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## Getting Started – Movelt 1 Noetic

### 1. **rosdep update** untuk memperbarui database dependensi ROS.

```
fadhildz@DESKTOP-IMTGFNL: ~$ rosdep update
reading in sources list data from /etc/ros/rosdep/sources.list.d
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/osx-homebrew.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/base.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/python.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/ruby.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/releases/fuerte.yaml
Query rosdistro index https://raw.githubusercontent.com/ros/rosdistro/master/index-v4.yaml
Skip end-of-life distro "ardent"
Skip end-of-life distro "bouncy"
Skip end-of-life distro "crystal"
Skip end-of-life distro "dashing"
Skip end-of-life distro "eloquent"
Skip end-of-life distro "foxy"
Skip end-of-life distro "galactic"
Skip end-of-life distro "groovy"
Add distro "humble"
Skip end-of-life distro "hydro"
Skip end-of-life distro "indigo"
Add distro "iron"
Skip end-of-life distro "jade"
Add distro "jazzy"
Skip end-of-life distro "kinetic"
Skip end-of-life distro "lunar"
Skip end-of-life distro "melodic"
Add distro "noetic"
Add distro "rolling"
updated cache in /home/fadhildz/.ros/rosdep/sources.cache
fadhildz@DESKTOP-IMTGFNL: ~$
```

### 2. **sudo apt update** untuk memperbarui daftar paket dan versi terbaru di repositori.

```
fadhildz@DESKTOP-IMTGFNL: ~$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [128 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Get:4 http://packages.ros.org/ros-testing/ubuntu focal InRelease [4679 B]
Get:5 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 Packages [826 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-backports InRelease [128 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [3272 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [3640 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [481 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [14.3 kB]
Get:11 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [3211 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [558 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [17.8 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [3330 kB]
Get:15 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [449 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [465 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1237 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [28.3 kB]
Fetched 17.9 MB in 8s (2372 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
fadhildz@DESKTOP-IMTGFNL: ~$
```

### 3. **sudo apt dist-upgrade** untuk memperbarui paket yang sudah diinstal dan menjaga kompatibilitas.

```
fadhildz@DESKTOP-INTGFNL: ~$ sudo apt dist-upgrade
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [28.3 kB]
Fetched 17.9 MB in 8s (2372 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
fadhildz@DESKTOP-INTGFNL:~$ sudo apt dist-upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
  libavresample-dev libavformat58 libpostproc-dev libavfilter7
  liburiparser-dev liburiparser1 libswresample3 libopenexr-dev libzmq5
  libavdevice-dev python2.7-minimal libhdf5-103 libmagickwand-6.q16-6
  libcgraph6 python2.7 libavformat-dev libhdf5-dev libswresample-dev
  libzmq3-dev libpostproc55 liblab-gamut1 libavutil-dev libavcodec-dev
  hdf5-helpers libpmix2 libhdf5-cpp-103 libavcodec58 libcdt5 libavutil56
  libpathplan4 libavdevice58 libavfilter-dev libswscale5 libgvcpr2 libopenexr24
  libstdl2-2.0-0 libmysofal libmagickcore-6.q16-6 libpython2.7-minimal
  libhdf5-openmpi-103 libswscale-dev libgvc6 libpython2.7-stdlib python3-scipy
  graphviz libavresample4 libhdf5-openmpi-dev libhdf5-mpi-dev
  imagemagick-6-common
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages will be upgraded:
  python3-rosdistro python3-rosdistro-modules
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 39.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-INTGFNL:~$
```

### 4. **sudo apt install ros-noetic-catkin python3-catkin-tools** untuk menginstall alat Catkin dan dependensinya untuk membangun workspace.

```
fadhildz@DESKTOP-INTGFNL: ~$ sudo apt install ros-noetic-catkin python3-catkin-tools
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
fadhildz@DESKTOP-INTGFNL:~$ sudo apt dist-upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
  libavresample-dev libavformat58 libpostproc-dev libavfilter7
  liburiparser-dev liburiparser1 libswresample3 libopenexr-dev libzmq5
  libavdevice-dev python2.7-minimal libhdf5-103 libmagickwand-6.q16-6
  libcgraph6 python2.7 libavformat-dev libhdf5-dev libswresample-dev
  libzmq3-dev libpostproc55 liblab-gamut1 libavutil-dev libavcodec-dev
  hdf5-helpers libpmix2 libhdf5-cpp-103 libavcodec58 libcdt5 libavutil56
  libpathplan4 libavdevice58 libavfilter-dev libswscale5 libgvcpr2 libopenexr24
  libstdl2-2.0-0 libmysofal libmagickcore-6.q16-6 libpython2.7-minimal
  libhdf5-openmpi-103 libswscale-dev libgvc6 libpython2.7-stdlib python3-scipy
  graphviz libavresample4 libhdf5-openmpi-dev libhdf5-mpi-dev
  imagemagick-6-common
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages will be upgraded:
  python3-rosdistro python3-rosdistro-modules
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 39.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-INTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-INTGFNL:~$
```

