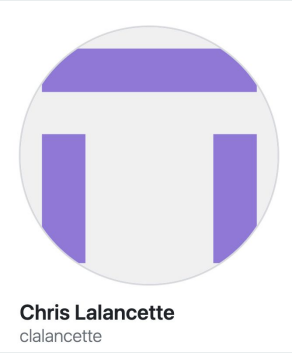
The State of ROS: Beneath the Kilt

Chris Lalancette - ROS 2 Project Lead
September 25, 2024

ROS

Who am I?



Chris Lalancette
clalancette

ROS

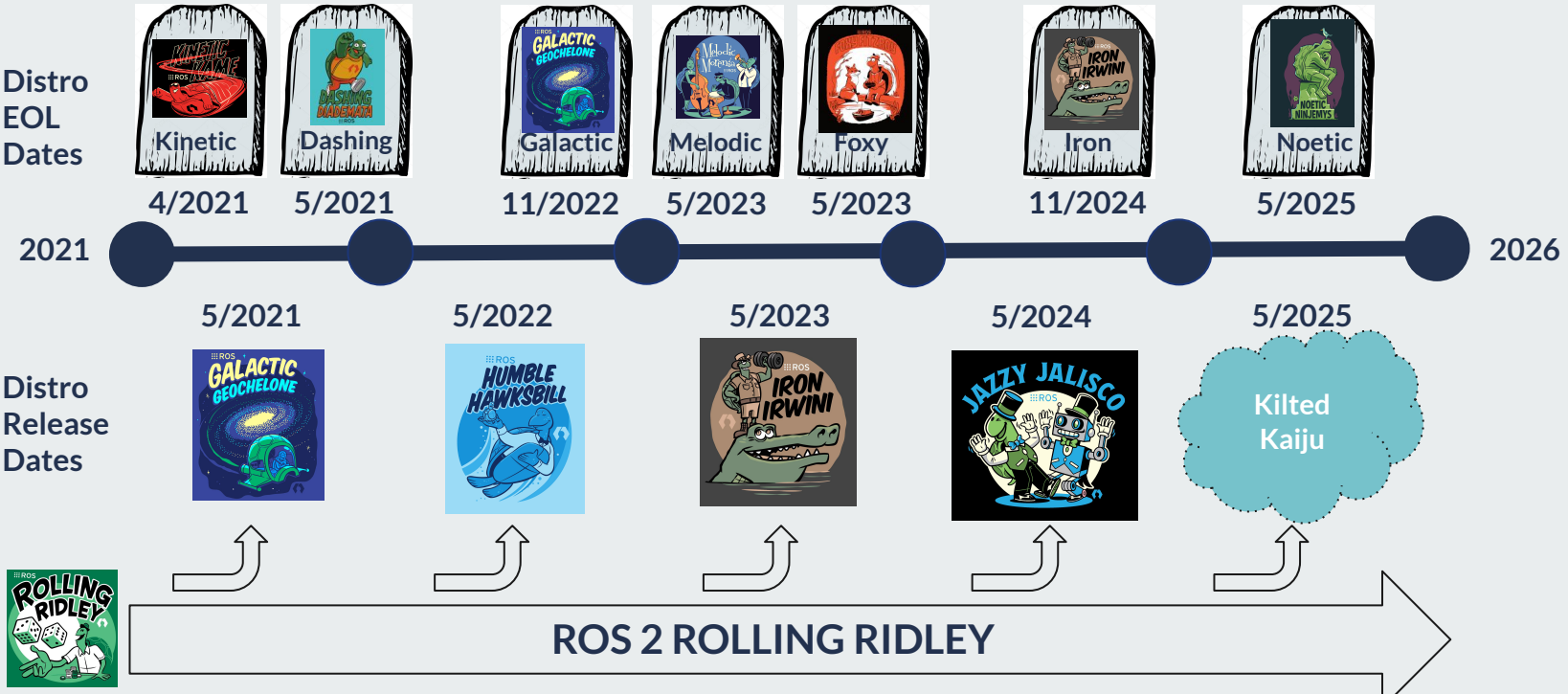
Outline

- ROS distribution update
- OSRA
- The community
- New core features in Jazzy Jalisco (May 2024)
- Features in development for Kilted Kaiju (May 2025)
- Long-term outlook for core features

