

Notes-ROS

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1 Package

A package is a directory containing one or more ROS nodes, libraries, configuration files, and other resources that are related to a specific functionality or task. Packages in ROS are used to organize and manage the code and data for a particular robot system or application. They are designed to be easily reusable, so that developers can share their code with others and easily integrate existing packages into their own projects.

2 Node

A node is a program file that performs a specific computation or task within a robot system or application. Nodes communicate with each other using ROS messages, services.

3 Topic

Nodes can publish and subscribe to messages over topic. Topics provide flexible and distributed communication mechanism for sending and receiving data between different parts of a robot system, establishing communication. Nodes can publish messages to a topic, and other nodes can subscribe to that topic to receive these messages. Topics are typically used to exchange sensor data, status information, and other types of data.

4 Services

A service is a type of request-response communication channel between two ROS nodes. Services provide a way for nodes to send a request and receive a response with a specific result or outcome. Nodes can provide a service that other nodes can call to request information or trigger an action. Services are typically used to request information such as configuration data, or to trigger actions such as starting or stopping a process.

5 URDF

URDF(Unified Robot Description Format) is a key component of ROS ecosystem. URDF is an XML-based file format for describing the physical and visual properties of a robot model. URDF files specify the links, joints, sensors and other components of a robot, as well as their properties such as mass, inertia and visual appearance. URDF files can be used to generate robot models in various formats, such as COLLADA files for 3D rendering or SDF(Simulation Description Format) files for simulation.

6 TF

tf is a system for managing coordinate frame transformation in a robot system. The tf system allows nodes to keep track of the positions and orientations of different parts of a robot system in a consistent and easy-to-use way. tf system works by defining a hierarchy of coordinate frames that describe the position and orientation of different parts of robot system. Each frame is defined relative to one or more parent frame, allowing transformations between frames to be easily computed.