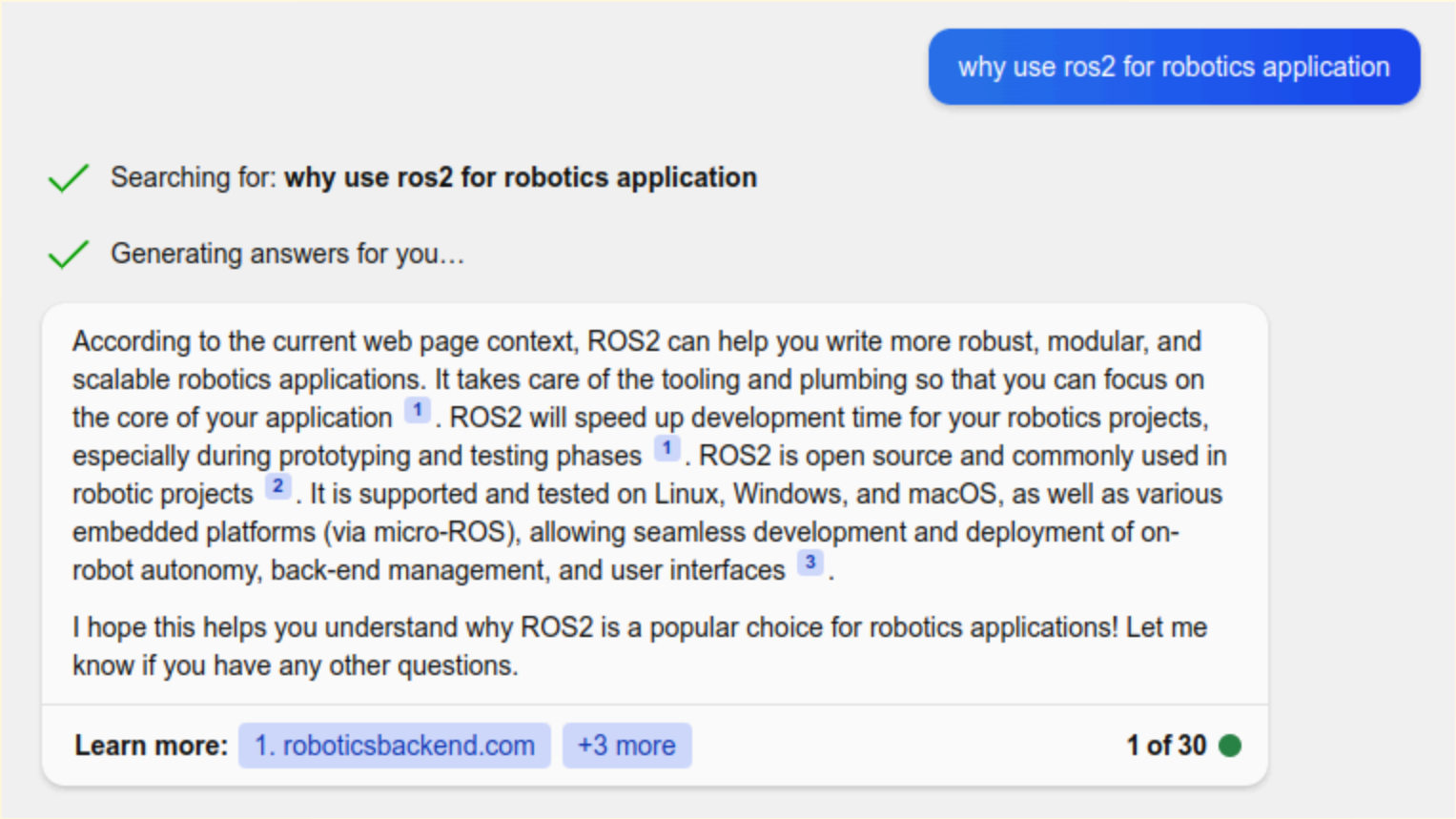
ROS2

What, Why and basic verbs and concept

What

- Open source software development kit for robotics applications.
- Standard
- From research and prototyping through to deployment and production