ROS

ROS Distribution update

ROS Distros (REP-2000)



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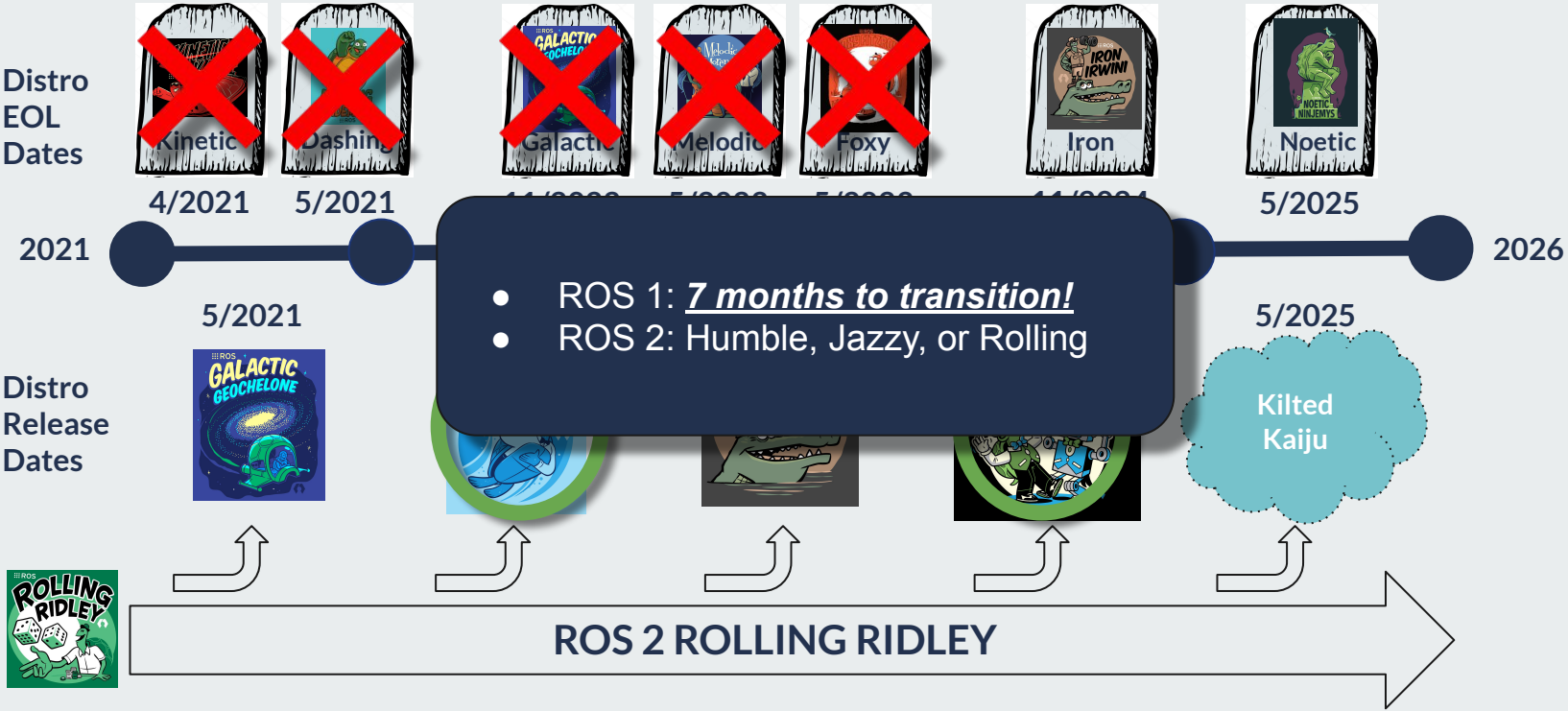


- ROS 1: ***7 months to transition!***
- ROS 2: Humble, Jazzy, or Rolling

ROS

Packages available (September 2024)

