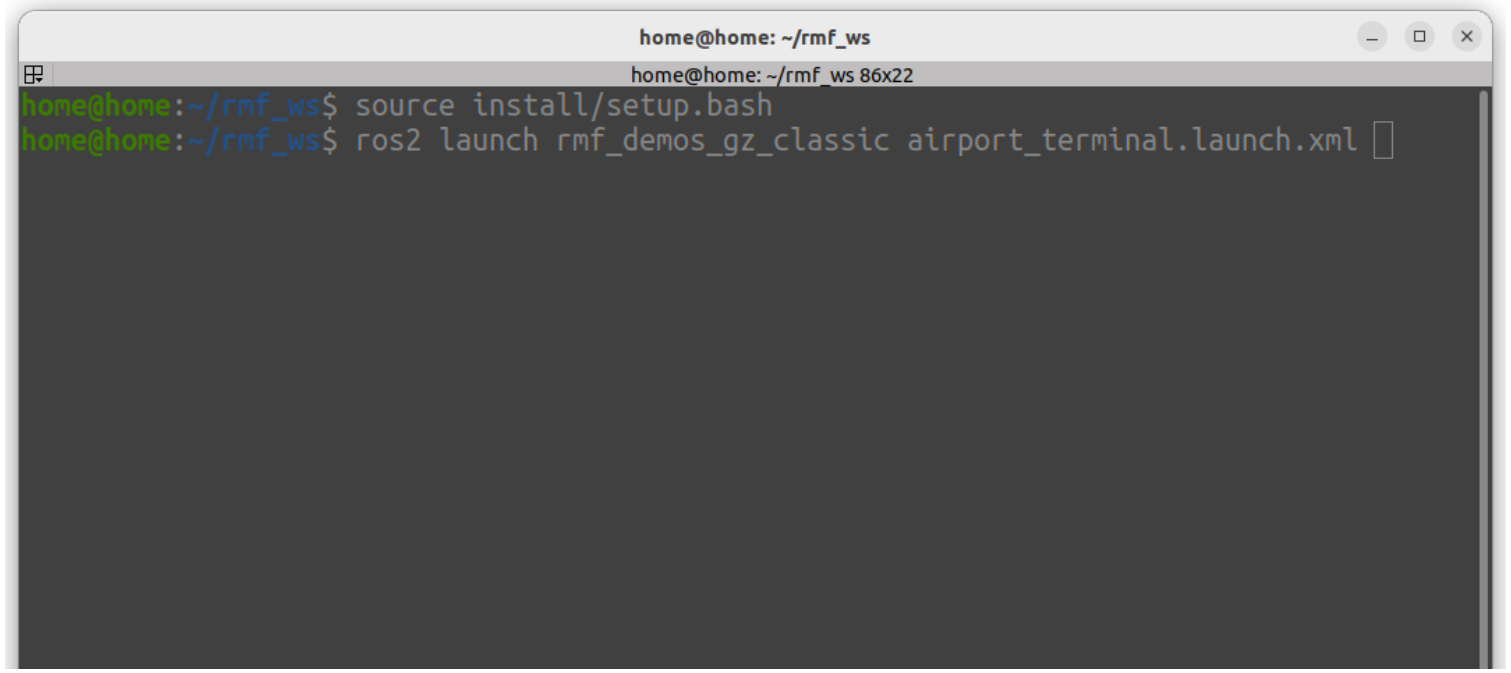


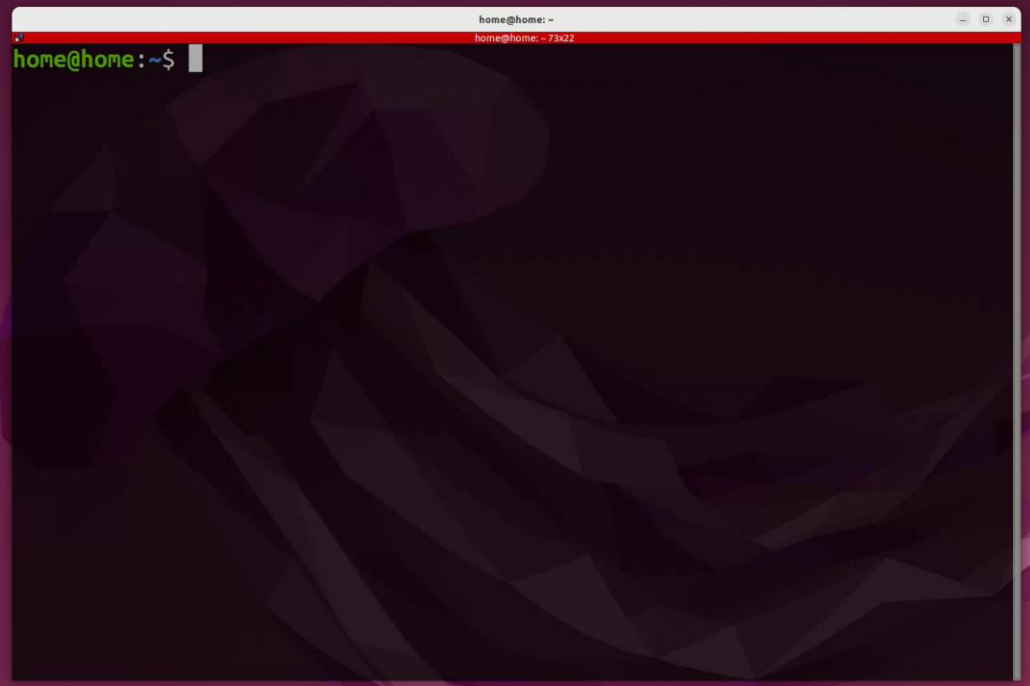
Airport Terminal world Demo

Airport Terminal world 실행

Classic Gazebo로 **Airport Terminal** world 실행

```
ros2 launch rmf_demos_gz_classic airport_terminal.launch.xml
```