5. **sudo apt install python3-wstool** untuk menginstall wstool untuk mengelola beberapa repositori di workspace.

```
fadhildz@DESKTOP-INTGFNL: ~$ sudo apt install python3-wstool
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
libavresample-dev libavformat58 libpostproc-dev libavfilter7
liburiparser-dev liburiparser1 libswresample3 libopenexr-dev libzmq5
libavdevice-dev python2.7-minimal libhdf5-103 libmagickwand-6.q16-6
libcgraph6 python2.7 libavformat-dev libhdf5-dev libswresample-dev
libzmq3-dev libpostproc55 liblab-gamut1 libavutil-dev libavcodec-dev
hdf5-helpers libpmix2 libhdf5-cpp-103 libavcodec58 libcdt5 libavutil56
libpathplan4 libavdevice58 libavfilter-dev libswscale5 libgyp2 libopenexr24
libSDL2-2.0-0 libmysofal libmagickcore-6.q16-6 libpython2.7-minimal
libhdf5-openmpi-103 libswscale-dev libgvc6 libpython2.7-stdlib python3-scipy
graphviz libavresample4 libhdf5-openmpi-dev libhdf5-mpi-dev
imagemagick-6-common
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages will be upgraded:
  python3-rosdistro python3-rosdistro-modules
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 39.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-INTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-INTGFNL:~$ sudo apt install python3-wstool
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-wstool is already the newest version (0.1.18-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-INTGFNL:~$
```

6. **mkdir -p ~/ws\_moveit/src** untuk membuat direktori workspace, dan **cd ~/ws\_moveit/src** untuk masuk ke direktori sumber workspace.

```
fadhildz@DESKTOP-INTGFNL: ~$ sudo apt install python3-wstool
liburiparser-dev liburiparser1 libswresample3 libopenexr-dev libzmq5
libavdevice-dev python2.7-minimal libhdf5-103 libmagickwand-6.q16-6
libcgraph6 python2.7 libavformat-dev libhdf5-dev libswresample-dev
libzmq3-dev libpostproc55 liblab-gamut1 libavutil-dev libavcodec-dev
hdf5-helpers libpmix2 libhdf5-cpp-103 libavcodec58 libcdt5 libavutil56
libpathplan4 libavdevice58 libavfilter-dev libswscale5 libgyp2 libopenexr24
libSDL2-2.0-0 libmysofal libmagickcore-6.q16-6 libpython2.7-minimal
libhdf5-openmpi-103 libswscale-dev libgvc6 libpython2.7-stdlib python3-scipy
graphviz libavresample4 libhdf5-openmpi-dev libhdf5-mpi-dev
imagemagick-6-common
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages will be upgraded:
  python3-rosdistro python3-rosdistro-modules
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 39.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-INTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-INTGFNL:~$ sudo apt install python3-wstool
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-wstool is already the newest version (0.1.18-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-INTGFNL:~$ mkdir -p ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$
```

## 7. **wstool init** . untuk menginisialisasi workspace dengan wstool.

```
hdf5-helpers libpmix2 libhdf5-cpp-103 libavcodec58 libcdt5 libavutil56
libpathplan4 libavdevice58 libavfilter-dev libswscale5 libgyp2 libopenxr24
libstdl2-2.0-0 libmysofal libmagickcore-6.q16-6 libpython2.7-minimal
libhdf5-openmpi-103 libswscale-dev libgvc6 libpython2.7-stdlib python3-scipy
graphviz libavresample4 libhdf5-openmpi-dev libhdf5-mpi-dev
imagemagick-6-common
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages will be upgraded:
  python3-rosdistro python3-rosdistro-modules
2 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 39.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install python3-wstool
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-wstool is already the newest version (0.1.18-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ mkdir -p ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool init .
Writing /home/fadhildz/ws_moveit/src/.rosinstall

update complete.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$
```