2094

1732

1346

1384

1251

ROS

73.4%

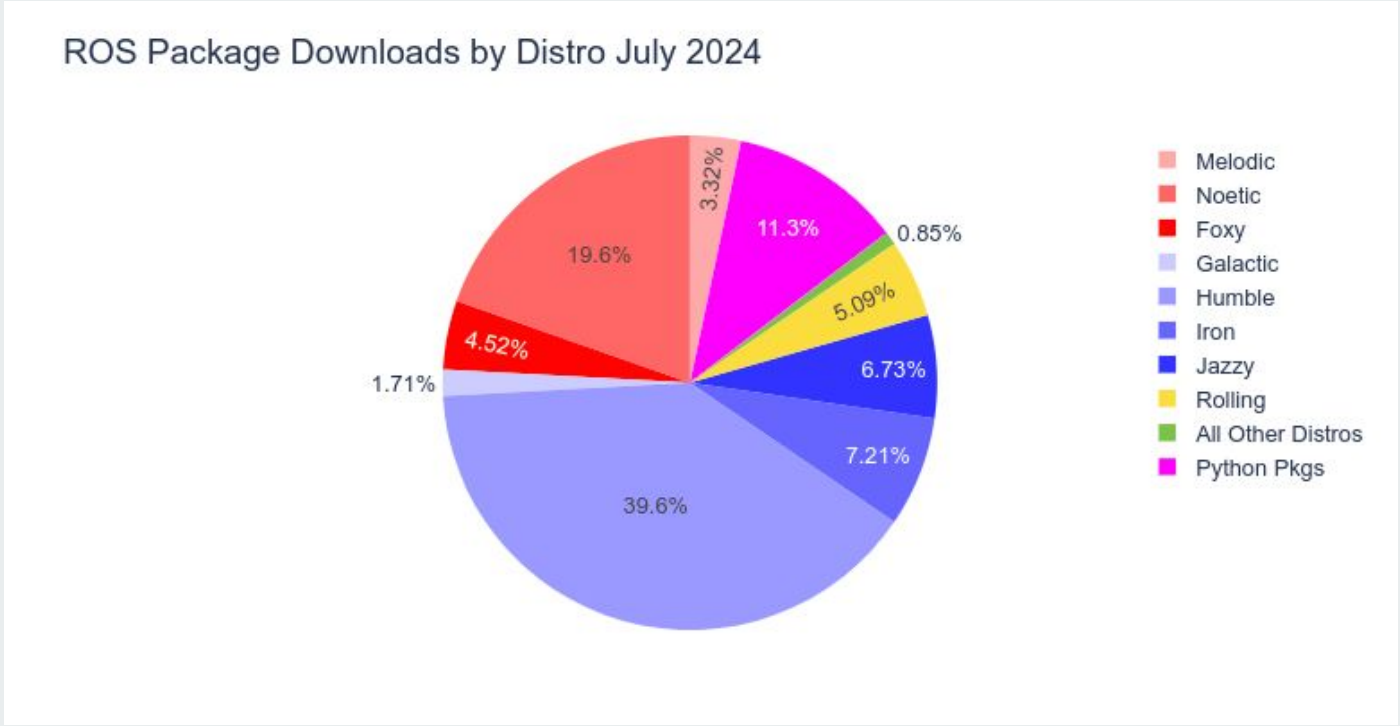
Percentage ROS downloads that were ROS 2 in July 2024!

40,514,316

ROS package downloads in July 2024 alone!