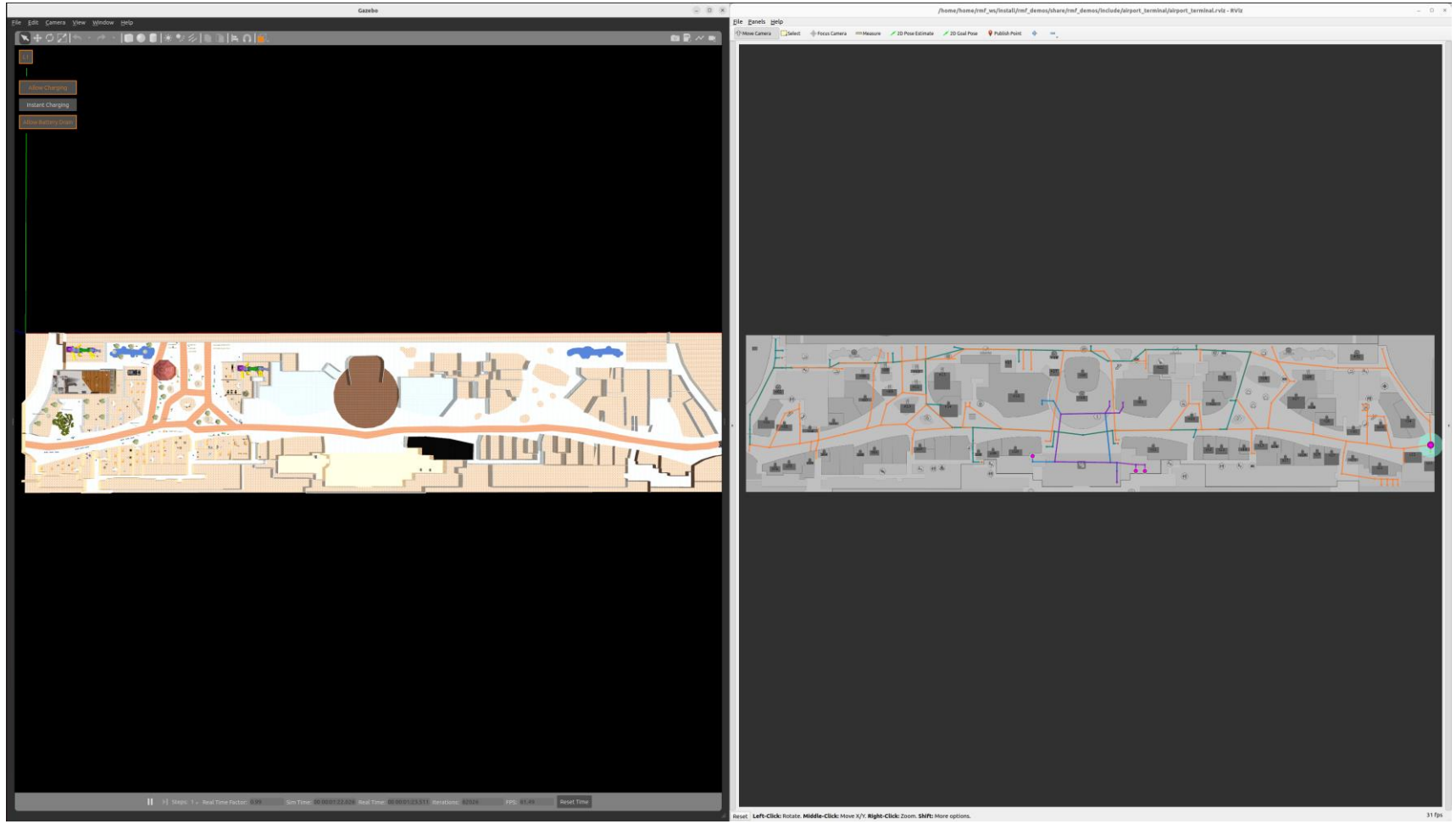



home@home: ~
home@home: ~ 73x22
home@home:~$

Airport Terminal world Demo

Airport Terminal world 실행

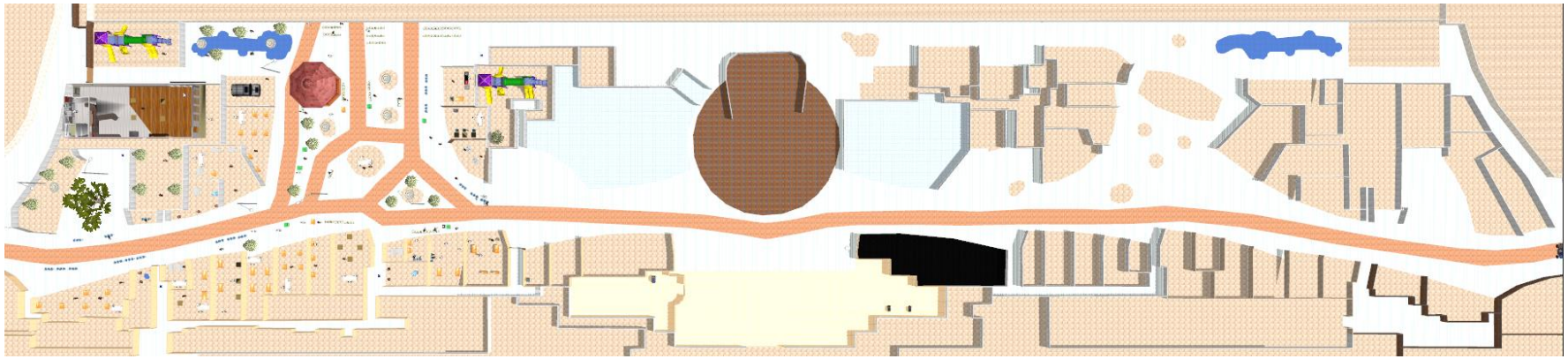
- Classic Gazebo로 **Airport Terminal** world 실행