Why



- For me it a STANDARD

Verbs

- DDS
- Node
- Pub / Sub
- Service
- Parameters

Tools

- Rqt
- Rviz
- Gazebo

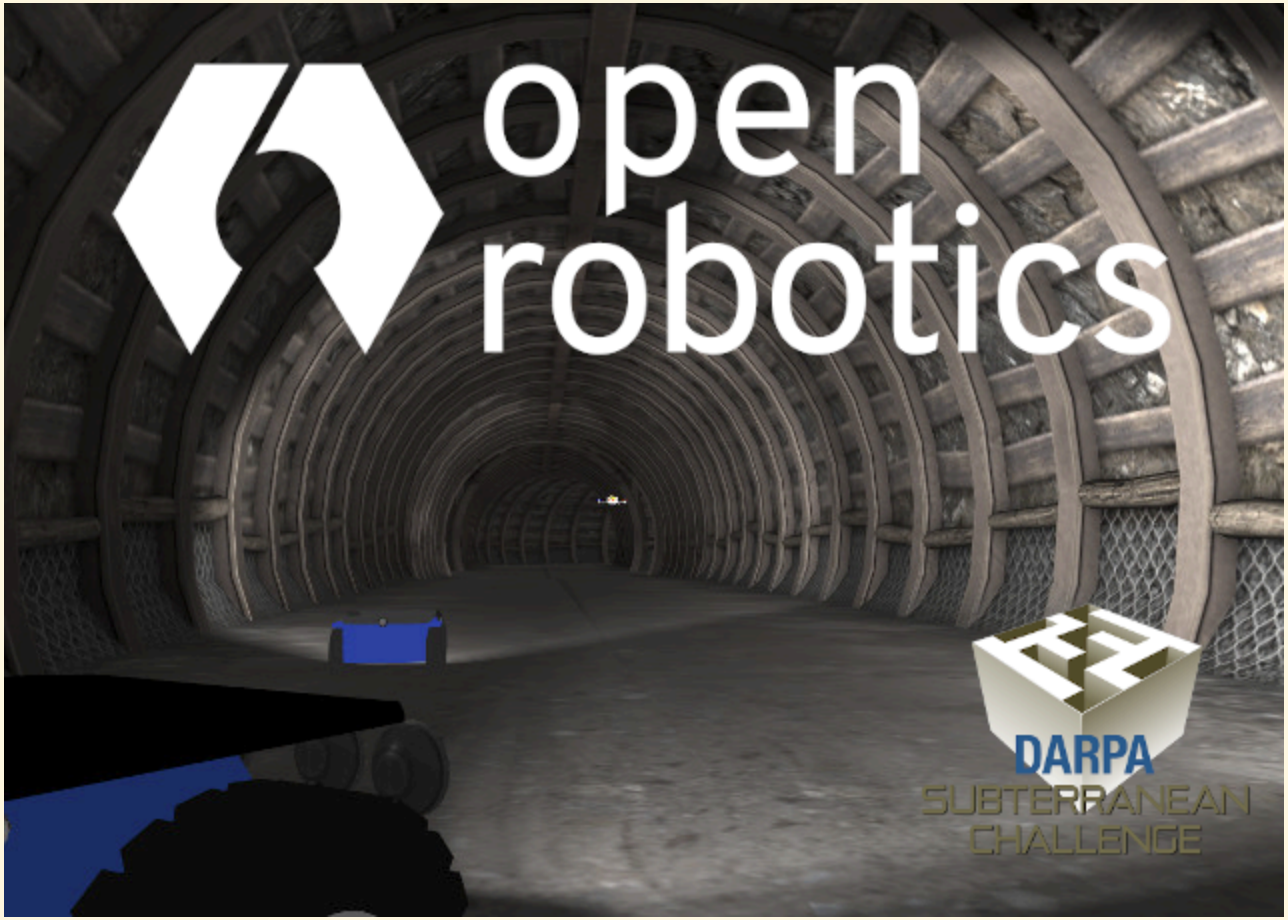
What to remember

- ROS2 is a standard
  - Don't invite the wheel (reuse other works)
- ROS2 is a way of thinking to solve robotics problems
- ROS2 is a SDK