## 8. **wstool merge -t** . <https://raw.githubusercontent.com/moveit/moveit/master/moveit.rosinstall> untuk menggabungkan konfigurasi repositori Moveit ke workspace.

```
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro-modules all 1.0.1-1 [36.2 kB]
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install python3-wstool
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-wstool is already the newest version (0.1.18-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ mkdir -p ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool init .
Writing /home/fadhildz/ws_moveit/src/.rosinstall

update complete.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool merge -t . https://raw.githubusercontent.com/moveit/moveit/master/moveit.rosinstall
Performing actions:

  Add new elements:
    geometric_shapes, moveit, moveit_msgs, moveit_resources, moveit_tutorials, moveit_visual_tools, panda_moveit_config, rviz_visual_tools,
    srdfdom

Config changed, maybe you need run wstool update to update SCM entries.
Overwriting /home/fadhildz/ws_moveit/src/.rosinstall

update complete.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$
```



## 9. wstool remove moveit\_tutorials untuk menghapus tutorial Moveit dari workspace.

```
fadhildz@DESKTOP-IMTGFNL: ~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Get:2 http://packages.ros.org/ros-testing/ubuntu focal/main amd64 python3-rosdistro all 1.0.1-100 [3724 B]
Fetched 39.9 kB in 1s (44.7 kB/s)
(Reading database ... 153419 files and directories currently installed.)
Preparing to unpack .../python3-rosdistro-modules_1.0.1-1_all.deb ...
Unpacking python3-rosdistro-modules (1.0.1-1) over (1.0.0-1) ...
Preparing to unpack .../python3-rosdistro_1.0.1-100_all.deb ...
Unpacking python3-rosdistro (1.0.1-100) over (1.0.0-100) ...
Setting up python3-rosdistro-modules (1.0.1-1) ...
Setting up python3-rosdistro (1.0.1-100) ...
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install ros-noetic-catkin python3-catkin-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-catkin-tools is already the newest version (0.9.4-1).
ros-noetic-catkin is already the newest version (0.8.10-1focal.20210423.221558).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ sudo apt install python3-wstool
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3-wstool is already the newest version (0.1.18-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
fadhildz@DESKTOP-IMTGFNL:~$ mkdir -p ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool init .
Writing /home/fadhildz/ws_moveit/src/.rosinstall

update complete.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool merge -t . https://raw.githubusercontent.com/moveit/moveit/master/moveit.rosinstall
Performing actions:

Add new elements:
geometric_shapes, moveit, moveit_msgs, moveit_resources, moveit_tutorials, moveit_visual_tools, panda_moveit_config, rviz_visual_tools,
srdfdom

Config changed, maybe you need run wstool update to update SCM entries.
Overwriting /home/fadhildz/ws_moveit/src/.rosinstall

update complete.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool remove moveit_tutorials
Overwriting /home/fadhildz/ws_moveit/src/.rosinstall
Removed entries ['moveit_tutorials']
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$
```