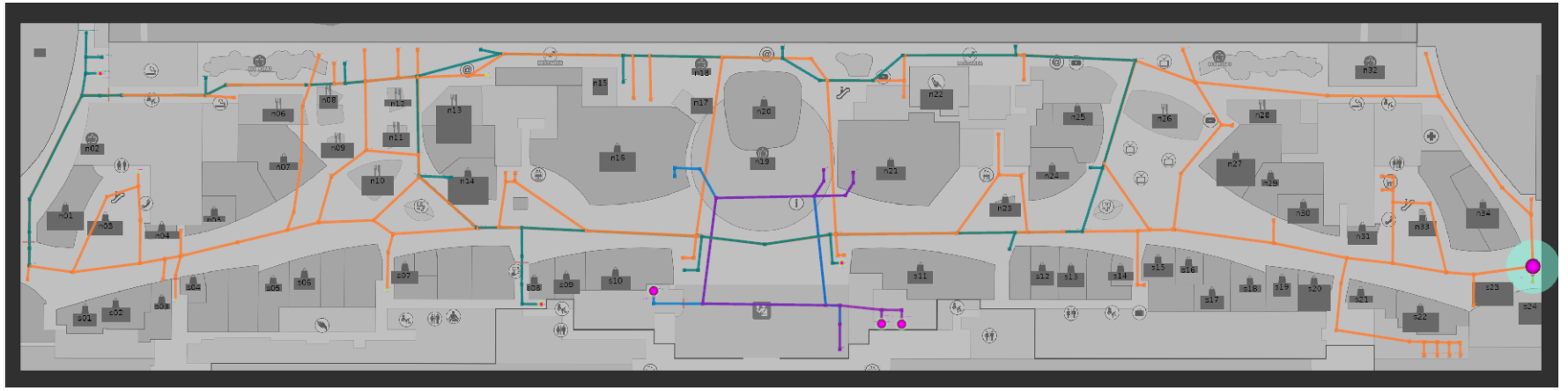


Airport Terminal world Demo

Airport Terminal world 실행

Airport Terminal world 설명

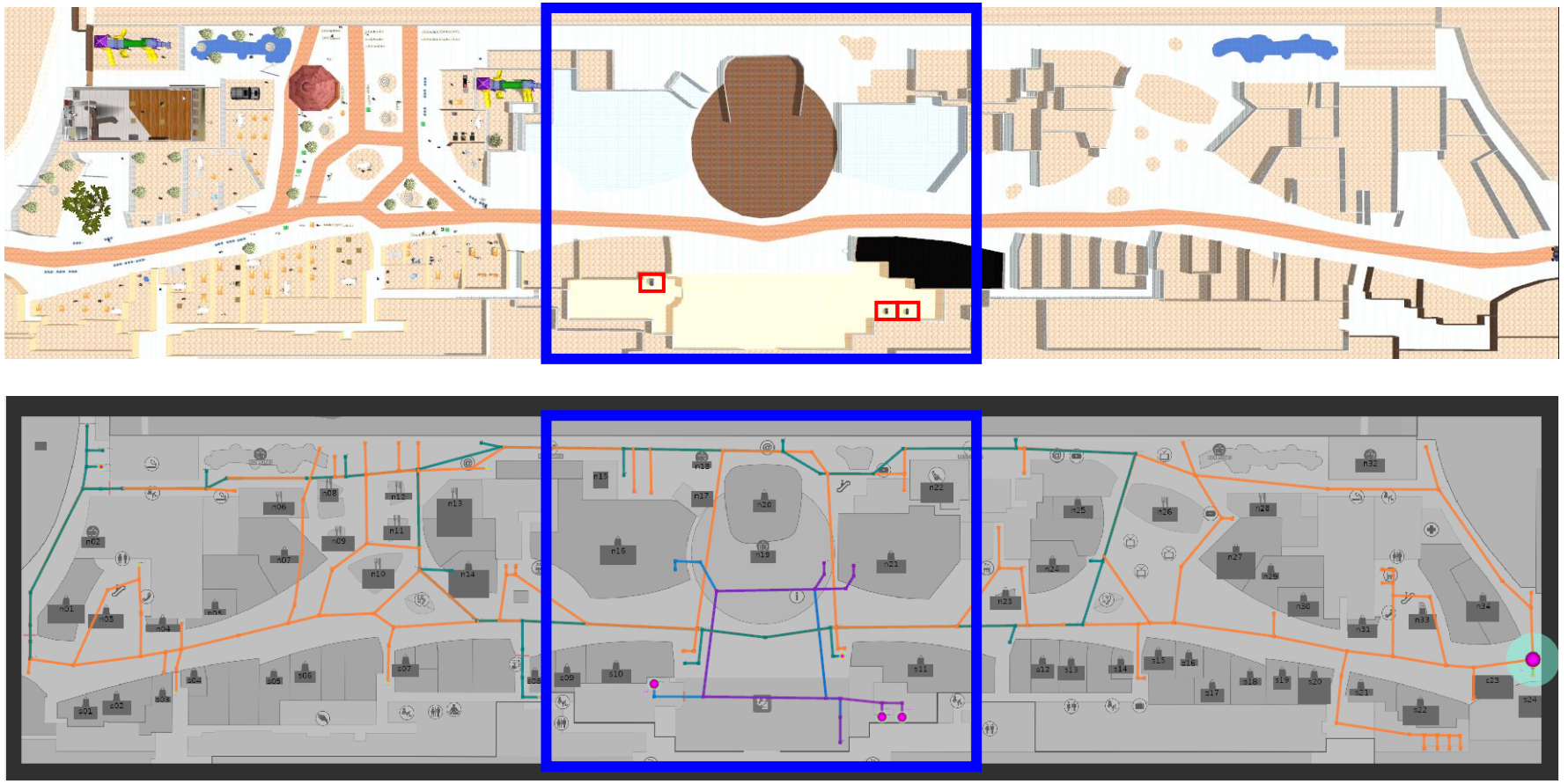




Airport Terminal world Demo

Airport Terminal world 실행

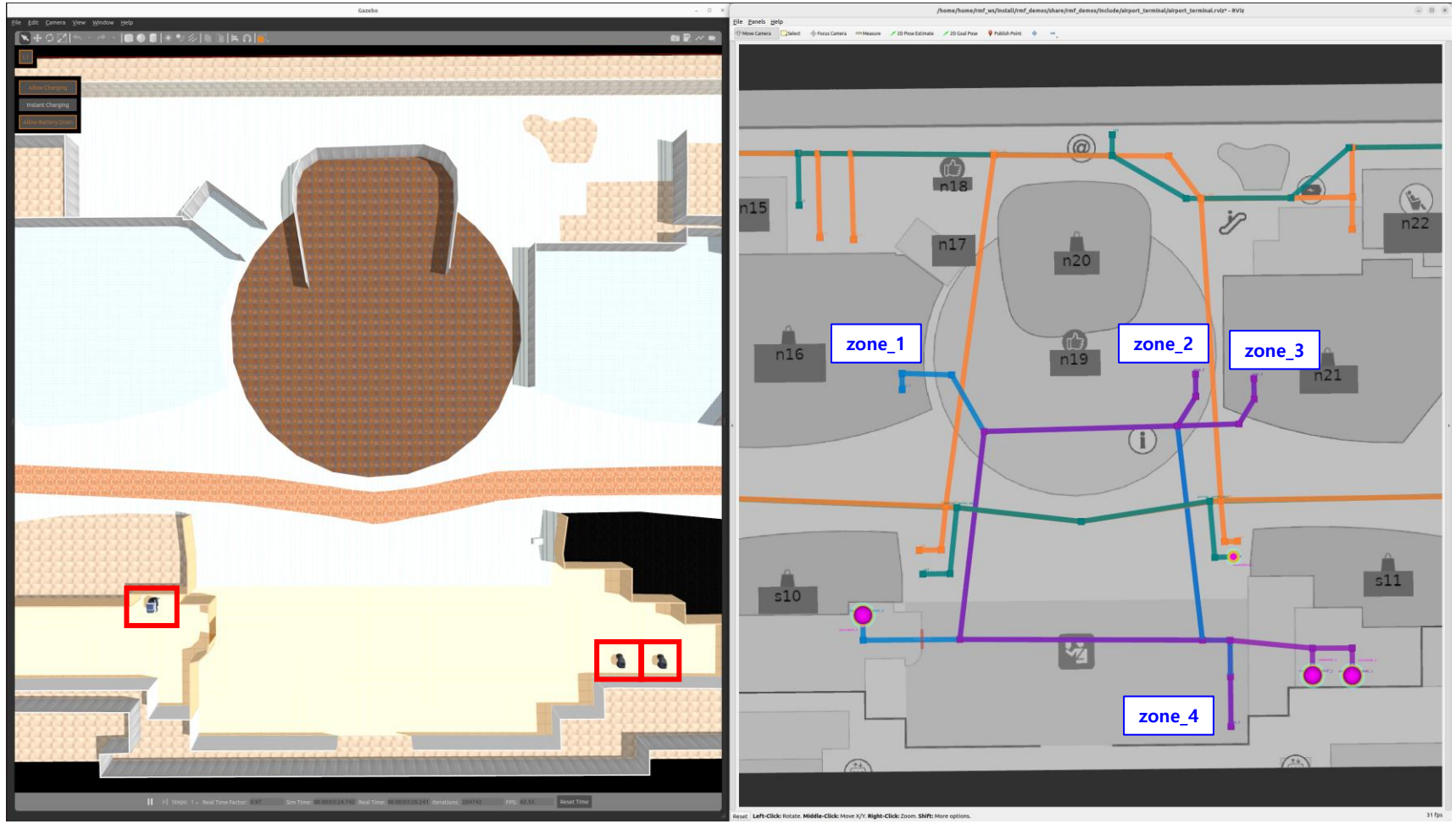
Airport Terminal world 설명



Airport Terminal world Demo

Airport Terminal world 실행

Airport Terminal world 설명



Airport Terminal world Demo

Clean Task 실행

환경 불러오기

```
cd ~/rmf_ws && source install/setup.bash
```

Clean Task 명령

```
ros2 run rmf_demos_tasks dispatch_clean –cs zone_3 --use_sim_time
```