ROS

Package downloads

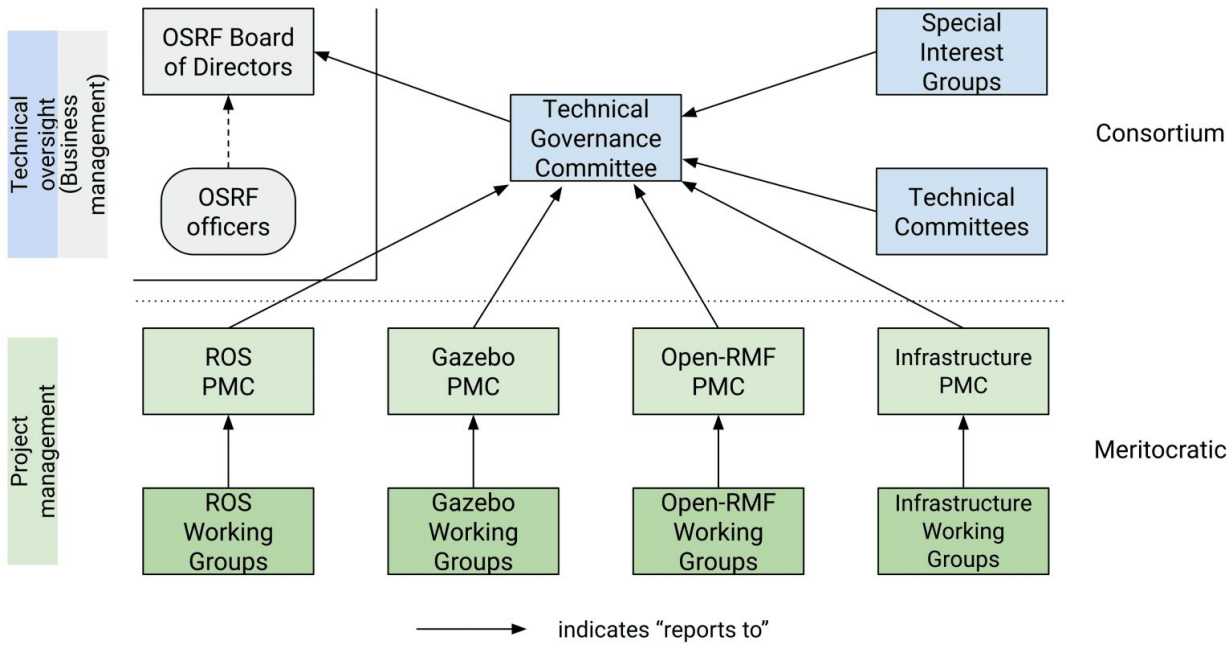


ROS

OSRA

ROS

OSRA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OSRF Board of Directors
OSRF officers
Technical Governance Committee
Special Interest Groups
Technical Committees
Consortium
Project management
ROS PMC
Gazebo PMC
Open-RMF PMC
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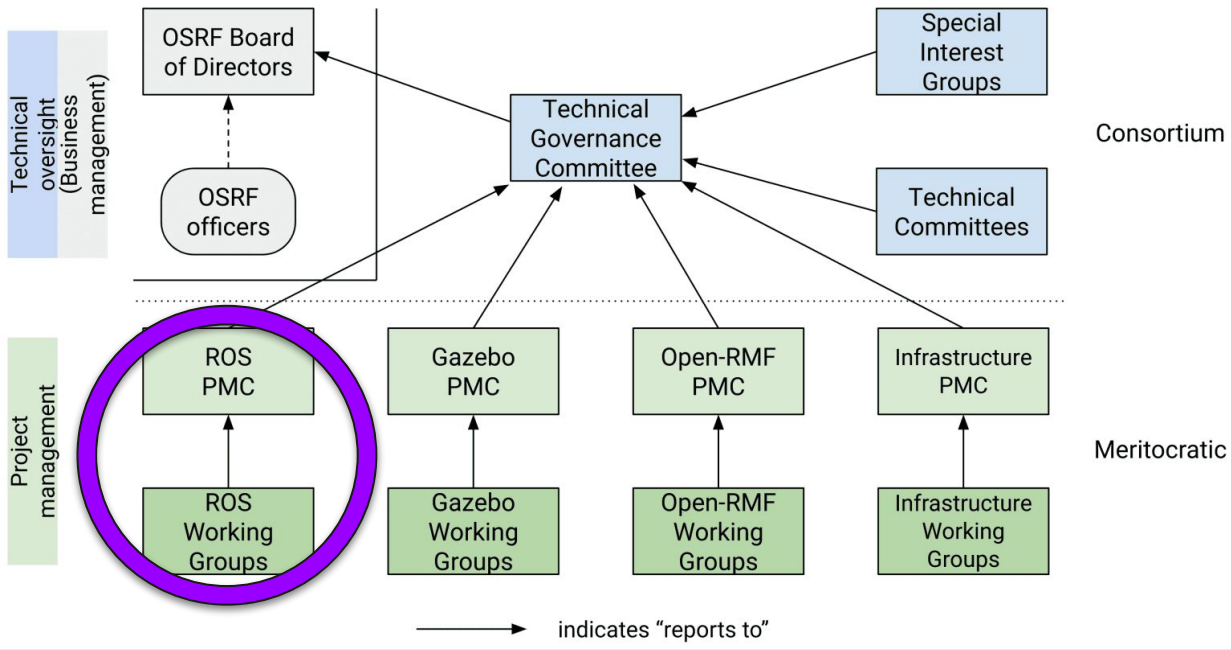
indicates “reports to”