Learn from others

- Autonomous, GPS-Denied Quadrotor Flight

DARPA



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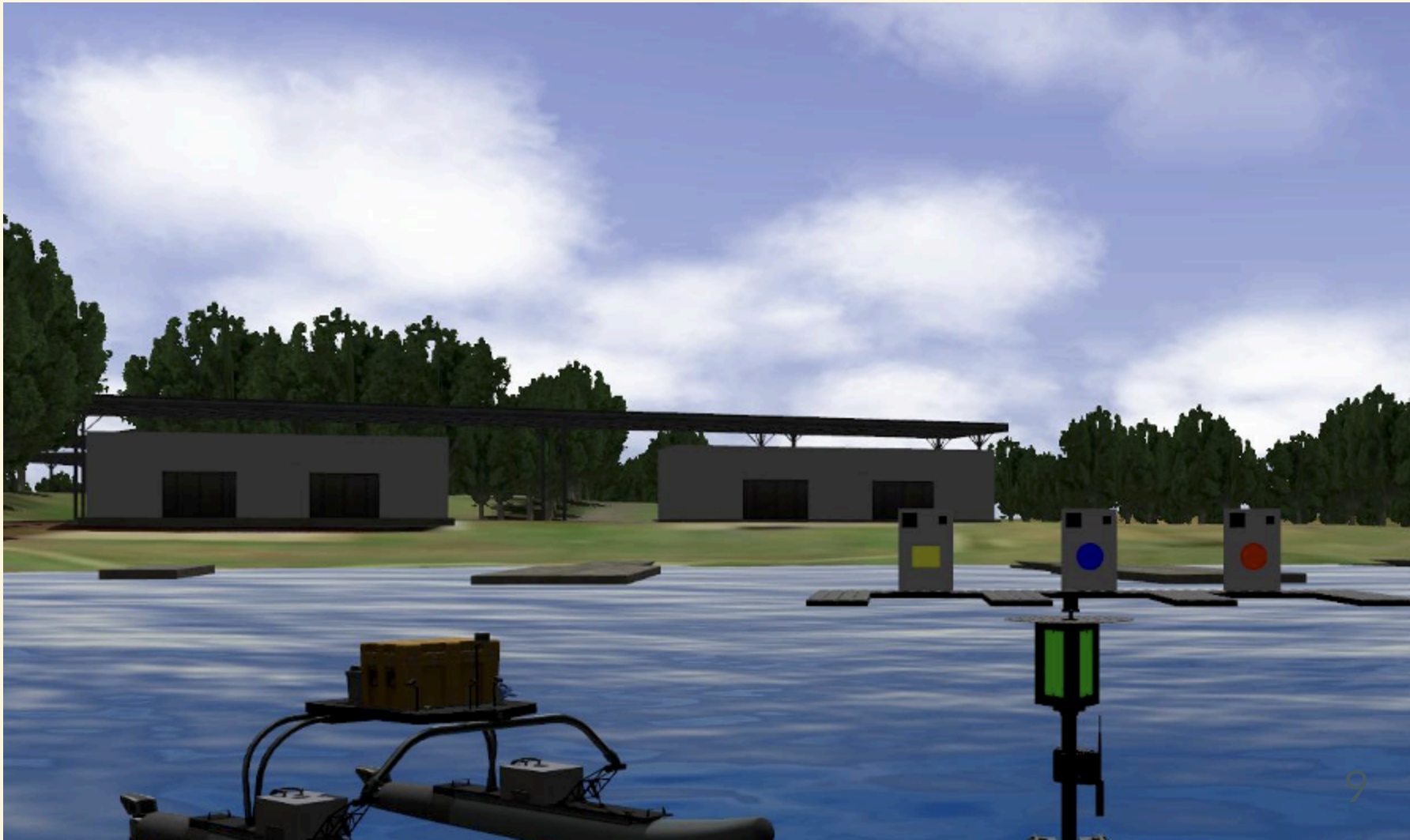
VRX