Airport Terminal world Demo

Clean Task 실행

환경 불러오기

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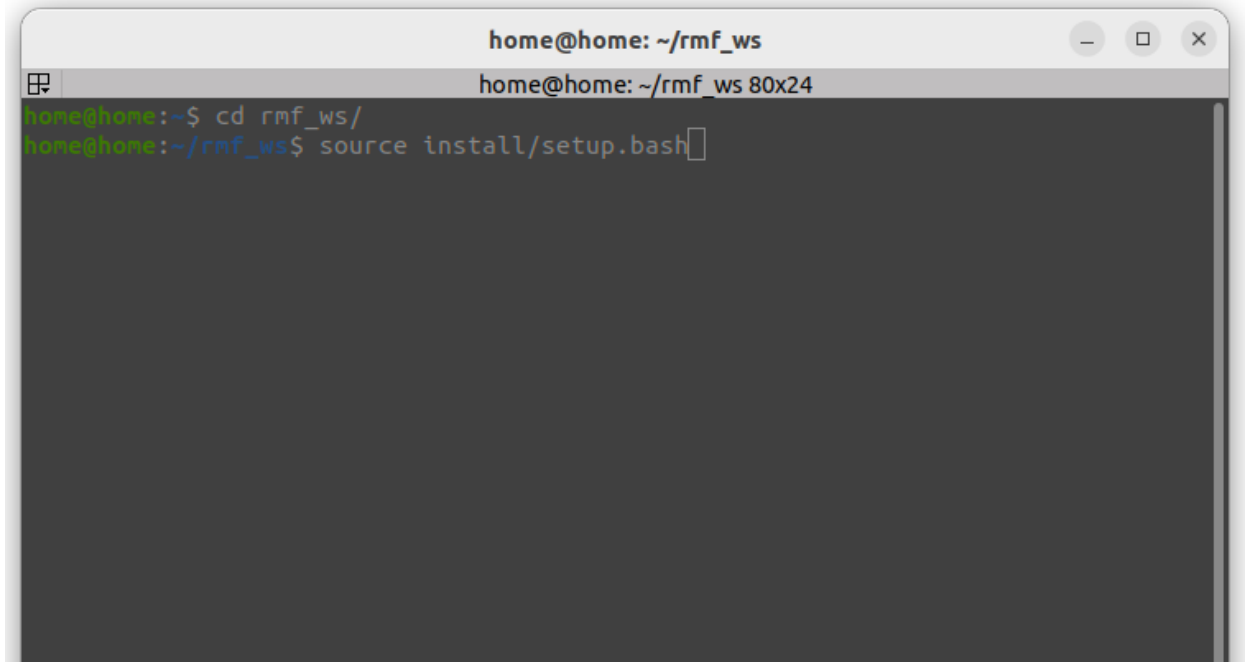
cd ~/rmf_ws && source install/setup.bash
```



Airport Terminal world Demo

Clean Task 실행

Clean Task 명령

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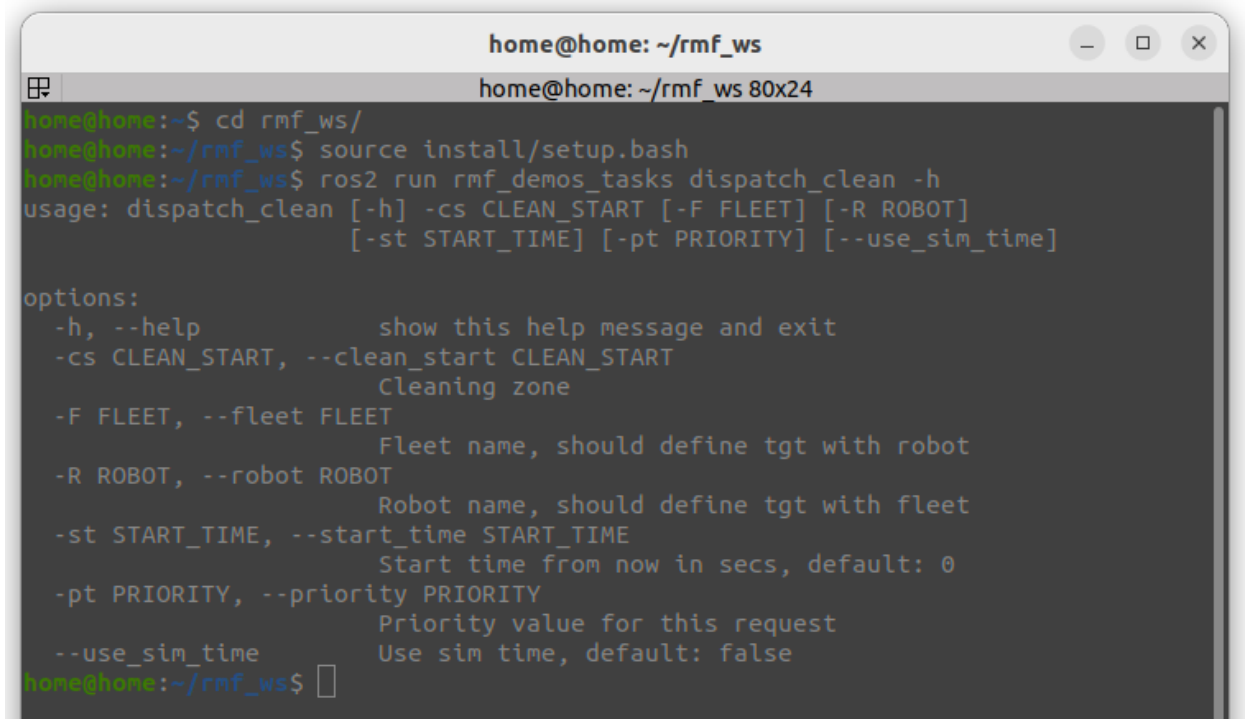
ros2 run rmf_demos_tasks dispatch_clean –cs zone_3 --use_sim_time
```