## 10. wstool update -t . untuk memperbarui repositori di workspace.

```
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ wstool update -t .
[geometric_shapes] Fetching https://github.com/moveit/geometric_shapes.git (version noetic-devel) to /home/fadhildz/ws_moveit/src/geometric_shapes
Cloning into '/home/fadhildz/ws_moveit/src/geometric_shapes'...
remote: Enumerating objects: 2102, done.
remote: Counting objects: 100% (368/368), done.
remote: Compressing objects: 100% (162/162), done.
remote: Total 2102 (delta 280), reused 221 (delta 204), pack-reused 1734 (from 1)
Receiving objects: 100% (2102/2102), 580.79 KiB | 1.85 MiB/s, done.
Resolving deltas: 100% (1325/1325), done.
[geometric_shapes] Done.
[moveit] Fetching https://github.com/moveit/moveit.git (version master) to /home/fadhildz/ws_moveit/src/moveit
Cloning into '/home/fadhildz/ws_moveit/src/moveit'...
remote: Enumerating objects: 111708, done.
remote: Counting objects: 100% (10049/10049), done.
remote: Compressing objects: 100% (1285/1285), done.
remote: Total 111708 (delta 9222), reused 9039 (delta 8716), pack-reused 101659 (from 1)
Receiving objects: 100% (111708/111708), 69.13 MiB | 5.75 MiB/s, done.
Resolving deltas: 100% (66891/66891), done.
[moveit] Done.
[moveit_msgs] Fetching https://github.com/moveit/moveit_msgs.git (version master) to /home/fadhildz/ws_moveit/src/moveit_msgs
Cloning into '/home/fadhildz/ws_moveit/src/moveit_msgs'...
remote: Enumerating objects: 1742, done.
remote: Counting objects: 100% (290/290), done.
remote: Compressing objects: 100% (97/97), done.
remote: Total 1742 (delta 229), reused 200 (delta 190), pack-reused 1452 (from 1)
Receiving objects: 100% (1742/1742), 299.10 KiB | 3.60 MiB/s, done.
Resolving deltas: 100% (941/941), done.
[moveit_msgs] Done.
[moveit_resources] Fetching https://github.com/moveit/moveit_resources.git (version master) to /home/fadhildz/ws_moveit/src/moveit_resources
Cloning into '/home/fadhildz/ws_moveit/src/moveit_resources'...
remote: Enumerating objects: 2605, done.
remote: Counting objects: 100% (704/704), done.
remote: Compressing objects: 100% (214/214), done.
remote: Total 2605 (delta 551), reused 554 (delta 486), pack-reused 1901 (from 1)
Receiving objects: 100% (2605/2605), 36.55 MiB | 4.31 MiB/s, done.
Resolving deltas: 100% (1598/1598), done.
[moveit_resources] Done.
[moveit_visual_tools] Fetching https://github.com/moveit/moveit_visual_tools.git (version master) to /home/fadhildz/ws_moveit/src/moveit_visual_tools
Cloning into '/home/fadhildz/ws_moveit/src/moveit_visual_tools'...
remote: Enumerating objects: 2225, done.
remote: Counting objects: 100% (284/284), done.
```

11. `cd ~/ws_moveit/src` untuk masuk ke direktori sumber, `git clone https://github.com/moveit/moveit_tutorials.git -b master` dan `Git clone https://github.com/moveit/panda_moveit_config.git -b noetic-devel` untuk mengkloning repositori tutorial dan konfigurasi panda MoveIt.

```
fadhildz@DESKTOP-INTGFNL: ~$ cd ~/ws_moveit/src
Resolving deltas: 100% (1256/1256), done.
[moveit_visual_tools] Done.
[panda_moveit_config] Fetching https://github.com/moveit/panda_moveit_config.git (version noetic-devel) to /home/fadhildz/ws_moveit/src/panda_moveit_config
Cloning into '/home/fadhildz/ws_moveit/src/panda_moveit_config'...
remote: Enumerating objects: 683, done.
remote: Counting objects: 100% (410/410), done.
remote: Compressing objects: 100% (145/145), done.
remote: Total 683 (delta 310), reused 305 (delta 265), pack-reused 273 (from 1)
Receiving objects: 100% (683/683), 142.95 KiB | 2.60 MiB/s, done.
Resolving deltas: 100% (444/444), done.
[panda_moveit_config] Done.
[rviz_visual_tools] Fetching https://github.com/PickNikRobotics/rviz_visual_tools (version master) to /home/fadhildz/ws_moveit/src/rviz_visual_tools
Cloning into '/home/fadhildz/ws_moveit/src/rviz_visual_tools'...
remote: Enumerating objects: 2809, done.
remote: Counting objects: 100% (421/421), done.
remote: Compressing objects: 100% (207/207), done.
remote: Total 2809 (delta 269), reused 325 (delta 196), pack-reused 2388 (from 1)
Receiving objects: 100% (2809/2809), 3.88 MiB | 3.90 MiB/s, done.
Resolving deltas: 100% (1706/1706), done.
[rviz_visual_tools] Done.
[srdfdom] Fetching https://github.com/moveit/srdfdom (version noetic-devel) to /home/fadhildz/ws_moveit/src/srdfdom
Cloning into '/home/fadhildz/ws_moveit/src/srdfdom'...
remote: Enumerating objects: 1041, done.
remote: Counting objects: 100% (186/186), done.
remote: Compressing objects: 100% (71/71), done.
remote: Total 1041 (delta 158), reused 115 (delta 115), pack-reused 855 (from 1)
Receiving objects: 100% (1041/1041), 240.68 KiB | 2.93 MiB/s, done.
Resolving deltas: 100% (550/550), done.
[srdfdom] Done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/moveit_tutorials.git -b master
Cloning into 'moveit_tutorials'...
remote: Enumerating objects: 5170, done.
remote: Counting objects: 100% (412/412), done.
remote: Compressing objects: 100% (258/258), done.
remote: Total 5170 (delta 208), reused 318 (delta 149), pack-reused 4758 (from 1)
Receiving objects: 100% (5170/5170), 76.00 MiB | 6.56 MiB/s, done.
Resolving deltas: 100% (2990/2990), done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/panda_moveit_config.git -b noetic-devel
fatal: destination path 'panda_moveit_config' already exists and is not an empty directory.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$
```