ROS

OSRA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ROS

ROS PMC

- Officially started ROS PMC in July 2024
- Charter: https://osralliance.org/staging/wp-content/uploads/2024/03/ros_project_charter.pdf
- Meetings are public
- Three roles in the PMC
  - Project leader
  - Member
  - Committer
- Formal decisions can be made by a vote of the PMC members
- In short, ROS PMC is responsible for development and release of ROS 2
- Meritocratic

ROS PMC Constituents

Members

Name	Affiliation
Christophe Bedard	Apex.AI
Michael Orlov	Apex.AI
Alejandro Hernandez Cordero	Independent
Audrow Nash	Intrinsic
Chris Lalancette	Intrinsic
Marco Gutierrez	Intrinsic
Michael Carroll	Intrinsic
Scott Logan	Intrinsic
Shane Loretz	Intrinsic
Steven! Ragnarök	Intrinsic
William Woodall	Intrinsic
Yadunund Vijay	Intrinsic
Alberto Soragna	iRobot
Tomoya Fujita	Sony

Committers

Name	Affiliation
Erik Boasson	ADI/Zettascale
Miguel Company	eProsima
Aditya Pande	Independent
Brandon Ong	Intrinsic
Dharini Dutia	Intrinsic
Kat Scott	Intrinsic
Steve Peters	Intrinsic
Steve Macenski	Open Navigation
Barry Xu	Sony
G A van der Hoorn	TU Delft
Morgan Quigley	Intrinsic
Tully Foote	Intrinsic
Andrea Sorbini	RTI

ROS

The Community

ROS

ROS Bosses

Steven! Ragnarok

Steven! Ragnarok

Michael Carroll

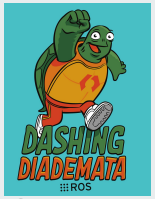
Scott Logan

Yadunund Vijay

Steven! Ragnarok

Ken Conley

Mikael Arguedas / Steven! Ragnarok



Steven! Ragnarok

Jacob Perron / Dharini Dutia

Audrow Nash

Marco A. Gutiérrez

Ken Conley

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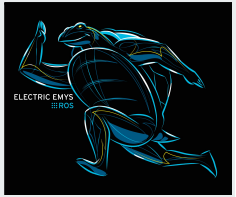
Mikael Arguedas / Chris Lalancette

Chris Lalancette

Shane Loretz



Ken Conley

Ken Conley

Tully Foote

Tully Foote

Tully Foote

Tully Foote / William Woodall

Tully Foote

ROS

Resources

- Core documentation: https://docs.ros.org
- Package index: https://index.ros.org
- Discourse for discussion, announcements, or release: https://discourse.ros.org
- Discord server for real-time conversation: https://www.ros.org/blog/discord/
- ROS Robotics stack exchange: https://robotics.stackexchange.com/questions/tagged/ros
- Working groups: https://docs.ros.org/en/rolling/The-ROS2-Project/Governance/Working-Groups.html
- GitHub:
  - https://github.com/ros2
  - https://github.com/ament
  - https://github.com/ros

ROS

New Core Features in Jazzy Jalisco

Released May 23rd 2024

Changelog

ROS

Feature-complete rmw_zenoh

- Reminder of the context for rmw_zenoh
  - Motivations and community discussions: https://discourse.ros.org/t/investigation-into-alternative-middleware-solutions/32642/43
  - Report: https://discourse.ros.org/t/ros-2-alternative-middleware-report/33771/14

- rmw_zenoh supports all core RMW concepts
  - Nodes
  - Publishers
  - Subscriptions
  - Service Clients
  - Service Servers
  - Quality of Service
  - Events
  - Graph introspection

ROS

Better Gazebo Integration!