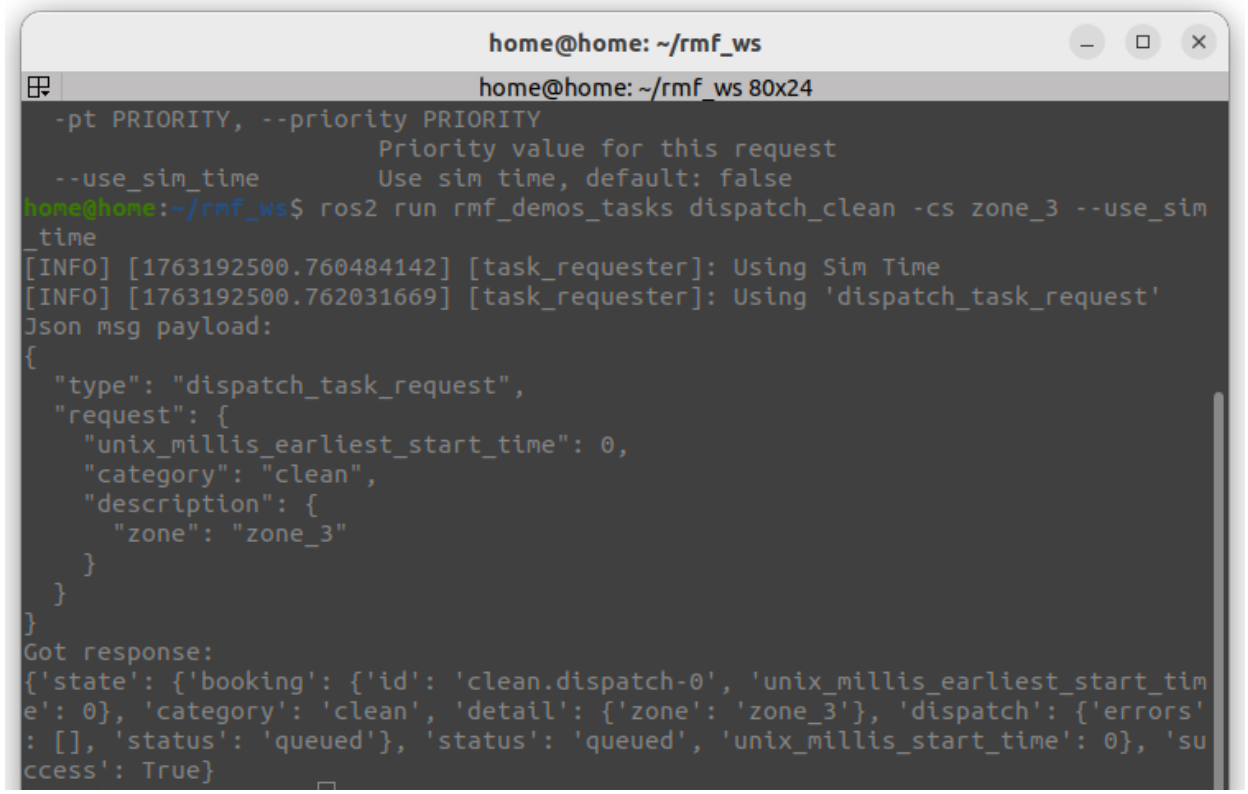


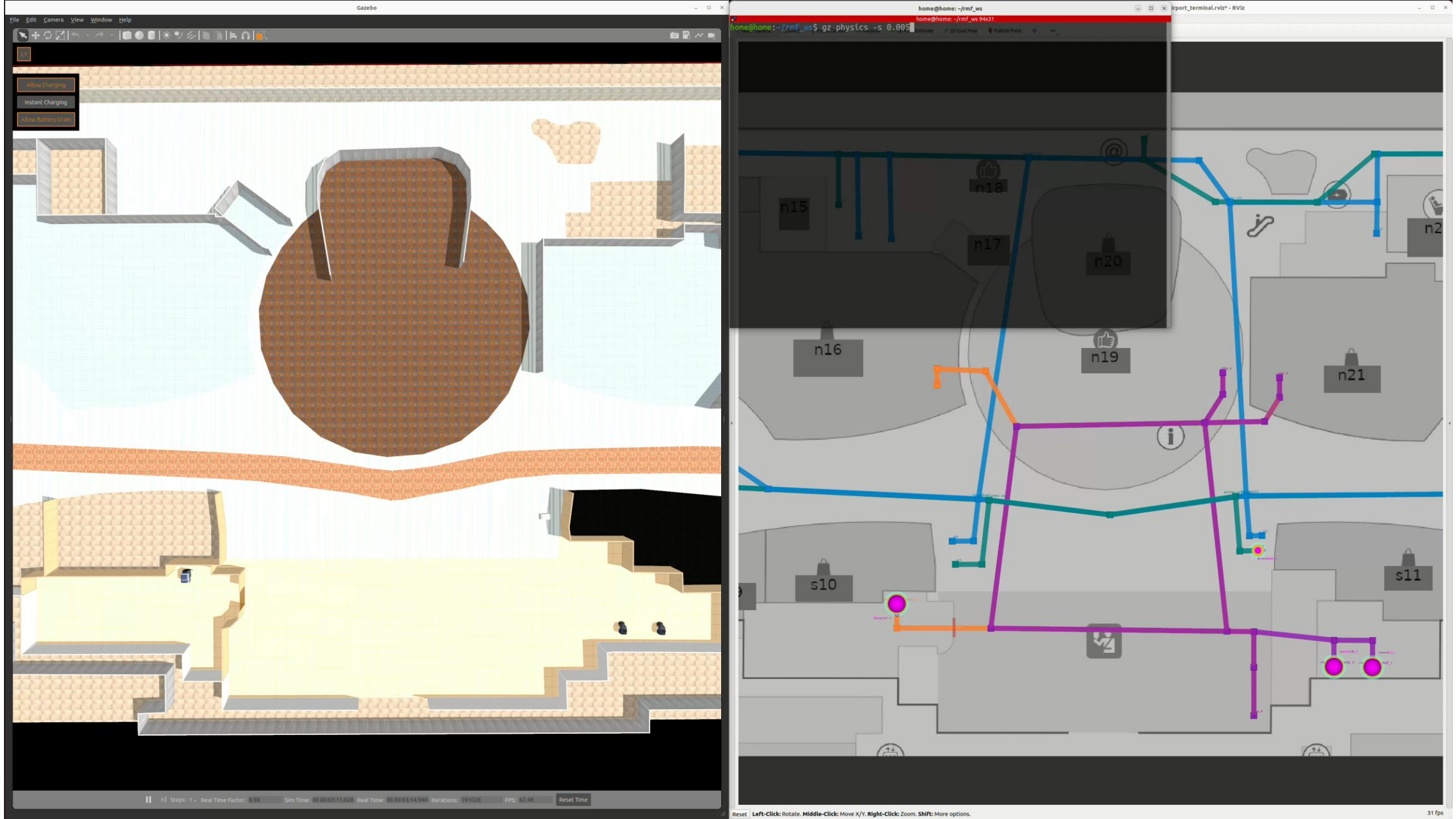
Airport Terminal world Demo

Clean Task 실행

Clean Task 명령

```
ros2 run rmf_demos_tasks dispatch_clean –cs zone_3 --use_sim_time
```




Gazebo
File Edit Camera View Window Help
Allow Charging
Instant Charging
Allow Battery Drain
Steps: 1 Real Time Factor: 0.98 Sim Time: 00 00:03:11.028 Real Time: 00 00:03:14.940 Iterations: 191028 FPS: 62.48 Reset Time
home@home: ~/rmf_ws
home@home: ~/rmf_ws 94x31
home@home:~/rmf_ws$ gz physics -s 0.005
n15
n18
n17
n20
n16
n19
n21
s10
s11
Reset
Left-Click: Rotate. Middle-Click: Move X/Y. Right-Click: Zoom. Shift: More options.
31 fps

Airport Terminal world Demo

Clean Task log 확인

Task 할당 log

```
[fleet_adapter-16] [INFO] [1763192511.870197685] [tinyRobot_command_handle]: Robot tinyRobot_3 has successfully navigated along requested path.
[rmf_task_dispatcher-13] [INFO] [1763192515.792854841] [rmf_dispatcher_node]: Add Task [clean.dispatch-1] to a bidding queue
[rmf_task_dispatcher-13] [INFO] [1763192515.905752550] [rmf_dispatcher_node]:  - Start new bidding task: clean.dispatch-1
[fleet_adapter-24] [INFO] [1763192515.905906995] [cleanerBotE_fleet_adapter]: [Bidder] Received Bidding notice for task_id [clean.dispatch-1]
[fleet_adapter-24] [INFO] [1763192515.906017515] [cleanerBotE_fleet_adapter]: Planning for [2] robot(s) and [1] request(s)
[fleet_adapter-22] [INFO] [1763192515.905908902] [cleanerBotA_fleet_adapter]: [Bidder] Received Bidding notice for task_id [clean.dispatch-1]
[fleet_adapter-22] [INFO] [1763192515.906008485] [cleanerBotA_fleet_adapter]: Planning for [1] robot(s) and [1] request(s)
[fleet_adapter-16] [INFO] [1763192515.905909001] [tinyRobot_fleet_adapter]: [Bidder] Received Bidding notice for task_id [clean.dispatch-1]
[fleet_adapter-18] [INFO] [1763192515.905909434] [deliveryRobot_fleet_adapter]: [Bidder] Received Bidding notice for task_id [clean.dispatch-1]
[fleet_adapter-22] [INFO] [1763192515.906462323] [cleanerBotA_fleet_adapter]: Submitted BidProposal to accommodate task [clean.dispatch-1] by robot [cleanerBotA_0] with new cost [747.538261]
[fleet_adapter-24] [INFO] [1763192515.906923407] [cleanerBotE_fleet_adapter]: Submitted BidProposal to accommodate task [clean.dispatch-1] by robot [cleanerBotE_1] with new cost [692.147233]
[fleet_adapter-24] [INFO] [1763192516.048701963] [cleanerBotE_command_handle]: Robot [cleanerBotE_0] has reached the destination for cmd_id 32
[rmf_task_dispatcher-13] [INFO] [1763192517.905844985] [rmf_dispatcher_node]: Determined winning Fleet Adapter: [cleanerBotE], from 4 responses
[rmf_task_dispatcher-13] [INFO] [1763192517.905911742] [rmf_dispatcher_node]: Dispatcher Bidding Result: task [clean.dispatch-1] is awarded to fleet adapter [cleanerBotE], with expected robot [cleanerBotE_1].
[fleet_adapter-24] [INFO] [1763192517.906115879] [cleanerBotE_fleet_adapter]: Bid for task_id [clean.dispatch-1] awarded to fleet [cleanerBotE]. Processing request...
[fleet_adapter-24] [INFO] [1763192517.906440128] [cleanerBotE_fleet_adapter]: Assignments updated for robots in fleet [cleanerBotE] to accommodate task_id [clean.dispatch-1]
[fleet_adapter-24] [INFO] [1763192517.906654403] [cleanerBotE_fleet_adapter]: Beginning new task [clean.dispatch-1] for [cleanerBotE/cleanerBotE_1]. Remaining queue size: 1
[fleet_adapter-24] [INFO] [1763192517.906724823] [cleanerBotE_command_handle]: Requesting cleanerBotE_1 to stop...
```

RMF Panel

RMF Panel

RMF Panel으로 Clean Task 명령 내리기

환경 불러오기

```
cd ~/rmf_ws && source install/setup.bash
```

Classic Gazebo로 airport_termnal world 실행

```
ros2 launch rmf_demos_gz_classic airport_terminal.launch.xml server_uri:="ws://localhost:7878"
```