12. `rosdep install -y --from-paths . --ignore-src --rosdistro noetic` untuk menginstall semua dependensi yang dibutuhkan oleh workspace.

```
fadhildz@DESKTOP-INTGFNL: ~$ cd ~/ws_moveit/src
Cloning into '/home/fadhildz/ws_moveit/src/panda_moveit_config'...
remote: Enumerating objects: 683, done.
remote: Counting objects: 100% (410/410), done.
remote: Compressing objects: 100% (145/145), done.
remote: Total 683 (delta 310), reused 305 (delta 265), pack-reused 273 (from 1)
Receiving objects: 100% (683/683), 142.95 KiB | 2.60 MiB/s, done.
Resolving deltas: 100% (444/444), done.
[panda_moveit_config] Done.
[rviz_visual_tools] Fetching https://github.com/PickNikRobotics/rviz_visual_tools (version master) to /home/fadhildz/ws_moveit/src/rviz_visual_tools
Cloning into '/home/fadhildz/ws_moveit/src/rviz_visual_tools'...
remote: Enumerating objects: 2809, done.
remote: Counting objects: 100% (421/421), done.
remote: Compressing objects: 100% (207/207), done.
remote: Total 2809 (delta 269), reused 325 (delta 196), pack-reused 2388 (from 1)
Receiving objects: 100% (2809/2809), 3.88 MiB | 3.90 MiB/s, done.
Resolving deltas: 100% (1706/1706), done.
[rviz_visual_tools] Done.
[srdfdom] Fetching https://github.com/moveit/srdfdom (version noetic-devel) to /home/fadhildz/ws_moveit/src/srdfdom
Cloning into '/home/fadhildz/ws_moveit/src/srdfdom'...
remote: Enumerating objects: 1041, done.
remote: Counting objects: 100% (186/186), done.
remote: Compressing objects: 100% (71/71), done.
remote: Total 1041 (delta 158), reused 115 (delta 115), pack-reused 855 (from 1)
Receiving objects: 100% (1041/1041), 240.68 KiB | 2.93 MiB/s, done.
Resolving deltas: 100% (550/550), done.
[srdfdom] Done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/moveit_tutorials.git -b master
Cloning into 'moveit_tutorials'...
remote: Enumerating objects: 5170, done.
remote: Counting objects: 100% (412/412), done.
remote: Compressing objects: 100% (258/258), done.
remote: Total 5170 (delta 208), reused 318 (delta 149), pack-reused 4758 (from 1)
Receiving objects: 100% (5170/5170), 76.00 MiB | 6.56 MiB/s, done.
Resolving deltas: 100% (2990/2990), done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/panda_moveit_config.git -b noetic-devel
fatal: destination path 'panda_moveit_config' already exists and is not an empty directory.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ rosdep install -y --from-paths . --ignore-src --rosdistro noetic
#All required rosdeps installed successfully
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$
```

