ⓘ Tutorials Version: Noetic

This is the latest (and last) version of MoveIt 1 for ROS Noetic, which is still actively developed. See also MoveIt 2 tutorials and other available versions in drop down box on left.

Getting Started

This tutorial will install MoveIt and create a workspace sandbox to run the tutorials and example robot.

Install ROS and Catkin 🔗

Install ROS Noetic. It is easy to miss steps when going through the ROS installation tutorial. If you run into errors in the next few steps, a good place to start is to go back and make sure you have installed ROS correctly.

Once you have ROS installed, make sure you have the most up to date packages:

```
rosdep update
sudo apt update
sudo apt dist-upgrade
```

Install catkin the ROS build system:

```
sudo apt install ros-noetic-catkin python3-catkin-tools
```

Install wstool :

```
sudo apt install python3-wstool
```

Create a Catkin Workspace

You will need to have a catkin workspace setup:

```
mkdir -p ~/ws_moveit/src
cd ~/ws_moveit/src
```

Download MoveIt Source

Because the tutorials are actively developed in sync with MoveIt's master, you will most likely need to build all of MoveIt from source. To this end, follow the instructions below. However, building MoveIt from source takes roughly an hour, so you might want to skip this step for now and try using the binary Debian packages first. Come back to this step, if building of your workspace fails due to unknown symbols!

```
wstool init .
wstool merge -t . https://raw.githubusercontent.com/ros-planning/moveit/master/moveit.rosinstall
wstool remove moveit_tutorials   # this is cloned in the next section
wstool update -t .
```

Download Example Code

To easily follow along with these tutorials, you will need a **ROBOT_moveit_config** package. The default demo robot is the Panda arm from Franka Emika. To get a working **panda_moveit_config** package, we recommend you install from source.

Within your catkin workspace, download the tutorials as well as the `panda_moveit_config` package. You may safely ignore any `git clone` errors saying the destination already exists:

```
cd ~/ws_moveit/src
git clone https://github.com/ros-planning/moveit_tutorials.git -b master
git clone https://github.com/ros-planning/panda_moveit_config.git -b noetic-devel
```

> **❗ Note**
>
> For now we will use a pre-generated `panda_moveit_config` package but later we will learn how to make our own in the MoveIt Setup Assistant tutorial.

Build your Catkin Workspace

The following will install from Debian any package dependencies not already in your workspace:

```
cd ~/ws_moveit/src
rosdep install -y --from-paths . --ignore-src --rosdistro noetic
```

Note In case an upstream package is not (yet) available from the standard ROS repositories or if you experience any build errors in those packages, please try to fetch the latest release candidates from the ROS testing repositories instead:

```
sudo sh -c 'echo "deb http://packages.ros.org/ros-testing/ubuntu $(lsb_release -sc) main" >
/etc/apt/sources.list.d/ros-latest.list'
sudo apt update
```

The next command will configure your catkin workspace:

```
cd ~/ws_moveit
catkin config --extend /opt/ros/${ROS_DISTRO} --cmake-args -DCMAKE_BUILD_TYPE=Release
catkin build
```

Source the catkin workspace:

```
source ~/ws_moveit/devel/setup.bash
```

Optional: add the previous command to your `.bashrc`:

```
echo 'source ~/ws_moveit/devel/setup.bash' >> ~/.bashrc
```

> **❶ Note**
>
> Sourcing the `setup.bash` automatically in your `~/.bashrc` is not required and often skipped by advanced users who use more than one catkin workspace at a time, but we recommend it for simplicity.

Next Step

[Visualize a robot with the interactive motion planning plugin for RViz](#)