Eye on the prize. glance to the future

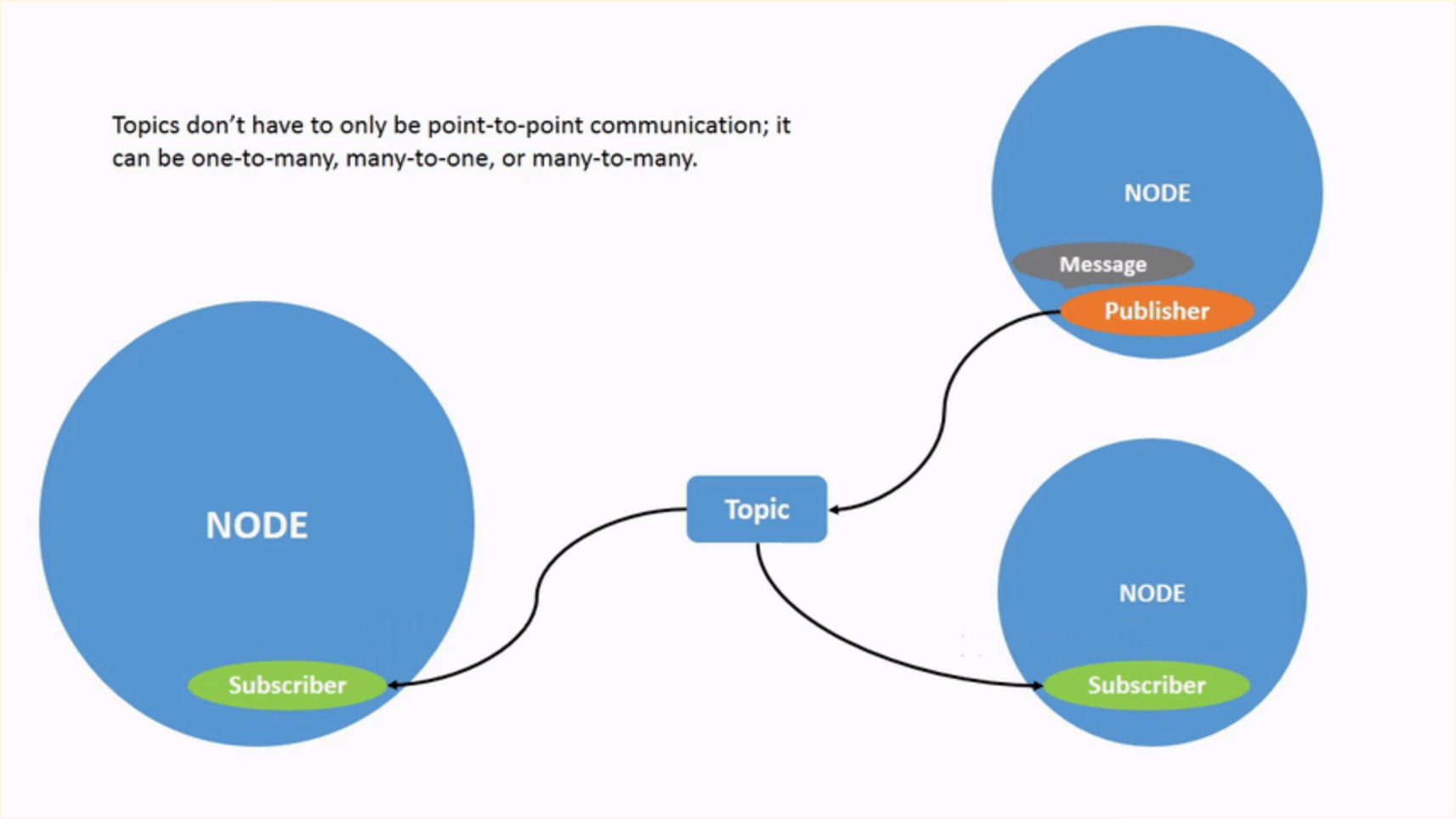
- ROS Version
- Simulation
  - Gazebo version
- Flight controller
  - PX4 /ArduPilot