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

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

```
remote: Enumerating objects: 683, done.
remote: Counting objects: 100% (410/410), done.
remote: Compressing objects: 100% (145/145), done.
remote: Total 683 (delta 310), reused 305 (delta 265), pack-reused 273 (from 1)
Receiving objects: 100% (683/683), 142.95 KiB | 2.60 MiB/s, done.
Resolving deltas: 100% (444/444), done.
[panda_moveit_config] Done.
[rviz_visual_tools] Fetching https://github.com/PickNikRobotics/rviz_visual_tools (version master) to /home/fadhildz/ws_moveit/src/rviz_visual_tools
Cloning into '/home/fadhildz/ws_moveit/src/rviz_visual_tools'...
remote: Enumerating objects: 2809, done.
remote: Counting objects: 100% (421/421), done.
remote: Compressing objects: 100% (207/207), done.
remote: Total 2809 (delta 269), reused 325 (delta 196), pack-reused 2388 (from 1)
Receiving objects: 100% (2809/2809), 3.88 MiB | 3.90 MiB/s, done.
Resolving deltas: 100% (1706/1706), done.
[rviz_visual_tools] Done.
[srdfdom] Fetching https://github.com/moveit/srdfdom (version noetic-devel) to /home/fadhildz/ws_moveit/src/srdfdom
Cloning into '/home/fadhildz/ws_moveit/src/srdfdom'...
remote: Enumerating objects: 1041, done.
remote: Counting objects: 100% (186/186), done.
remote: Compressing objects: 100% (71/71), done.
remote: Total 1041 (delta 158), reused 115 (delta 115), pack-reused 855 (from 1)
Receiving objects: 100% (1041/1041), 240.68 KiB | 2.93 MiB/s, done.
Resolving deltas: 100% (550/550), done.
[srdfdom] Done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/moveit_tutorials.git -b master
Cloning into 'moveit_tutorials'...
remote: Enumerating objects: 5170, done.
remote: Counting objects: 100% (412/412), done.
remote: Compressing objects: 100% (258/258), done.
remote: Total 5170 (delta 208), reused 318 (delta 149), pack-reused 4758 (from 1)
Receiving objects: 100% (5170/5170), 76.00 MiB | 6.56 MiB/s, done.
Resolving deltas: 100% (2990/2990), done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/panda_moveit_config.git -b noetic-devel
fatal: destination path 'panda_moveit_config' already exists and is not an empty directory.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ rosdep install -y --from-paths . --ignore-src --rosdistro noetic
#All required rosdeps installed successfully
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ sudo sh -c 'echo "deb http://packages.ros.org/ros-testing/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$
```

14. `sudo apt update` untuk memperbarui daftar repositori setelah menambah repositori ROS-testing.

```
fadhildz@DESKTOP-INTGFNL: ~$ sudo apt update
```

```
remote: Counting objects: 100% (421/412), done.
remote: Compressing objects: 100% (207/207), done.
remote: Total 2809 (delta 269), reused 325 (delta 196), pack-reused 2388 (from 1)
Receiving objects: 100% (2809/2809), 3.88 MiB | 3.90 MiB/s, done.
Resolving deltas: 100% (1706/1706), done.
[rviz_visual_tools] Done.
[srdfdom] Fetching https://github.com/moveit/srdfdom (version noetic-devel) to /home/fadhildz/ws_moveit/src/srdfdom
Cloning into '/home/fadhildz/ws_moveit/src/srdfdom'...
remote: Enumerating objects: 1041, done.
remote: Counting objects: 100% (186/186), done.
remote: Compressing objects: 100% (71/71), done.
remote: Total 1041 (delta 158), reused 115 (delta 115), pack-reused 855 (from 1)
Receiving objects: 100% (1041/1041), 240.68 KiB | 2.93 MiB/s, done.
Resolving deltas: 100% (550/550), done.
[srdfdom] Done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/moveit_tutorials.git -b master
Cloning into 'moveit_tutorials'...
remote: Enumerating objects: 5170, done.
remote: Counting objects: 100% (412/412), done.
remote: Compressing objects: 100% (258/258), done.
remote: Total 5170 (delta 208), reused 318 (delta 149), pack-reused 4758 (from 1)
Receiving objects: 100% (5170/5170), 76.00 MiB | 6.56 MiB/s, done.
Resolving deltas: 100% (2990/2990), done.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ git clone https://github.com/moveit/panda_moveit_config.git -b noetic-devel
fatal: destination path 'panda_moveit_config' already exists and is not an empty directory.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ rosdep install -y --from-paths . --ignore-src --rosdistro noetic
#All required rosdeps installed successfully
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ sudo sh -c 'echo "deb http://packages.ros.org/ros-testing/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$ sudo apt update
Hit:1 http://packages.ros.org/ros-testing/ubuntu focal InRelease
Hit:2 http://archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://security.ubuntu.com/ubuntu focal-security InRelease
Get:4 http://archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Hit:5 http://archive.ubuntu.com/ubuntu focal-backports InRelease
Fetched 128 kB in 2s (66.1 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
fadhildz@DESKTOP-INTGFNL:~/ws_moveit/src$
```

