

Proposal on short- and mid-term strategy of pointcloud_container #4112

Unanswered)

kminoda asked this question in Ideas



kminoda on Jan 22 (Collaborator)

Introduction

Currently, Autoware has /pointcloud_container which may contain nodes from multiple component such as follows.

- /sensing/lidar/concatenate_filter
- /perception/object_recognition/detection/voxel_grid_downsample_filter

The container is launched only when use_pointcloud_container = true , which behaves as a flag whether to gather pointcloud-related nodes into one inter-component container or not.

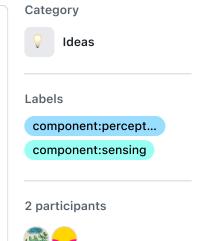
Cons of use pointcloud container = false

The /pointcloud_container is introduced to enable zero-copy communication of data-intense messages such as /sensing/lidar/concatenated/pointcloud . For example in TIER IV, all applications (including Robotaxi, Robobus, Cargo, etc) use this /pointcloud_container to enhance the performance around LiDAR data communication among multiple ROS nodes. We also have an evaluation flow for use_pointcloud_container = true case, but NOT for use_pointcloud_container = false . Thus, at least from our end, the false case is not evaluated enough.

Cons of use pointcloud container = true

The /pointcloud_container accepts nodes from multiple components e.g. Sensing & Perception. This makes it difficult to split those components into separate computers, which may be troublesome for some usecases where they want to load Sensing and Perception components on different computers from computational resource perspective.

Proposal



Short-term strategy

I propose to remove use_pointcloud_container flag and use /pointcloud_container by default.

This is mainly due to the fact that the case when use_pointcloud_container = false is not tested enough. Also, removing the unused flag will improve the readability of launch scripts.

PR: autowarefoundation/autoware.universe#6115

Mid-term strategy

As discussed internally w/ @yukkysaito, we should seek alternative means to enable zero-copy communication without using ROS 2 composable nodes, e.g. IceOryx in order to address the cons of use_pointcloud_container = true .

Let us know if you have any agrees/disagrees for this proposal. We especially would like to know if there is anyone who see a clear disadvantage of use_pointcloud_container = true .



2 comments · 1 reply

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xmfcx on Jan 24 (Maintainer)

edited -

I would like to also propose:

- Remove: use_pointcloud_container variable and set it true for where it is used.
- Set: pointcloud_container_name to pointcloud_container or something more general like: sensing_component_container and remove this variable.

Used in:

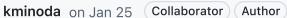
https://github.com/autowarefoundation/autoware_launch/blob/8b818d4ddbe 2e5ad16d3f2f4b20bdd08e3694963/autoware_launch/launch/autoware.laun ch.xml#L7-L8

- Also make use_intra_process_comms to be true by default for all composable nodes.
 - Without this, there is no zero copy within the container.





1 reply





Thank you for your comment. For the naming, I would prefer pointcloud_container as it may include pointcloud-related nodes from multiple components (sensing, perception, localization, ...).

