

The background features a faint, stylized illustration of a robotic arm on the left, reaching towards several 3D blocks. One block is labeled '1', another '2', and a third '3'. Two blue blocks in the center are labeled 'HELLO' and 'WORLD'. In the bottom left corner, there is a logo consisting of a 3x3 grid of dots followed by the text 'ROS'.

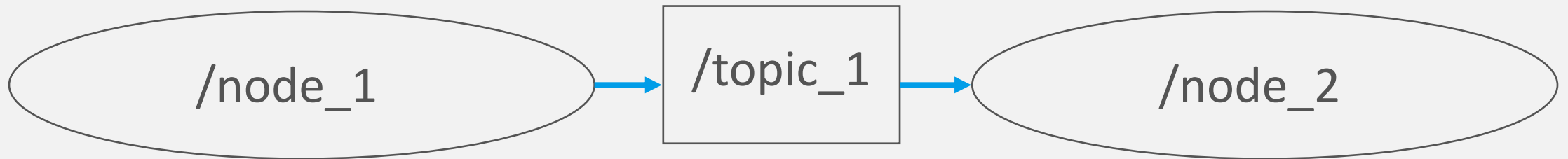
1.3.4

Build your own ROS application – Custom message types

Mukunda Bharatheesha

Topic type and message type

Information:
A Topic type is only an abstract idea. Topic type acquires or inherits the ROS message type that is to be exchanged between nodes.



New Information:
robot joint values
sensor readings

New Information
robot joint values
sensor readings

ROS message types

- Basic message type was used in the publisher and subscriber example.
- ROS-based robotic application – information is mainly in floating point numbers, possibly combined with integers and strings.
- Examples: Robot joint angles with corresponding joint names, distance sensor information, robot position in 3D and so on.

Derived message types in ROS

- ROS also supports derived message types (common_msgs stack)
 - **Point** message type
 - float x
 - float y
 - float z
 - **PointStamped** message type
 - time stamp
 - string reference_frame
 - float x
 - float y
 - float z
 - **Pose** message type
 - position
 - float x
 - float y
 - float z
 - orientation
 - float x
 - float y
 - float z
 - float w

Create custom ROS message

- Messages are defined in **message files** of a ROS application.
- Message files typically exist in a ROS package with the following naming convention: **<ros_package_name>/msg** with **<NewMessageType>.msg** as the filename.
- In this course:
<path_to_workspace>/src/hrwros/hrwros_msgs/msg folder.

Custom ROS message – example

- Purchased a new ultrasound sensor.
- Requirement – new message type **SensorInformation**
 - a **ROS message type** for interfacing with distance sensors
 - a **string** for the name of the manufacturer
 - an **unsigned Integer** sensor part number

Message file: hrwros_msgs/msg/SensorInformation.msg

```
sensor_msgs/Range sensor_data
string maker_name
uint32 part_number
```

- How do we use this in code?