RMF Panel 접속

https://open-rmf.github.io/rmf-panel-js/

RMF Panel

RMF Panel으로 Clean Task 명령 내리기

RMF Panel 접속

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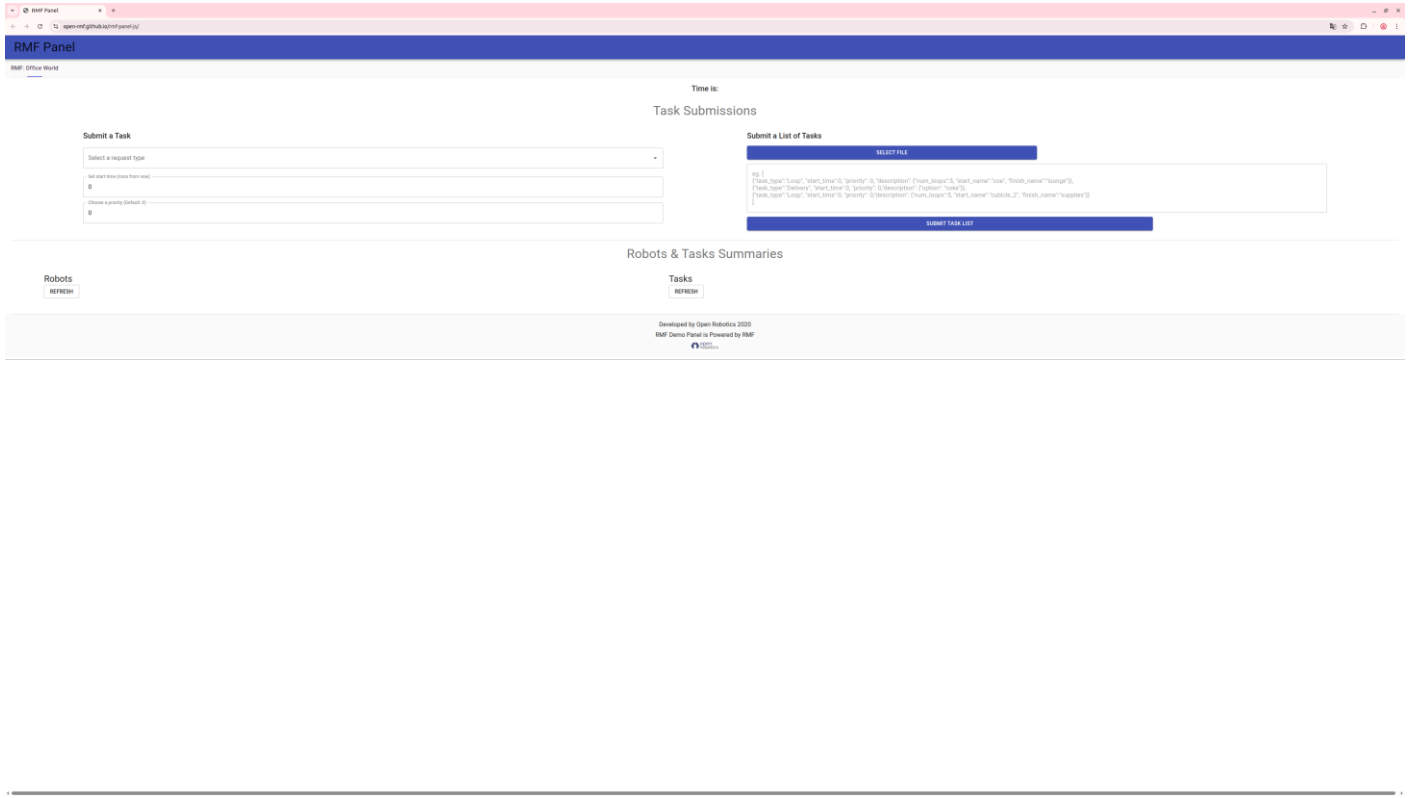
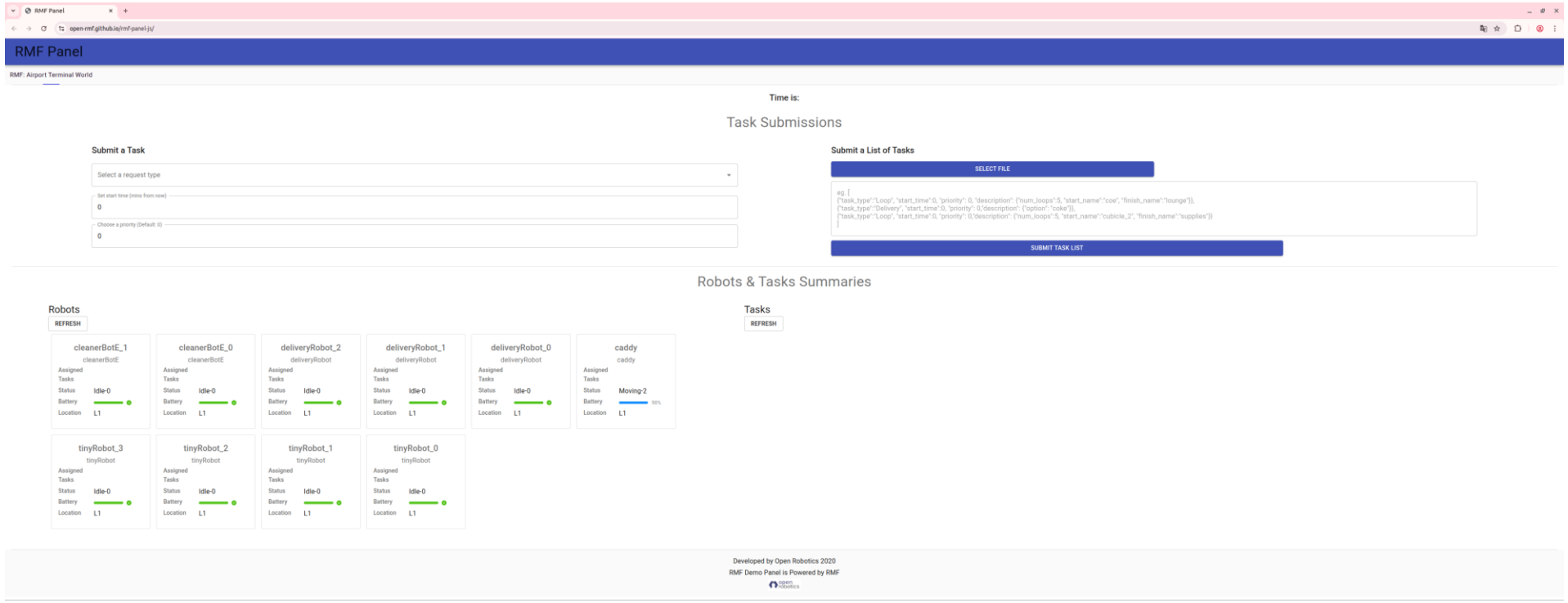