2024 ROS Metrics Report

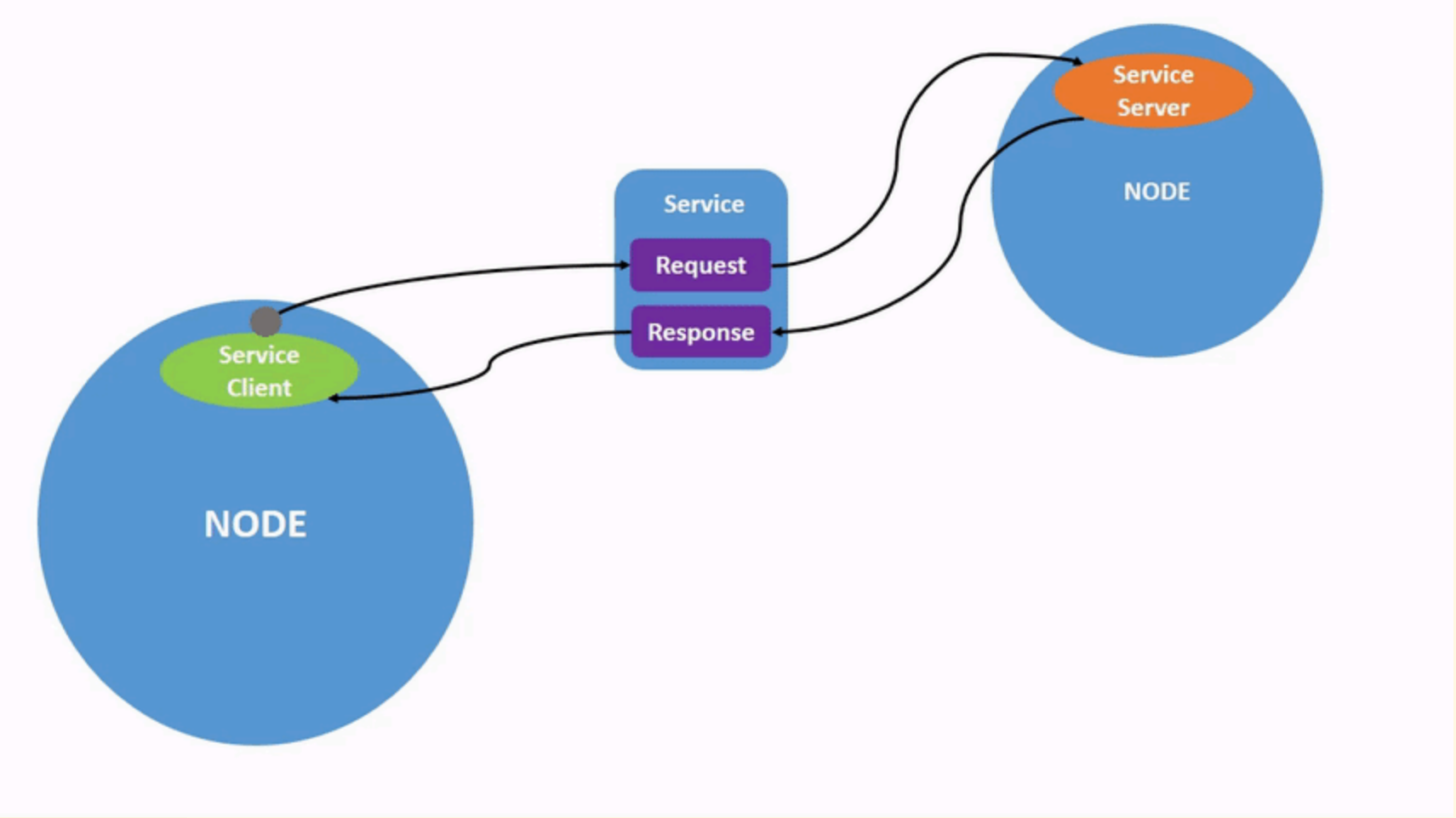
Node message and topic

Node: A node is an executable that uses ROS to communicate with other nodes.
Message: ROS data type
Topics: ROS2 topic is a way of communication between ROS2 nodes