- Gazebo Classic is near end of life. The community requested a better modern Gazebo install process.
- Gazebo Harmonic works best with Jazzy, but other versions can also be used
- `sudo apt-get install ros-jazzy-gz-sim-vendor`

See: https://bit.ly/JazzySimulation

ROS

Bagging ROS 2 services

- Ability to bag services is a feature request going back to ROS 1
- Jazzy finally implements it
- `ros2 bag record --all-services`
- You can also replay the bagged services calls from a bag file from the command line using the flag: `--publish-service-requests`

See: https://bit.ly/ROSBagServices

ROS

ROSBag2 Improvements

Bag Faster!

ROSBag2 recorder and player are now rclcpp components that can use IPC for better performance. You can also control thread priority for compression.

Splitting

You can now convert a ROS bag file and split it into files all in one go using `ros2 bag convert`.

Bag Metadata

As part of a broader initiative ROSBag files now contain topic metadata, which means you can replay a ROS Bag anywhere you want!

ROS

ROSBag2 Improvements

Include Distro Name

The ROS distro name is now included in bag metadata. This makes it easy to determine what ROS Distro created the bag file!

RMW Timestamps

ROSBags now record the RMW send and receive timestamps, which are more indicative of when the data was actually sent and received.

Disable Keyboard Controls

This feature allows you to optionally disable keyboard input for bag recording. This prevents accidentally stopping data collection.

Save Messages By Type

Ever want to save every image captured on every camera on your robot?

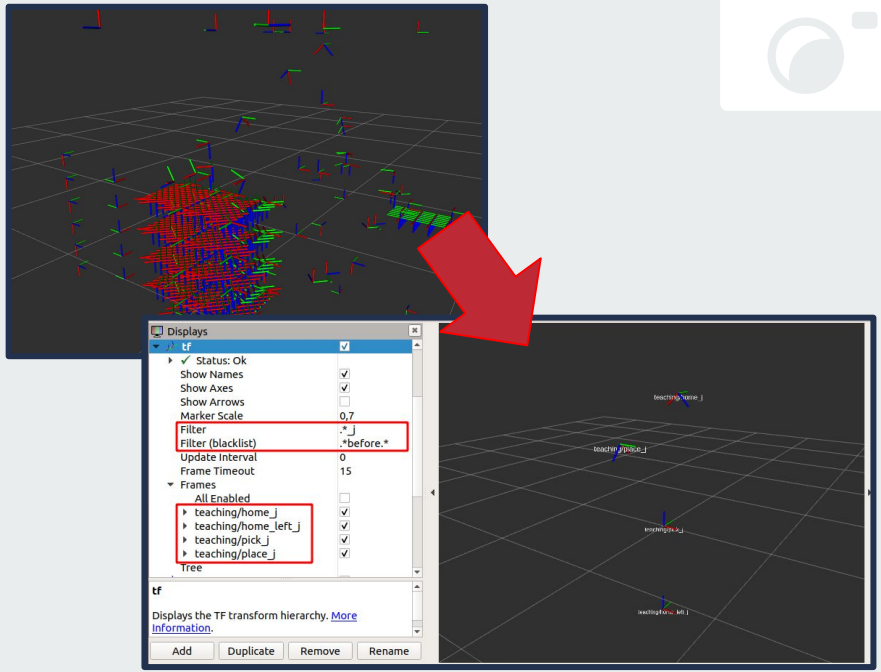
Now you can!

```
ros2 bag record --topic-types <full msg type> ...
```

ROS

RViz2 RegEx Filtering for TF Frames

You can now filter TF frames using RegEx expressions inside of RViz2. This makes it much easier to filter your display to show only relevant data.



