Fraunhofer IPA

Robotics and Assistance Systems

Porting ROS 1 packages to ROS 2

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Chapter 1

Installing ROS 2

1.1 Set Locale

Make sure to set a locale that supports UTF-8. If you are in a minimal environment such as a Docker container, the locale may be set to something minimal like POSIX.

```
sudo locale-gen en_US en_US.UTF-8
sudo update-locale LC_ALL=en_US.UTF-8 LANG=en_US.UTF-8
export LANG=en_US.UTF-8
```

1.2 Add the ROS2 apt repository

To install the Debian packages you will need to add our Debian repository to your apt sources. First you will need to authorize our gpg key with apt like this

```
sudo apt update && sudo apt install curl gnupg2 lsb-release
curl http://repo.ros2.org/repos.key | sudo apt-key add -
```

And then add the repository to your sources list:

```
sudo sh -c 'echo␣"deb␣[arch=amd64,arm64]␣http://packages.ros.org/ros2/
   ubuntu␣`lsb_release␣-cs`␣main"␣>␣/etc/apt/sources.list.d/ros2-latest.
   list'
```

1.3 Install development tools and ROS tools

```
sudo apt update && sudo apt install -y \
build-essential \
cmake \
git \
python3-colcon-common-extensions \
```

```
python3-lark-parser \
python3-pip \
python-rosdep \
python3-vcstool \
wget
# install some pip packages needed for testing
python3 -m pip install -U \
argcomplete \
flake8 \
flake8-blind-except \
flake8-builtins \
flake8-class-newline \
flake8-comprehensions \
flake8-deprecated \
flake8-docstrings \
flake8-import-order \
flake8-quotes \
pytest-repeat \
pytest-rerunfailures \
pytest \
pytest-cov \
pytest-runner \
setuptools
# install Fast-RTPS dependencies
sudo apt install --no-install-recommends -y \
libasio-dev \
libtinyxml2-dev
```

1.4 Install dependencies using rosdep

```
sudo rosdep init
rosdep update

rosdep install --from-paths src --ignore-src --rosdistro crystal -y --
   skip-keys "console_bridge␣fastcdr␣fastrtps␣libopensplice67␣
   libopensplice69␣python3-lark-parser␣rti-connext-dds-5.3.1␣
   urdfdom_headers"
python3 -m pip install -U lark-parser
```

1.5 Building the code in the Workspace

```
cd ~/ros2_ws/
```

```
colcon build --symlink-install --packages-ignore qt_gui_cpp rqt_gui_cpp
```

Chapter 2

NodeHandle to NodeClass

2.1 NodeHandle

A NodeHandle is an object which represents a ROS node. It provides startup and shutdown of the internal node inside a roscpp program and it provides an extra layer of namespace resolution that can make writing subcomponents easier.
When the first *ros::NodeHandle* is created it will call *ros::start()*, and when the last *ros::NodeHandle* is destroyed, it will call *ros::shutdown()*.

```
ros::NodeHandle nh;
```

2.2 Node Class

```
ros::NodeHandle nh;
```

Chapter 3

Publisher Subscriber

Chapter 4

ROS Bridge

Chapter 5

ROS spin