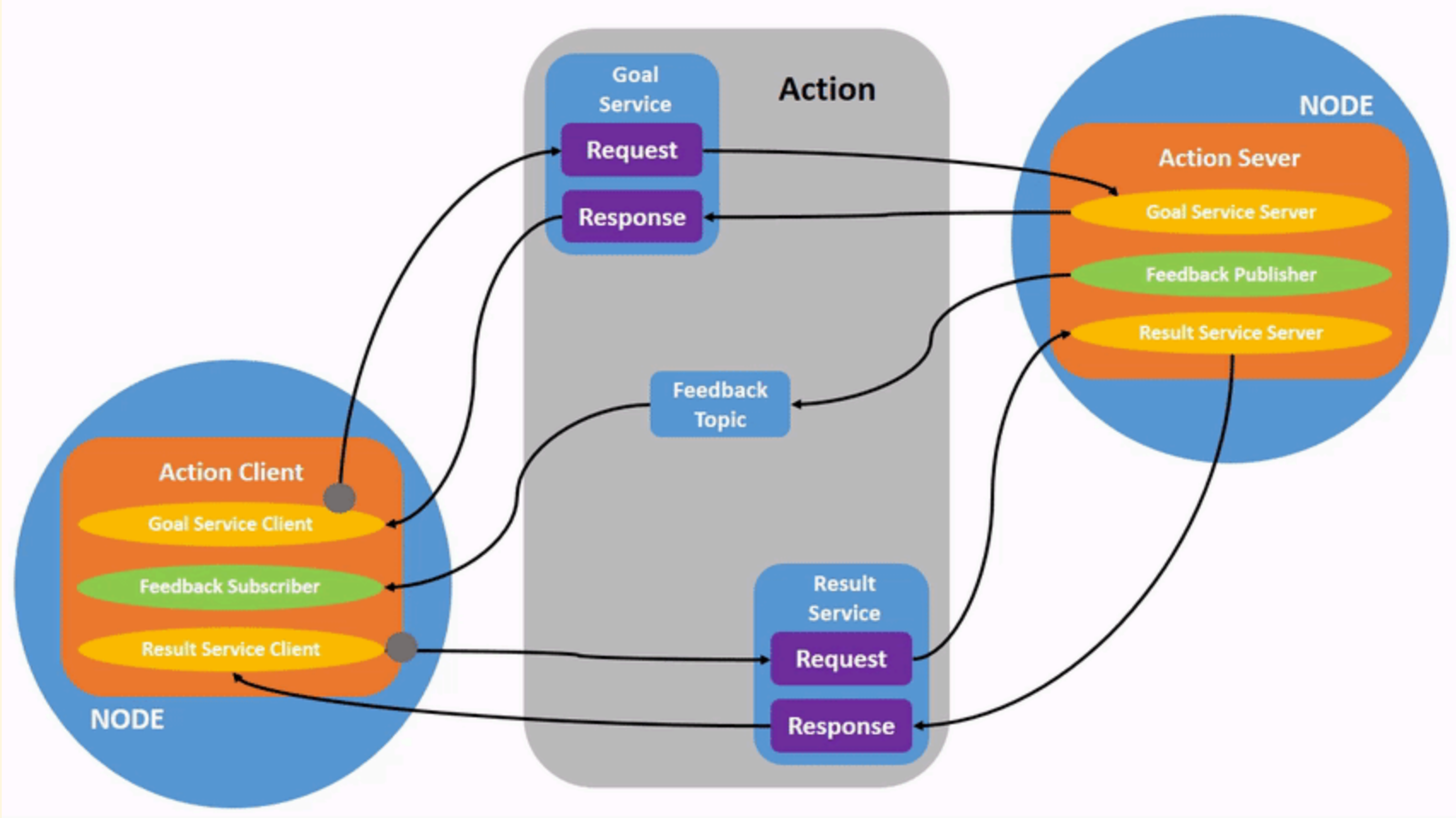
Pub / Sub


Topics don't have to only be point-to-point communication; it can be one-to-many, many-to-one, or many-to-many.
NODE
Message
Publisher
NODE
Subscriber
Topic
NODE
Subscriber

Service

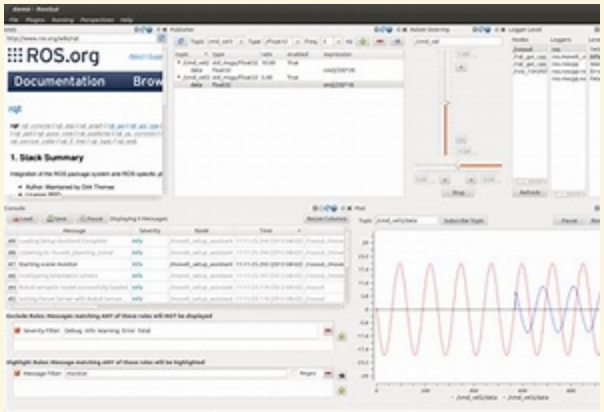

Service
Server
NODE
Service
Request
Response
Service
Client
NODE

Action


Goal
Service
Request
Response
Action
NODE
Action Sever
Goal Service Server
Feedback Publisher
Result Service Server
Feedback
Topic