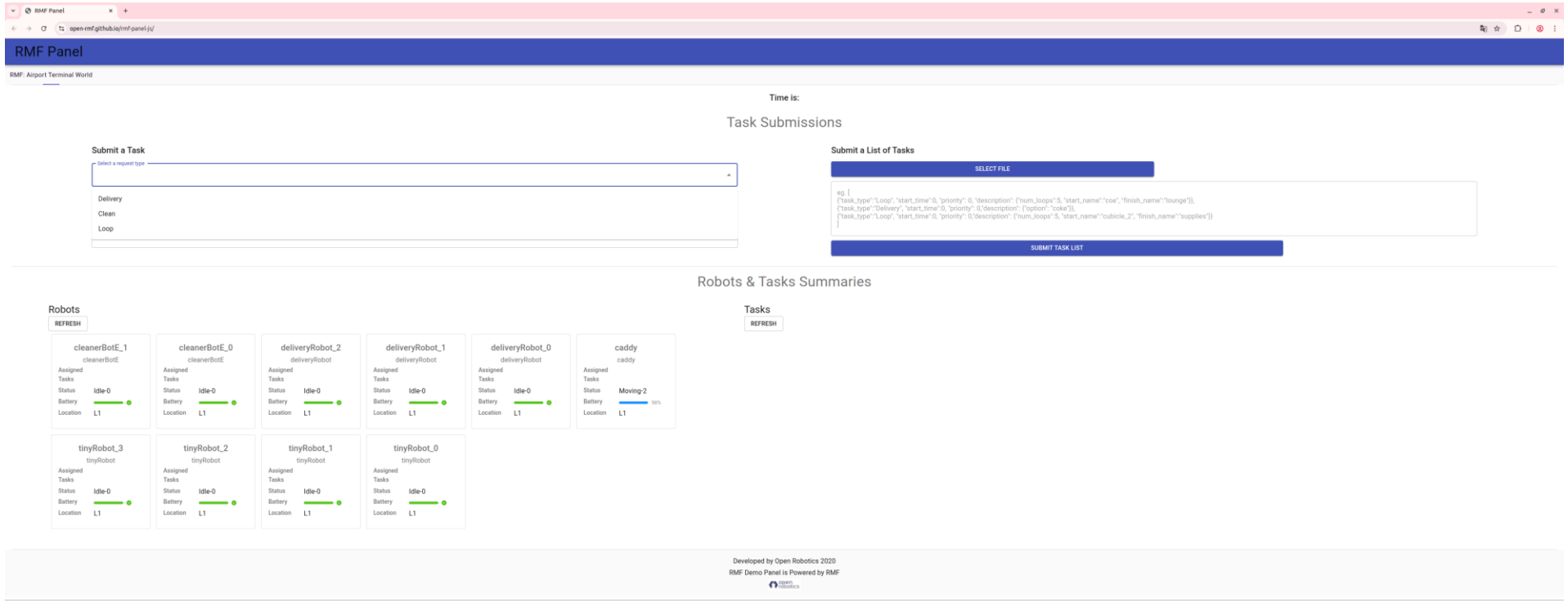
RMF Panel

- **RMF Panel**으로 Clean Task 명령 내리기



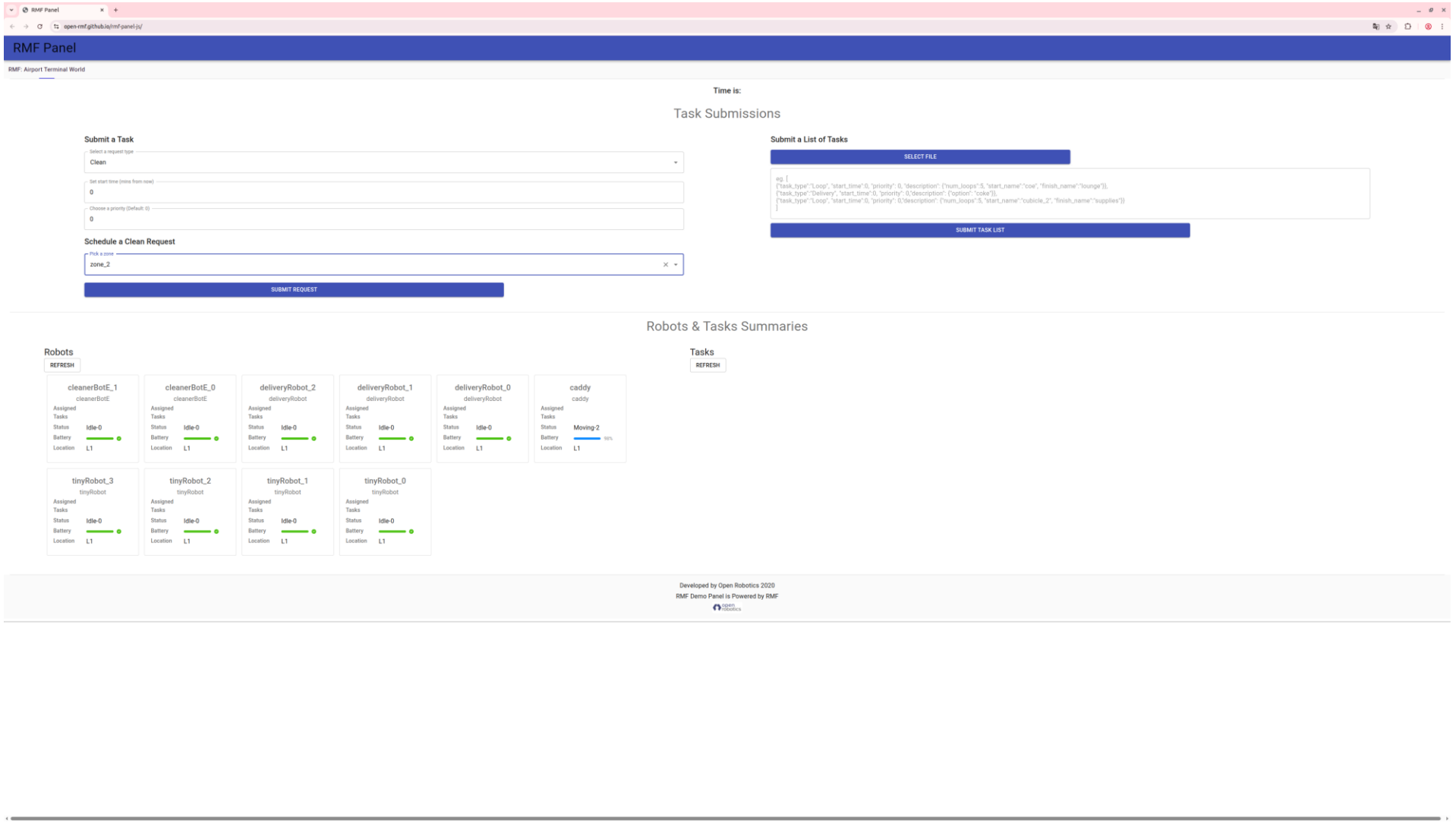
RMF Panel

- **RMF Panel**으로 Clean Task 명령 내리기



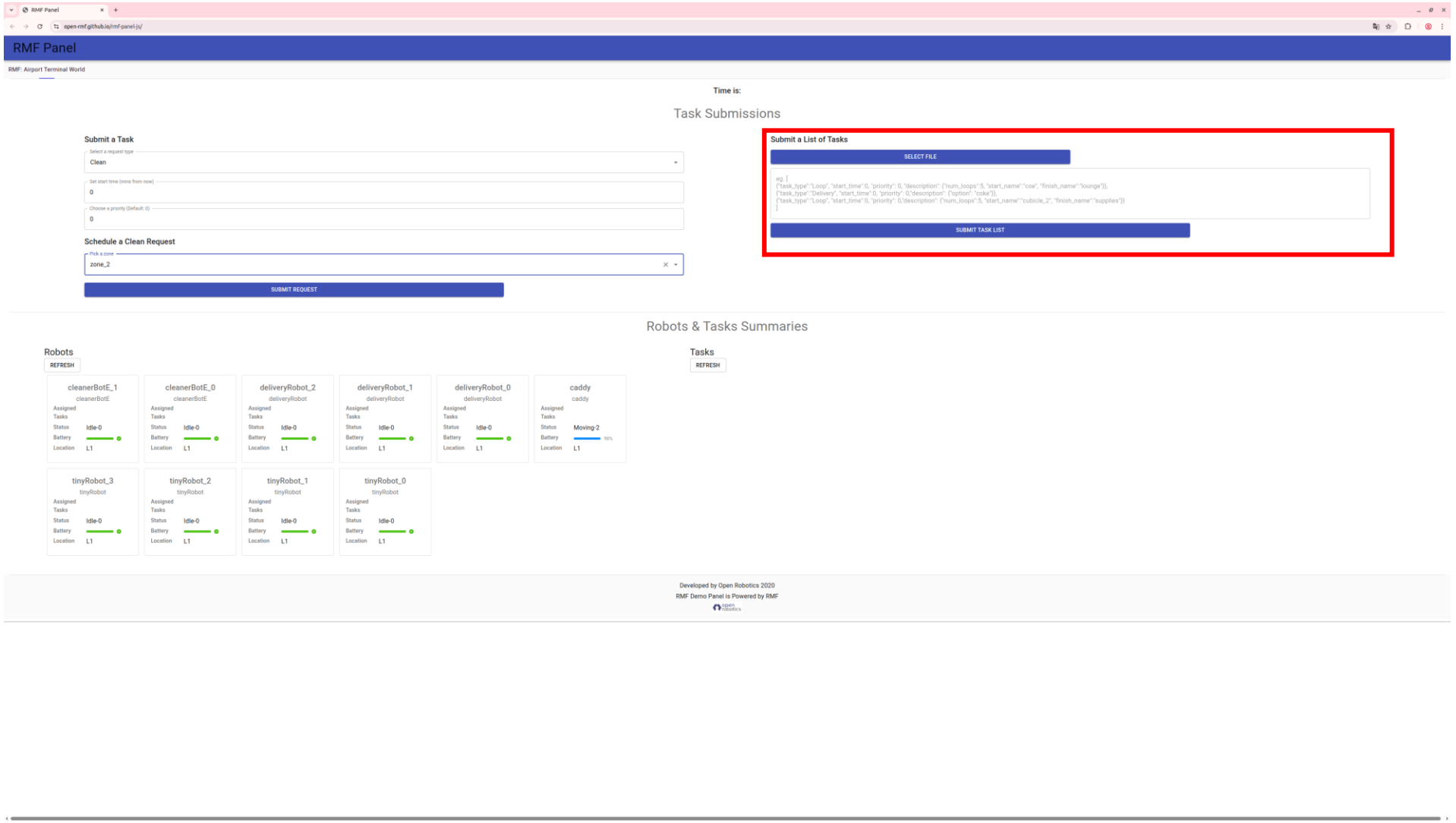
RMF Panel

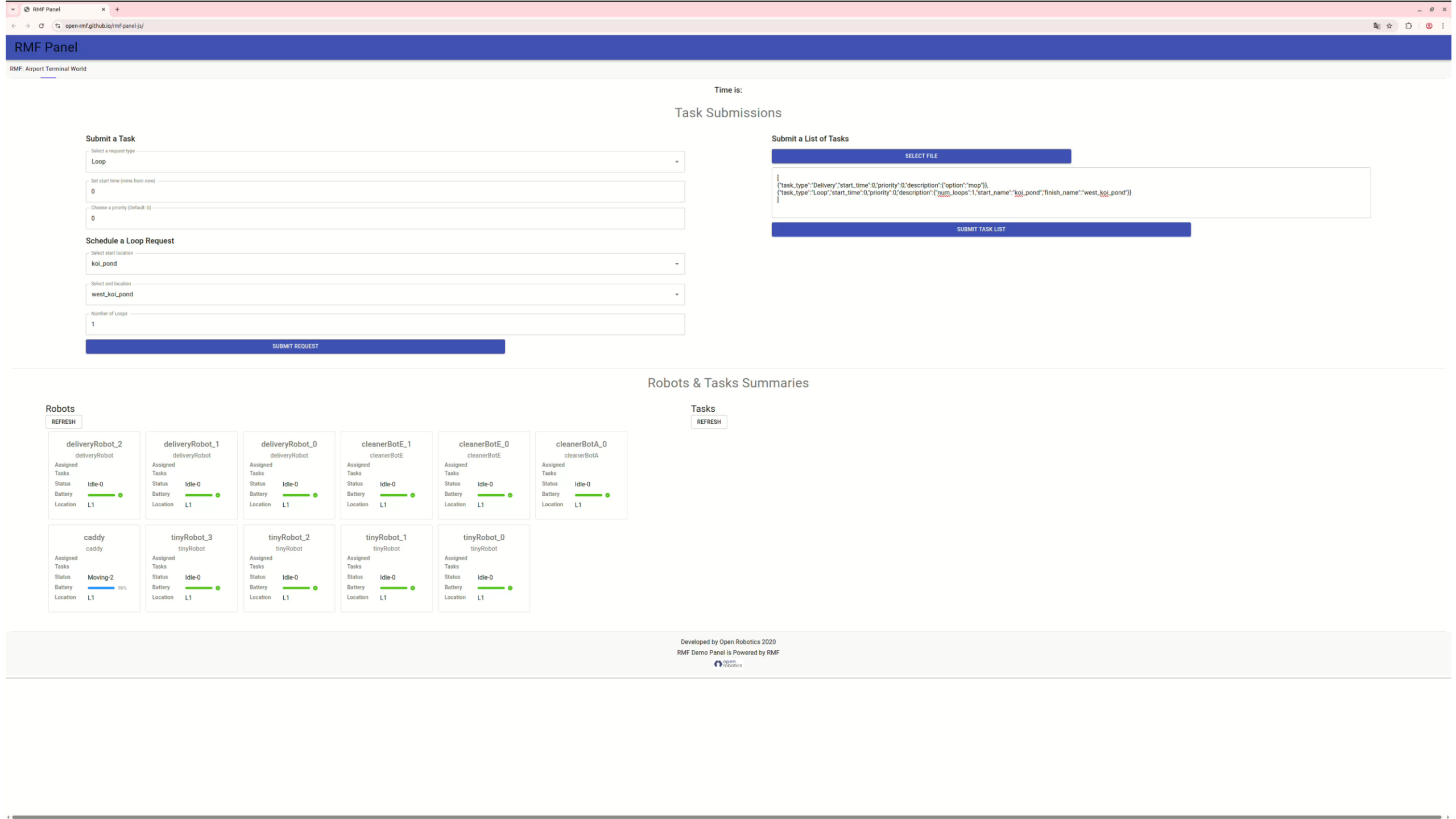
- **RMF Panel**으로 Clean Task 명령 내리기



RMF Panel

- **RMF Panel**으로 loop, delivery Task 명령 내리기




RMF Panel
open-rmf.github.io/rmf-panel-js/
RMF Panel
RMF: Airport Terminal World
Time is:
Task Submissions
Submit a Task
Select a request type
Loop
Set start time (mins from now)
0
Choose a priority (Default: 0)
0
Schedule a Loop Request
Select start location
koi_pond
Select end location
west_koi_pond
Number of Loops
1
SUBMIT REQUEST
Submit a List of Tasks
SELECT FILE
[
{"task_type":"Delivery","start_time":0,"priority":0,"description":{"option":"mop"}},
{"task_type":"Loop","start_time":0,"priority":0,"description":{"num_loops":1,"start_name":"koi_pond","finish_name":"west_koi_pond"}}
]
SUBMIT TASK LIST
Robots & Tasks Summaries
Robots
REFRESH
deliveryRobot_2
deliveryRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
deliveryRobot_1
deliveryRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
deliveryRobot_0
deliveryRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
cleanerBotE_1
cleanerBotE
Assigned Tasks
Status Idle-0
Battery
Location L1
cleanerBotE_0
cleanerBotE
Assigned Tasks
Status Idle-0
Battery
Location L1
cleanerBotA_0
cleanerBotA
Assigned Tasks
Status Idle-0
Battery
Location L1
caddy
caddy
Assigned Tasks
Status Moving-2
Battery 98%
Location L1
tinyRobot_3
tinyRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
tinyRobot_2
tinyRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
tinyRobot_1
tinyRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
tinyRobot_0
tinyRobot
Assigned Tasks
Status Idle-0
Battery
Location L1
Tasks
REFRESH
Developed by Open Robotics 2020
RMF Demo Panel is Powered by RMF
open robotics

감사합니다