

Part 1b: ROS Related Questions

1. What is a ROS_DOMAIN_ID? (2pt)

A ROS_DOMAIN_ID is a unique number that groups ROS 2 nodes. It also allows only those with the same ID to communicate.

2. What is a node? (2pt)

A node is an executable process that performs a specific task, such as data processing or control. Nodes communicate with each other by sending and receiving messages through topics, services, and actions.

3. What is a topic? (2pt)

A topic is a channel through which nodes can send and receive messages asynchronously. It also allows for communication between nodes without them being directly connected.

4. What is a message? (2pt)

A message is a data structure used for communication between nodes and contains information that is published on a topic. It also has predefined fields that store data types like integers, floats, strings, or more complex structures.

5. What is a subscriber? Write the syntax to create a subscriber that subscribes to the topic `amazing_int`, which takes message of type `UInt64`, and uses the callback function `magic_fun`, in C++ or Python. Note: This should only be a few lines of code, not a full script. (5pt)

A subscriber is an object that listens for messages on a specific topic and triggers a callback function when a message is received.

Code: `subscription = node.create_subscription(std_msgs.msg.UInt64, "amazing_int", magic_fun, 10)`

6. What is a publisher? Write the syntax to create a publisher that publishes to the topic `amazing_bool`, which takes message of type `Bool`, in Python. Note: This should only be a few lines of code, not a full script. (5pt)

A publisher sends messages to a specific topic, allowing multiple subscribers to receive the data. It manages the communication and messages for asynchronous data exchange between nodes.

Code: `publisher = node.create_publisher(std_msgs.msg.Bool, "amazing_bool", 10)`

7. Can a node have multiple subscribers? Can a node have multiple publishers? (2pt)

Yes, a node can have multiple subscribers and multiple publishers. A node can subscribe to multiple topics to receive different types of messages and can publish to multiple topics to send different types of messages.