See: https://bit.ly/RViz2RegEx

ROS

Other RViz2 Goodies

Subscription Hz Display

The topic status widget now tells you the you each topic's update rate by default. No more guessing if a topic is updating!

Plugin Parity

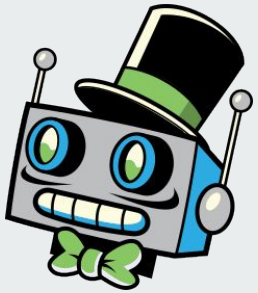
The RViz plugins for DepthCloud, AccelStamped, TwistStamped, WrenchStamped, and Effort message types are now supported!

Reset Time

You can now reset simulation time inside of RViz2. This can be done by calling /rviz/reset_time or by pressing the "R" key.

Camera Info Display

The camera info topic can now be displayed in RViz2. All of your camera calibration parameters and ROI info are now visible in RViz 2.



Point Cloud Transport

Rendering large point cloud displays in RViz2 is now possible! Bring on the LIDARs because this beloved functionality is back!

ROS

Improved executor performance

- What are executors?
- Available executors in rclcpp
  - SingleThreaded
  - MultiThreaded
  - StaticSingleThreaded - deprecated
  - EventsExecutor
- The Client Libraries Working Group significantly improved executor performance in Jazzy

Features in development for Kilted Kaiju

ROS

rmw_zenoh

- Goal for Kilted is to make rmw_zenoh a Tier-1 RMW
  - Implement security (SROS2)
  - Windows support
  - Pass all tests in the core
- Development happening at https://github.com/ros2/rmw_zenoh

Windows improvements

- Use of

for Windows dependencies

ROS

Long term outlook for core features

Redesign of the logging subsystem

Services redesign

ROS

ROSIDL redesign

rclpy performance improvements

Ability to release Rust packages

ROS

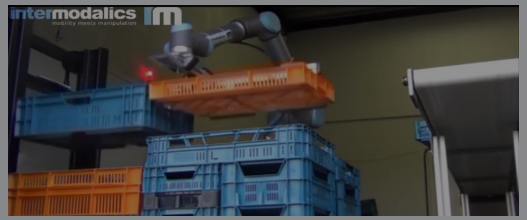
Evolving messages over time

Automatically detect “best” data delivery

Interested in helping?

http://docs.ros.org/en/rolling/The-ROS2-Project/Contributing.html

ROS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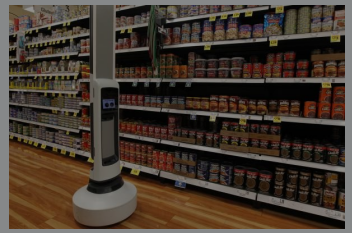
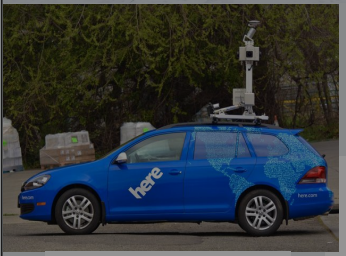


NASA ARC
ASTROBEE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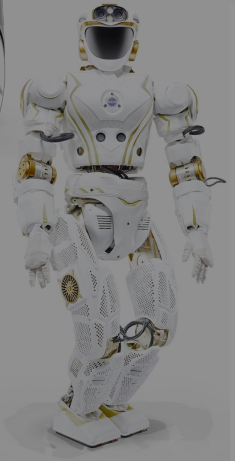
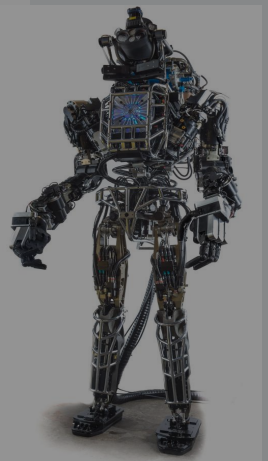
KNIGHTSCOPE





SESTO

relay

HXB
Segment A
Segment B