Action Client
Goal Service Client
Feedback Subscriber
Result Service Client
NODE
Result
Service
Request
Response

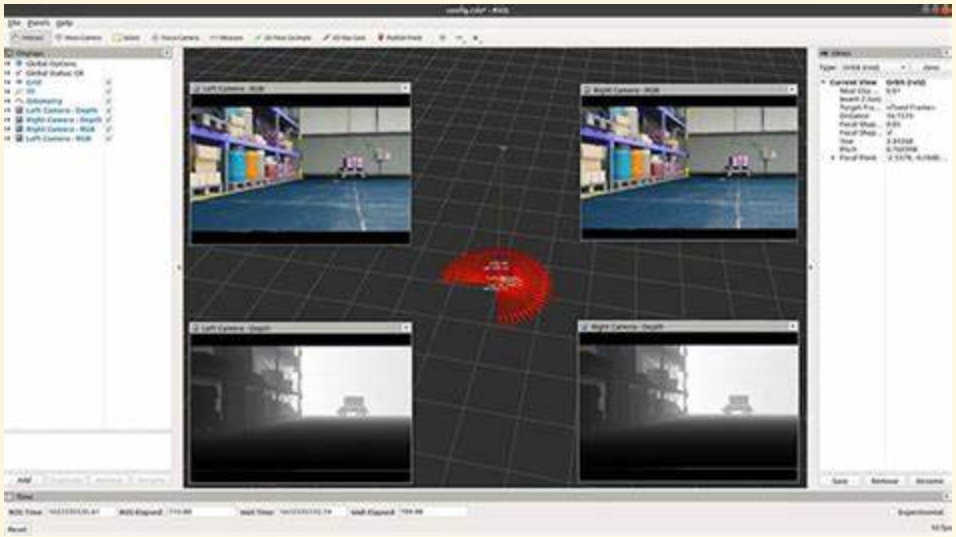
Rqt

RQT is a Qt-based framework for GUI development for ROS



Rviz

- Rviz is a 3D visualization tool for ROS
- It allows you to visualize sensor data and other information from your robot in real-time



Gazebo

Without words

video link

Final

- ROS is a standard
- Way of thinking
- SDK for develop robotics application