15. **cd ~/ws\_moveit** untuk masuk ke workspace utama, dan **catkin config --extend /opt/ros/\${ROS\_DISTRO} --cmake-args -DCMAKE\_BUILD\_TYPE=Release** untuk memperluas dari ROS Noetic.

```
fadhildz@DESKTOP-IMTGFNL: ~/ws_moveit/src$ sudo apt update
Hit:1 http://packages.ros.org/ros-testing/ubuntu focal InRelease
Hit:2 http://archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://security.ubuntu.com/ubuntu focal-security InRelease
Get:4 http://archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Hit:5 http://archive.ubuntu.com/ubuntu focal-backports InRelease
Fetched 128 kB in 2s (66.1 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ cd ~/ws_moveit
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit$ catkin config --extend /opt/ros/${ROS_DISTRO} --cmake-args -DCMAKE_BUILD_TYPE=Release

Profile: default
Extending: [explicit] /opt/ros/noetic
Workspace: /home/fadhildz/ws_moveit

Build Space: [missing] /home/fadhildz/ws_moveit/build
Devel Space: [missing] /home/fadhildz/ws_moveit/devel
Install Space: [unused] /home/fadhildz/ws_moveit/install
Log Space: [missing] /home/fadhildz/ws_moveit/logs
Source Space: [exists] /home/fadhildz/ws_moveit/src
DESTDIR: [unused] None

Devel Space Layout: Linked
Install Space Layout: None

Additional CMake Args: -DCMAKE_BUILD_TYPE=Release
Additional Make Args: None
Additional catkin Make Args: None
Internal Make Job Server: True
Cache Job Environments: False

Buildlisted Packages: None
Skiplist Packages: None

Workspace configuration appears valid.

Initialized new catkin workspace in '/home/fadhildz/ws_moveit'
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit$
```

