

Something big is coming in ros2_control with ROS 2 Jazzy!



Bence Magyar, Denis Stogl



r/ROS • 1 yr. ago

to ros2_control or to not ros2_control









Image source: lego.com



Frameworks



History





https://control.ros.org/master/doc/supported_robots/supported_robots.html



Command and state interfaces









Async Support





Async Controllers



Async Hardware

3rd party

Controllers

safety_critical_controller

joint_state_broadcaster

slow_controller







Fallback controllers







Fallback controllers



















Chaining controllers

Velocity limiting based on range sensors ros2_control Range Sensor /ultrasound Range Sensor Broadcaster sensor_msgs/nsg/Range navigation Range Sensor Filter stack Broadcaster /cmd_vel **4**.....(Left Wheels geometry_msgs/nisg/TwistStamped Safe Base Controller **Right Wheels** \triangle Distance Actuator ♦ Interfaces



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Data Management in Drivers



- Rely on framework for boilerplate code
- No handling of double-pointers needed
- Make hardware drivers more future-proof
- Ability to add custom "undeclared interfaces"
 - \circ $\,$ For things not present in the URDF
- Lower driver maintenance effort
 - Companies tend to lag a little with updates
- Future-proofing

Data Management in Drivers



Command-/StateInterfaces are now created and exported automatically by the framework via on_export_command_interfaces() or on_export_state_interfaces()

New members to access states/commands in hardware drivers:

- joint_state_interfaces_
- joint_commands_interfaces_

No changes for controllers!

Backward compatibility in Jazzy.

When you export using the old API, it will work as before.









double*















std::array<double, 100>





class Handle { double* value;

public:

double get();
void set(double v);
};

class Handle
{
 std::variant<double> value;

public:

```
double get();
void set(double v);
};
```



```
class Handle
{
   std::variant<double, bool, uint8_t, std::array<char, 100>,
        std::array<char, 100>> value;
public:
   T get();
   void set(T v);
};
```



Implications...

sizeof(std::variant<double, bool, uint8_t, std::array<char, 100>>); **112** + std::array<double, 100>>

VS

sizeof(double*);

14x



808



For PAL's TALOS with 32 DoF and 20+20 interfaces each this is a 130kB/1000kB increase in memory footprint





Contributing



2 https://github.com/ICube-Robotics/pytroller

https://github.com/Gepetto/ros2 control py

https://github.com/ros-controls

📮 ros-co	ntrols / ros2	control Public
<> Code	○ Issues 97	11 Pull requests

Working Group Meetings every second Wednesday!

Next one is 6th November!

Add additional return value to the hardware interface::return type good first issue (\cdot) good second issue help wanted #815 opened 27 days ago by destogl

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ros2 control reviewers



References

• <u>https://control.ros.org/</u>

• ros_control paper in

the Journal of Open Source Software

- ros2_control presentations
 - <u>https://control.ros.org/master/doc/resources/resources.html</u>

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control.ros.org stats "Year to date"

Unique visitors: 105k

Total pageviews: 476k

• Github repositories at https://github.com/ros-controls

Total visits: 144k





PICKNIK

Bence Magyar, Denis Štogl, Christoph Froehlich, Sai Kishor Kothakota, Felix Exner, Manuel Muth, Alejandro Hernandez Cordero, Reza Kermani, Lennart Nachtigall, Takashi Sato, Henry Moore, Abrar Rahman Protyasha, Jakub Delicat, Wiktor Bajor, Silvio Traversaro, Noel Jimenez Garcia, Tony Baltovski, Vladimir Ivan, Mateus Menezes, Abishalini Sivaraman, Alex Moriarty, Marq Rasmussen, Paul Gesel, Olivier Stasse, Márk Szitanics,...... and many more!