High CPU load issue #5296

felixf4xu started this conversation in **General**

felixf4xu on Oct 1

Code of Conduct

- [x] I have read CODE OF CONDUCT and Support Guidelines before creating this Discussion post.

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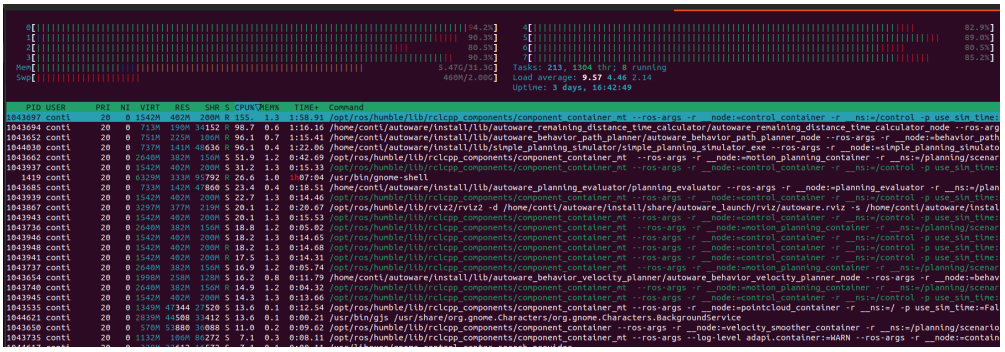
Hi,

I'm running autoware (the latest main branch) in PC with CPU type of Intel® Core™ i7-8809G @ 3.10GHz × 8, it has a graphic card of Intel® HD Graphics 630 (no cuda).

When I run the planning simulation (`ros2 launch autoware_launch planning_simulator.launch.xml`), I have a very high CPU load:



This is actually after I have disabled `pointcloud_container`, it would be even higher with that.

This cause autoware to ERROR:

> [topic_state_monitor_node-11] [WARN] [1727836489.142532714] [system.topic_state_monitor_scenario_planning_trajectory]: /planning/scenario_planning/trajectory topic rate has dropped to the error level. Set ERROR in diagnostics.

Then I looked again to the processes with top CPU load:

Category

General

Labels

None yet

2 participants

> %CPU CMD
> 152 /opt/ros/humble/lib/rclcpp_components/component_container_mt --ros-args -r __node:=control_container
> 96.4 /home/ccccc/autoware/install/lib/simple_planning_simulator/simple_planning_simulator_exe
> 96.1 /home/ccccc/autoware/install/lib/autoware_behavior_path_planner/autoware_behavior_path_planner_node
> 95.9 /home/ccccc/autoware/install/lib/autoware_remaining_distance_time_calculator/autoware_remaining_distance_time_calculator_node
> 52.8 /opt/ros/humble/lib/rclcpp_components/component_container_mt --ros-args -r __node:=motion_planning_container

I don't think `autoware_remaining_distance_time_calculator` should consume so much CPU power, by its function role in autoware.

My PC has an old CPU, i7-8809G, but I don't think it's too old to run a framework like autoware. In real world, what's the CPU spec in a vehicle? It will be some arm based multicore CPU but I would not assume it will be as powerful as a new PC.

I have 3 questions:

1. Is it acceptable? is CPU like i7-8809G too old to run autoware?
2. How to reduce the CPU load, by ROS2 setting (like change of RMW, use more intra-process communication)?
3. How to profile the functions in differenct autoware packages to found out the most time consuming functions

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maxime-clem on Oct 2 Collaborator

Such high CPU loads (especially for the `autoware_remaining_distance_time_calculator`) are unexpected so please make sure you are building Autoware with the `Release` flag (add the argument `-DCMAKE_BUILD_TYPE=Release` to the `colcon build` command).

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felixf4xu on Oct 2 Author

nice catch! yes the cpu data above is captured for a debug build. When I switched to release, the cpu load (first column) is like this:

```
35.9
/opt/ros/humble/lib/rclcpp_components/component_containe
--ros-args -r __node:=control_container
```

```
27.2 /opt/ros/humble/lib/rviz2/rviz2 -d
/home/ccccc/autoware/install/share/autoware_launch/rviz/autowa
22.5
/home/ccccc/autoware/install/lib/autoware_behavior_path_planne
20.7
/opt/ros/humble/lib/rclcpp_components/component_container_mt
--ros-args -r __node:=motion_planning_container
13.9
/opt/ros/humble/lib/rclcpp_components/component_container_mt
--ros-args --log-level adapi.container:=WARN
11.5
/home/ccccc/autoware/install/lib/simple_planning_simulator/sim
 9.7 /usr/bin/python3 /opt/ros/humble/bin/ros2 launch
autoware_launch planning_simulator.launch.xml
 8.0
/home/ccccc/autoware/install/lib/autoware_behavior_velocity_pl
 6.2
/opt/ros/humble/lib/rclcpp_components/component_container_mt
--ros-args --log-level
autoware_api.external.rtc_controller.container
 6.1
/home/ccccc/autoware/install/lib/autoware_planning_evaluator/p
 5.4
/home/ccccc/autoware/install/lib/autoware_remaining_distance_t
 5.2
/opt/ros/humble/lib/rclcpp_components/component_container -
-ros-args -r __node:=velocity_smoother_container
 4.9
/opt/ros/humble/lib/rclcpp_components/component_container -
-ros-args -r __node:=container -r
__ns:=/system/component_state_monitor
 4.8
/home/ccccc/autoware/install/lib/diagnostic_graph_aggregator/a
```

much more reasonable!

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