16. **catkin build** untuk membangun workspace Moveit.

```
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit$ catkin build

Profile: default
Extending: [explicit] /opt/ros/noetic
Workspace: /home/fadhildz/ws_moveit

Build Space: [exists] /home/fadhildz/ws_moveit/build
Devel Space: [exists] /home/fadhildz/ws_moveit/devel
Install Space: [unused] /home/fadhildz/ws_moveit/install
Log Space: [exists] /home/fadhildz/ws_moveit/logs
Source Space: [exists] /home/fadhildz/ws_moveit/src
DESTDIR: [unused] None

Devel Space Layout: linked
Install Space Layout: None

Additional CMake Args: -DCMAKE_BUILD_TYPE=Release
Additional Make Args: None
Additional catkin Make Args: None
Internal Make Job Server: True
Cache Job Environments: False

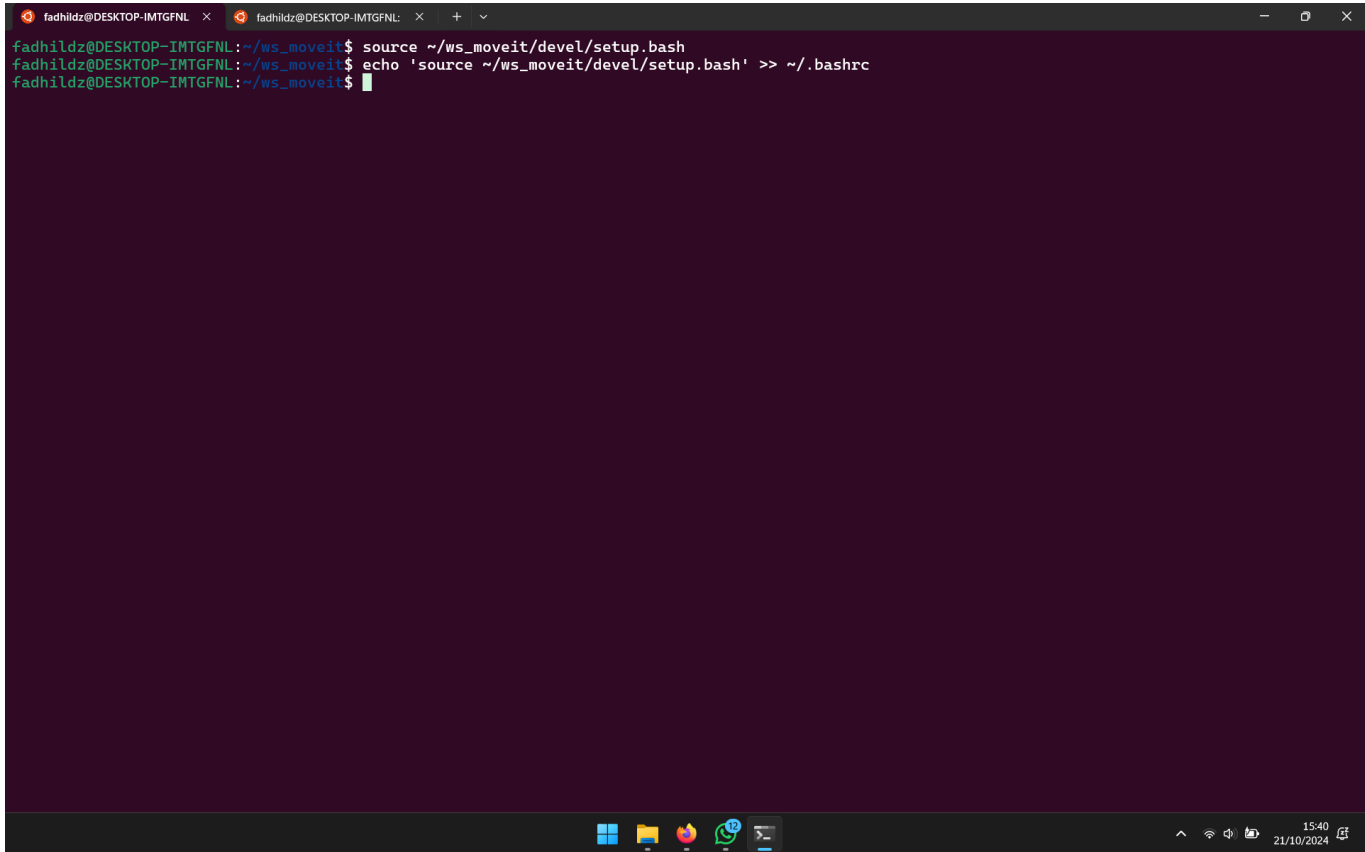
Buildlisted Packages: None
Skiplist Packages: None

Workspace configuration appears valid.

[build] Found 47 packages in 0.0 seconds.
[build] Package table is up to date.
Starting >>> geometric_shapes
Starting >>> moveit_msgs
Starting >>> moveit_resources_fanuc_description
Starting >>> moveit_resources_panda_description
Starting >>> moveit_resources_pr2_description
Starting >>> moveit_resources_prbt_support
Starting >>> rviz_visual_tools
Starting >>> srdfdom
Finished <<< geometric_shapes [ 0.4 seconds ]
Finished <<< moveit_resources_fanuc_description [ 0.3 seconds ]
Finished <<< moveit_resources_panda_description [ 0.3 seconds ]
Starting >>> moveit_resources_dual_panda_moveit_config
Finished <<< moveit_resources_pr2_description [ 0.2 seconds ]
Starting >>> moveit_resources_fanuc_moveit_config
```



17. **source ~/ws\_moveit/devel/setup.bash** untuk memuat workspace ke environment shell, dan **echo 'source ~/ws\_moveit/devel/setup.bash' >> ~/.bashrc** untuk menambahkan perintah pemuatan otomatis saat terminal dibuka.



```
fadhildz@DESKTOP-IMTGFNL: ~/ws_moveit$ source ~/ws_moveit/devel/setup.bash
fadhildz@DESKTOP-IMTGFNL: ~/ws_moveit$ echo 'source ~/ws_moveit/devel/setup.bash' >> ~/.bashrc
fadhildz@DESKTOP-IMTGFNL: ~/ws_moveit$
```

The image shows a Windows terminal window with a dark purple background. The title bar indicates the user is 'fadhildz@DESKTOP-IMTGFNL'. The terminal shows the user navigating to the directory ~/ws\_moveit and running the command 'source ~/ws\_moveit/devel/setup.bash'. The next line shows the user running 'echo 'source ~/ws\_moveit/devel/setup.bash' >> ~/.bashrc', which appends the source command to the .bashrc file. The prompt returns to ~/ws\_moveit\$. The Windows taskbar is visible at the bottom, showing icons for the Start menu, File Explorer, Firefox, and a terminal icon, along with the system clock showing 15:40 on 21/10/2024.